Googong Integrated Water Cycle - Stage C Network East

Statement of Environmental Effects

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Name	Signature	Date
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Contents

Appendices

1 Proposal Description

Table 1-1 Part 3A Concept Conditions of Approval for statutory and planning framework

CoA#	Condition	Response
2.1 (a)	A detailed project description, including the design and location of ancillary infrastructure (including access roads and temporary construction compounds) and its relationship to the approved concept and approved project stages.	Section 1 outlines a detailed description of the proposal and all ancillary facilities including temporary compound sites. Appendix I includes the concept design for the project.

1.1 Introduction

Googong Township Proprietary Limited (GTPL) – a partnership between Canberra Investment Corporation (CIC) and Mirvac – is responsible for the development of the new Googong township that will be located in the Canberra region, around seven kilometres south of Queanbeyan in NSW. The new Googong township will be home to about 16,000 people and developed over the next 25 years.

The township is designed around an integrated water cycle (IWC), with a dedicated Water Recycling Plant (WRP) that will reduce the consumption of potable water in the community to around 60 per cent of a traditional development and recycle the township's water for non-potable use. The Googong township IWC Project is being constructed and operated in stages to ensure the infrastructure is appropriately sized to meet the incremental level of demand as development of the Googong township progresses.

On 24 November 2011, the *Googong Township Water Cycle Project Environmental Assessment* (Manidis Roberts, 2010) was approved by the Minister for Planning under Part 3A (now repealed) of the *Environment Planning and Assessment Act 1979* (EP&A Act). The approval included Concept Approval for the ultimate development (Stage 1 and 2) and the Project Approval for Stage 1 development of the IWC Project.

Stage 1 of the IWC Project is under construction or has commenced operation. The Googong township development is expected to reach capacity of the Stage 1 IWC Project by late 2016, therefore planning for Stage 2 of the IWC Project has commenced.

Stage 2 of the IWC Project will be delivered in two sub stages in order to provide the appropriate IWC infrastructure to accommodate the size and growth of the Googong township. Therefore, Stage C is under development, with Stage D to be developed as demand requires in the future. Stage C has been further divided into three components, to facilitate project planning approvals, these being Stage C Network West (within Queanbeyan local government area (LGA)), Stage C Network East (within Palerang LGA) and Stage C WRP (within Queanbeyan LGA).

This Statement of Environmental Effects (SEE) assesses Googong IWC Stage C Network East. Googong IWC Stage C Network East works are located entirely within the Palerang LGA and include the following scope of work (refer to Figure 1-1).

- Installation of a new underground DN375 potable water pressure main from the existing bulk water pumping station to the boundary with Queanbeyan LGA (where it will connect to potable water pressure main being developed as part of the Googong IWC Stage C Network West works). This main would run parallel to existing DN225 rising main from the bulk water pumping station and be located within the existing access road.
- Installation of an above ground metering station at the boundary between Queanbeyan LGA and Palerang LGA (adjacent to existing metering station).

- Upgrades to the bulk water pumping station (BWPS) would be undertaken within the existing boundary of the BWPS and would include:
  - Installation of a high voltage power conduit from an overhead supply to the BWPS.
  - Installation of BWPS block-work building and associated foundations complete with vehicle access and gantry crane.
  - Upgrades to the pump station, including installing two new pumps, all interconnecting pipes and valves.
  - Installation of a new transformer to replace the existing 100kva pole mounted transformer.
  - Discharge pipework and connection to pressure main.
  - Variable Speed Drive and starters for new pumps, to be located in existing Motor Control Centre building.

The impact boundary for the scope of work for Googong IWC Stage C Network East is represented in Figure 1-1.

1.1.1 Purpose of the report

This SEE has been prepared by RPS on behalf of GTPL who are acting as the proponent for the proposal on behalf of Queanbeyan City Council (QCC). This proposal is subject to assessment under Part 4 of the EP&A Act with Palerang Shire Council (PSC) as the consent authority. Therefore this SEE has been prepared as part of this Part 4 Development Application, in addition to the Detailed Designs and Construction Report to be considered by PSC.

The purpose of this SEE is to describe the proposal, assess the likely impacts of the proposal on the environment, and to identify measures to mitigate these impacts.

This SEE has been prepared within the context of Section 79C(1) of the EP&A Act 'Matters for Consideration' for a consent authority in determining a development application. Refer to Appendix A.

In addition, this SEE has taken into account the environmental assessment requirements for future stages of the IWC Project that were included in the Part 3A Concept Approval for the Project. These requirements are provided in Schedule 2 of the Concept Approval and are reproduced in Appendix B of this SEE, with a reference to the section of the SEE where each requirement is addressed. Where relevant, each section of this SEE starts with an excerpt from Schedule 2 of the Concept Approval which lists the specific requirements relevant to each section and summarises where the response to the requirement is located.

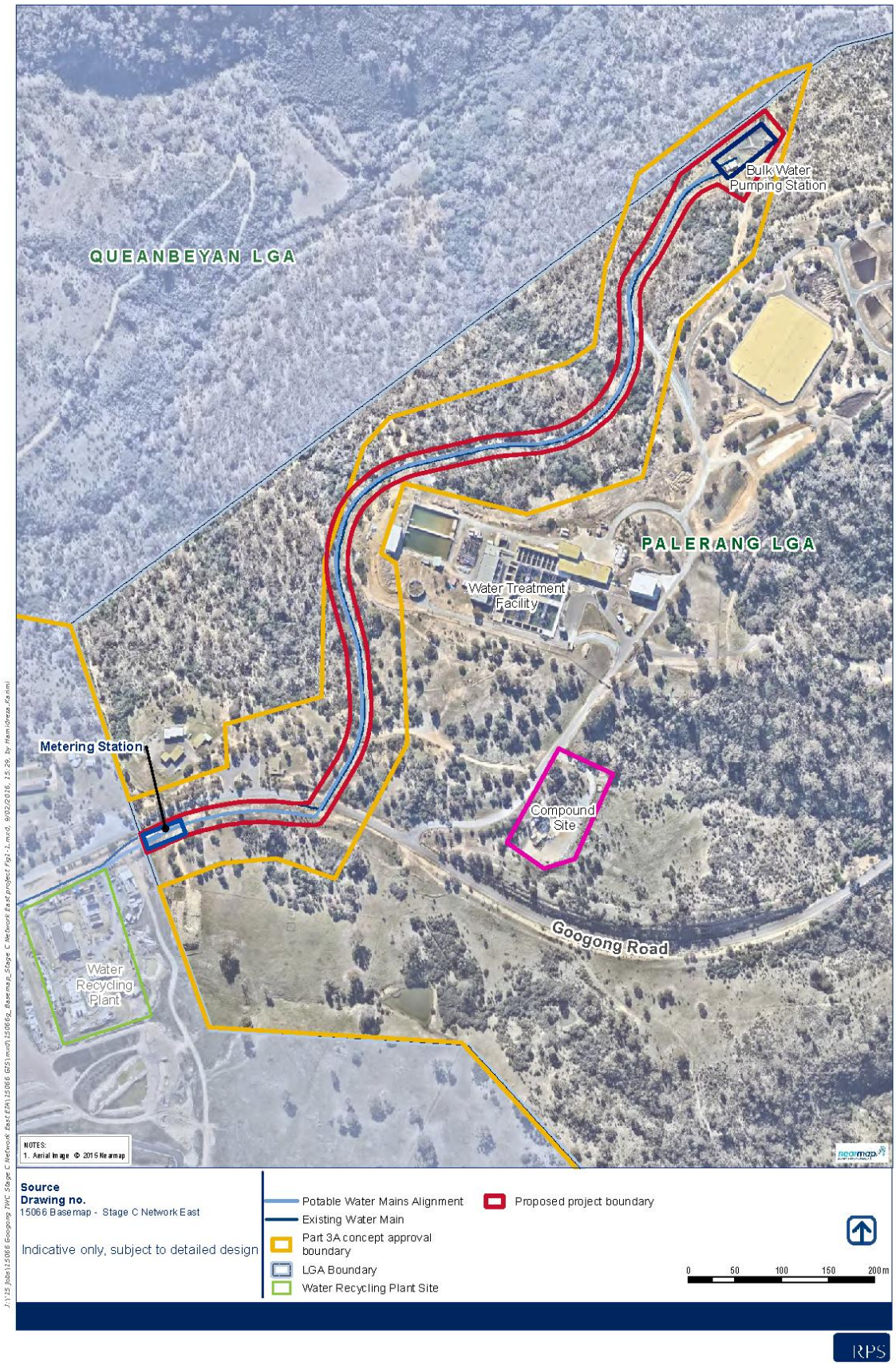

Figure 1-1 Googong IWC Stage C Network East scope of works (the proposal)

1.2 Background

Googong is a new, master-planned township in the Canberra region within NSW, located about seven kilometres south of the Queanbeyan CBD and about 16 kilometres from the Australian Parliament House. On 24 December 2009 the NSW government re-zoned the area to provide for the Googong township. The township is to be built on 780 hectares of former grazing land and will include a town centre and four neighbourhood centres located in five walkable neighbourhoods. As a complete self-contained township, in addition to housing, Googong will provide community facilities, shops, schools, recreational and employment facilities.

GTPL is responsible for the development of the new Googong township. The new Googong township will include about 5,500 new homes, which will be home to about 16,000 people and will be developed over 25 years. The township is designed around the IWC system, with a dedicated WRP that will reduce the consumption of potable water in the community to around 60 per cent of a traditional development and recycle the township's water for non-potable use.

On 24 November 2011, the *Googong Township Water Cycle Project Environmental Assessment* (Manidis Roberts, 2010) was approved by the Minister for Planning under Part 3A (now repealed) of the EP&A Act. The approval included Concept Approval for the ultimate development (Stages 1 and 2) and the Project Approval for Stage 1 development of the IWC Project. The IWC Project is being constructed and operated in stages to ensure the infrastructure is correctly sized to meet the incremental level of demand.

1.2.1 IWC Project – Concept Approval

The Concept Plan Approval for the IWC Project provided for the potable water, recycled water and sewage system required to service the anticipated population of the Googong township at the ultimate development. This included (also refer to Figure 1-2):

- Potable water system – a new BWPS located adjacent to the existing Googong water treatment plant to transfer flows from the existing Icon Water supply system to new potable water reservoirs via a new rising main. Potable water distribution mains provided to transfer flows from the potable water reservoirs to the township's water reticulation system. A potable water main to allow the recycled water system to be topped up when demand is high. This infrastructure is located within the Palerang LGA.
- Sewerage system - sewage to be collected from the Googong township and transferred to the WRP using the sewage mains. In some sections it would be pumped and in other sections it would flow by gravity. The sewerage system includes a series of sewage pumping stations to transfer the flow to the WRP.
- WRP - a new WRP to treat sewage from the Googong township to a standard suitable for non-potable urban re-use and discharge to the environment. The plant utilises physical removal, biological and chemical treatment and disinfection to meet these standards, and membrane bioreactor technology at the core of the treatment process. Treated effluent from the plant would primarily be used for the recycled water system. When recycled water availability exceeds demand, excess water would be discharged into the stormwater management system.

- Recycled water system – recycled (non-potable) water produced by the WRP would be pumped to reservoirs. Flow from these reservoirs would then be transferred to the recycled water reticulation system through distribution mains and be used as necessary within the Googong township for non-potable household uses such as toilet flushing and garden watering, as well as for open space irrigation. This would reduce potable water demand by an estimated 60 per cent. Rainwater would also be collected throughout the new township for non-potable uses in houses and commercial facilities. To maintain supply of non-potable water during times of high demand, the potable water system would be used to top up the recycled water system.

1.2.2 IWC Project - Stage 1 Project Approval

In addition to approving the overall Concept Plan, the Part 3A approval included a Project Approval for Stage 1 of the IWC Project. Stage 1 involves the infrastructure required to service the initial stage of the Googong township, with an equivalent population (EP) of 3,600.

Stage 1 of the IWC Project includes (refer to Figure 1-3):

- Stages A and B of the WRP.
- The establishment of an interim reservoir site at Hill 765 for recycled and potable water reservoirs.
- Pumping stations for sewage, recycled water and potable water:
  - Sewage Pumping Stations (SPSs) – SPS1 is located in the northern part of the township adjacent to Googong Road and SPS2 is located within the eastern part of the township. The SPSs collect flows from the initial development and are sized with a capacity to collect flows from all future stages of the Googong township.
  - The BWPS – located within the north of the site adjacent to the existing Icon Water Googong Water Treatment Plant.
  - The recycled water pumping station – located within the WRP site.
- Rising and distribution mains for recycled water and potable water and collection mains for sewage to connect to the initial development area.

Stage 1 of the IWC Project has been delivered in sub-stages (Stages A and B) to allow the staged development of the project in line with the staged development of the township. The various components of Stage 1 are either under construction (i.e. the WRP) or have commenced servicing the township (i.e. the BWPS, the SPSs and the interim reservoirs).

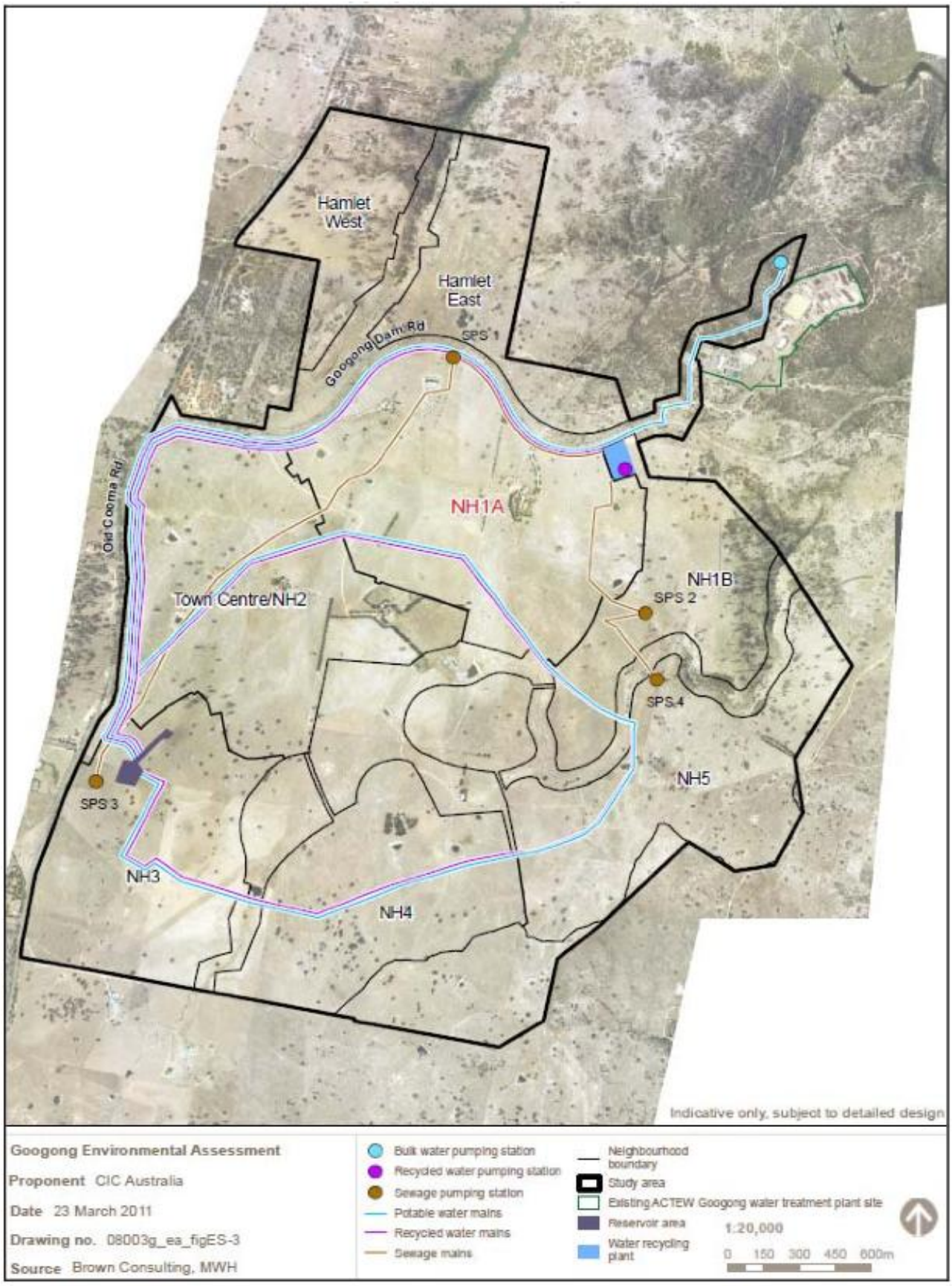

Figure 1-2 Googong IWC Concept Plan as approved under Part 3A Concept Approval

(Source: Googong Township Water Cycle Project Submissions Report, Manidis Roberts 2010)

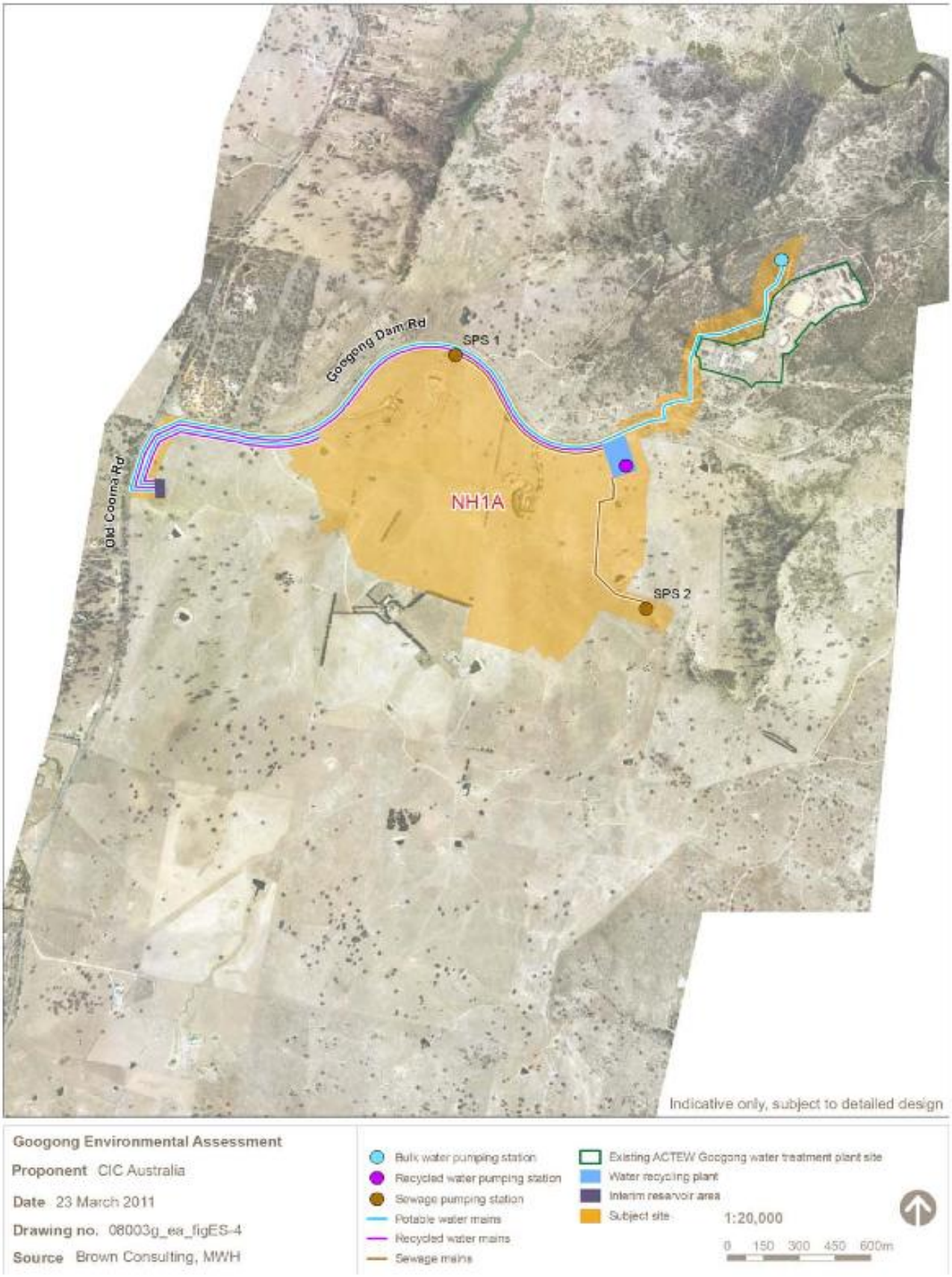

Figure 1-3 Googong IWC Stage 1 Project as approved under Part 3A Stage 1 Project Approval

(Source: Googong Township Water Cycle Project Submissions Report, Manidis Roberts 2010)

1.2.3 Future Stages of IWC Project

Works will continue to progress on Stage 1 (Stages A and B) at the WRP. Future works at this stage will include seeking a modification to the current approval to increase the operation capacity of the WRP from an equivalent population (EP) of 3,600 to an EP of 4,700. The existing infrastructure is capable of processing the increases capacity, however the current approval only permits the WRP to operate at an EP of 3,600. This modification would be undertaken as a separate assessment and has not yet been commenced.

A concept design of Stage 2 of the IWC Project was outlined in the Environmental Assessment (Manidis Roberts, 2010). As described in this document, the timing for these stages was to be determined by the servicing requirements of the developing township. Based on the current growth of the Googong township, GTPL estimates that the township will reach the capacity of some components of Stage 1 of the IWC Project (about 1,200 dwellings) by late 2016. Therefore, additional capacity under Stage 2 of the IWC Project will be required at that time. Stage 2 of the IWC Project will be delivered in two sub-stages to meet the requirements of the developing township. These stages are:

- Stage C – Increasing the capacity of the IWC Project to 9,600 EP. This would include construction of the initial stages of the permanent reservoir facilities and associated mains and pumps, increases in capacity of the WRP, upgrades to the BWPS and associated mains and pumps.
- Stage D – All final works to bring the IWC Project to full capacity.

Planning for Stage C is underway in order to ensure delivery to meet the requirements of the developing township. prior to the end of 2016. Stage C is to be delivered in three separate components:

- Googong IWC Stage C Network West - all network elements within Queanbeyan LGA.
- Googong IWC Stage C Network East - all network elements within the Googong Foreshores area (Commonwealth land), within Palerang LGA.
- Googong IWC Stage C WRP – within Queanbeyan LGA (this is currently planned to be delivered in 2017).

This SEE assesses Googong IWC Stage C Network East including construction and operation impacts. A separate assessment for the Googong IWC Stage C Network West is currently being prepared with QCC the determining authority under Part 5 of the EP&A Act and the Googong IWC Stage C WRP assessment will be prepared in the future when required.

1.3 Detailed proposal description

All of the proposal works outlined below are within Palerang LGA.

1.3.1 Upgrade to the Bulk Water Pumping Station

The existing BWPS was built as part of the Googong IWC Stage AB works under the Part 3A Planning Approvals in 2013/14. It is currently operational, supplying potable water to the Googong township and the WRP as required. Upgrades to the existing BWPS are required to increase capacity of the facility to supply potable water to the township. These upgrades to the BWPS would be undertaken within the existing boundary of the BWPS and would include (refer to Appendix I for design drawings of the proposal):

- Installation of a high voltage power conduit from an overhead supply to the BWPS.
- Installation of BWPS block-work building and associated foundations complete with vehicle access and gantry crane. This will include a new building (including concrete foundations) about 12 metres by 8 metres connecting to the northern side of the existing building.

- Upgrades to the pump station, including installing two new pumps, all interconnecting pipes and valves.
- Installation of a new transformer to replace the existing 100kva pole mounted transformer.
- Discharge pipework and connection to pressure main.
- Variable Speed Drive and starters for pumps, to be located in existing Motor Control Centre building.

1.3.2 Upgrades to the Potable Water Mains

A new underground DN375 potable pressure main will be installed from the existing BWPS to the boundary with Queanbeyan LGA (where it will connect to a potable pressure main being developed as part of the Googong IWC Stage C Network West works). This main would run parallel to existing DN225 rising main from the bulk water pumping station and the existing access road.

These upgrades will also include the installation of an above ground metering station at the boundary between Queanbeyan LGA and Palerang LGA (adjacent to existing metering station). It would be established on a concrete foundation of about one metre by one metre and would stand about 1.5 metres tall.

1.4 Construction activities

1.4.1 Works at the Bulk Water Pumping Station

The BWPS would remain operational throughout the construction period and upgrades to the BWPS as part of the Stage C Network East works. The contractor would prepare a construction methodology prior to commencement of works which would outline steps to ensure that there are no impacts to the ongoing operation of the station.

Pre-construction

- All relevant approvals, licenses and permits will be obtained prior to commencement of works.
- All relevant management plans will be prepared prior to commencement of works.
- Environmental controls will be implemented prior to commencement of works.

BWPS upgrade construction

- Identify the location of all existing utilities, pipes and foundations.
- Excavation of underground pipelines and utility works.
- Installation of all under-ground utilities.
- Formation of building foundations and pouring of concrete foundations.
- Construction of new pumping station building.
- Installation of new pump facilities within the building.
- Connection all pipe works and utilities.
- Restoration of exposed areas.
- Site cleanup.

1.4.2 Works for the Potable Water Mains

Pre-construction

- All relevant approvals. licenses and permits will be obtained prior to commencement of works.
- All relevant management plans will be prepared prior to commencement of works.
- Environmental controls will be implemented prior to commencement of works.

Material Storage

- Material storage areas will be established. Locations will not interfere with normal usage of access roads, other designated areas of the site or on overland flow paths. Consideration will be given for other storage locations for pipework, pipe bedding and backfill material, and excavated spoil.
- Fencing and environmental controls will be provided to all storage areas as required.

Pipeline Construction

- The location of existing water main and other services will be confirmed.
- Lines and levels for the new 375 millimetres diameter pipeline will be set out.
- Open trench lengths will be limited to a length which can be restored within four hours as noted in Emergency Restoration below. The recommended length is in the order of 30 metres.
- In fill areas, trenches will be excavated using an excavator with bucket. Care will be taken to minimise trench over break. Excavation equipment will be positioned to not impart loading from tracks over the existing main.
- In rock, trenches will be excavated using rock cutting or grinding techniques that minimise vibration. Examples of suitable techniques include chain trenching, rock sawing or rock grinding. Excavation equipment will be positioned to not impart loading from tracks over the existing main.
- Blasting will not be undertaken during construction.
- Excavated spoil shall be removed and disposed of to spoil locations.
- For trenches greater than 1.5 metres depth, written geotechnical advice will be obtained regarding suitable trench support. Suitable supports may include shoring.
- Pipework will be bedded and laid in accordance with Icon Water standards. Bedding and pipeline materials will be brought from storage areas as required. Material will not be stored in a location that may block access roads.
- Pipework will be backfilled with general fill or granular material in accordance with Icon Water standard drawings. Backfill material will be brought from storage areas as required.
- Other elements of the pipeline will be constructed progressively with main installation including thrust blocks, scour valves, air valves and revenue meter pit.

Surface Restoration

- For existing sealed roads, pavements will be reconstructed to match existing pavement including asphalt or seal surface as specified on the drawings and specification.
- For existing unsealed roads, pavements will be reconstructed to match existing with suitable road base as specified on the drawings and specification.

Emergency Restoration

In the event of an emergency, the following restoration activities will be undertaken:

- Disturbed roadways will be reinstated to a suitable surface within four hours of notification.
- Existing excavation works will cease and any exposed ends of pipework capped.
- Trench excavation will be backfilled to surface levels with excavated material, or material from storage. Backfilled material will be compacted to provide a solid, even travelling surface.
- Surplus materials will be removed from the access road. In emergency situations, stockpiling adjacent to the access road will be acceptable if access, work health and safety and existing vegetation is not compromised.
- Upon receipt of approval to recommence works, backfilled material will be excavated, and pipeline construction recommenced.

1.4.3 Construction timing and duration

The construction program would be determined by the project contractor prior to the start of works. It is expected to start in early 2016 and is estimated to take about six months to complete. Works would be undertaken in stages to ensure minimal impacts on access to and the ongoing operation of the BWPS.

To minimise the risk of access to the BWPS not being available, the section of the potable water main between the BWPS and the link access road to the Googong Water Treatment Plant will be constructed first. Following the construction of this section of the main, access to the BWPS for construction and operation will be available via the link road while construction of the other sections of the main is completed.

1.4.4 Compound site

The location of the compound site would be determined by the contractor prior to the start of construction. However, an indicative compound site has been identified along the access road to the Googong Water Treatment Plant off Googong Dam Road (as shown on Figure 1-1).

The proposed compound site is an existing cleared hardstand area that has previously been for construction activities. It has two entry points located about 135 metres and 190 metres north of the intersection with the Googong Dam Road. The site is about 2,300 metres square.

No vegetation would be cleared for the proposed compound site and the site would be fenced for security purposes prior to the start of construction.

1.4.5 Construction access points

There are currently two access points into the BWPS as shown in Figure 1-4. Both access roads are located north off Googong Dam Road. The access roads include:

- The access road to the Googong Water Treatment Plant.

  This primarily provides access from Googong Dam Road and the Googong Water Treatment Plant. However, there is secondary access from the Water Treatment Plant up to the BWPS.

- The access road to the BWPS.

  This road provides access between Googong Dam Road and the existing BWPS. The proposal would include locating the main within this road and would therefore require the closure of the road for construction activities.

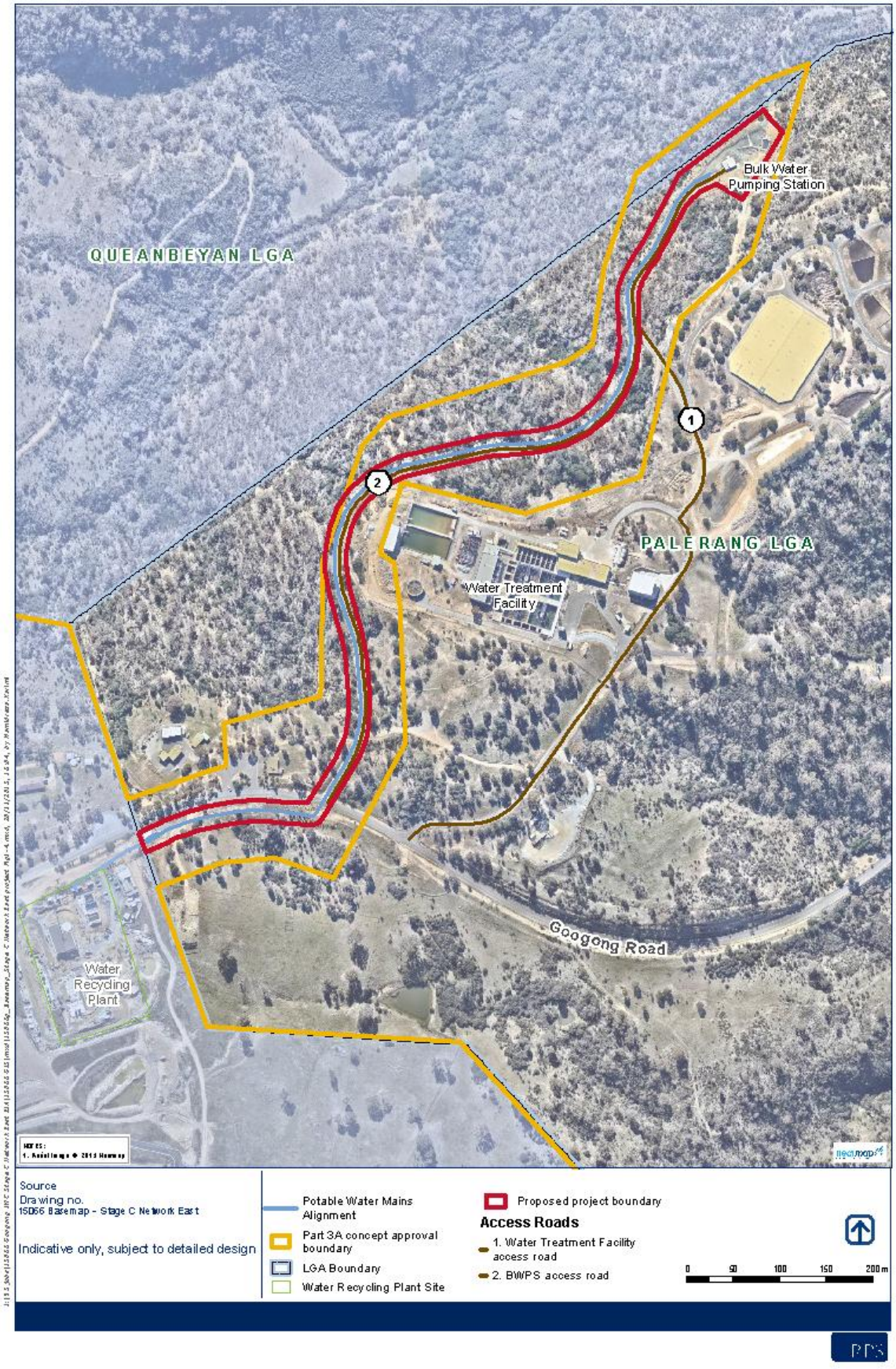

Figure 1-4 Access roads to the proposal area

1.5 Operational activities

The BWPS will enable the transfer of potable water from the existing Icon Water potable water supply system to the interim (short-term) or permanent (long-term) potable water reservoirs via the rising main. It will continue to be operated and maintained by Icon Water.

The pumps at the BWPS will be fully automated and controlled by telemetry, triggered by reservoir levels i.e. the reservoirs will fill based on demand from the township. They will be operated 24 hours, seven days a week. The telemetry will be capable of monitoring and controlling associated equipment, including operational alarms. In the event of a power failure, the BWPS will have ability for an emergency generator to be connected of sufficient capacity to complete operation.

2 Strategic need

The Googong township is a new urban development located in the Canberra region, around seven kilometres south of Queanbeyan in NSW. The new Googong township will be home to about 16,000 people and developed over the next 25 years.

The township is designed around an IWC, with a dedicated WRP that will reduce the consumption of potable water in the community to around 60 per cent of a traditional development and recycle the township's water for non-potable use.

The Googong IWC Stage C Network East proposal is required as part of the overall Googong IWC infrastructure to provide the Googong township with a serviceable sewage treatment and recycled water system. Stage 1 of the project involves the infrastructure required to service the initial stage of the Googong township, with an EP of 3,600. It is estimated that, due to the current growth rate of the development, the Googong township will reach this capacity by late 2016. Therefore this proposal is required to establish the necessary infrastructure to upgrade the WRP to a stage that will accommodate the increase in population of up to 9,600 EP.

2.1 Proposal objectives

Section 2.5 of the *Googong Township Water Cycle Project Environmental Assessment* (Manidis Roberts, 2010) identifies the general and specific objectives for the IWC Project.

The general project objectives are:

- Delivery of essential water and wastewater services to the Googong township community.
  - Ensure that the supply of water, recycled water and wastewater services meets the demand profile of the Googong township community.
  - Ensure that all potential human health impacts from provision of water and wastewater services are mitigated.
- To achieve best practice water conservation outcomes relative to other regional urban developments.
- Ecologically sustainable development, including:
  - Minimise impacts on the environment from wastewater discharge.
  - Minimise impacts on the environment from construction activities.
  - Minimise impacts on the environment from location and operation of plant and machinery.

The key objectives of the IWC Project are:

- Provide an IWC system for the Googong township that reduces potable water consumption to at least 60 per cent, when compared with traditional developments.
- Treat all waste water from the Googong township and produce high quality recycled water suitable for irrigation, household use and discharge to the environment.
- Ensure that construction and operation environmental and human health risks are adequately managed during construction and operation.
- Protect the Googong Dam and Foreshores area.
- Gain endorsement from relevant stakeholders.
- Construction and operate an economically feasible water cycle system.

GTPL proposes to continue to adopt the above objectives for Googong IWC Stage C Network East.

2.2 Strategic need for the proposal

The Concept Approval for the Googong township IWC Project considered the strategic need for the ultimate project in order to provide sustainable water supply to the planned township. Section 2.1 of the *Googong Township Water Cycle Project Environmental Assessment* (Manidis Roberts, 2010) outlined the strategic need for the IWC Project. It identified that the Project is consistent with the following strategic planning documentation:

- The Sydney – Canberra Regional Strategy 2006 - 2031 (DoP, 2008).
- Queanbeyan Residential and Economic Strategy 2013.
- Memorandum of Understanding on ACT and NSW Cross Border Water Resources (between the Commonwealth, NSW and ACT governments, 2006).
- The Memorandum of Understanding on ACT and NSW Cross Border Region Settlement (between the NSW and ACT governments, 2006).
- General regional water security planning.
- Queanbeyan Local Environmental Plan (Googong) 2009 (this plan was subsequently repealed, and incorporated into the Queanbeyan Local Environmental Plan 2012).

Therefore the strategic need for the ultimate proposal has previously been justified and approved.

The proposed Googong IWC Stage C Network East works are therefore considered to be justified as they are consistent with and a critical component of the IWC Project covered by the Part 3A Concept Approval.

2.3 Options considered

Chapter 4 of the *Googong Township Water Cycle Project Environmental Assessment* (Manidis Roberts, 2010) considered:

- The alternative water and wastewater systems that were considered for the Googong township.
- Why a self-contained IWC is the only feasible alternative, when considered against the project objectives.
- The environmental costs and benefits of an IWC system versus a traditional system, highlighting superior environmental outcomes achieved by an integrated system incorporating the use of recycled effluent.
- The IWC scenarios that were assessed and identified the preferred scenario.
- The options assessed for the key elements of the system, including alternative wastewater treatment processes, excess recycled water discharge management and service water reservoirs.

The proposed Googong IWC Stage C Network East is generally consistent with the Concept Approval for the Googong township IWC Project. Therefore the options for the proposed works have already been addressed, and approved as part of the Part 3A Concept Approval and have not been repeated here.

3 Statutory and planning framework

3.1 Part 3A Concept Approval requirements

Table 3-1 outlines the relevant Conditions of Approval that apply to this section of the environmental impact assessment.

Table 3-1 Part 3A Concept Conditions of Approval for statutory and planning framework

CoA#	Condition	Response
2.1 (b)	An assessment of relevant statutory matters including land zoning, permissibility and consistency with the objects of the EP&A Act.	An assessment of relevant statutory matters including land zoning and permissibility is outlined in Section 3 of the SEE. Consistency of the proposal with the objects of the EP&A Act are outlined in Section 6.1 of the SEE.
2.1 (c)	A demonstration that the project is consistent with the requirements of this Concept Plan approval and generally consistent with the scope and intent of the Concept Plan and environmental impacts outlined in the documents under condition 1.1 of this approval.	A demonstration that the proposal is consistent with the Concept Plan approval is outlined in Section 1 of the SEE. Consideration of the environmental impacts of the proposal are outlined in Section 5 of this SEE.
2.1 (j)	The environmental assessment of the project must take into account relevant State Government guidelines, policies and plans	This section outlines how the proposed works have taken into account relevant NSW legislation

3.2 Environmental Planning and Assessment Act 1979

3.2.1 Section 75(1)(b) - Part 3A Concept Approval

On 24 November 2011, the *Googong Township Water Cycle Project Environmental Assessment* (Manidis Roberts, 2010) was approved by the Minister for Planning under Part 3A (now repealed) of the EP&A Act. The approval included Concept Approval for the ultimate development (Stage 1 and 2) and the Project Approval for Stage 1 development of the Googong township IWC Project. Individual Conditions for Approval (CoAs) were included for both the Stage 1 Project Approvals and the overall Concept Approval.

The *Environmental Planning and Assessment Amendment (Part 3A Repeal) Act 2011* (Part 3A Repeal Act) commenced 1 October 2011. Under the Part 3A Repeal Act, projects deemed to be 'transitional Part 3A projects' will continue to be subject to Part 3A of the EP&A Act (as in force immediately before the repeal and as modified by the Part 3A Repeal Act).

Transitional Part 3A projects include certain projects that were the subject of an existing approval under Part 3A. As the IWC Project Concept Approval was issued under Part 3A, it is considered to be a transitional Part 3A project. The provisions of Part 3A (as in force immediately prior to its repeal) continue to be applicable.

In issuing the Part 3A approval, under Section 75O of the EP&A Act the Minister for Planning determined that further assessment would be required for projects developed under Stage 2 of the Concept Plan in accordance with the EP&A Act. It identified that under Section 75P(2)(C):

(i) where development is subject to Part 4 of the EP&A Act, that development is subject to the further environmental assessment requirements specified in Schedule 2 of this approval.

(ii) where development is subject to Part 5 of the EP&A Act, that development is subject to the further environmental assessment requirements specified in Schedule 3 of this approval.

The requirements outlined in Schedule 2 have been addressed as part of this assessment and are reproduced in Appendix B of this SEE, with a reference to the section of the SEE where each requirement is addressed. Where relevant, each section of this SEE starts with an excerpt from Schedule 2 of the Concept Approval which lists the specific requirements relevant to each section and summarises the response can be found within the document.

3.2.2 Section 79C(1) – Matters for consideration

Under the provisions of Section 79C(1) of the EP&A Act, in determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development subject of the development application.

(a) the provisions of:

(i) any environmental planning instrument

(ii) any draft environmental planning instrument that is or had been placed on public exhibition and details of which have been notified to the consent authority, and

(iii) any development control plan

(iiia) any planning agreement that has been entered into under Section 93F, or any draft planning agreement that a developer has offered to enter into under Section 93F, and

(iv) any matters prescribed by the regulations that applied to the land to which the development relates

(v) any coastal zone management plan (with the meaning of the Coastal Protection Act 1979)

(b) the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts on the locality

(c) the suitability of the site for the development

(d) any submissions made in accordance with this Act or the regulations

(e) the public interest.

Consideration of each of these aspects of Section 79C(1) is demonstrated in Appendix A.

In summary, the assessment of the environmental effects of the proposed development has demonstrated that the proposal will not result in adverse impacts and is a suitable land use activity.

3.2.3 State environmental planning policies

The *State Environmental Planning Policy (Infrastructure) 2007* (ISEPP) aims to facilitate the effective delivery of infrastructure across the State.

Clause 125(1) of ISEPP permits development on any land for the purposes of a water reticulation system to be carried out by or on behalf of a public authority without consent. Clause 124 of ISEPP defines a water reticulation system as a facility for the transport of water, including pipes, tunnels, canals, bores, pumping stations, related electricity infrastructure, dosing facilities and water supply reservoirs.

The proposal meets the definition of water reticulation system and the works are being carried out by GTPL on behalf of QCC. However, as all proposed works are within the Palerang LGA, it was not considered appropriate for QCC to act as the determining authority for the proposal. Therefore development consent from PSC is required under Part 4 of the EP&A Act and the ISEPP has not been applied to the proposal.

The proposal does not affect land or development regulated by the *State Environmental Planning Policy No.14 – Coastal Wetlands*, *State Environmental Planning Policy No. 26 – Littoral Rainforests* or *State Environmental Planning Policy (State and Regional Development) 2011*.

3.3 Palerang Local Environment Plan 2014

The proposal is located within the Palerang LGA. Development within this LGA is governed by the *Palerang Local Environment Plan (LEP) 2014*. The proposal area is located within an area zone as SP2 – Water Supply System. The objectives of this zone classification is to:

- Provide for infrastructure and related uses.
- Prevent development that is not compatible with or that may detract from the provision of infrastructure.

Under this zoning classification no development is permitted without consent. The types of development that are permitted with consent include community facilities, road or infrastructure for the purposes of a water supply system. As the proposed works are for the purpose of supplying water to the Googong township, the proposal is permitted within this zoning with consent from PSC.

The proposal area is not located within land identified under the LEP as:

- Drinking Water Catchment.
- Potential for salinity.
- Erodible lands.

However, the proposal area is located within areas of land identified under the LEP as 'Slopes over 18 degrees' and 'Terrestrial Biodiversity Area'.

Slopes over 18 degrees

The objective is to provide for the appropriate management of land that has a slope of over 18 degrees.

In deciding whether to grant development consent for the proposal, PSC must consider:

(a) whether the proposal is likely to have an impact on surrounding vegetation, the movement of water and soil erosion, and

(b) any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.

The impacts of the proposal on soils and landscapes has been considered further in Section 5.4. However, given the small scale of works and that the proposal is located within an area that has previously been disturbed the impacts on slopes over 18 degrees is expected to minimal. In addition, a number of management measures have been identified in Section 5.4 to manage any risks to the local environment.

Terrestrial biodiversity area

The objective is to maintain terrestrial biodiversity by:

(a) protecting native fauna and flora, and

(b) protecting the ecological processes necessary for their continued existence, and

(c) encouraging the conservation and recovery of native fauna and flora and their habitats.

In deciding whether to grant development consent for the proposal, PSC must consider if the proposal is likely to have:

- an adverse impact on the condition, ecological value and significance of the fauna and flora on the land,
- any adverse impact on the importance of the vegetation on the land to the habitat and survival of native fauna, and
- any potential to fragment, disturb or diminish the biodiversity structure, function and composition of the land, and
- any adverse impact on the habitat elements providing connectivity on the land, and
- any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.

The impacts of the proposal on terrestrial biodiversity has been considered further in Section 5.2. However, given the small scale of works and that the proposal is located within an area that has previously been disturbed the impacts on terrestrial biodiversity is expected to minimal. In addition, a number of management measures have been identified in Section 5.2 to manage any risks to the local environment.

3.4 Other relevant NSW legislation

3.4.1 Canberra Water Supply (Googong Dam) Act 1974

The *Canberra Water Supply (Googong Dam) Act* (Googong Dam Act) was established in 1974 to provide 'an Act relating to the Construction of a Dam on the Queanbeyan River in New South Wales and the Supply of Water from that Dam for use in the ACT, and for purposes connected therewith'.

The *Googong Township Water Cycle Project Environmental Assessment* (Manidis Roberts, 2010) considered the Googong Dam Act as part of its assessment due to the project area being located within land identified under the Googong Dam Act as the Googong Dam Area (GDA) and includes the use of the existing Googong Water Treatment Plant site also within the GDA. The purpose of the Googong Dam Act is to account for the management of this land and the water resource within it.

The Environmental Assessment identified that the proposed project use of the water treatment plant site and associated corridor for connecting pipes are considered to be in line with the purpose and intent of the Googong Dam Act.

None of the proposal area is located within Googong Dam surface catchment area.

Section 12(1) of the Act provides that water stored in the Googong Dam Area by means of the works constructed under the Act shall be supplied primarily and principally for use in the Territory. Clause 12(2) provides that Australia may enter into an agreement in writing with the State of NSW for or in relation to the supply, or the conveyance and supply, of water from the Googong Dam Area for use in a place other than the Territory.

An agreement, the Queanbeyan Water Supply Agreement, between the Australian Commonwealth, the State of NSW and the ACT government was signed on 16 September 2008 to provide for the supply of water from the Googong Dam to the Queanbeyan LGA.

As identified in the *Googong Township Water Cycle Project Environmental Assessment* (Manidis Roberts, 2010) the provision of the Googong IWC Project is consistent with this Act. Therefore the proposal is also consistent with this Act as it provides important infrastructure as part of the Googong township water supply.

3.4.2 Googong Dam Catchment Area Act 1975

The *Googong Dam Catchment Area Regulation 2000* was repealed on 31 August 2007, therefore does not apply to this proposal.

3.4.3 Threatened Species Conservation Act 1995

The *Threatened Species Conservation Act 1995* (TSC Act) provides for the protection of threatened or endangered flora and fauna species, populations and ecological communities.

The TSC Act requires that a species impact statement be prepared under Sections 109-113 of the TSC Act (terrestrial species) and/or Sections 221J and 221K of the *Fisheries Management Act* (aquatic species) for a proposed activity that would have a significant effect on:

- Critical habitat of flora and fauna.
- Threatened species, populations or ecological communities or their habitats.

A biodiversity assessment for the proposal has been undertaken and is outlined in Section 5.2 of this SEE. This assessment concluded that no significant impacts are predicted and a species impact statement is not required.

3.4.4 National Parks and Wildlife Act 1974

The proposal is not located on land reserved under the *National Parks and Wildlife Act 1974* (NPW Act).

Part 8A of the NPW Act regulates the undertaking of activities which may impact on threatened species, populations and ecological communities listed under the TSC Act and their habitats. The NPW Act provides that a person must not harm any animal that is a threatened species, population or ecological community, pick any plant which is part of a threatened species, population or ecological community, damage any critical habitat or damage any habitat of a threatened species, population or ecological community without a licence being obtained under the NPW Act or TSC Act or unless another exception applies.

A biodiversity assessment for the proposal has been undertaken and is outlined in Section 5.2 of this SEE. This assessment concluded that there would no impacts to endangered ecological communities, and there are unlikely to be any impacts to any threatened flora or fauna species.

The NPW Act provides protection for Aboriginal objects (material evidence of indigenous occupation) and Aboriginal places (areas of cultural significance to the Aboriginal community) across NSW.

It is an offence to harm Aboriginal objects or places without a permit authorised by the Director-General of the Office of Environment and Heritage (OEH). This permit is issued under Section 90 of the Act to allow the investigation, impact and/or destruction of Aboriginal objects.

An Aboriginal heritage assessment has been prepared for the proposed works and is outlined in Section 5.8 of this SEE. This assessment concluded that no direct harm to Aboriginal object or places is predicted, and a number of management measures have been to minimise potential indirect impacts to Aboriginal heritage items.

3.4.5 Heritage Act 1997

The *Heritage Act 1997* applies to deposits, objects or material evidence within NSW which either relates to the non-Aboriginal settlement of the area that comprises NSW, or items listed as being of State or local heritage significance. Under this Act it is an offence to harm relics protected by Interim Heritage Orders (IHO) or the State Heritage Register (SHR) unless an exemption (Section 57) or an approval (Section 60 or a permit (Section 140) is obtained. Furthermore, the impact to or removal of a relic requires an excavation permit from the NSW Heritage Council.

A non-Aboriginal heritage assessment had been considered for the proposed works and is outlined in Section 5.9 of this SEE. This assessment concluded that no impacts to non-Aboriginal heritage are predicted.

3.4.6 Protection of the Environment Operations Act 1997

Section 120 of the *Protection of the Environment Operations Act 1997* (PoEO Act) prohibits the pollution of waters. Section 5.4 and Section 5.5 identifies the potential impacts to local natural water systems and the management measures to address risk of water pollution.

Part 3.2 of the PoEO Act requires an Environment Protection Licence (EPL) for scheduled development work and the carrying out of schedule activities. Schedule 1 does not include potable water systems and therefore an EPL is not required for this proposal.

3.5 Commonwealth legislation

Under the *Environment Protection and Biodiversity Conservation Act 1999 (*EPBC Act) a referral is required to the Commonwealth for proposed 'actions that have the potential to significantly impact on matters of national environmental significance or the environment of Commonwealth land.'

The potential for the IWC Project to significantly impact a matter of national environment significance or Commonwealth land and the need to make a referral to the Commonwealth Department of the Environment for a decision by the Commonwealth Minister for the Environment was previously completed in parallel with the Part 3A Concept Approval process. An approval for the ultimate development of the IWC Project (including Stage C) was granted on19 May 2011 and no additional approvals are required for the proposal under the EPBC Act.

3.6 Confirmation of statutory position

Development consent from PSC for the proposal is required under Part 4 of the EP&A Act. Therefore this SEE will accompany the Development Application submitted to PSC for determination.

Under the Part 3A Concept Approval, where development is subject to Part 4 of the EP&A Act, that development is subject to the further environmental assessment requirements specified in Schedule 2 of the approval. The requirements outlined in Schedule 2 have been addressed as part of this assessment as described in Appendix B of this SEE.

The matters for consideration under Part 4 Section 79C(1) of the EP&A Act are addressed as part of this assessment as described in Appendix A of this SEE.

4 Stakeholder and community consultation

4.1 Part 3A Concept Plan Approval requirements

Table 4-1 Part 3A Concept Conditions of Approval for Consultation

CoA #	Condition	Response
2.1 (i)	evidence of an appropriate level of consultation with (but not necessarily limited to) the following parties, including identification of the issues raised and how these have been addressed in the assessment: ▪ Commonwealth Department of Sustainability, Environment, Water, Population and Communities (now referred to as the Department of the Environment); ▪ Office of Environment and Heritage (including its Heritage Branch and the EPA); ▪ Department of Trade and Investment, Regional Infrastructure and Services (including its Primary Industries Division) (now referred to as Department of Primary Industries); ▪ Roads and Traffic Authority (now referred to as Roads and Maritime Services); ▪ Queanbeyan City Council; ▪ Palerang Council; ▪ Relevant services providers; and ▪ Property owners and the local community.	All consultation that has been undertaken for this proposal, the issues raised in response to this consultation and GTPL's responses are described in section 4 of the SEE.
3.1	Subject to confidentiality, the Proponent shall make all documents required under this approval available for public inspection on request.	All planning documents for the Googong IWC project have been made publicly available by GTPL on the projects website www.compliance.googong.net.

CoA #	Condition	Response
3.2	Prior to the commencement of construction of any projects associated with this Concept Plan approval, the Proponent shall establish a dedicated website or maintain dedicated pages within its existing website for the provision of electronic information associated with the project. The Proponent shall publish and maintain up-to-date information on this website or dedicated pages including, but not necessarily limited to: (a) the status of the project; (b) a copy of each relevant environmental approval, licence or permit required and obtained in relation to the project; (c) a copy of each approved plan, report, or monitoring program required by this approval and associated project approvals; (d) a summary of the monitoring result of the project, which have been reported in accordance with the various plans and programs approved under this approval and associated project approvals; (e) a summary of the monitoring results of the project, which have been reported in accordance with the various plans and programs approved under this approval and associated project approvals; (f) details of the outcomes of compliance reviews and audits of the project, to the satisfaction of the Director-General.	GTPL has established the IWC project website to inform the community of progress on the planning and construction of the project. This website is www.compliance.googong.net. In addition GTPL provides regular quarterly updates delivered via email to all residents, property owners and any other listed on the Googong stakeholder list. Contact information is made available for all residents to report any issues with construction activities and records are kept of any reports and how these were addressed.

4.2 Background

Community consultation regarding the proposal for a Googong township commenced in the preliminary development stages in early 2000s. The stakeholder consultation process for the Part 3A Concept Approval assessment for the Googong township formally commenced in May 2007.

Consultation regarding the IWC Project was undertaken during the preparation of concept designs and the environmental assessment throughout 2009 and 2010. The results of this consultation were outlined in Chapter 16 of the *Googong Township Water Cycle Project Environmental Assessment* (Manidis Roberts, 2010).

In 2010 the NSW Department of Planning placed the *Googong Township Water Cycle Project Environmental Assessment* (Manidis Roberts, 2010) on public exhibition from the 17 November to 20 December 2010. As a result of the exhibition, twelve (12) submissions were received, including:

- Four from local residents.
- Two from ACT government agencies - ACT Department of Environment, Climate Change, Energy and Water and ActewAGL (now Icon Water).
- Five from NSW government agencies – the Roads and Traffic Authority (now Roads and Maritime), the Greater Southern Area Health Service, the Department of Trade and Investment, OEH, the NSW Office of Water (now DPI Water).
- One from QCC.

Government submissions were supportive or neutral regarding the project, while community submissions raised some concerns, including some that objected to aspects of the project.

A Submissions Report was prepared in May 2011 considering and responding to the issues raised in submission received and additional meetings were held with a number of residents and government agencies, including QCC, to discuss their concerns.

Since construction commenced on the Stage AB works for the Googong township IWC, regular updates are provided to the community to keep them informed about the progress of the project. A community hotline has been established to provide an avenue for residents to raise any issues that they may have with construction activities. A register has been kept of all communication with the community in response to construction activities and the actions/responses provided.

4.3 Community consultation

In September 2015, a Community Letter for the Googong IWC Stage C Network East project was delivered to all residents of the Googong township (via letterbox drop to about 250 residents), all community members listed on the Googong IWC stakeholders list (about 70 listed stakeholders) and to nearby residents within the Palerang LGA. The letter (refer to Appendix C) provided a brief outline of the proposal and provided an opportunity for members of the community to raise any issues or concerns that they may have with the project team. The letter also identified that a SEE for the proposal is being prepared and would be submitted to PSC in the last quarter of 2015.

To date, no community members had contacted the project team to raise any issues or make any comments regarding the proposal.

4.4 Stakeholder consultation

In September 2015, key State and Federal agencies (as identified in the Part 3A Conditions of Approval) were consulted on the proposal. A letter was sent providing a brief outline of the proposal and the Part 3A Conditions to the following agencies:

- Commonwealth Department of the Environment
- NSW Department of Planning and Environment
- NSW Department of Primary Industries
- NSW Environment Protection Authority
- Icon Water
- NSW Office of Water (now DPI Water)
- NSW Office of Environment and Heritage
- NSW Roads and Maritime Services
- QCC.

A number of responses were received from the above agencies. Matters raised as part of this consultation is outlined in Table 4-2.

Table 4-2 Responses from Agency Consultation

Agency	Issue raised	Response
ACT Icon Water	Icon Water would like GTPL to confirm that: ▪ The upgrades to the pump stating will include installation of possibly three new pumps, and; ▪ The new transformer installation will be a transformer kiosk.	An outline of the proposal is provided in Section 1.3
NSW Roads and Maritime Services	The Environmental Assessment (EA) needs to: ▪ Identify and address any potential construction traffic impacts on the safety and efficiency of the surrounding road network. ▪ Consider the environmental impacts of any roadworks within the road reserve that are required to manage the impacts of the development. These impacts include traffic and road safety impacts as well as other impacts such noise, flora and fauna, heritage and impact to community.	Potential traffic impacts have been considered in Section 5.1.
NSW Environment Protection Authority	GTPL holds Environment Protection Licence (EPL) No. 20188 under the *PoEO Act 1997* in relation to the operation of the Water Recycling Plant and associated sewage reticulation infrastructure. The proposal as outlined does not appear to constitute a scheduled activity, and therefore it is unlikely the proposal will trigger any statutory provisions of environmental legislation administered by the EOA, or require an amendment of the EPL.	Noted
	All construction activities must be carried out with due diligence, and with accordance with best environmental management practices to avoid air, noise and water pollution. We consider that particular care and attention should be placed in the design and construction of erosion and sediment controls as the receiving waters form part of a drinking water catchment. All personnel involved should be aware of the details of the works plans, legislation and associated pollution controls and the environmental sensitivity of the receiving waters before any works commence. We would recommend that site specific adaptive controls be developed and managed, as the project has the potential to increase sediment load to waters.	The potential impacts of construction activities on erosion and sediment controls have been considered in Sections 5.4 and 5.5. In addition, a specialist review of potential impacts to soils in the local area has been undertaken and is provided in Appendix F. The safeguards outlined in Section 5 provide management measures to minimise and avoid potential impacts to the surrounding environment.

Agency	Issue raised	Response
	▪ Water management The SEE should describe existing surface and groundwater quality. An assessment needs to be undertaken for any water resource likely to be affected by the proposal. The SEE should provide details of the project that are essential for predicting and assessing impacts to waters including the quantity and physio-chemical properties of all potential water pollutants and the risks posed to the environment and human health, including the risks they pose to Water Quality Objectives in the ambient waters using technical criteria derived from the Australian and New Zealand Guidelines for Fresh and Marine Water Quality, ANZECC 2000). The SEE should describe the proposal including position of any intakes and discharges, volumes, water quality and frequency of all water discharges, and demonstrate that all practical options to avoid discharge have been implemented and environmental impact minimised where discharge is necessary. Appropriate controls should be put in place in to ensure that the proposed construction works, are undertaken in manner that does not contravene section 120 of the POEO Act (prohibition of the pollution of waters).	The impacts of the proposal on water have been considered in Sections 5.5 and 5.4.

Agency	Issue raised	Response
	▪ Sediment and erosion control The IWC project has been planned in four Stages (A, B, C and) to support the progressive population growth of the Googong township, and given the number of incidents involving the discharge of sediment from the site during the construction (Stages A and B), the EPA considers particular attention should be given to soil erosion and sediment transport and greater emphasis should be placed in the design and construction of the proposal. The proponent should consider clean water diversion around the construction site in order to reduce the volume of sediment laden water to be controlled. The Proponent should consider measures such as: ▪ Sediment traps ▪ Diversion banks ▪ Sediment fences ▪ Bunds (earth, hay, mulch) ▪ Geofabric liners ▪ Other control measures as appropriate The SEE should: ▪ present all of the sediment and erosion control measures to be employed at the site, any operational procedures that will be required to prevent the pollution of waters, and must also demonstrate that the measures are consistent with the document Managing urban stormwater: soils and construction, vol. 1 (Landcom 2004) and vol. 2 (A. Installation of services; C. Unsealed roads) (DECC 2008); ▪ Include a description of the mitigation and management options that will be used to prevent, control, abate or minimise identified soil and land resource impacts associated with the project. This should include an assessment of the effectiveness and reliability of the measures and any residual impacts after these measures are implemented. Where required, add any specific assessment requirements relevant to the project; ▪ Address erosion and sediment control including measures to be implemented to minimise erosion, and sediment mobilisation at the site during works; ▪ Show the location of each measure to be implemented.	The impacts of the proposal on soil and erosion have been considered in Sections 5.4 and 5.5.

Agency	Issue raised	Response
	▪ Waste management All wastes generated during the project must be managed in a manner that prevents the pollution of waters and air. Waste must be classified in accordance with the PoEO Act and *Waste Classification Guidelines* (DECCW, 2010). All waste material must be taken to a place which can lawfully receive them in accordance with the requirements of the PoEO Act. Specifically the proponent should: ▪ Identify, characterise and classify all waste that will be generated onsite through excavation, demolition or construction activities, including proposed quantities of the waste; ▪ Identify, characterise and classify all waste that is proposed to be disposed of to an offsite location, including proposed quantities of the waste and the disposal locations for the waste. This includes waste that is intended for re-use or recycling; ▪ Include a commitment to retaining all sampling and classification results for the life of the project to demonstrate compliance with EPA's Waste Classification Guidelines; ▪ Provide details of how waste will be handled and managed onsite to minimise pollution; ▪ Provide details of how the waste will be handled and managed during transport to a lawful facility. If the waste possesses hazardous characteristics, the Proponent must provide details of how the waste will be treated or immobilised to render it suitable for transport and disposal. ▪ Include details of all procedures and protocols to be implemented to ensure that any waste leaving the site is transported and disposed of lawfully and does not pose a risk to human health or the environment; ▪ Include a statement demonstrating that the Proponent is aware of the EPA's requirements with respect to notification and tracking of waste; ▪ Include a statement demonstrating that the Proponent is aware of the relevant legislative requirements for disposal of the waste, including any relevant Resource Recovery Exemptions, as gazetted by the EPA from time to time.	The impacts of the proposal on waste management have been considered in Section 5.11.

Agency	Issue raised	Response
	▪ Noise management General Noise generated during the construction phase of the project must be managed in a manner consistent with the objectives and provisions of the *Interim Construction Noise Guideline* (DECCW, 2009) prior to commencement of construction. This includes implementing all reasonable and feasible measures to minimise noise arising from the activities, in particular from plant and equipment. This can include selection of appropriate times for the operation of noisy equipment so as not to cause a noise nuisance to the surrounding community. The amenity of residents adjacent to the site must be considered by the SEE. Industry Operational noise from all industrial activities to be undertaken on the premises should be assessed using the guidelines contained in the NSW Industrial Noise Policy (EPA, 2000) and Industrial Noise Policy Application Notes. http://www.epa.nsw.gov.au/noise/industrial.htm	The impacts of the proposal in noise and vibration have been considered in Section 5.6.
	▪ Dust management The management of dust around the construction site is required to reduce the potential for the pollution of air and waters and to minimise the impact on the amenity of the surrounding community. The SEE should describe mitigation and management options that will be used to prevent, control, abate or mitigate identified environmental impacts associated with the project and to reduce risks to human health and prevent the degradation of the environment. This should include an assessment of the effectiveness and reliability of the measures and any residual impacts after these measures are implemented.	The impacts of the proposal on dust in the local area have been considered in Section 5.10.

Agency	Issue raised	Response
	▪ Air quality ▪ Assess the risk associated with potential discharges of fugitive and point source emissions for all stages of the proposal. Assessment of risk relates to environmental harm, risk to human health and amenity. ▪ Justify the level of assessment undertaken on the basis of risk factors, including but not limited to: – proposal location; – characteristics of the receiving environment; and – type and quantity of pollutants emitted. ▪ Describe the receiving environment in detail. The proposal must be contextualised within the receiving environment (local, regional and inter-regional as appropriate). The description must include but need not be limited to: – meteorology and climate; – topography; – surrounding land-use; receptors; and – ambient air quality. ▪ Include a detailed description of the proposal. All processes that could result in air emissions must be identified and described. Sufficient detail to accurately communicate the characteristics and quantity of all emissions must be provided. ▪ Include a consideration of 'worst case' emission scenarios and impacts at proposed emission limits. ▪ Account for cumulative impacts associated with existing emission sources as well as any currently approved developments linked to the receiving environment. ▪ Include air dispersion modelling where there is a risk of adverse air quality impacts, or where there is sufficient uncertainty to warrant a rigorous numerical impact assessment. Air dispersion modelling must be conducted in accordance with the Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (2005) http://www.epa.nsw.gov.au/resources/air/ammodelling05361.pdf. ▪ Demonstrate the proposal's ability to comply with the relevant regulatory framework, specifically the Protection of the Environment Operations (POEO) Act (1997) and the POEO (Clean Air) Regulation (2010). ▪ Detail emission control techniques/practices that will be employed by the proposal.	Consideration of the potential impacts of the proposal on local air quality has been considered in Section 5.10.

Agency	Issue raised	Response
Office of Environment and Heritage	The Review of Environmental Factors Environmental Assessment Requirements (EARs) provided by OEH are limited to Aboriginal cultural heritage, biodiversity and flooding.	It is noted that as part of their submission OEH provided detailed information that needed to be considered as part of the environmental assessment for Aboriginal cultural heritage, biodiversity and flooding (refer to Appendix I). These requirements have been considered as part of our assessment outlined in the applicable sections in Section 5 (Aboriginal cultural heritage in Section 5.8 and biodiversity in Section 5.2).

Agency	Issue raised	Response
	In particular the SEE should: ▪ Undertake an assessment of the following threatened entities, listed under the *Threatened Species Conservation Act 1995* ▪ White Box Yellow Box Blakey's Red Gum Woodland EEC (referred to as Box-gum woodland). ▪ The following threatened species – Regent Honeyeater, – Gang-gang Cockatoo – Speckled Warbler, – Brown Treecreeper (eastern subspecies) – Varied Sittella, – Spotted-tailed Quoll, – Eastern False Pipistrelle, – Little Eagle, – Hoary Sunray, – Square-tailed Kite, – Hooded Robin (south-eastern form) – Barking Owl – Powerful Owl, – Scarlet Robin, – Flame Robin, – Pink Robin, – Koala, – Pale Pomaderris – Diamond Firetail, – Rosenberg's Goanna.	Biodiversity impacts have been considered as part of the assessment outlined in Section 5.2 and a biodiversity assessment has been undertaken by Biosis and is provided in Appendix E. The assessment identified that the proposal is unlikely to impact threatened species or endangered ecological communities within the area.

Agency	Issue raised	Response
	▪ Due to the presence of Aboriginal cultural heritage sites within the development footprint, and high likelihood for further sites to be present, a full archaeological assessment and application for an Aboriginal Heritage Impact Permit (AHIP) should be made.	An Aboriginal cultural heritage assessment has been undertaken for the proposal by Navin Officer and is provided in Appendix F. A summary of this assessment is provided in Section 5.8 of this SEE. The assessment identified that no Aboriginal sites will be directly impacted by the project. Safeguards to minimise the potential for impacts on adjacent or unknown sites have been identified. It has not been recommended that an AHIP is required for this proposal.

4.5 Ongoing or future consultation

Prior to construction commencing a Googong IWC Stage C Network East Consultation Plan would be prepared in accordance with the requirements of the Concept Approval (CoA 3.2). It would outline how and when consultation would be undertaken with the local community throughout the construction period and how information about the project progress would be communicated to the community.

The existing Googong IWC website (www.compliance.googong.net) would be maintained throughout the Googong IWC Stage C Network East construction period and kept up-to-date to provide the community with, as a minimum, the following information:

- The status of the project.
- A copy of each relevant environmental approval, licence or permit required and obtained in relation to the project.
- A copy of each approved plan, report, or monitoring program required by this approval and associated project approvals.
- A summary of the monitoring result of the project, which have been reported in accordance with the various plans and programs approved under this approval and associated project approvals.
- A summary of the monitoring results of the project, which have been reported in accordance with the various plans and programs approved under this approval and associated project approvals.
- Details of the outcomes of compliance reviews and audits of the project.

A community complaints register would be kept and maintained throughout construction to document any issues raised by the community and how these issues were addressed.

5 Environmental assessment

This section of the SEE provides a detailed description of the potential environmental impacts associated with the construction and operation of the proposal. All aspects of the environment potentially impacted by the proposal are considered. This includes the matters for consideration under Part 4 Section 79C(1) of the EP&A Act, described in Appendix A and the requirements of the Part 3A Concept Approval Schedule 2, described in Appendix B.

5.1 Traffic and access

5.1.1 Concept Plan Conditions of Approval

CoA #	Condition	Response
2.1 (h)	traffic and access – including details of transport routes to and from construction and operation sites and associated impacts to existing activities, including safety impacts;	Details of the temporary traffic and access routes during construction and operation are outlined in this section.

5.1.2 Existing environment

The proposal area is a predominantly rural and bushland landscape with three primary roads (refer to Figure 1-1):

- Googong Dam Road – is a continuance of Googong Road once the road meets the Googong Foreshore area. Googong Dam Road is a two lane road with a single lane in each direction. It is a bitumen road that does not include kerb and gutters and has dirt shoulders with table drains.
- The BWPS access road – runs north off Googong Dam Road and provides access to the BWPS. It is a single lane unsealed road with dirt shoulders and table drains.
- The Water Treatment Facility access road - runs north off Googong Dam Road and provides access to the Water Treatment Facility. This road also continues north to connect with the BWPS access road and currently provides an alternative access to the BWPS. It is a single lane unsealed road with dirt shoulders with table drains.

The proposed compound site location would be located off the Water Treatment Facility access road in an existing cleared area that has previously been used as a construction compound.

5.1.3 Potential impacts

Construction

Throughout construction there will be increases in vehicle movements to, from and throughout the proposal area. These will change dependent on the stage and progress of construction activities. Construction vehicle activities would include:

- At initial set up stage – large construction plant and equipment would be delivered to the construction site using flatbed trucks, articulated trucks and low loaders up to 25 metres in length. Where feasible construction plant will be left on-site for the duration of use in order to minimise impacts to the local road network.

- Throughout construction – peak heavy vehicle traffic movements are likely to occur during excavation and construction of mains and during construction activities at the BWPS. Delivery of equipment and materials would also be required as well as construction staff accessing the site.
- Completion of construction – large construction plant would be removed from the site.

Table 5-1 outlines the estimated number of vehicle movements per day throughout construction. These vehicle movements would not all be undertaken at the same time as construction would be progressive. In addition, the vehicles would be accessing different areas of the proposal area, reducing the cumulative traffic impacts of construction.

Table 5-1 Peak construction vehicle movements estimated per day

Construction activity	Peak trips per day	Construction activity
Set up/mobilisation	10	Delivery of plant and amenities to site
Earthworks	20	Excavation, trenching and laying of mains
New pumps at BWPS	5	Delivery and installation of pumps at BWPS
Mechanical/electrical works	5	Various electrical and mechanical works at the BWPS and the metering station
Removal of waste	10	Site clean up
Construction staff	15	Construction staff accessing the site

The construction methodology, as outlined in Section 1.4, provides for the closure of the BWPS access road throughout construction of the new potable water main. Access to the BWPS would be maintained via the Water Treatment Facility access road. Closing the BWPS access road would allow construction activities to proceed unhindered without having to provide for traffic flow through the site, which would extend the construction timeframe and provide a safety risk to workers. The closure of this road would require a minor detour about 100 metres east to the Water Treatment Facility access road. It would also result in additional traffic along the Water Treatment Facility access road. However given the low number of vehicles using both these roads combined, this is expected to be a low impact and would be temporary.

Operation

Given the unmanned nature of the BWPS, there are no expected impacts on local roads or access to properties as a result of operation of the proposal.

5.1.4 Management measures

Construction

- A detailed traffic and access management plan would be prepared prior to construction to outline all access routes to, from and within the construction zones, traffic control methods to be utilised and methods to minimise impacts on the local road network.
- Access to the BWPS would be maintained as much as feasible. At times when access to the BWPS is required to be closed, an agreement on the time, day and duration of closure would be reached with Icon Water prior to closure of access.
- The access road to the BWPS would be fully re-instated at the completion of construction in accordance with Icon Water requirements and re-opened to vehicles.

- All employees and contractors would be inducted into the site and would receive appropriate training to fulfil their individual and environmental responsibilities, including requirements and responsibilities under the traffic and access management plan.
- Where feasible, construction deliveries would be scheduled outside of peak periods, in particular peak residential access times.
- Access to residential properties would be maintained at all times.
- Construction staff and delivery vehicles would not park in public parking areas where supply is limited.
- Any permits required for oversize vehicles to transport plant or equipment are to be obtained from Roads and Maritime Services.

5.2 Biodiversity

A Flora and Fauna Assessment has been prepared by Biosis (Biosis, 2015) for the proposed works. A summary of the findings of this assessment are outlined below and the full report is included as Appendix D.

5.2.1 Concept Plan Conditions of Approval

CoA #	Condition	Response
2.1 (h)	Flora and fauna – including terrestrial riparian and aquatic, with accurate estimates of vegetation disturbance associated with the project;	Impacts of the proposal on terrestrial, riparian and aquatic biodiversity , including vegetation disturbance, are assessed in this section.

5.2.2 Existing environment

Previous assessments

The proposal area is generally equivalent to the construction footprint for the Googong IWC Stage A Network East works, which included the construction of the BWPS and associated pipeline and the BWPS access road. The ecological impacts of clearing for Stage A Network East were assessed in the Flora and Fauna Assessment Report (Biosis, 2011). Minor changes were then made to the pipeline and road route to avoid ecological impacts. The extent of the final approved construction footprint is shown in Figure 1-1.

The assessment determined that the works would not have a significant impact upon flora, fauna or ecological communities listed pursuant to the EPBC Act or the TSC Act.

Current environment

A survey of the proposal area was undertaken on 25 August 2015 to confirm the vegetation mapping completed by Biosis (2011) and to examine the extent of clearance and disturbance which had been undertaken for the approved Stage A works. This was then used to determine whether the current proposal is likely to result in any impacts to biodiversity.

Ecological communities

Natural vegetation within the proposal area and surrounds consists of a mosaic of Grassy Woodland / Dry Forest (predominantly Dry Forest), varying in both floristic composition and degree of disturbance. Within the study area, some natural vegetation occurs in the form of two discernible vegetation communities:

- Scribbly Gum / Red Box / Bundy Dry Forest.

- Blakely's Red Gum / Red Box / Bundy Grassy Woodland - The small area (approximately 1210m^2 as recorded in Biosis (2011)) was determined to meet the criteria for the White Box / Yellow Box / Blakely's Red Gum Woodland ecological community, listed as endangered pursuant to the NSW TSC Act and critically endangered pursuant to the EPBC Act.

Modified communities present within the study area include Maintained Woodland Regeneration, Native Pasture with scattered planted native trees and some Acacia Regrowth.

The vegetation communities present within the study area, as mapped in 2011 and confirmed during the recent site visit (25 August 2015), are shown on Figure 5-1. The vegetation communities shown on Figure 5-1 also include areas cleared or otherwise disturbed for installation of the potable water mains pipeline and formation of the gravel road and associated batters for the BWPS works. The extent of clearing/disturbance for this road is considerably wide (at least six metres). The new pipeline will run along the existing potable water mains pipeline under the gravel road.

South of Googong Dam Road, the proposed pipeline will also run through an area previously disturbed for Stage A Network East, although the disturbance corridor is not as wide as that north of Googong Dam Road.

Flora

A total of 81 flora species were recorded within the study area during the survey undertaken by Biosis (2011), comprising 57 native species and 24 exotic species. Targeted surveys for threatened flora with a moderate or higher likelihood of occurrence were completed in 2011 throughout the study area. No plant species listed as threatened pursuant to the EPBC Act and/or the TSC Act were recorded. During the recent survey (25 August 2015) for the current proposal, no threatened flora species were recorded.

Fauna

Fauna surveys recorded by Biosis (2011) found 18 bird species and nine mammals, with two of these species, Speckled Warbler (*Chthonicola sagittata*) and Eastern Bentwing-bat (*Miniopterus schreibersii oceanensis*), listed as vulnerable under the TSC Act. Other threatened fauna have since been recorded within or adjacent to the study area, including the TSC Act listed vulnerable Scarlet Robin (*Petroica boodang*).

Review of the NSW Wildlife Online database ('Bionet') and Commonwealth EPBC Protected Matters Search Tool has not identified any additional listed species that may have a moderate or higher likelihood of occurrence within the study area.

During the recent survey (25 August 2015) for the current proposal, no threatened fauna species were recorded.

Habitat

Several hollow-bearing trees have been recorded within or adjacent to the study area during surveys for the Stage A Network East works (refer Figure 5-1). Some of these trees have been since cleared. No hollow-bearing trees will require removal for construction of the proposal.

5.2.3 Potential impacts

The proposal area is predominantly within the area previously cleared for the construction of the Stage AB works including the construction of the BWPS and the potable water main. As the proposal largely occurs within the previously disturbed area, there would be minimal impacts to local biodiversity as a result of the proposal. The vegetation that would be cleared as a result of the proposal would include planted or re-growth of grasses or shrubs along the road side. This is minimal as the road access has been kept predominantly cleared for access and bushfire management of the site.

The assessment has identified that the proposal would result in the following impacts:

- There would no impacts to endangered ecological communities - White Box / Yellow Box / Blakely's Red Gum Woodland ecological community.
- There are unlikely to be any impacts to any threatened flora species.
- There are unlikely to be any impacts to any threatened fauna species.
- No hollow-bearing trees would be removed.

5.2.4 Management measures

- Fencing would be established around all identified areas of Blakely's Red Gum Woodland within the proposal area to avoid inadvertent impacts.
- Vegetation clearing would be limited to grasses and shrubs along the road side and would be minimised as much as feasible.
- No clearing of any trees (including dead or hollow-bearing trees) would be undertaken as part of the proposal.
- Prior to and following the works, weed control of the proposal area would be undertaken to limit the spread of weeds into adjacent bushland areas.

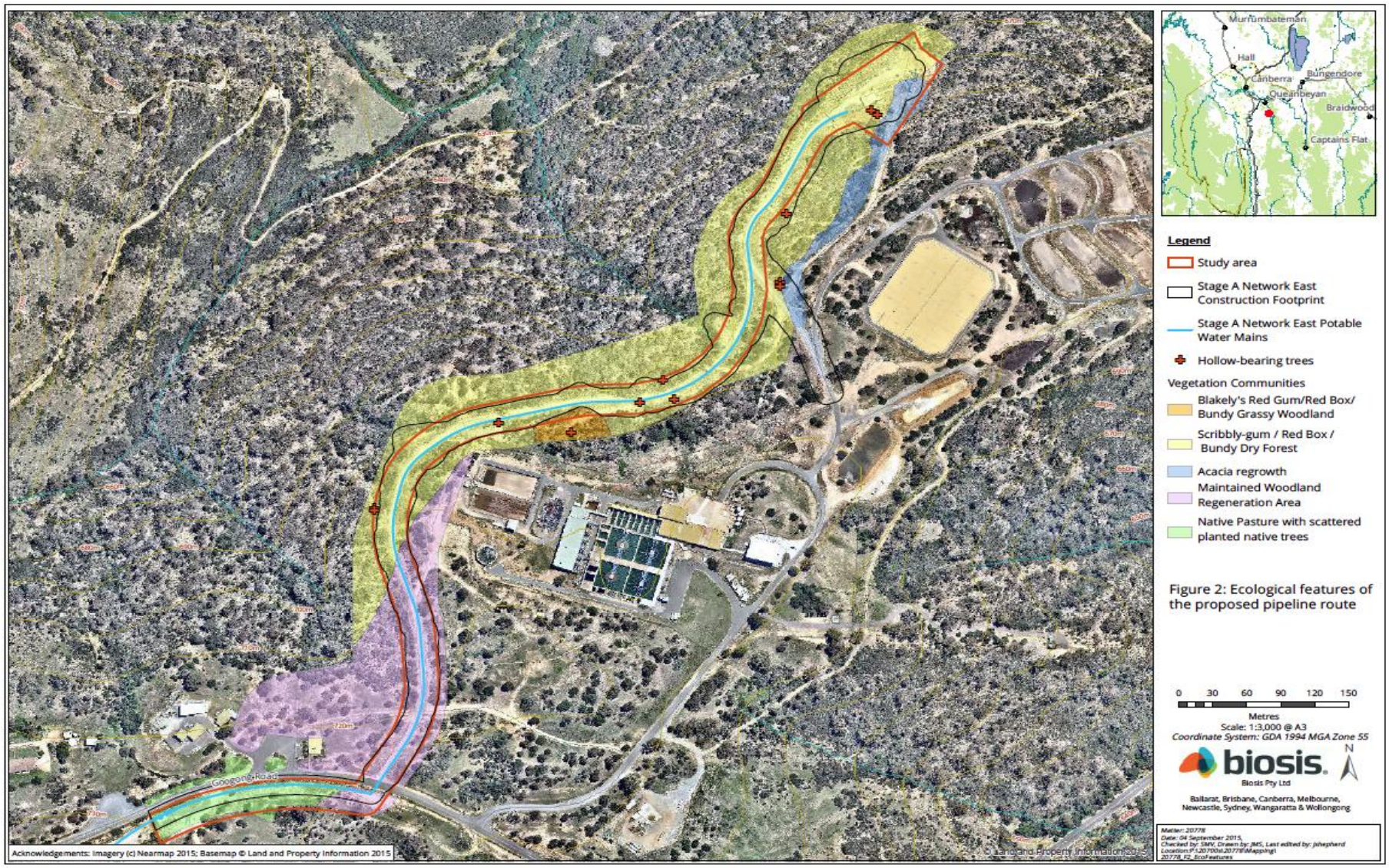

Figure 5-1 Biodiversity mapping in the proposal area

5.3 Bushfire assessment

A Bushfire Assessment has been prepared by EcoLogical (EcoLogical, 2015) for the proposed works. A summary of the findings of this assessment are outlined below and the full report is included as Appendix E.

5.3.1 Policy setting

The NSW Rural Fire Service document *Planning for Bush Fire Protection* (PBP) (RFS, 2006) is the guideline controlling development on bushfire prone land. The document focuses on habitable development (such as dwellings) and Special Fire Protection Purpose (SFPP) development such as schools, hospitals and other similar uses. It does not address development associated with infrastructure such as reservoirs and plant.

As stated within Section 4.3.6. of PBP, the Building Code of Australia (BCA) does not provide for any bushfire specific performance requirements for the type of development proposed. As such, the asset protection zone (APZ) and building construction requirements specified within PBP and *AS 3959-2009 Construction of buildings in bushfire-prone areas* (Standards Australia 2009) do not apply as deemed-to-satisfy provisions for bushfire protection.

Practice notes have been prepared by NSW Rural Fire Service to provide a position or guidance on specific developments that may not be covered by PBP. One such example is telecommunication towers (*Practice Note 1/11 Telecommunication Towers in Bush Fire Prone*, Version 0.2 February 2012), however a position or requirement has not been prepared for water supply infrastructure or the like. Typically the owner of the asset takes responsibility of the level of bushfire risk management applied.

This assessment compares the requirements of other infrastructure installations imposed by NSW Rural Fire Service and the expectation of PBP for non-habitable development.

The works have been divided into three components based on vulnerability to the impacts of fire and geographical location. The components are:

1. Potable water mains would be located underground and therefore will not be impacted by fire. These components do not require further assessment.
2. Above-ground metering station at the boundary between Queanbeyan and Palerang LGAs, to the north east of the WRP. The station is effectively a small measurement kiosk and does not provide critical operational functionality. The location is surrounded by managed lands and does not require any further assessment.
3. Upgrades to the BWPS located at the north eastern end of the fire trail access road, and north of the Googong Water Treatment Plant. The upgrade include provision of aboveground power supply and increased capacity of the pumps and associated fittings and connections. The BWPS provides critical infrastructure and is required to be assessed further.

5.3.2 Existing environment

A bushfire assessment is typically required when a development is proposed within bushfire prone land as mapped by the local council. The development site is identified as bushfire prone land by PSC as shown on Figure 5-2, therefore there is a statutory requirement to provide a bushfire assessment of the proposal. The Concept Approval does not require the preparation of a bushfire assessment; however GTPL has recognised an assessment of bushfire protection to be important for the IWC Project in the same way that it has been identified for the design of the Googong township.

An assessment of the bushfire hazard is necessary to determine the application of bushfire protection measures such as asset protection zone location and dimension. The following sub-sections provide a detailed account of the vegetation communities (bushfire fuels) and the topography (effective slope) that combine to create the bushfire hazard that may affect bushfire behaviour at the site.

Vegetation communities influencing bushfire

The predominant vegetation influencing fire behaviour approaching the development site has been assessed in accordance with the methodology specified within Appendix 2 of PBP. PBP requires a structural classification of the vegetation that predominates in area and severity over a distance of at least 140 metres from the asset being assessed. PBP assigns a worst case equilibrium fuel load based on vegetation structure.

Bushfire behaviour is influenced by fuel load and the availability of the fuel which is mostly determined by the arrangement of the fuel and its moisture content. Fuel load and availability affects the rate of spread and intensity of a bushfire.

The land surrounding the BWPS is extensively vegetated with a combination of Low-open Forest and areas of Scrub/Tall Heath. The forest vegetation is situated on moderate to steep slopes to all aspects of the site. The forest-structured vegetation tends to dominate the slopes and ridge tops, while some of the moister riparian areas and slopes with high wind exposures tend to be dominated by heath / open scrub.

The areas surrounding both the BWPS and associated access road have been modified during the construction process for Stage AB works. Subsequently, the vegetation immediately surrounding these areas is disturbed, with the natural topography being regraded to allow for the road construction and to establish a suitable building envelope for the BWPS. Along the north western interface of both the fire trail and BWPS site, the slopes are initially very steep for a short distance, before becoming moderately steep down towards Googong Creek. Steep up-slopes exist beyond the creekline.

Based on the above the predominant vegetation has been assessed as ‘forest’.

Cleared / managed land is present to the south and south east associated with the Googong Water Treatment Plant.

Slopes influencing bushfire

The effective slope influencing fire behaviour has been assessed in accordance with the methodology specified within Appendix 2 of PBP. This is conducted by measuring the slope that would most influence fire behaviour where the vegetation occurs over a 100 metre transect measured outwards from the asset.

Steeper slopes significantly increase the rate of spread of fires, whereby each 10 degree increase in slope corresponds to doubling in the rate of spread.

The forest vegetation surrounding the BWPS site varies, ranging from the PBP slope class of >10-15° downslope to north west, whilst being level (along contours) to the north east, and upslope to the south east and south. The location of the varying slope classes are identified in Figure 5-3.

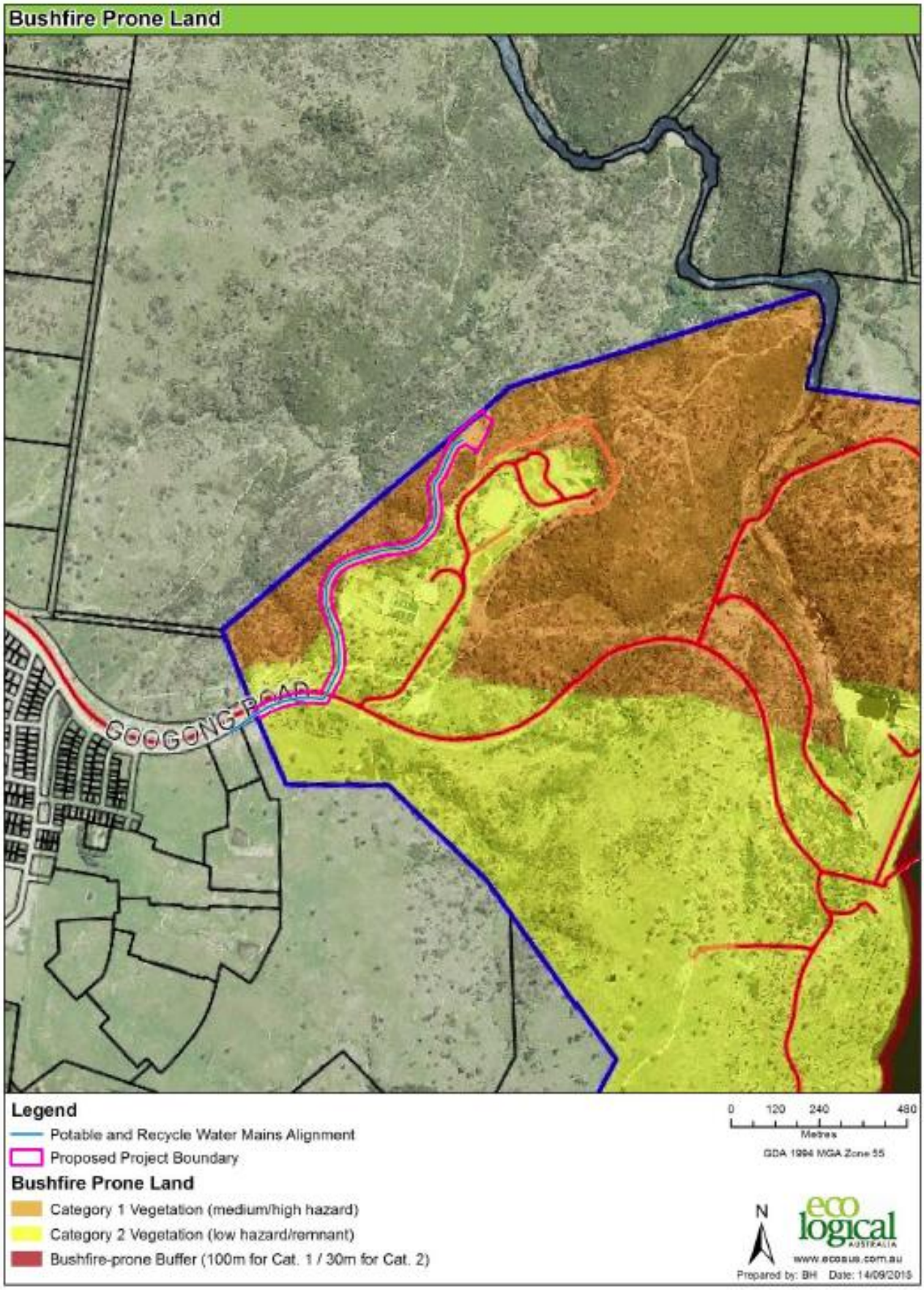

Figure 5-2 Palerang LGA Bushfire Prone Land Map for the proposal area

Figure 5-3 Slopes Bushfire Hazard Assessment at the BWPS

5.3.3 Potential impacts

Based on the hazard assessment for the proposal (refer to 5.3.2), and likely fire behaviour, the level of impact can be predicted.

Construction

There is the potential for a low forest / scrub fire to spread towards the BWPS and associated access road. Therefore, a fire in the local bushland may spread towards the construction activities and the BWPS. Given the construction methodology proposes to limit access to the BWPS to one access road (refer to Figure 1-4) this may create an evacuation hazard for construction workers. A fire passing through the construction site would also potentially impact on machinery and resources stored within the construction areas and/or the compound site.

There is potential for construction activities to start a fire in the adjacent vegetation, for example welding or rock breaking which may create sparks. There is also potential for construction workers to start a fire in the vegetation adjacent to the proposal area through the careless disposal of cigarettes. This would be highly dependent on the time of year that construction activities are undertaken and the fire hazard rating at the time.

Operation

There is the potential for a low forest / scrub fire to spread towards the BWPS and associated access road. This potential is limited by the availability of fuel influenced by season (rainfall, rates of growth) as well as past disturbance to the vegetation structure. However, there are extensive areas of vegetation surrounding multiple aspects of the site, with potential impacts directly from a westerly, north westerly and northerly direction being of most concern and impact potential.

Based on the current assessment of vegetation, it is expected that sufficient fuel will be available to allow for rapid spread. A fire ignition along the roadside to the west, for example, could impact on the site. The intensity at the asset would be limited by the fuel loads available, and would likely be of short duration during the passing of the fire front (residence time), being likely less than five minutes, based on the available fuel load and structure present at time of site inspection.

The BWPS provides a defendable space of 22 metres to the south and south west; 25 metres to the north west and north; and 58 metres to the north east and east. The combination of slope and vegetation to the north west means that with only a 25 metres separation, the BWPS is considered to be in the Flame Zone (BAL-FZ). This rating means that under the worst case scenario fire weather and fuel load arrangements, there is potential for a fully developed high intensity fire to impact upon the site and cause direct flame contact with the facility.

The proposed defendable space is considered adequate to the southern and eastern elevations of the BWPS and associated infrastructure. In relation to the north westerly aspect, an increase of the APZ from 25 to 39 metres is preferable in order to position the BWPS out of the Flame Zone (BAL-FZ) and reduce to BAL-40. However, in this instance, the existing nature of the BWPS and the highly constrained nature of the subject site means there is minimal opportunity to expand the defendable space / APZ. Therefore, whilst not the preferred separation, the defendable space to the north west is also considered to be adequate, particularly as the external materials of the BPS will be entirely non-combustible.

Above ground assets and infrastructure are rated to be of low vulnerability primarily due to the nature of construction and external materials used. The reliance on steel and concrete (non-combustible) construction and the fact that the asset is not habitable or offering protection for human life, coupled with the low consequence of impact means that the risk of significant or costly damage, or disruption to capacity, is low.

5.3.4 Management measures

Construction

- The Construction Environment Management Plan (CEMP) would include an emergency evacuation plan for the construction area and compound site, and would include early warning measures such as monitoring fire hazard ratings on a daily basis and monitoring accordingly.
- The CEMP would provide for measures to minimise the potential to start a fire from construction activities, e.g. restrictions on the types of activities that can occur during high fire risk ratings and/or the provision for a spotter during such activities.
- Fire fighting equipment would be located at the construction site at all times and on appropriate plant.
- Smoking would not be permitted on the construction area, the compound site or the adjacent bushland areas during construction.

Operation / detailed design

- The existing fire trail/access road to the BWPS should be maintained as a five metre wide maintenance trail, therefore no revegetation of this buffer area would be undertaken. Low level grasses would be used to stabilise the area at the completion of construction.
- The existing minimum 25 metre buffer area and hard stand areas around the BWPS would be maintained to provide a minimum defendable space.
- No tree or tree canopy is to occur within two metre of the building roofline.
- The presence of a few shrubs and small trees within the APZ is acceptable provided that they:
  - are well spread out and do not form a continuous canopy;
  - are not species that retain dead material or deposit excessive quantities of ground fuel in a short period or in a danger period; and
  - are located far enough away from the building so that they will not ignite the building by direct flame contact or radiant heat emission.
- Any landscaping or plantings should preferably be local endemic mesic species or other low flammability species.
- A minimal ground fuel is to be maintained to include less than four tonnes per hectare of fine fuel (i.e. dead or living vegetation of less than six millimetre in diameter e.g. twigs less than a pencil in thickness.) Four tonnes per hectare is equivalent to a one centimetre thick layer of leaf litter.
- Any structures storing combustible materials, such as flammable liquids and gases (e.g. sheds), must be sealed to prevent entry of burning debris.
- The facilities within the BWPS will have the capacity to provide water for fire fighting via the infrastructure if required. Installation of a 65 millimetres Storz fitting to tanks or outlets will allow fire appliances to utilise the water.

5.4 Soils and landscape

A soils and water impact assessment was undertaken by SESL Australia for the proposal (SESL, 2015). The full report can be found in Appendix F.

5.4.1 Concept Plan Conditions of Approval

CoA #	Condition	Response
2.1 (h)	Soils and landscape – including potential soil contamination, erosion risks, irrigations and rehabilitation;	Impacts of the proposal on the soil landscape, including potential soil contamination, erosion risks and rehabilitation, are assessed in this section.

5.4.2 Existing environment

Landform

The area that makes up the Googong township comprises approximately 850 hectares of undulating terrain bordering a series of relatively steep gullies.

Land elevations vary from approximately 600 metres Australian Height Datum (AHD) along the Queanbeyan River to 816 metres at Swan Hill, which forms part of a low series of ridges that run northwest to southeast through the centre of the wider Googong project area.

The natural topography of the proposal area is predominantly steep hillslopes (>20%) with rocky outcrops as tors. The elevation across the site is approximately 677 metres AHD in the south up to 725 metres AHD in the north, with a six degree slope. The landform surrounding the proposal area generally has a steeper slope running perpendicular the proposal area. Surface runoff flows in a northerly direction along the site, in an existing stormwater management system built on the site.

As outlined in Section 3.3, the proposal area is located on land defined as ‘Slopes over 18 degrees’ which provides for the potential for erosion throughout the proposal area.

Geology and soils

The *Soils Landscapes of the Canberra 1:100 000 Sheet Map* (Jenkins, 2000) indicates the proposal area is within the Round Hill and Anembo Soil Landscape.

The majority of the proposal area (including the BWPS and northern sections of the main) is located within the Round Hill soil landscape group. Soil within this landscape group is known to have with variable soil depth ranging from 20-80cm deep. The soil profile is generally sandy loams topsoil, whilst subsoils, when they occur, tend to be clay. Clay accumulation in upper slope subsoils occurs behind tors (rock outcrops) and other subsurfaces. These soils are underlain by steep and often isolated hills on granitic material of the Queanbeyan valley, with abundant rock outcrops as tors. These areas are occupied by uncleared open-forest with occasional low woodland on exposed crests.

The proposal area south of the Ranger Station along Googong Dam Road, is located within the Anembo soil landscape group. Soils in these areas are similar to Round Hill landscape group, with coarse sandy loam topsoil and underlying medium clay. These soils are underlain by undulating rises and flats on granitic material of the Cullarin Upland and Canberra Lowlands. These areas have been extensively cleared of the original open to tall open-forests with woodland to low woodland in frost hollows.

The general characteristics of both the Round Hill and Anembo landscape groups include:

- Mass movement hazard related to steep slopes.
- Minor to moderate sheet erosion is wide spread, with gully erosion risk and localised wind erosion hazard (Round Hill). Anembo soil landscape group has occasional minor erosion hazard, with >50% of the landscape having no appreciable erosion.
- Shallow soil profile.
- Abundant of granite rocks.
- Steep rocky slopes.
- Low fertility.
- Acidic soil.
- Low water holding capacity and prone to water logging.

Field observations showed minimal variation from the soil mapping classifications. The natural materials in the proposal area consist of brown loamy/clayey sand topsoil, underlain with light brown clayey sand subsoil with weathered granite. Soil profiles were shallow, ranging between 0.25 metres and 0.30 metres prior to encountering large rocks.

Physical test results indicated that the majority of dispersion results where above 10%, classifying the material as dispersible (Landcom 2004, the Bluebook). Laboratory analysis of the Emerson Stability class found that majority of the soil tested are Class 5 and Class 3.1, Therefore this soils exhibit a erosion potential risk. Soil salinity levels were found to be low at the sampling locations across the proposal site.

Results of the cation analysis indicated that the soil is generally dominated by hydrogen and magnesium salts. These salts balance the cation exchange capacity, resulting in a high exchangeable hydrogen and magnesium percentage. High magnesium increases the risk for dispersion and soil structure collapse.

The site is also identified as having erodibility potential on the Landscape Map under the *Palerang Local Environmental Plan 2014*.

Contamination

Coffey Geosciences undertook an initial contamination investigation (Stage 1 investigation) in 2004 to identify Areas of Environmental Concern (AECs) for the Googong Township Water Cycle Project Environmental Assessment. No AECs were identified in proximity to the Googong IWC Stage C Network East proposed project boundary.

A site survey to confirm the presence of any actual or potential contamination sites was carried out in July 2012. No additional areas of potential or actual contamination were identified within the proposal area.

5.4.3 Potential impacts

Construction

Construction activities that may affect soil include:

- Vegetation clearance, topsoil stripping and soil disturbance.
- Trenching and soil excavation.
- Soil contamination.

Excess spoil from excavation is estimated at 500 cubic metres of primarily virgin for the proposal.

Vegetation clearing, topsoil stripping and soil disturbance

Clearing of vegetation and topsoil stripping may result in the exposure of soil horizons that are susceptible to erosion. This can lead to erosion of exposed areas; deposition of eroded sediment in waterways increasing turbidity and smothering benthic habitat and organisms.

Trenching and soil excavation

The potential for soil erosion is most likely to occur during excavation works, particularly during any trench construction. Erosion can be from water (creating inter-rill erosion, rill and gully erosion and tunnel erosion) and wind. Potential impacts include the erosion of excavation spoil, fill stockpiles, and the disturbance of topsoil due to loss of vegetation cover.

Soil properties for each soil landscape would be affected differently in relation to erosion potential. Table 5.1 outlines the erosion potential of each respective soil landscape as well as any excavation restraint expected and would be considered further when developing management and mitigation measures.

Table 5.1 Potential erosion hazards and excavation constraints for soil landscape categories

Soil landscape	Erosion potential	Excavation constraints
Round Hill	▪ Non-concentrated flows –moderate to low erosion potential. ▪ Concentrated flows – moderate to high erosion potential. ▪ Soils are also subject to moderate to high risk from wind erosion.	Excavation constraints are likely on steep slopes and crests associated with shallow (less 15 cm) soils over bedrock. Areas with stony soils and/or tors may also be present. The dispersion and shrink–swell properties of subsoils may limit foundation design.
Anembo	▪ Non-concentrated flows –moderate erosion potential. ▪ Concentrated flows – high to very high erosion potential.	Limited problems are likely on crests and upper slopes associated with shallow (less than 60 cm) soils. Possible soil moisture issues may be encountered on lower slopes and flat ground. Stony ground and the presence of tors may also present constraints.

The erosion potential and excavation constraints of soil would be considered during construction planning. As noted above, the proposal is situated on the Round Hill or Anembo soil landscapes, which have moderate and very high erosion potential.

Soil contamination

As previously noted, no AECs were identified in proximity to the proposed project boundary, however there is always the potential for trenching and grading activities to disturb unidentified contaminated land and adversely impact existing soil characteristics if not managed appropriately. In addition, there is the potential during construction to contaminate soils through fuel or chemical spills. Risks include contamination of soil profiles, adverse impacts on human health and consequential affects on the groundwater quality.

Operation

There are no expected impacts to the proposal area during operation as:

- The site will be fully rehabilitated following construction.
- All pipeworks are fully enclosed and sealed.
- No discharge to the environment is proposed during regular day-to-day operating conditions.

During rare occurrences where maintenance works is required on the proposed potable water mains, connections to existing outlet pipes located along the existing potable water mains will be in place to allow for the controlled release of potable water to the environment. The volume of water released would be minimal, as it would only consist of the water present in the mains at the time. The existing outlet pipes include scour structures to minimise potential erosion and sediment impacts due to release of the water.

5.4.4 Management measures

Construction

Erosion potential for the proposal would be managed by the following measures:

- Maintaining surface and soil stability at all times during cut-and-fill excavation activities (particularly in relation to trenching) by implementing erosion and sediment controls in accordance with Section 8 of the Soil and Water Impact Assessment (SESL, 2015) and *Managing Urban Stormwater: Soils and Construction* (Landcom, 2004 – also referred to as 'The Blue Book'). Site-specific Erosion and Sediment Control Plans (ESCPs) will be prepared progressively to include the management strategies and controls for all activities with the potential to impact on sediment loss and erosion.
- Erosion within the trench would be mitigated by using trench plugs (i.e. trench/sack breakers) at appropriate intervals. These measures are in accordance with the Blue Book.
- Measures to ensure limited tracking of dirt off site will be implemented at access points. Where required the controls may include exit rumble grids at all points of egress onto public (sealed) roads, and/or stabilisation of site roads/tracks with aggregate where appropriate.
- Erosion and sedimentation controls will be inspected prior to and after each rain period and during periods of prolonged rainfall. Any defects will be rectified immediately.
- Erosion and sediment measures to secure the stockpile areas (e.g. diversions, sediment fences) will be installed prior to the commencement of spoil stockpiling activities.
- Stockpiles will be checked for stability weekly and after heavy rainfall.
- Topsoil will be conserved, where reasonable and feasible, for use in site rehabilitation/revegetation.

Furthermore, during the restoration and clean-up of construction sites, the following measures would be applied to stabilise the soils:

- The site would be re-profiled to achieve soil stability and congruity with the surrounding landscape.
- Re-seeding would be undertaken, and geotextile materials used as required.
- Trenches would be backfilled and compacted in layers.
- Access to the site would be managed (including site restrictions) to assist with site recovery.
- There will be progressive revegetation, stabilisation and restoration works of earthworks areas in accordance with the Blue Book.

To prevent the contamination of soils and in the event that contamination is encountered during construction, the following measures would be implemented:

- Works in the vicinity will be stopped or modified and will not recommence until the material has been analysed, the hazard has been assessed and appropriate action has been taken (including delineating areas of concern as required until earthworks can resume safely).

- Storage areas for fuels, oils and chemicals used during construction will be covered and contained within an impervious bund to retain any spills of more than 110% of the volume of the largest container in the bunded area. Any spillage will be immediately contained and absorbed with a suitable absorbent material. The contaminated material will be disposed of according to manufacturers and EPA requirements.
- Where possible, all refuelling would occur at designated fuel distribution points. These distribution points would be underlain by compacted earth to prevent the significant loss of fuel into the ground in the event of a spill. They would also be bunded to contain any large spills that may occur as a result of machinery or tank failure.
- Spill response procedures and equipment for containment and recovery would be available on site.
- Workforce training would be conducted on the transport, storage, handling and disposal procedures relating to chemicals.

Operation

- Outlet pipes and scour structures along the potable water main will be regularly checked to ensure functionality is maintained.

5.5 Water quality and hydrology

5.5.1 Concept Plan Conditions of Approval

CoA #	Condition	Response
2.1 (h)	Surface Water – including potential water quality impacts on local creeks and rivers and impacts on surface water flows, as a result of construction and operation of the project;	The potential impacts to surface water quality have been considered in Sections 5.4 and 5.5.
	Groundwater – including potential impacts on local recharge levels, contamination risks, groundwater mounding, isolated waterlogging of soils and impacts on groundwater quality.	The potential impacts to groundwater quality have been considered in Section s 5.4 and 5.5.
2.1 (k)	The assessments of the subsequent project stages shall take into account, but not limited to the following guidelines, as relevant; ▪ *National Water Quality Management Strategy: Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC 2000).* ▪ *National Water Quality Management Strategy – Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (Natural Resource Management Ministerial Council, Environment Protection and Heritage Council and Australian Health Ministers Conference 2006)*	These guidelines have been considered as part of the proposal assessment outlined in this section.

5.5.2 Existing environment

Surface water drainage

Drainage in the proposal area consists of a number of small ephemeral and semi-permanent creeks, farm dams and depressions. The main catchments in the proposal area are:

- Queanbeyan River: All of the proposal area drains to the Queanbeyan River below the Googong Dam. The Queanbeyan River has undergone considerable changes since construction of the Googong Dam, and the base flow has been regulated to about 0.1 cubic metres per second (down from one cubic metre per second prior to damming).
- Googong Creek: This is an unofficial name for the unnamed Creek that runs through Googong township from the west at Old Cooma Road across the side, under Googong Road and continues to Queanbeyan River. The majority of the proposal area is within the Googong Creek catchment.
- Montgomery Creek: This creek flows through the Googong township from the south to the east and joins the Queanbeyan River just below Googong Dam. A small part of the proposal area, where the potable water main crosses Googong Dam Road is within the Montgomery Creek catchment.

Groundwater environment

According to SMEC (2015), groundwater is hosted in a regionally extensive fractured-rock aquifer. Minor alluvial aquifers are located along the alignments of locally significant waterways, but these are expected to have minimal storage and not to be of significance to the assessment of the potential groundwater impacts of the IWC Project. The depth to bedrock across much of the site is expected to be between about one to two metres, with fresh bedrock encountered at shallower depths at higher elevations, and marked changes of slope. Shallow groundwater is expected to migrate along the interface between the soil horizons and relatively fresh bedrock, and to discharge to surface water streams across the site.

Existing plans to manage and protect water quality and aquatic ecology throughout the operational life of the IWC Project

Stage 1 of the IWC Project was designed to meet the requirements of the Part 3A Project Approval. This included a condition to prepare and implement a Water Management Plan (WMP). The key objective of the WMP (RPS, 2015) is to manage potential impacts on surface water and groundwater systems during operation of the IWC Project. To realise this objective the following will continue to be undertaken during Googong IWC Stage C Network East.

The WMP was approved by the NSW Department of Planning and Environment on 10 November 2015. The proposal will be operated in accordance with the approved WMP.

5.5.3 Potential impacts

Construction

The proposal will not cross any major watercourses. Despite this there is still potential for the following to occur during construction:

- Construction activities would require the disturbance and excavation of soils. During rain events this may cause erosion and sedimentation of drainage channels which may impact on water quality downstream.

- There is potential for accidental spills from plant or activities (e.g. hydraulic fluid or cement) during construction, which may enter the natural drainage lines causing pollution of the local waterways. Groundwater may also become contaminated in the event of a spill.
- There is potential for water used during construction activities (such as wash down bays) to run-off the construction site and enter the natural drainage lines causing pollution of the local waterways.
- The compound site would generate waste water that would need to be disposed of offsite, with the potential to spill off site and enter the local drainage lines causing pollution of the waterways.

Excavation also has the potential to result in a slight increase in the localised groundwater recharge, if significant rainfall is experienced when there are a large number of trenches and/or excavations open across the site. However, increases in recharge potential are expected to be minor because:

- Trenches are generally expected to be less than five metres deep across the site.
- The depth of groundwater is expected to be around 10 to 15 metres.
- Low to very low hydraulic gradients and conductivities are expected over much of the site.

Operation

There are no expected impacts to the proposal area during operation as:

- The site will be fully rehabilitated following construction.
- All pipeworks are fully enclosed and sealed.
- No discharge to the environment is proposed during regular day-to-day operating conditions.

5.5.4 Management measures

Construction

Construction water quality and erosion and sediment control management measures are outlined in Section 5.4.4.

Operation

Operational water quality and hydrology management measures outlined in the WMP will be implemented.

5.6 Noise

A Noise and Vibration Assessment has been prepared by SLR Consulting (SLR, 2015) for the proposed works. A summary of the findings of this assessment are outlined below and the full report is included as Appendix G.

5.6.1 Concept Plan Conditions of Approval

CoA #	Condition	Response
2.1 (h)	Noise and vibration – including construction and operation noise impacts in the context of planned urban development in the area;	Construction and operational noise impacts of the proposal have been assessed in this section.

CoA #	Condition	Response
2.1 (k)	The assessments of the subsequent project stages shall take into account, but not limited to the following guidelines, as relevant; ▪ *NSW Industrial Noise Policy (EPA, 2000)* ▪ *Interim Construction Noise Guidelines (DECC, 2009)* ▪ *Environmental Noise Management – Assessing Vibration: a Technical Guideline (DECC, 2006)* ▪ *Environment Criteria for Road Traffic Noise (EPA, 1999)*	The Noise Assessment has been prepared with reference to Australian Standard AS1055:1997 *Description and Measurement of Environmental Noise* Parts 1, 2 and 3 and in accordance with the Interim Construction Noise Guidelines (DECC, 2009) and EPA NSW Industrial Noise Policy (INP, 2000), with reference also made to the NSW Road Noise Policy (RNP, 2010). The Vibration Assessment has been undertaken based on Assessing Vibration: a technical guidelines (OEH, 2006) and the British Standard BS7385-1993.

5.6.2 Existing environment

The proposal is located within the Googong Dam foreshores area which is predominantly a natural bushland setting with scattered rural properties. A number of open space picnic areas and walking tracks are also located throughout the area as part of the Googong Dam Foreshores Area.

In addition the neighbouring Googong township is a predominantly rural landscape characterised by large rural landholdings, that is gradually changing into a suburban area with the ongoing development of the township. The surrounding area is predominantly characterised by low-intensity grazing, bushland and rural residential land uses; no intensive agricultural activities are known to occur.

Figure 5-4 indicates a total of 21 receptors that have been identified close to the project area.

There are 15 receivers marked with a prefix “R” and two prefixed with a “C”, which represent Residential and Commercial type receivers respectively. The receiver marked “C1” is the existing Googong Water Treatment Plant while the receiver marked “C2” is a ranger station.

The nearest sensitive receivers were identified in earlier assessments (including for Stage C Network West) conducted by SLR, and were used in this assessment for consistency. It should be noted:

- R12 was an existing dwelling prior to the Googong Township development. Being surrounded by new residential land, this property now forms part of the Googong Township.
- R14 West and R14 East represent the residential receptors within the Googong Township along the western and eastern boundaries respectively. In addition, the Rockley Oval and the Anglican School within the Googong Township have also been identified, which are classified as recreation area and educational establishment respectively.

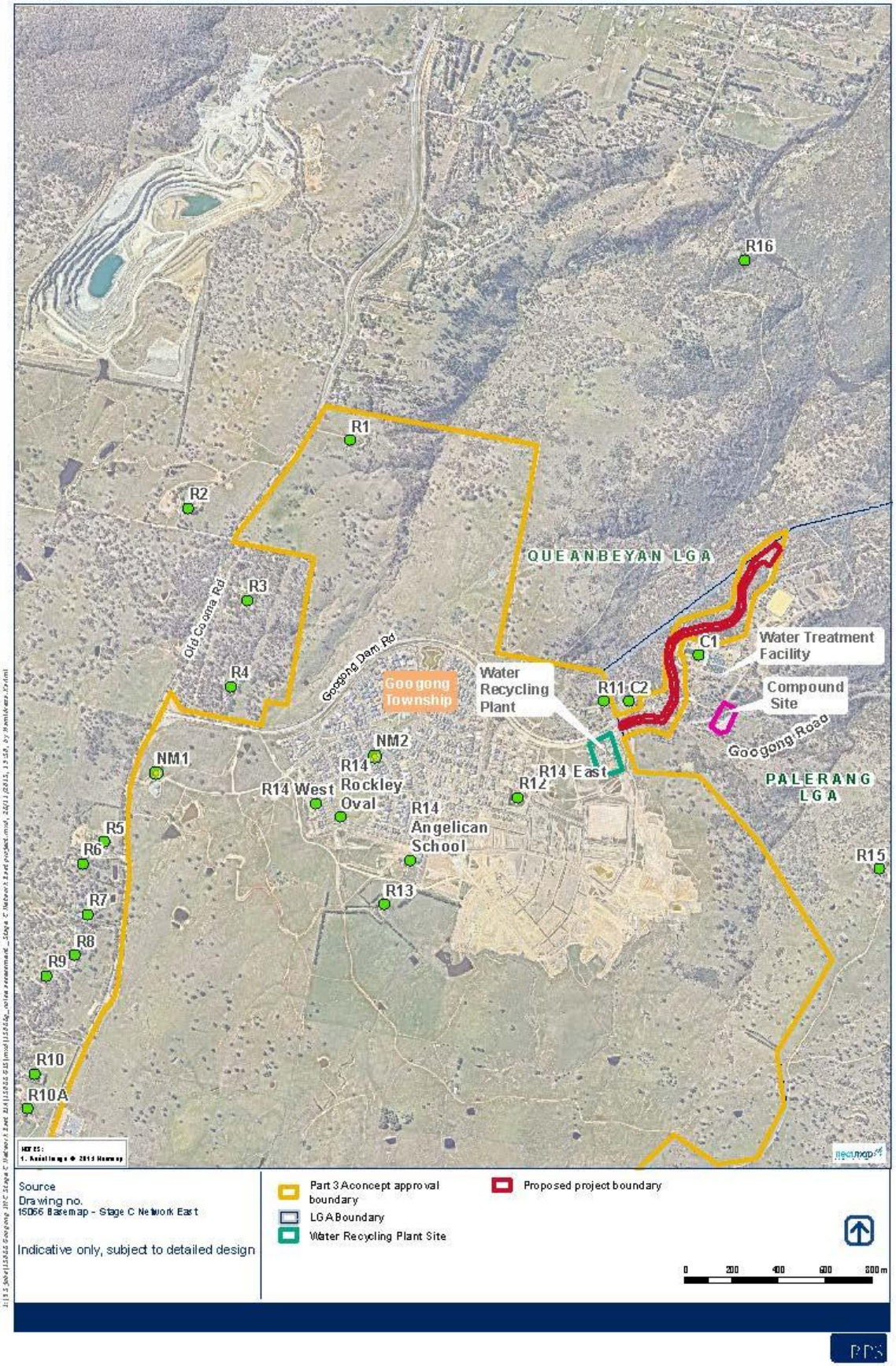

Figure 5-4 Sensitive receivers in the vicinity of the proposal area

Environmental noise loggers were deployed at NM1 and NM2 from 10 June 2015 to 24 June 2015. The loggers were programmed to record statistical noise levels contiguously over 15 minute periods including the LA1, LA10, LA90, and LAeq indices.

The logger microphones were located in a free-field position and away from extraneous noise sources.

A summary of the noise monitoring results is provided in Table 5-2. Complete daily noise logger results graphs for each location are presented in Appendix G.

Table 5-2 Unattended continuous noise monitoring results

Location	Description	Noise Level Descriptor dB(A)			
		L_1	L_{10}	L_{90}	L_{eq}
NM1	Day (7am to 6pm)	62	58	38	67
	Evening (6pm to 10pm)	60	54	30	51
	Night (10pm to 7am)	55	41	25	48
NM2	Day (7am to 6pm)	63	52	35	53
	Evening (6pm to 10pm)	49	40	29	44
	Night (10pm to 7am)	38	32	25	40

The Rating Background Levels (RBLs) are the median values of the L_{A90} levels recorded over the duration of the noise monitoring for each assessment time period. Where the RBL is found to be less than 30dBA, then it is set to 30dBA. Therefore, the RBL for assessment purposes are shown in Table 5-3.Table 5-3 also notes the estimated contribution the existing industrial noise adds to this background noise level.

Table 5-3 Background noise levels at identified noise receivers

Location	Description	Background LA_{90} Noise Level, dB(A)	Estimated existing industrial LAeq contribution, dB(A)
		RBL	
R1 to R9	Day (7am to 6pm)	38	<20
	Evening (6pm to 10pm)	30	<20
	Night (10pm to 7am)	30	<20
R11 to R14	Day (7am to 6pm)	35	<20
	Evening (6pm to 10pm)	30	<20
	Night (10pm to 7am)	30	<20
R15	Day (7am to 6pm)	30	<20
	Evening (6pm to 10pm)	30	<20
	Night (10pm to 7am)	30	<20

5.6.3 Criteria

Construction noise

The NSW 'Interim Construction Noise Guideline' (ICNG), (DECC, 2009) contains procedures for management of noise in relation to construction activities for residential and other sensitive receivers by defining Noise Management Levels (NMLs) and how they are applied. A summary of the derivation of NMLs from the ICNG is contained in Table 5-4 for residential receivers, Table 5-5 for sensitive receivers and Table 5-6 commercial/industrial premises.

Table 5-4 Interim construction noise guidelines for residences

Time of day	Management (LAeq (15min))	How to apply
Recommended standard hours: Monday to Friday: 7 am to 6 pm Saturday 8 am to 1 pm No work on Sundays or public holidays	Noise affected RBL + 10dB(A)	The noise affected level represents the point above which there may be some community reaction to noise. Where the predicted or measured LAeq (15 min) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75dB(A)	The highly noise affected level represents the point above which there may be strong community reaction to noise. Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours	Noise affected RBL + 5dB(A)	A strong justification would typically be required for works outside the recommended standard hours. The proponent should apply all feasible and reasonable work practices to meet the noise affected level. Where all feasible and reasonable practices have been applied and noise is more than 5dB(A) above the noise affected level, the proponent should negotiate with the community.

Note: Noise levels apply at the property boundary that is most exposed to construction noise, and at a height of 1.5 m above ground level. If the property boundary is more than 30 m from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30 m of the residence. Noise levels may be higher at upper floors of the noise affected residence.

Table 5-5 Interim construction noise guidelines for sensitive land uses

Land use	Management Level, LAeq(15minute (applies when properties are being used)
Classrooms at schools and other educational institutions	Internal noise level 45dB(A)
Hospital wards and operating theatres	Internal noise level 45dB(A)

Land use	Management Level, LAeq(15minute (applies when properties are being used)
Places of worship	Internal noise level 45dB(A)
Active recreation areas[1]	External noise level 65dB(A)
Passive recreation areas[2]	External noise level 60dB(A)
Community centres	Depends on the intended use of the centre. Refer to the recommended 'maximum' internal levels in AS2107 for specific uses.

[1] Characterised by sporting activities and activities which generate their own noise or focus for participants, making them less sensitive to external noise intrusion.

[2] Characterised by contemplative activities that generate little noise and where benefits are compromised by external noise intrusion, for example reading and meditation.

Table 5-6 Interim construction noise guidelines for commercial/industrial properties

Land use	Management Level, LAeq(15minute)
Industrial premises	External noise level 75dB(A)
Office, retail outlets	External noise level 70dB(A)

All construction works are proposed to be undertaken within standard operation hours (between 7am to 6pm Monday to Friday and 8am to 1pm on Saturday). Therefore the $LA_{eq(15minute)}$construction NML for all residential receiver locations will be a minimum of 40dBA for the 'noise affected category, and 75dBA for industrial properties and 70dBA for commercial properties.

The Anglican School Googong is open and operating and is located on Gorman Drive on the southern side of the existing Googong township. A public Googong township school is currently under construction and may be in operation during the construction timeframe. The noise criteria that would apply if in operation would be 45dBA (internal).

Table 5-7 Project specific construction assessment criteria

Noise receivers	Description	LAeq 'Noise Affected' Noise Management Level (background plus 10dB)
R1 to R9	Daytime (7am to 6pm)	48
	Evening (6pm to 10pm)	40
	Night time (10pm to 7am)	40
R11 to R14	Daytime (7am to 6pm)	45
	Evening (6pm to 10pm)	40
	Night time (10pm to 7am)	40
R15	Daytime (7am to 6pm)	40
	Evening (6pm to 10pm)	40
	Night time (10pm to 7am)	40
School classrooms	Daytime (during hours of operation)	45
C1	Any time	70
C2	Any time	70

Construction vibration criteria

The effects of vibration in buildings can be divided into two main categories – those in which the occupants or users of the building are inconvenienced or possibly disturbed and those in which the integrity of the building or structure may be impacted.

Human comfort vibration

The EPA's *Assessing Vibration: A Technical Guide* (DEC 2006) provides guideline values for continuous, transient and intermittent events that are based on a Vibration Dose Value (VDV) rather than continuous vibration level. The VDV is dependent upon the level and duration of the short-term vibration event, as well as the number of events occurring during the daytime or night-time period.

The VDVs recommended for vibration of an intermittent nature (i.e. construction works where more than three distinct vibration events occur) are described in Table 5-8.

Table 5-8 Acceptable vibration dose value for intermittent vibration (m/s $^{1.75}$)

Location	Daytime (7am to 10pm)		Night time (10pm to 7am)	
	Preferred value	Maximum value	Preferred value	Maximum value
Critical areas[1]	0.10	0.20	0.10	0.20
Residences	0.20	0.40	0.13	0.26
Office, schools, educational institutions and places of worship	0.40	0.80	0.40	0.80
Workshops	0.80	1.60	0.80	1.60

[1] *Examples include hospital operating theatres and precision laboratories where sensitive operations are occurring. These criteria are only indicative.*

Structural damage vibration

Structural damage vibration limits are based on *Australian Standard AS 2187:Prt 2-2006, Explosives – Storage and Use – Part 2: Use of Explosives*, *and British Standards BS 7385 Part 2-1993 Evaluation and Measurement for Vibration in Buildings Part 2*. These standards provide frequency-dependent vibration limits related to cosmetic damage, noting that cosmetic damage is very minor in nature, is readily repairable and does not affect the structural integrity of the building. The recommended vibration limits from BS7385 for transient vibration for minimal risk of cosmetic damage to residential and industrial buildings are described in Table 5-9.

Table 5-9 Transient vibration guide values for minimal risk of cosmetic damage (BS 7385-2)

Type of building	Peak component particle velocity in frequency range of predominant pulse	
	4 Hz to 15 Hz	15 Hz and above
Reinforced or framed structures Industrial and heavy commercial buildings	50mm/s at 4Hz and above	
Unreinforced or light framed structures Residential or light commercial type buildings.	15 mm/sat 4Hz increasing to 20mm/s at 15Hz	20mm/s at 15Hz increasing to 50mm/s at 40Hz and above

Ground borne (regenerated) noise

Ground-borne (or regenerated) construction noise can be present on construction projects where vibration from activities such as rock breaking, road heading, rotary cutting and rock drilling/sawing can be transmitted through the ground and into the habitable areas of nearby buildings. Ground-borne noise occurs when this vibration in the ground and/or building elements is regenerated as audible noise within areas of occupancy inside the buildings.

The EPA ICNG defines internal ground-borne noise goals for residential receivers of 40dB(A) $L_{Aeq(15\ minute)}$ during the evening 6:00pm to 10:00pm and 35dB(A) during the night-time (10:00pm to 7:00am). The goals are only applicable where ground-borne noise levels are higher than airborne noise levels.

5.6.4 Potential impacts

Construction noise

A number of scenarios were modelled to account for different stages of construction associated with both the rising main construction and the BWPS upgrade. These scenarios used typical construction equipment noise levels and construction scenarios to model expected noise levels at each of the sensitive receivers (worst case scenarios were used). As all works would be undertaken during standard operating hours, only this criteria has been considered in accordance with the INP.

Single point noise prediction results derived from the noise model for the proposed works are presented in Table 5-10. Cells in the table are shaded where the noise levels are predicted to exceed the respective “Noise Affected” NML.

Table 5-10 Construction noise prediction results

Receiver	Day time ‘noise affected’ NML	Predicted construction noise level dB(A) $L_{Aeq(15\ minutes)}$	
		Works near to town	Works midway along the corridor
R1	48	<30	<30
R2		<30	<30
R3		<30	<30
R4		<30	<30
R5		<30	<30
R6		<30	<30
R7		<30	<30
R8		<30	<30
R9		<30	<30
R10		<30	<30
R11	45	**55**	40
R12		38	30
R13		<30	<30
R14W		32	<30
R14E		<30	<30

Receiver	Day time 'noise affected' NML	Predicted construction noise level dB(A) $L_{Aeq(15\ minutes)}$	
		Works near to town	Works midway along the corridor
R14 – Rockley Oval	60	<30	<30
R14 – Anglican School	55 external	<30	<30
R15	40	<30	<30
C1	75	34	45
C2	70	60	43

Note: Shaded figures imply exceedance of the "Noise Affected" NML.

Based on the results, no receptors were identified as being "Highly Noise Affected" (i.e. construction noise great than 75 dBA). The construction works have the potential of causing an exceedance of the "Noise Affected" NML at one receptor (R11).

It should be noted that the predicted noise levels are based on typically "worst-case" scenarios assuming multiple plant is operating concurrently, and in this case, the works will progressively move away from the receptor. Therefore the receptor may experience the construction noise for a relatively short period of time.

The proposal is not expected to cause any vibration impacts at any nearby sensitive receivers.

Operational noise

The BWPS and parallel rising mains are currently in operation. The proposal would involve increasing the volume of water being pumped through the facility and pipes to accommodate the growth of Googong, which requires increasing the number of pumps at the BWPS. Given the isolated nature of the proposed works from any sensitive receivers and that the existing operational noise from the BWPS is not audible from any of the receivers, it is not expected that the ongoing operation of the proposal would have any noise or vibration impacts on sensitive receivers.

5.6.5 Management measures

- A Construction Noise and Vibration Management Plan would be prepared for all construction activities and included in the CEMP. It would outline measures to minimise construction noise and vibration impacts on sensitive receivers. This would also include an action plan to be followed if complaints are received.
- Works (including delivery of plant and equipment) would be limited to standard working hours of:
  - Monday to Friday 7:00am to 6:00pm.
  - Saturday 8:00am to 1:00pm.
  - No works on Sunday or public holidays.
- All potentially impacted residents would be notified of the proposed works, including the nature and duration of construction activities, predicted noise levels and contact details should they have any issues with the construction activities.

- Construction plant and equipment would be well maintained (including noise reduction fittings where feasible) and would be turned off when not in use to minimise noisy emissions.
- Where feasible reversing equipment would use 'quacker' alarms or would be minimised to prevent causing a nuisance.
- Loading and unloading would be undertaken away from sensitive receivers.
- During operation plant and machinery would be well maintained in order to minimise operational noise emissions.
- Rock breaking activities are not to be undertaken within 50 metres of sensitive receivers.

5.7 Visual amenity

5.7.1 Concept Plan Conditions of Approval

CoA #	Condition	Response
2.1 (h)	Visual amenity – an assessment of the impact of the project on visual amenity, including future sensitive receptor areas, including residential;	Construction and operational visual amenity impacts of the proposal have been assessed in this section.

5.7.2 Existing environment

The proposal is located within the Googong Dam Foreshores Area which is predominantly a natural bushland setting with scattered rural properties. A number of open space picnic areas and walking tracks are also located throughout the area.

In addition, the neighbouring Googong township is located within a predominantly rural landscape characterised by large rural landholdings, that is gradually changing into a suburban area with the ongoing development of the Googong Township. The surrounding area is predominantly characterised by low-intensity grazing, bushland and rural residential land uses; no intensive agricultural activities are known to occur.

The primary people who access the proposal area are workers at the Googong Water Treatment Facility Plant or the BWPS, the Googong Dam Foreshores Area rangers or visitors to the area for recreational activities.

5.7.3 Potential impacts

Construction

During construction the construction machinery, construction activities and excavation of the area will impact the visual amenity of the proposal area. However, given much of the Googong township is currently under development and the fact that there will be no houses near the Googong IWC Stage C Network East works during construction, there are expected to be minimal to negligible visual impacts.

The presence of construction activities within the proposal area may impact on the visual amenity of visitors to the Googong Dam Foreshores Area. However, given that visitors to the area would only be driving on Googong Dam Road to get to the public open areas around Googong Dam this impact would be low. In addition, workers to the area may be impacted by the construction activities, although given the temporary nature of the works and the intention of their visit to the area, this impact is expected to be low.

Operation

There are no expected impacts to the proposal area during operation as:

- All mains and pipes would be located underground.
- The works within the BWPS would be located within the existing facility and would not be visible from outside the facility.
- The works at the metering station, while being visible from outside for site, would be located within the existing facility therefore the impacts would be minor.

5.7.4 Management measures

Construction

The management of these visual impacts during the construction phase would require:

- Installation of temporary fencing at the construction site for security and to visually delineate the area of construction.
- The site to be kept tidy and well maintained, including removal of all rubbish at regular intervals. There should be no storage of materials beyond the construction boundaries.
- Temporary hoardings, barriers, traffic management and signage would be removed when no longer required.
- Locate construction plant, machinery and vehicle parking areas away from public or sensitive viewing areas.
- Upon completion, the proposal site would be reinstated and revegetate at the completion of works.

5.8 Aboriginal heritage

A Due Diligence Archaeological Assessment has been prepared by Navin Officer (Navin Officer, 2015) for the proposed works. A summary of the findings of this assessment are outlined below and the full report is included as Appendix H.

5.8.1 Concept Plan Conditions of Approval

CoA #	Condition	Response
2.1 (h)	Aboriginal Heritage – including an assessment of Aboriginal sites affected by the proposed development, their cultural value and the significance of these values for Aboriginal people	This section provides the results of an Aboriginal Heritage assessment which was undertaken to identify any Aboriginal sites affected by the proposal.

5.8.2 Assessment methodology

A cultural heritage assessment for the proposal has been undertaken according to the NSW Office of Environment and Heritage *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW, 2010).

A range of archaeological data was reviewed for the proposed project boundary and its surrounds. This literature and data review was used to determine if known Aboriginal sites were located within the proposal and to facilitate site prediction on the basis of known regional and local site patterns, and to place the area within an archaeological and heritage management context. The review of documentary sources included:

- Heritage registers and schedules, in particular the Aboriginal Heritage Information Management System (AHIMS) search results. One hundred and sixteen Aboriginal recordings are listed on the OEH AHIMS for the area around the Googong township. Sites comprise:
  - 106 artefact scatters
  - Eight Potential Archaeological Deposits (PADs)
  - One modified tree
  - One cultural feature.
- Previous research within the Googong township area which included local histories and archaeological reports.

No field inspections were conducted for this Due Diligence assessment. All areas within the proposed project boundary has been included in previous heritage assessments.

5.8.3 Existing environment

Sites within the proposal boundary

One Aboriginal heritage site has been previously recorded within the proposal area (refer to Figure 5-5). This site is GWTP5 and is a scatter of three artefacts located on a track intersection. Artefacts were found on the edge of the track which is highly disturbed and located on a spur crest. The soils in the area are gravelly decomposing granite sand with a bedrock at the surface in close proximity to the site. The track has been laid with gravels. Visibility on the track was 70 per cent with disturbance off the track limited to 20 to 60 per cent visibility.

Sites within the vicinity of the proposal area

Eight Aboriginal sites are recorded within 120 metres of the proposal boundary. These sites area shown in Figure 5-5 and include:

- GWTP1 – This site comprises four artefacts located on a slight rise above a gully.
- GWTP3 – This site comprises eight artefacts located on a rocky spur crest above dry creek and gully.
- GWTP4 – This site comprises an isolated artefact located on a dirt track which joins onto Googong Dam Road.
- GWTP6 – This site is an isolated find located on a formed access track edge adjacent to a fence line. The site is located adjacent to a heavily disturbed drainage line.
- GWTP7 – This site is an isolated find located on a track edge. The artefact is located on a steep spurline leading to the Queanbeyan River.
- G1BAS1 – This site comprises five stone artefacts across approximately 19 m by 12 m on a low gradient ridge crest. The artefacts appear to result from procurement of locally occurring quartz.
- G1BAS2 – This site comprises an isolated grey volcanic hammerstone with pitting at one end. The artefact measures 90 x 70 x 60 mm. The site is located in a grassy, cleared area within a mid-slope/crest landform.
- GA23 – This site comprises a single artefact located on moderate gradient slopes on the eastern side of a spur above a minor creek line located approximately 100 m to the south.

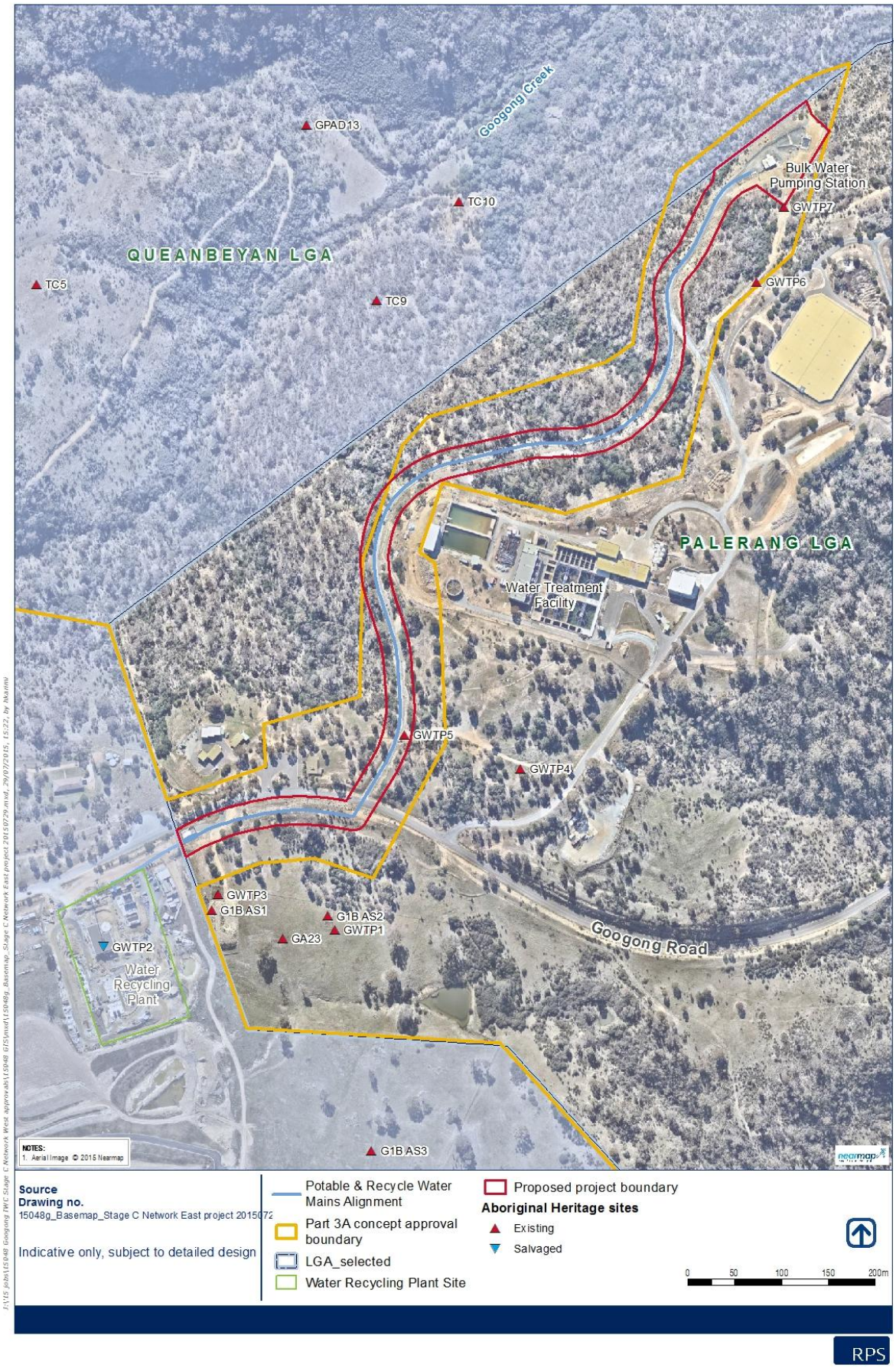

Figure 5-5 Known Aboriginal sites within the vicinity of the proposal area

5.8.4 Potential impacts

Construction

One Aboriginal site, GWTP5, is located within the proposal area, however the project has been designed to avoid direct impacts to the site.

There is also a risk of inadvertent impacts on known or unknown Aboriginal sites occurring during construction, particularly if activities are undertaken outside of the proposal area.

Management measures outlined in Section 5.8.4 would aim to avoid any potential indirect impacts to the site and any nearby sites.

Operation

No impacts to Aboriginal heritage items are expected as a result if operation of the proposal.

5.8.5 Management measures

- An Aboriginal Heritage Management Sub Plan would be prepared prior to the commencement of works. As a minimum this plan would include:
  - Methodology for the actioning of all management measures outlined in section 5.8.5 of the SEE.
  - Inductions procedures on Aboriginal heritage for all staff and sub-contractors working on the proposal.
  - A site constraints map indentifying known Aboriginal and the project boundaries and requirements for the display of the constraints map on site.
  - Any ongoing Aboriginal consultation and involvement required.
  - Management plans for the erection, maintenance and de-commissioning of the fencing around the identified Aboriginal sites before, during and at the completion of construction.
  - Procedures for managing any potential unidentified finds during construction, including human skeletal remains.
- No further archaeological assessment is required for the Googong IWC Stage C Network East project.
- Aboriginal site GWTP5 would be fenced for the duration of construction activities associated with the proposal. The construction of the fence would be conducted with on-site advice from the project archaeologist.
- The location of all heritage sites would be clearly marked on all site plans and maps utilised for the proposal.
- All construction staff would be inducted on site and advised of the proximity of Aboriginal heritage items within the area and the need to avoid impacts to them.
- Construction staff would remain within the designated proposal area throughout construction activities to avoid any potential indirect impacts to adjacent heritage items.
- The protocols for the unanticipated discovery of archaeological material and suspected human remains would be implemented for the Googong IWC Stage C Network East project if necessary. A copy of these would be included in the CEMP.

5.9 Non-Aboriginal heritage

A Due Diligence Archaeological Assessment has been prepared by Navin Officer (Navin Officer, 2015) for the proposed works. A summary of the findings of this assessment are outlined below and the full report is included as Appendix H.

5.9.1 Concept Plan Conditions of Approval

CoA #	Condition	Response
2.1 (h)	Heritage – both Aboriginal and non-Aboriginal, including an assessment of Aboriginal sites affected by the proposed development, their cultural value and the significance of these values for Aboriginal people;	This section provides the results of an Non-Aboriginal desk top review which was undertaken to identify any Non-Aboriginal sites affected by the proposal.

5.9.2 Existing environment

In 2003, Navin Officer conducted a cultural heritage assessment of the proposed Googong township as part of a Local Environmental Study. The assessment involved a comprehensive surface survey of approximately 1,000 hectares. Seven historical sites (GH1-7) were identified during this survey.

In 2014, Navin Officer conducted a cultural heritage assessment of the remaining areas of the Googong township not assessed south of Googong Road. Five additional European sites (Grwh1-5) were recorded during this additional survey.

No non-Aboriginal heritage sites have been recorded within the proposal area.

5.9.3 Potential impacts

Given that there are no known non-Aboriginal heritage items located within or immediately adjacent to the proposal area, no impacts to items of non-Aboriginal heritage significance are expected.

5.9.4 Management measures

If any unknown non-Aboriginal heritage items are discovered during the construction activities, works in the area of the find would cease immediately and the site Environmental Officer contacted for further advice. Works would not resume until after the site Environment Officer has given approval to proceed. This procedure would be detailed in the CEMP.

5.10 Air quality

5.10.1 Concept Plan Conditions of Approval

CoA #	Condition	Response
2.1 (h)	Air quality – including dust and odour impacts.	Dust and odour impacts are addressed in this section.

CoA #	Condition	Response
2.1 (k)	the assessments of the subsequent project stages shall take into account, but not limited to the following guidelines, as relevant: ▪ *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (DEC, 2005)*	Air quality impacts are addressed in this section.

5.10.2 Existing environment

The proposal is located within the Googong Dam Foreshores Area which is predominantly a natural bushland setting with scattered rural properties. A number of open space picnic areas and walking tracks are also located throughout the area.

In addition the neighbouring Googong township is located within a predominantly rural landscape characterised by large rural landholdings, that is gradually changing into a suburban area with the ongoing development of the Googong township. The surrounding area is predominantly characterised by low-intensity grazing, bushland and rural residential land uses; no intensive agricultural activities are known to occur.

Googong is located within a temperate climate, distinctively characterised by dry (and warm) summers and cold winters. Mean temperatures are within the range of 13 to 27°C during summer and 0.5 to12°C in winter. Uniform rainfall is experienced throughout the year with an average of 615.5 millimetres received per annum.

The ambient air quality of the study area is affected by the predominantly agricultural use of the surrounding area, and is considered to be good. (There are minimal odour impacts from the agricultural uses due to the low-intensity farming.) Quantitative analysis of the air quality has not been deemed necessary given the absence of prevailing factors that would alter the air quality from its relatively benign state.

Various external factors would occasionally have impacts on air quality in the area. These include:

- Construction activities related to the ongoing development of the Googong township.
- Seasonal bushfires, burn-offs and hazard reduction burning, which produce smoke and ash.
- Extreme weather events combined with drought, which can cause dust or particulates from the ongoing construction activities related to the development of the Googong township.

Note that odour controls installed at the WRP are expected to avoid any offsite odour impacts.

5.10.3 Potential impacts

Construction

Construction would generate minor dust impacts. Principal dust and particulate matter emissions from construction activities would be associated with bulk earthworks. The extent of the impact would vary depending upon soil type, soil moisture, ground cover and the prevailing wind conditions at a given location.

The following construction activities are potential sources of dust generation:

- Vegetation clearing of roadside vegetation, trenching, backfilling and reinstatement.
- Wind erosion from stockpiling of excavated topsoil and trench spoil.
- Movement of vehicles and construction machinery, both within and in/out of the construction site.
- Excavation (e.g. by drilling) of hard rock areas.

Construction of the pipelines would involve only minimal surface disturbance at any one time as the excavation works and rehabilitation would happen progressively.

During construction, it is unlikely that there would be any odour impacts that would affect air quality, as construction plant and vehicles are the only sources and any odour emissions would be negligible within the context of the open areas surrounding the construction site.

Operation

During operation, it is unlikely that particulate matter (dust) would affect air quality within the study area. The site would be rehabilitated after construction, minimising the potential for dust generation.

There are no significant sources of odour associated with the operation of the proposal.

5.10.4 Management measures

Construction

The following dust suppression measures would be implemented to minimise nuisance dust:

- Speed limits would be reduced during high dust/windy conditions.
- Clearing of vegetation and topsoil would be limited to the designated footprint required.
- Disturbed areas would be progressively reinstated with suitable stabilising agents or revegetation.
- Water trucks would be used to reduce dust in dry, windy conditions.
- Working practices would be modified during periods of high winds by limiting the use of some machinery and by reducing travel speeds.
- The burning of material on site would be prohibited, except under the instruction of NSW Rural Fire Services.

These dust suppression measures are based on standard construction industry measures based on the 'Blue Book' (Landcom, 2004) and would be sufficient to adequately manage dust during the construction phase.

5.11 Waste management

5.11.1 Concept Plan Conditions of Approval

CoA #	Condition	Response
2.1 (h)	Waste Management – including the likely waste quantities and qualities generated during the construction (including spoil generation) and operation of the project.	Waste assessment and management for the project is considered in this section.

5.11.2 Policy setting

Waste management would be undertaken in accordance with the *Waste Avoidance and Resource Recovery Act 2001*. The objectives of the Act that are applicable to the proposal are:

- to encourage the most efficient use of resources and to reduce environmental harm in accordance with the principles of ecologically sustainable development.

- to ensure that resource management options are considered against a hierarchy of the following order:
  - avoidance of unnecessary resource consumption
  - resource recovery (including reuse, reprocessing, recycling and energy recovery)
  - disposal of waste.
- to provide for the continual reduction in waste generation.
- to minimise the consumption of natural resources and the final disposal of waste by encouraging the avoidance of waste and the reuse and recycling of waste.
- to assist in the achievement of the objectives of the *Protection of the Environment Operations Act 1997*.

5.11.3 Potential impacts

Waste streams from construction activities will vary depending on the construction activities being undertaken at any one time. General expected waste streams would include:

- Vegetation waste from clearing and stripping activities, although this is expected to be minimal given the disturbed nature of the proposal area.
- Excess spoil from excavation – an estimated 500 cubic metres of primarily virgin excess spoil.
- Used fuel and chemical containers.
- Packaging waste from delivery of construction materials and plant and equipment.
- General construction waste such as excess concrete, formwork, pipe offcuts, cabling and wiring.
- Contaminated soil material caused by accidental fuel and chemical spills.
- General waste from site amenities including food waste, office waste and waste water.
- Disused environmental controls such as sediment fences, straw bales, gravel socks etc.

Generally waste to be produced would be in minimal quantities and would be disposed of at an appropriately licensed facility. It is not expected that any contaminated waste (except as a result of accidental spills) would be produced as a result of the proposed construction activities.

Resources would be sourced from local suppliers where feasible and volumes required would be minimised where possible. No materials required for the proposal are likely to become in short supply in the near future.

Operation

Operation is not expected to generate a substantial volume of waste. The likely types of waste would include:

- Empty bottles and storage containers from materials used for maintenance of the BWPS.
- General waste from staff attending the operation of the facility.

Therefore impacts from operational waste are expected to be minor and suitable standard operational procedures would be implemented to manage any operational waste produced.

5.11.4 Management measures

- Resource management hierarchy principles are to be followed:
  - Avoid unnecessary resource consumption as a priority.

- Avoidance is followed by resource recovery (including reuse of materials, reprocessing, recycling and energy recovery).
- Disposal is undertaken as a last resort at a licensed waste facility.

(in accordance with the *Waste Avoidance and Resource Recovery Act 2011*).

- Waste materials is not to be left on site once the works are complete.
- Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day.
- No waste is to be burnt on site.

5.12 Hazards and risks

5.12.1 Concept Plan Conditions of Approval

CoA #	Condition	Response
2.1 (h)	Hazards and risk – including details of hazardous materials used or kept on the premises during the construction and operation phases of the project	Hazards and risks for the proposal are assessed in this section.
	Human Health – inducing impacts arising from the application of recycled water and discharges of wastewater and recycled water.	Impacts to human health from the proposal are considered in this section.

5.12.2 Potential impacts

Construction

Potential construction hazards and risks would be associated with:

- Workplace health and safety of construction personnel, as well as the safety of any passersby.
- Construction activities on and in the vicinity of roads (including the delivery of equipment materials etc). Potential impacts on traffic safety have been considered in Section 5.1.3 of this report.
- Construction near powerlines and other existing services.
- Environmental events, such as major storms, bushfires and the like.

These construction hazards and risks are considered typical of such projects and would generally be adequately managed by standard industry practices and procedures.

Operation

The proposal would not result in the use, delivery or storage of any additional chemicals when compared to the existing operating BWPS. Therefore there would be no additional hazard risks as a result of the proposal.

The proposal only provides for the transport of potable water therefore there would be no potential impacts to human health as a result of the proposal.

5.12.3 Management measures

Construction

Mitigation measures that would be implemented during construction would be outlined in the CEMP and would include (but not limited to):

- Implementation of appropriate safety and training procedures, such as safe work method statements, safety management plan(s), auditing of contractors' safety management and approval of construction equipment.
- Risks register and risk minimisation process.
- Implementation of a traffic management plan (see Section 5.1.4).
- Liaison with local emergency services, in particular regarding high fire-danger periods.
- Installing exclusion fencing where appropriate.

6 Conclusion

The proposal is justified because it would provide an important component of the next stage of the Googong township IWC Project. Stage 1 of the IWC Concept Plan is currently under construction and partially operational with a capacity of 3,600 EP. The development of the Googong township is to reach this capacity by late 2016, therefore the next stage of infrastructure is required to continue servicing the local community.

6.1 Objects of the EP&A Act

Object	Comment
5(a)(i) To encourage the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment.	The proposal would involve temporary impacts to traffic, noise and air quality throughout construction. The proposal would also require some removal of planted vegetation that is within the existing road corridor. However, the proposal would provide an integral part of the IWC Project that supplies water and wastewater services to the Googong township. The township is expected to reach the capacity of the existing infrastructure by late 2016 and therefore this next stage of the project is required to provide for the ongoing development of the township.
5(a)(ii) To encourage the promotion and co-ordination of the orderly economic use and development of land.	The proposal provides for the ongoing development of the Googong township.
5(a)(iii) To encourage the protection, provision and co-ordination of communication and utility services.	The proposal will provide utility services to meet the demand of the growing Googong township.
5(a)(iv) To encourage the provision of land for public purposes.	Not relevant to the proposal.
5(a)(v) To encourage the provision and co-ordination of community services and facilities.	The proposal would provide an integral part of the IWC Project to service the Googong township.
5(a)(vi) To encourage the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats.	The proposal would have minimal impacts within the local area with many of the impacts being temporary in nature throughout construction. The proposal is not likely to have any operational impacts on the local environment.
5(a)(vii) To encourage ecologically sustainable development.	Ecologically sustainable development is considered below in Section 6.2.
5(a)(viii) To encourage the provision and maintenance of affordable housing.	Not relevant to the proposal.
5(b) To promote the sharing of the responsibility for environmental planning between different levels of government in the State.	The proposal has been developed by and on behalf of QCC, approval is being sought from PSC and consultation with relevant State agencies has been undertaken.
5(c) To provide increased opportunity for public involvement and participation in environmental planning and assessment.	Section 4 of this SEE outlines the community consultation and stakeholder consultation that has been undertaken for this proposal and for the overall Googong IWC Project.

6.2 Ecological sustainable development

6.2.1 The precautionary principle

The precautionary principle upholds that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

When applying the precautionary principle public and private decisions should be guided by:

- Careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment.
- An assessment of risk-weighted consequences of various options.

A precondition for the operation of the precautionary principle is that there are threats of serious or irreversible environmental damage. This SEE has predicted that such threats are not present for the proposal.

Regardless, the proposal has sought to take a precautionary approach to minimise environmental impacts. This has also been applied in the development of safeguards and management measures. Best available technical information, environmental standards and measures have been used to minimise identified environmental risks of the proposal.

Conservative 'worst case' scenarios were considered while assessing the environmental impact of the proposal.

Specialist advice in noise and vibration, heritage, ecology and bushfire management were incorporated for a detailed understanding of the existing environment and assessment of impacts.

Planning for the proposal involved a risk assessment process that evaluated the environmental risks of the Googong IWC Stage C Network East proposal on the local environment, the community and the overall concept plan delivery.

6.2.2 Intergenerational equity

The principle of intergenerational equity upholds that 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 would benefit both existing and future generations in the following ways:

- Providing an environmentally sustainable IWC system for the whole of the Googong township, which would reduce the use of potable water to 60 per cent of a traditional development.
- Maintaining the local environment and implementing safeguards and management measures to protect the environmental values the Googong area.
- Providing for future development of the Googong township.

The proposal has integrated short and long-term social, financial and environmental considerations so that foreseeable impacts are not left to be addressed by future generations. Issues with potential long term implications such as the consumption of non renewable resources, waste disposal and water quality have been avoided and/or minimised through construction planning and the application of safeguards and management measures described at Section 5.

6.2.3 Conservation of biological diversity and ecological integrity

The principle of biological diversity upholds that the conservation of biological diversity and ecological integrity should be a fundamental consideration.

The construction planning outcomes and safeguard and management measures described at Section 5 would minimise the impacts of the proposal on aquatic and terrestrial biodiversity and the ecological integrity of the area.

6.2.4 Improved valuation, pricing and incentive mechanisms

This principle upholds that environmental factors should be included in the valuation of assets and services, such as:

- Polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement.
- The users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste.
- Environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.

Environmental issues have been considered in the strategic planning for the proposal. The preservation of social, environmental and economic values of the Googong township assist in justifying the need for the proposal. The environmental goals of the proposal have been pursued in the most cost effective way through the construction planning process.

Safeguards and management measures identified at Section 5.11.4 for avoiding, reusing, recycling and managing waste during construction and operation would be implemented.

6.3 Statement of commitments

SoC #	Management measure / commitment	Issue	Responsibility
Construction			
C1	A Construction Environment Management Plan (CEMP) would be prepared to manage the environmental issues assessed in this SEE and implement the identified mitigation measures where required during construction.	General	Contractor
C2	A detailed traffic and access management plan would be prepared prior to construction to outline all access routes to, from and within the construction zones, traffic control methods to be utilised and methods to minimise impacts on the local road network.	Traffic and access	Contractor
C3	Access to the BWPS would be maintained as much as feasible. At times when access to the BWPS is required to be closed, an agreement on the time, day and duration of closure would be reached with Icon Water prior to closure of access.	Traffic and access	Contractor
C4	The access road to the BWPS would be fully re-instated at the completion of construction in accordance with Icon Water requirements and re-opened to vehicles.	Traffic and access	Contractor
C5	All employees and contractors would be inducted into the site and would receive appropriate training to fulfil their individual and environmental responsibilities, including requirements and responsibilities under the traffic and access management plan.	Traffic and access	Contractor
C6	Where feasible, construction deliveries would be scheduled outside of peak periods, in particular peak residential access times.	Traffic and access	Contractor
C7	Access to residential properties would be maintained at all times.	Traffic and access	Contractor
C8	Construction staff and delivery vehicles would not park in public parking areas where supply is limited.	Traffic and access	Contractor
C9	Any permits required for oversize vehicles to transport plant or equipment are to be obtained from Roads and Maritime Services.	Traffic and access	Contractor
C10	Fencing would be established around all identified areas of Blakely's Red Gum Woodland within the proposal area to avoid inadvertent impacts.	Biodiversity	Contractor
C11	Vegetation clearing would be limited to grasses and shrubs along the road side and would be minimised as much as feasible.	Biodiversity	Contractor
C12	No clearing of any trees (including dead or hollow-bearing trees) would be undertaken as part of the proposal.	Biodiversity	Contractor

SoC #	Management measure / commitment	Issue	Responsibility
C13	Prior to and following the works, weed control of the proposal area would be undertaken to limit the spread of weeds into adjacent bushland areas.	Biodiversity	Contractor
C14	The CEMP would include an emergency evacuation plan for the construction area and compound site, and would include early warning measures such as monitoring fire hazard ratings on a daily basis and monitoring accordingly.	Bushfire	Contractor
C15	The CEMP would provide for measures to minimise the potential to start a fire from construction activities, e.g. restrictions on the types of activities that can occur during high fire risk ratings and/or the provision for a spotter during such activities.	Bushfire	Contractor
C16	Fire fighting equipment would be located at the construction site at all times and on appropriate plant.	Bushfire	Contractor
C17	Smoking would not be permitted on the construction area, the compound site or the adjacent bushland areas during construction.	Bushfire	Contractor
C18	Maintaining surface and soil stability at all times during cut-and-fill excavation activities (particularly in relation to trenching) by implementing erosion and sediment controls in accordance with Section 8 of the *Soil and Water Impact Assessment* (SESL, 2015) and *Managing Urban Stormwater: Soils and Construction* (Landcom, 2004 – also referred to as 'The Blue Book'). Site-specific Erosion and Sediment Control Plans (ESCPs) will be prepared progressively to include the management strategies and controls for all activities with the potential to impact on sediment loss and erosion.	Soils and hydrology	Contractor
C19	Erosion within the trench would be mitigated by using trench plugs (i.e. trench/sack breakers) at appropriate intervals. These measures are in accordance with the Blue Book.	Soils and hydrology	Contractor
C20	Measures to ensure limited tracking of dirt off site will be implemented at access points. Where required the controls may include exit rumble grids at all points of egress onto public (sealed) roads, and/or stabilisation of site roads/tracks with aggregate where appropriate.	Soils and hydrology	Contractor
C21	Erosion and sedimentation controls will be inspected prior to and after each rain period and during periods of prolonged rainfall. Any defects will be rectified immediately.	Soils and hydrology	Contractor
C22	Erosion and sediment measures to secure the stockpile areas (e.g. diversions, sediment fences) will be installed prior to the commencement of spoil stockpiling activities.	Soils and hydrology	Contractor
C23	Stockpiles will be checked for stability weekly and after heavy rainfall.	Soils and hydrology	Contractor
C24	Topsoil will be conserved, where reasonable and feasible, for use in site rehabilitation/revegetation.	Soils and hydrology	Contractor

SoC #	Management measure / commitment	Issue	Responsibility
C25	During the restoration and clean-up of construction sites, the following measures would be applied to stabilise the soils: ▪ The site would be re-profiled to achieve soil stability and congruity with the surrounding landscape. ▪ Re-seeding would be undertaken, and geotextile materials used as required. ▪ Trenches would be backfilled and compacted in layers. ▪ Access to the site would be managed (including site restrictions) to assist with site recovery. ▪ There will be progressive revegetation, stabilisation and restoration works of earthworks areas in accordance with the Blue Book.	Soils and hydrology	Contractor
C26	To prevent the contamination of soils and in the event that contamination is encountered during construction, the following measures would be implemented: ▪ Works in the vicinity will be stopped or modified and will not recommence until the material has been analysed, the hazard has been assessed and appropriate action has been taken (including delineating areas of concern as required until earthworks can resume safely). ▪ Storage areas for fuels, oils and chemicals used during construction will be covered and contained within an impervious bund to retain any spills of more than 110% of the volume of the largest container in the bunded area. Any spillage will be immediately contained and absorbed with a suitable absorbent material. The contaminated material will be disposed of according to manufacturers and EPA requirements. ▪ Where possible, all refuelling would occur at designated fuel distribution points. These distribution points would be underlain by compacted earth to prevent the significant loss of fuel into the ground in the event of a spill. They would also be bunded to contain any large spills that may occur as a result of machinery or tank failure. ▪ Spill response procedures and equipment for containment and recovery would be available on site. ▪ Workforce training would be conducted on the transport, storage, handling and disposal procedures relating to chemicals.	Soils and hydrology	Contractor
C27	A Construction Noise and Vibration Management Plan would be prepared for all construction activities and included in the CEMP. It would outline measures to minimise construction noise and vibration impacts on sensitive receivers. This would also include an action plan to be followed if complaints are received.	Noise and vibration	Contractor

SoC #	Management measure / commitment	Issue	Responsibility
C28	Works (including delivery of plant and equipment) would be limited to standard working hours of: ▪ Monday to Friday 7:00am to 6:00pm. ▪ Saturday 8:00am to 1:00pm. ▪ No works on Sunday or public holidays.	Noise and vibration	Contractor
C29	All potentially impacted residents would be notified of the proposed works, including the nature and duration of construction activities, predicted noise levels and contact details should they have any issues with the construction activities.	Noise and vibration	Contractor
C30	Construction plant and equipment would be well maintained (including noise reduction fittings where feasible) and would be turned off when not in use to minimise noisy emissions.	Noise and vibration	Contractor
C31	Where feasible reversing equipment would use 'quacker' alarms or would be minimised to prevent causing a nuisance.	Noise and vibration	Contractor
C32	Loading and unloading would be undertaken away from sensitive receivers.	Noise and vibration	Contractor
C33	During operation plant and machinery would be well maintained in order to minimise operational noise emissions.	Noise and vibration	Contractor
C34	Rock breaking activities are not to be undertaken within 50 metres of sensitive receivers.	Noise and vibration	Contractor
C35	Installation of temporary fencing at the construction site for security and to visually delineate the area of construction.	Visual amenity	Contractor
C36	The site to be kept tidy and well maintained, including removal of all rubbish at regular intervals. There should be no storage of materials beyond the construction boundaries.	Visual amenity	Contractor
C37	Temporary hoardings, barriers, traffic management and signage would be removed when no longer required.	Visual amenity	Contractor
C38	Locate construction plant, machinery and vehicle parking areas away from public or sensitive viewing areas.	Visual amenity	Contractor
C39	Upon completion, the proposal site would be reinstated and revegetate at the completion of works.	Visual amenity	Contractor

SoC #	Management measure / commitment	Issue	Responsibility
C40	An Aboriginal Heritage Management Sub Plan would be prepared prior to the commencement of works. As a minimum this plan would include: ▪ Methodology for the actioning of all management measures outlined in section 5.8.5 of the SEE. ▪ Inductions procedures on Aboriginal heritage for all staff and sub-contractors working on the proposal. ▪ A site constraints map indentifying known Aboriginal and the project boundaries and requirements for the display of the constraints map on site. ▪ Any ongoing Aboriginal consultation and involvement required. ▪ Management plans for the erection, maintenance and de-commissioning of the fencing around the identified Aboriginal sites before, during and at the completion of construction. ▪ Procedures for managing any potential unidentified finds during construction, including human skeletal remains.	Aboriginal heritage	Contractor
C41	Aboriginal site GWTP5 would be fenced for the duration of construction activities associated with the proposal. The construction of the fence would be conducted with on-site advice from the project archaeologist.	Aboriginal heritage	Contractor
C42	The location of all heritage sites would be clearly marked on all site plans and maps utilised for the proposal.	Aboriginal heritage	Contractor
C43	All construction staff would be inducted on site and advised of the proximity of Aboriginal heritage items within the area and the need to avoid impacts to them.	Aboriginal heritage	Contractor
C44	Construction staff would remaining within the designated proposal area throughout construction activities to avoid any potential indirect impacts to adjacent heritage items.	Aboriginal heritage	Contractor
C45	The protocols for the unanticipated discovery of archaeological material and suspected human remains would be implemented for the Googong IWC Stage C Network East project if necessary. A copy of these would be included in the CEMP.	Aboriginal heritage	Contractor
C46	If any unknown non-Aboriginal heritage items are discovered during the construction activities, works in the area of the find would cease immediately and the site Environmental Officer contacted for further advice. Works would not resume until after the site Environment Officer has given approval to proceed. This procedure would be detailed in the CEMP.	Non-Aboriginal heritage	Contractor
C47	Speed limits would be reduced during high dust/windy conditions.	Air quality	Contractor
C48	Clearing of vegetation and topsoil would be limited to the designated footprint required.	Air quality	Contractor

SoC #	Management measure / commitment	Issue	Responsibility
C49	Disturbed areas would be progressively reinstated with suitable stabilising agents or revegetation.	Air quality	Contractor
C50	Water trucks would be used to reduce dust in dry, windy conditions.	Air quality	Contractor
C51	Working practices would be modified during periods of high winds by limiting the use of some machinery and by reducing travel speeds.	Air quality	Contractor
C52	The burning of material on site would be prohibited, except under the instruction of NSW Rural Fire Services.	Air quality	Contractor
C53	Resource management hierarchy principles are to be followed: ▪ Avoid unnecessary resource consumption as a priority. ▪ Avoidance is followed by resource recovery (including reuse of materials, reprocessing, recycling and energy recovery). ▪ Disposal is undertaken as a last resort at a licensed waste facility. (in accordance with the *Waste Avoidance and Resource Recovery Act 2011*).	Waste	Contractor
C54	Waste materials is not to be left on site once the works are complete.	Waste	Contractor
C55	Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day.	Waste	Contractor
C56	No waste is to be burnt on site.	Waste	Contractor
C57	Mitigation measures that would be implemented during construction would be outlined in the CEMP and would include (but not limited to): ▪ Implementation of appropriate safety and training procedures, such as safe work method statements, safety management plan(s), auditing of contractors' safety management and approval of construction equipment. ▪ Risks register and risk minimisation process. ▪ Implementation of a traffic management plan (see Section 5.1.4). ▪ Liaison with local emergency services, in particular regarding high fire-danger periods. ▪ Installing exclusion fencing where appropriate.	Hazards and risks	Contractor
Operation			
O1	The existing Stage AB Network Operational Environment Management Plan (OEMP) would be updated to manage the environmental issues assessed in this SEE and implement the identified mitigation measures where required during operation.	General	GTPL/Icon Water

SoC #	Management measure / commitment	Issue	Responsibility
O2	The existing fire trail/access road to the BWPS should be maintained as a five metre wide maintenance trail, therefore no revegetation of this buffer area would be undertaken. Low level grasses would be used to stabilise the area at the completion of construction.	Bushfire	Icon Water
O3	No tree or tree canopy is to occur within two metre of the building roofline	Bushfire	Icon Water
O4	The presence of a few shrubs and small trees within the APZ is acceptable provided that they: ▪ are well spread out and do not form a continuous canopy; ▪ are not species that retain dead material or deposit excessive quantities of ground fuel in a short period or in a danger period; and ▪ are located far enough away from the building so that they will not ignite the building by direct flame contact or radiant heat emission.	Bushfire	Icon Water
O5	Any landscaping or plantings should preferably be local endemic mesic species or other low flammability species.	Bushfire	Icon Water
O6	A minimal ground fuel is to be maintained to include less than four tonnes per hectare of fine fuel (i.e. dead or living vegetation of less than six millimetre in diameter e.g. twigs less than a pencil in thickness.) Four tonnes per hectare is equivalent to a one centimetre thick layer of leaf litter.	Bushfire	Icon Water
O7	Any structures storing combustible materials, such as flammable liquids and gases (e.g. sheds), must be sealed to prevent entry of burning debris.	Bushfire	Icon Water
O8	The facilities within the BWPS will have the capacity to provide water for fire fighting via the infrastructure if required. Installation of a 65 millimetres Storz fitting to tanks or outlets will allow fire appliances to utilise the water.	Bushfire	Icon Water
O9	Outlet pipes and scour structures along the potable water main will be regularly checked to ensure functionality is maintained.	Soil and hydrology	Icon Water
O10	Operational water quality and hydrology management measures outlined in the WMP will be implemented.	Water quality and hydrology	Icon Water
O11	Resource management hierarchy principles are to be followed: ▪ Avoid unnecessary resource consumption as a priority. ▪ Avoidance is followed by resource recovery (including reuse of materials, reprocessing, recycling and energy recovery). ▪ Disposal is undertaken as a last resort at a licensed waste facility. (in accordance with the *Waste Avoidance and Resource Recovery Act 2011*).	Waste	Icon Water

SoC #	Management measure / commitment	Issue	Responsibility
O12	Working areas are to be kept maintained and free of rubbish.	Waste	Icon Water

6.4 Conclusion

The proposed construction of the Googong IWC Stage C Network East is subject to assessment under Part 4 of the EP&A Act, with consideration of the Part 3A Concept Approval issued by the NSW Minister for Planning in 2010. This SEE has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity.

The proposal is unlikely to affect threatened species, populations or ecological communities or their habitats, within the meaning of the *Threatened Species Conservation Act 1995* or *Fisheries Management Act 1994* and therefore a Species Impact Statement is not required. The proposal is also unlikely to affect Commonwealth land or have a significant impact on any matters of national environmental significance.

A number of potential environmental impacts from the proposal have been avoided or reduced during design development. The proposal as described in the SEE best meets the project objectives and is consistent with the Part 3A Concept Approval, but would still result in some impacts on noise and air quality during construction. Safeguards and management measures as detailed in this SEE would ameliorate or minimise these expected impacts and they are not considered to be significant. The proposal would also provide important infrastructure to provide the IWC system for the Googong township. On balance the proposal is considered justified.

7 Terms and abbreviations

AEC	Area of Environmental Concern
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information Management System
APZ	Asset protection zone
BCA	Building Code of Australia
Blue Book	Managing Urban Stormwater: Soils and Construction (Landcom, 2004)
BWPS	Bulk water pumping station
CEMP	Construction Environmental Management Plan
CIC	Canberra Investment Corporation
EP	Equivalent population
EP&A Act	*Environment Planning and Assessment Act 1979*
EPA	NSW Environmental and Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EPL	Environment Protection Licence
ESCP	Erosion and Sediment Control Plan
GDA	Googong Dam Area
GTPL	Googong Township Pty Ltd
ICNG	Interim Construction Noise Guideline (DECC, 2009)
IHO	Interim Heritage Orders
ISEPP	*State Environmental Planning Policy (Infrastructure) 2007*
IWC	Integrated Water Cycle
LEP	Local Environmental Plan
LGA	Local Government Area
NML	Noise management level
NPW Act	*National Parks and Wildlife Act 1974*
OEH	NSW Office of Environment and Heritage
PAD	Potential Archaeological Deposit
Part 3A Repeal Act	*Environmental Planning and Assessment Amendment (Part 3A Repeal) Act 2011*
PBP	Planning for Bush Fire Protection (RFS, 2006)
PoEO Act	*Protection of the Environment Operations Act 1997*
PSC	Palerang Shire Council
QCC	Queanbeyan City Council
RBL	Rating background level
SEE	Statement of Environmental Effects
SFPP	Special Fire Protection Purpose
SHR	State Heritage Register
SPS	Sewage pumping station

TSC Act	*Threatened Species Conservation Act 1995*
VDV	Vibration Dose Value
WMP	Water Management Plan
WRP	Water recycling plant

8 References

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Appendix A

Section 79C(1) - Matters for consideration

Table A1 Summary of Section 79C(1) - Matters for Consideration

Matter for Consideration	Response
In determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development the subject of the development application:	
(a) the provisions of: (i) any environmental planning instrument, and (ii) any proposed instrument that is or has been the subject of public consultation under this Act and that has been notified to the consent authority (unless the Secretary has notified the consent authority that the making of the proposed instrument has been deferred indefinitely or has not been approved), and (iii) any development control plan, and (iiia) any planning agreement that has been entered into under section 93F, or any draft planning agreement that a developer has offered to enter into under section 93F, and (iv) the regulations (to the extent that they prescribe matters for the purposes of this paragraph), and (v) any coastal zone management plan (within the meaning of the Coastal Protection Act 1979), that apply to the land to which the development application relates,	All relevant planning instruments, control plans and/or planning agreements have been considered in Section 2 of this SEE. Community and stakeholder consultation has been undertaken for this proposal in accordance with the Part 3A Concept Approval requirements. The results of this consultation are outlined in Section 4 of this SEE. No coastal zone management plan apply to this proposal.
(b) the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality,	The potential impacts of the proposal have been outlined in Section 5 of this SEE.
(c) the suitability of the site for the development,	The proposal includes upgrading and increasing the existing potable water infrastructure within and adjacent to the existing infrastructure in this location. Therefore the development of the proposal is consistent with the existing use of the site.
(d) any submissions made in accordance with this Act or the regulation	Section 4 of this SEE outlines consultation that has been undertaken for this proposal and responses. In addition, this SEE may be placed on public display by Palerang Shire Council as part of the assessment process. Any responses received from the community would be considered and a submissions report prepared for council's consideration.
(e) the public interest.	The proposal provides for the integrated water cycle infrastructure servicing the developing Googong township. The provision of potable water to the developing township is considered to be in the public interest.
Note. See section 75P (2) (a) for circumstances in which determination of development application to be generally consistent with approved concept plan for a project under Part 3A.	This section has been repealed.

Appendix B

Concept Approval - Future environmental assessment requirements

Table B1 Summary of Part 3A Concept Approvals

CoA #	Condition	Response
2.1	Pursuant to section 75P(2)(c) of the EP&A Act, the following environmental assessment requirements apply with respect to any future development that is subject to Part 4 of Part 5 of the EP&A Act (which are not exempt or complying development), for the subsequent project stages:	
2.1 (a)	A detailed project description, including the design and location of ancillary infrastructure (including access roads and temporary construction compounds) and its relationship to the approved concept and approved project stages.	Section 1 outlines a detailed description of the proposal and all ancillary facilities including temporary compound sites. Appendix I includes the detailed design drawings for the project.
2.1 (b)	An assessment of relevant statutory matters including land zoning, permissibility and consistency with the objects of the EP&A Act.	An assessment of relevant statutory matters including land zoning and permissibility is outlined in Section 3 of the SEE. Consistency of the proposal with the objects of the EP&A Act are outlined in Section 6.1 of the SEE.
2.1 (c)	A demonstration that the project is consistent with the requirements of this Concept Plan approval and generally consistent with the scope and intent of the Concept Plan and environmental impacts outlined in the documents under condition 1.1 of this approval.	A demonstration that the proposal is consistent with the Concept Plan approval is outlined in Section 1 of the SEE. Consideration of the environmental impacts of the proposal are outlined in Section 5 of the SEE.
2.1 (d)	A risk assessment of the potential environmental impacts of the project, identifying the key issues for further assessment.	A risk assessment for the proposal was undertaken by the project team in mid 2015 to identify the potential environmental, construction and operational risks to the proposal. The risks identified were then utilised to guide the environmental impact assessment outlined in Section 5 of this SEE. A copy of the risk assessment table can be found in Appendix J.
2.1 (e)	A description of the measures that would be implemented to avoid, minimise and, if necessary, offset the potential impacts of the project, and ensure that the project is in the public interest.	Section 5 of this SEE identifies the management measures that would be implemented to avoid, minimise or offset the potential impacts of the proposal on the local environment. Section 6 of the SEE identifies the justification of the proposal that it is in the public interest to ensure sufficient potable water and recycled water supply to the growing Googong township.
2.1 (f)	An assessment of the consistency of the potential impacts and proposed mitigation measures with the management plans approved under Stage 1 Project and subsequent stages.	A demonstration that the proposal is consistent with the Concept Plan approval is outlined in Section 2 of the SEE. All potential impacts of the proposal have been considered in Section 5 of the SEE.

CoA #	Condition	Response
2.1 (g)	A detailed project specific statement of commitments	Section 6.2 of the SEE provides an outlined of the project specific statement of commitments for the project. These commitments summarise the proposed management measures for the proposal to avoid, minimise or offset the potential impacts of the proposal.
2.1 (h)	Assessment of the following key issues considering all components of the project (including temporary construction facilities) and cumulative impacts from other projects associated with the Concept Plan:	
	Surface Water – including potential water quality impacts on local creeks and rivers and impacts on surface water flows, as a result of construction and operation of the project;	The potential impacts to surface water quality have been considered in Sections 5.4 and 5.5.
	Soils and landscape – including potential soil contamination, erosion risks, irrigations and rehabilitation;	Impacts of the proposal on the soil landscape, including potential soil contamination, erosion risks and rehabilitation, are assessed in Section 5.4.
	Groundwater – including potential impacts on local recharge levels, contamination risks, groundwater mounding, isolated waterlogging of soils and impacts on groundwater quality.	The potential impacts to groundwater quality have been considered in Sections 5.4 and 5.5.
	Flora and fauna – including terrestrial riparian and aquatic, with accurate estimates of vegetation disturbance associated with the project;	Impacts of the proposal on terrestrial, riparian and aquatic biodiversity , including vegetation disturbance, are assessed in Section 5.2 of the SEE.
	Heritage – both Aboriginal and non-Aboriginal, including an assessment of Aboriginal sites affected by the proposed development, their cultural value and the significance of these values for Aboriginal people;	Section 5.8 provides the results of an Aboriginal Heritage assessment which was undertaken to identify any Aboriginal sites affected by the proposal. Section 5.9 provides the results of an Non-Aboriginal desk top review which was undertaken to identify any Non-Aboriginal sites affected by the proposal.
	Human Health – inducing impacts arising from the application of recycled water and discharges of wastewater and recycled water.	Impacts to human health from the proposal have been considered Section 5.12
	Waste Management – including the likely waste quantities and qualities generated during the construction (including spoil generation) and operation of the project.	Waste assessment and management for the project has been considered in Section 5.11.
	Hazards and risk – including details of hazardous materials used or kept on the premises during the construction and operation phases of the project	Hazards and risks for the proposal have been assessed in Section 5.12.
	Air quality – including dust and odour impacts.	Dust and odour impacts have been considered in Section 5.10.
	Noise and vibration – including construction and operation noise impacts in the context of planned urban development in the area;	Construction and operational noise impacts of the proposal have been assessed in Section 5.6.

CoA #	Condition	Response
	Visual amenity – an assessment of the impact of the project on visual amenity, including future sensitive receptor areas, including residential;	Construction and operational visual amenity impacts of the proposal have been assessed in Section 5.7.
	Traffic and access – including details of transport routes to and from construction and operation sites and associated impacts to existing activities, including safety impacts;	Details of the temporary traffic and access routes during construction and operation are outlined in Section 5.1.
2.1 (i)	evidence of an appropriate level of consultation with (but not necessarily limited to) the following parties, including identification of the issues raised and how these have been addressed in the assessment: ▪ Commonwealth Department of Sustainability, Environment, Water, Population and Communities (now referred to as the Department of the Environment); ▪ Office of Environment and Heritage (including its Heritage Branch); ▪ Department of Trade and Investment, Regional Infrastructure and Services (including its Primary Industries Division) (now referred to as Department of Primary Industries); ▪ Roads and Traffic Authority (now referred to as Roads and Maritime Services); ▪ Queanbeyan City Council; ▪ Palerang Council; ▪ Relevant services providers; and ▪ Property owners and the local community.	All consultation that has been undertaken for this proposal, the issues raised in response to this consultation and GTPL's responses are described in Section 4.
2.1 (j)	The environmental assessment of the project must take into account relevant State Government guidelines, policies and plans	All relevant State Government guidelines, policies and plans have been considered and referenced where required and have been considered in Section 3 and Section 5 under the relevant environmental issues.

CoA #	Condition	Response
2.1 (k)	The assessments of the subsequent project stages shall take into account, but not limited to the following guidelines, as relevant; ▪ *National Water Quality Management Strategy: Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC 2000).* ▪ *National Water Quality Management Strategy – Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (Natural Resource Management Ministerial Council, Environment Protection and Heritage Council and Australian Health Ministers Conference 2006)* ▪ *NSW Industrial Noise Policy (EPA, 2000)* ▪ *Interim Construction Noise Guidelines (DECC, 2009)* ▪ *Environmental Noise Management – Assessing Vibration: a Technical Guideline (DECC, 2006)* ▪ *Environment Criteria for Road Traffic Noise (EPA, 1999)* ▪ *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (DEC, 2005)*	These water guidelines have been considered as part of the design of the proposal and assessment outlined in Section 5.4 and 5.5. A noise assessment has been prepared taking into consideration the relevant guidelines. This is outlined in Section 5.6 of the SEE. Air quality impacts have been addressed in Section 5.10.
3.1	Subject to confidentiality, the Proponent shall make all documents required under this approval available for public inspection on request.	All planning documents for the Googong IWC project have been made publicly available by GTPL on the projects website www.compliance.googong.net.

CoA #	Condition	Response
3.2	Prior to the commencement of construction of any projects associated with this Concept Plan approval, the Proponent shall establish a dedicated website or maintain dedicated pages within its existing website for the provision of electronic information associated with the project. The Proponent shall publish and maintain up-to-date information on this website or dedicated pages including, but not necessarily limited to: (g) the status of the project; (h) a copy of each relevant environmental approval, licence or permit required and obtained in relation to the project; (i) a copy of each approved plan, report, or monitoring program required by this approval and associated project approvals; (j) a summary of the monitoring result of the project, which have been reported in accordance with the various plans and programs approved under this approval and associated project approvals; (k) a summary of the monitoring results of the project, which have been reported in accordance with the various plans and programs approved under this approval and associated project approvals; (l) details of the outcomes of compliance reviews and audits of the project, to the satisfaction of the Director-General.	GTPL has established the IWC project website to inform the community of progress on the planning and construction of the project. This website is www.compliance.googong.net. In addition GTPL provides quarterly updates delivered via email to all residents, property owners and any other listed on the Googong stakeholder list. Contact information is made available for all residents to report any issues with construction activities and records are kept of any reports and how these were addressed.

Appendix C

Community and stakeholder consultation

Appendix D

Ecology impact assessment

Appendix E

Bushfire assessment

Appendix F

Soils and water impact assessment

Appendix G

Noise and vibration impact assessment

Appendix H

Due diligence archaeological assessment

Appendix I

Design drawings

Appendix J

Proposal concept design risk assessment