Ordinary Meeting of Council

9 November 2022

UNDER SEPARATE COVER ATTACHMENTS

ITEMS 8.1 TO 9.4

QUEANBEYAN-PALERANG REGIONAL COUNCIL

Council Meeting Attachment

9 NOVEMBER 2022

ITEM 8.1 RESCISSION MOTION

ATTACHMENT 1 NOTICE OF MOTION OF RESCISSION

QPRC

NOTICES OF MOTION OF RESCISSION

Notice

The following rescission motion has been received and signed by:

1. Katrina Willis

2. John Preston

3. Edwina Webster

Motion

That Council rescind:
Resolution number: 428/22 **of** 26 October 2022 .
Date

Background:

Resolution number: 428/22 of 26 October 2022 is as follows:

N/A

Attachments:

QPRC

Name: Katrina Willis

Signature: Katrina Willis

Date: 28 October 2022 | 12:08 PM AEDT

Name: John Preston

Signature: John Preston

Date: 28 October 2022 | 1:45 PM AEDT

Name: Edwina Webster

Signature:

Date: 28.10.22

QUEANBEYAN-PALERANG REGIONAL COUNCIL

Council Meeting Attachment

9 NOVEMBER 2022

ITEM 9.1 MODIFICATION APPLICATION - DA.2020.1154.B - MODIFICATION OF CONSENT RELATING TO ENERGY SUPPLY - 44 BROOKS ROAD, BYWONG

ATTACHMENT 1 DA.2020.1154.B - SECTION 4.55 ASSESSMENT REPORT - 44 BROOKS ROAD, BYWONG

DELEGATED REPORT - DA.2020.1154.B

SUMMARY

Proposal:	Three lot Torrens title subdivision: Modification: change to Condition 28, 29 and 30 to enable proposed Lot 112 DP to connect to solar power, battery storage and backup generator instead of electricity supply.
Address:	44 Brooks Road BYWONG NSW 2621
Property description:	Lot 11 DP 245149
Applicant:	PHL Surveyors
Owner:	Cheryl Lorraine Le Mesurier & David Barry Le Mesurier
Date of lodgement:	22/12/2021
Notification period:	21/01/2022 to 08/02/2022
Submissions received:	Nil
Assessment officer:	Annie Shumaker
Estimated cost of works:	$60,110
Zoning:	C4 Environmental Living under Palerang Local Environmental Plan 2014
Heritage:	Not applicable
Flood affected:	Not applicable
Bushfire prone:	Yes
Recommendation of officer:	**Approval**

EXECUTIVE SUMMARY

Modify consent conditions 28, 29 and 30 of development consent DA.2020.1154.A to enable proposed Lot 112 of the three-lot subdivision to connect to solar power, battery storage and backup generator instead of electricity supply.

The application was notified between 21 January 2022 and 08 February 2022. No submissions were received.

Recommended for approval subject to amended conditions of consent 28, 29 and 30.

BACKGROUND

The subject site, commonly known as 44 Brooks Road, Bywong and described as Lot 11 on DP 245149, is a single allotment with approval for a three-lot Torrens title subdivision. It has a total area

of 19.61 Ha. and comprises two dwellings (dual occupancy, detached) and ancillary structures. The approved subdivision will create lots that are 3.92 Ha, 8.22 Ha and 7.47 Ha in size. Two of the proposed lots will each contain one of the existing dwellings, while the third lot ie proposed lot 112 will include a building envelope for future development, subject to development consent.

A prior modification to the development consent was approved on 26 August 2021 (DA.2020.1154.A). This modification amended condition 31 of the original consent to reduce the width of the required right of carriageway easement from 20m to 10m.

DESCRIPTION OF THE SITE AND LOCALITY

Located on the southeast side of Brooks Road, the site is extensively cleared. A watercourse ie Gum Flat creek runs from north to south through the southern portion of the block. The site has a divergent slope running to the creek in the proposed lot 112.

Existing development on the current lot 11 consists of two dwellings (detached dual occupancy) and ancillary structures. Vehicular access is provided to the site via an existing driveway from Brooks Road. A new access point to the southernmost proposed lot ie Lot 112 will be created from Shinglehouse Road. The lot will be known as 83 Shinglehouse Road, Bywong. Existing development within the locality is primarily rural residential dwellings and ancillary structures such as sheds and garages.

Figure 1: Locality plan

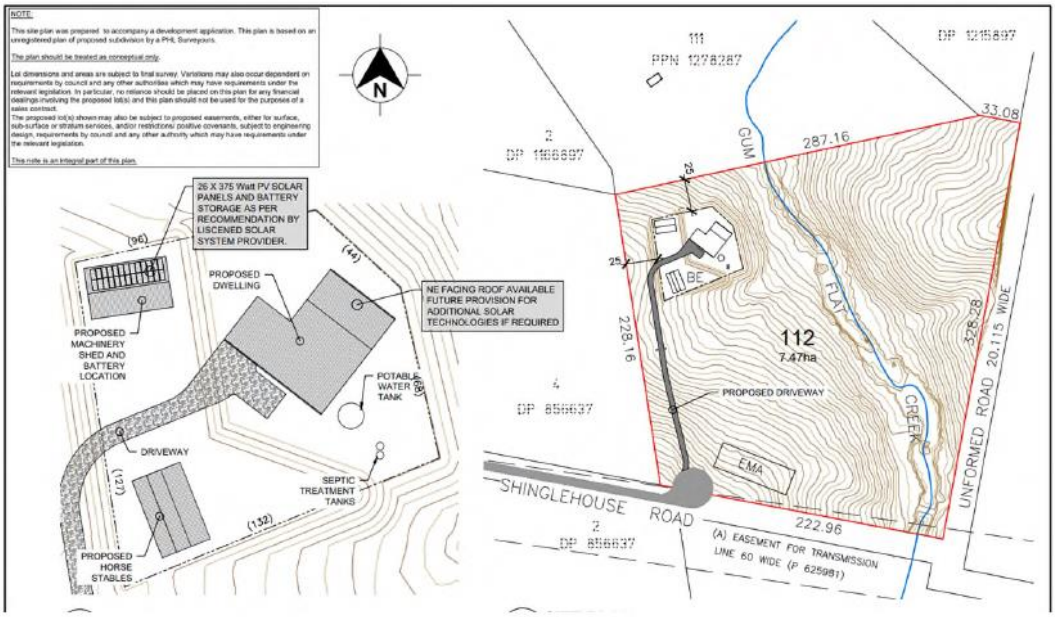


Figure 2. Indicative site plan for proposed Lot 112, showing proposed locations of solar panels and battery

PROPERTY BURDENS AND CONSTRAINTS

There are no easements or burdens on the land which could affect, or be affected by, the proposed development.

DESCRIPTION OF THE PROPOSED DEVELOPMENT

The specific elements of the proposal are:

- to connect solar power to proposed Lot 112 instead of connecting electricity supply. Due to well established trees, infrastructure, distance and intrusion of power lines for future purchasers of proposed Lot 111, connection to existing electrical supply from Lot 111 is difficult.

- battery storage and back up generator.

The application seeks Council approval for modification to consent conditions 28, 29 and 30.

CONSENT AUTHORITY

In accordance with the *Environmental Planning and Assessment Act 1979* (EP&A Act) the proposal as modified is considered to be local development and Council is the Consent Authority.

SECTION 4.10 DESIGNATED DEVELOPMENT – EP&A Act, 1979

The proposal as modified is not designated development.

SECTION 4.47 INTEGRATED DEVELOPMENT – EP&A Act, 1979

The proposal as modified is not integrated development.

REFERRALS

INTERNAL REFERRALS

Engineering Comments

Council's Development Engineer provided initial comments on the proposal as follows:

"The land parcel is identified as Lot 11 DP 245149 (44 Brooks Road, Bywong). The lot is classed as C4 (E4) Environmental Living under the *Palerang Local Environmental Plan 2014*.

DA.2020.1154 is for a three lot torrens title subdivision which was determined on the 4 January 2021. Conditions 26 and 27 relate to reticulated electrical supply to the newly created lots prior to the issue of a Subdivision Certificate. These became Conditions 28 and 29 in the amended consent.

Council's policy is to have a reticulated electricity supply to all new subdivisions. However, section C1.2.9 (3) of the Palerang Development Control Plan 2015 provides for consideration of alternative power sources in the RU1 Primary Production, C3 (E3) Environmental Management and C4 (E4) Environmental Living zones.

Subsequently, the removal of Conditions 28, 29 and amendment of Condition 30 is supported through this modification:

- to allow for the installation of a solar energy system in place of reticulated electricity supply;
- to restrict the sale of Lot 112, once created, without installation of the solar energy system
- to require a bond payment be made to Council by the applicant to the value of $65,000, being the value of installation of a suitable solar energy system on Lot 112.

The following conditions as per the approved Notice of Consent, dated 4 January 2021 to be removed or amended:

Condition #28 – Separate Connections & Services - To be deleted.

Condition #26A – Electricity Supply - Replacement Condition as below.

Condition #29 – Submission from Service Authority - To be deleted.

Condition #30 – Covenant on the Land - To be amended as below.

Condition 26A. Electricity Supply

The applicant is to provide a ground mounted solar electricity system with a minimum generating capacity of 7.5kW to each of the concessional lots. No infrastructure is to be installed if tree removal without prior consent from Queanbeyan-Palerang Regional Council. The applicant shall install the systems at their own cost and prior to the issue of a Subdivision Certificate for the land. A specification document for each system should be provided to Council prior to the release of a Subdivision Certificate.

Condition 30. Covenant on the Land (Amended)

Apply covenants under section 88B of the *Conveyancing Act 1919* to the new lots incorporating the restrictions listed below. Queanbeyan-Palerang Regional Council shall be nominated as the sole party with the power to vary or remove the required covenants.

a) Creation of a Right of Carriageway 10m wide in favour of proposed Lot 111 over proposed Lot 110,

b) Lot 112 will need an onsite system of power generation at the owners cost as the land is unlikely to be serviced by a reticulated electricity supply system. The owner of Lot 112, at any point in time, is responsible for the ongoing maintenance and replacement of any panels, batteries, inverters, and any parts that form part of the operation of the solar electricity supply system and that it must be maintained in good working order and condition in perpetuity. Prior to any sale, evidence as to the age of the system and its maintenance status is to be provided to any potential purchaser(s).

c) Nominating Council as the name of the person/authority empowered to release, vary or modify restriction or positive covenant numbered in the plan.

d) Plantings on the entire site, including within the building envelopes, are to exclude species listed on the regional weeds lists.

e) Ground covers are to be maintained at a minimum 70% in accordance with the guidelines

contained in Queanbeyan-Palerang Regional Council's Palerang DCP 2015.

Reason: To ensure public utility services, access and restrictions are legalised over the land."

Following a request from the applicant, proposed condition 26A - Electricity Supply was updated to:

"**Condition 26A. Electricity Supply**

The applicant is to provide a solar electricity system with a minimum generating capacity of 7.5kW to Lot 112. No infrastructure is to be installed if tree removal without prior consent from Queanbeyan-Palerang Regional Council. The applicant shall install the systems at their own cost and prior to the issue of a Subdivision Certificate for the land. A specification document for each system should be provided to Council prior to the release of a Subdivision Certificate."

The change in the proposed condition, accommodates the applicant's request to allow the solar panels to be mounted on the roof a proposed shed, rather than requiring them to be ground mounted.

EXTERNAL REFERRALS

NIL

SECTION 4.55 MODIFICATIONS – GENERALLY EP&A ACT, 1979

4.55 (1A) Modifications involving minimal environmental impact

A consent authority may, on application being made by the applicant or any other person entitled to act on a consent granted by the consent authority and subject to and in accordance with the regulations, modify the consent if:

(a) it is satisfied that the proposed modification is of minimal environmental impact, and
(b) it is satisfied that the development to which the consent as modified relates is substantially the same development as the development for which the consent was originally granted and before that consent as originally granted was modified (if at all), and
(c) it has notified the application in accordance with: (i) the regulations, if the regulations so require, or (ii) a development control plan, if the consent authority is a council that has made a development control plan that requires the notification or advertising of applications for modification of a development consent, and
(d) it has considered any submissions made concerning the proposed modification within any period prescribed by the regulations or provided by the development control plan, as the case may be. Subsections (1), and (2) do not apply to such a modification."

Comment:

In regards subclause 'a', it is considered that the modification(s) sought as part of this application is of minimal environmental impact.

Regarding subclause 'b', Council is satisfied that the development to which the consent as modified relates, is substantially the same development for which consent was originally granted. In answering this threshold question, a comparative analysis of the approved development as modified has been undertaken.

With regard to subclauses 'c' and 'd', the application was notified in accordance with Part E of the Palerang DCP 2015 between 21 January 2022 and 8 February 2022. No submissions were received.

SECTION 4.15 CONSIDERATIONS – EP&A Act, 1979

In determining a development application, the consent authority is to take into consideration the following matters of consideration contained within section 4.15 of the *Environmental Planning and Assessment Act, 1979* as relevant to the development application:

	YES	NO	N/A
Construction:			
Is the development likely to comply with BCA?	X		

Stormwater:			
Can stormwater be satisfactorily disposed of?			X
Is an easement required?		X	
Utilities:			
Does the development impact on sewer/drainage services or easements?		X	
Demolition:			
Does the development comply with AS2601-1991?			X
Disability Access:			
Can compliance be achieved with the Disability (Access to Premises – Building Standards 2010)?			X
The provisions of the Palerang Local Environmental Plan 2014 (LEP):			
Is the development permissible in the Zone?	X		
Is the development consistent with the aims and objectives of the zone?	X		
Are relevant clauses satisfied? Elaborate where necessary			X
Will the proposed development have a detrimental effect on:			
The views to and from potentially affected land		X	
The overshadowing of potentially affected land		X	
The privacy of potentially affected land		X	
From any zero lot line wall			X
The likelihood of land being detrimentally affected by noise			X
Drainage and stability of and onto, adjoining lands			X
Will the development detrimentally affect neighbouring land			X
Will the development effect light & ventilation to any adjacent window		X	
Any other detrimental effects		X	
Provisions of any Draft Environmental Planning Instruments (LEPS):			
Are there any Draft Environmental Planning Instruments?	X		
Will the proposal satisfy the Draft EPIs?	X		
Provisions of the Palerang Development Control Plan 2015			
Does the development satisfy the relevant sections? Elaborate when necessary.	X		
Are there any variations to the DCP? Elaborate when necessary.		X	
Is notification required under the provisions of Part E of the DCP?		X	
Have any submissions been received? If Yes, elaborate			X
Impact of the development on the Environment			
Context & Setting			
Is the impact on the character of the Locality/Streetscape satisfactory?	X		
Is the Scale, Form, Character, Density and Design satisfactory?	X		
Access			
Is vehicle access satisfactory? Refer to any engineering requirements below	X		
Public Domain			
Is the effect on Recreational Opportunities satisfactory?			X
Utilities			
Are utility services available (water, sewer, electricity, etc)?	X		
Heritage			
Is the site affected by a Heritage item or Conservation Area?		X	
If Yes, has it been referred to Council's Heritage Advisor/Committee?			X
Is a Heritage Impact Statement required?		X	
Soils/Stability			
Will the development effect stability of the land or adjoining land?			X
Will there be any cut and fill works?			X
Tree Removal			
Will any trees be removed?		X	
Waste			
Are the provisions for waste control adequate?			X
Hazards			
Are there risks from Natural hazards - Bushfires, Slope and Flooding? If Yes, elaborate		X	
Are there risks from Hazards - Industry, Contamination? If Yes, elaborate			X
Social/Economic Impact			
Will there be any Social Benefits?	X		
Will there be any Social Costs?			X
Will there be any Economic Benefits?	X		

Will there be any Economic Costs?			X
Design			
Is the development design sensitive to the Environment/Landscape?	X		
BASIX			
Is a BASIX Certificate required?			X
Have the required commitments been included on the plans?			X
4.15(1) Suitability of the site			
Is the proposal compatible with the locality?	X		
4.15(1)(d) Any submissions made.		X	
4.15(1)(e) Is the Public Interest adequately protected?	X		

Comments: Assessment of the modification application has taken into consideration matters outlined in section 4.15 of the *Environmental Planning and Assessment Act, 1979* as relevant to the development application:

4.15(1)(a)(ii) any draft environmental planning instruments

The draft Queanbeyan-Palerang Comprehensive Local Environmental Plan 2020 was on public exhibition from 1-30 June 2020. The draft plan has been considered as part of this assessment and has no effect on the proposed development.

CONCLUSION

The application has been assessed having regard to Section 4.55(1A) of the *Environmental Planning and Assessment Act 1979*, and is deemed satisfactory for approval, subject to the recommended conditions of consent.

RECOMMENDATION

That the conditions of consent of DA.2020.1154 be amended by:

- *Deleting condition 28 and inserting condition 26A*
- *Deleting condition 29, and*
- *Amending condition 30*

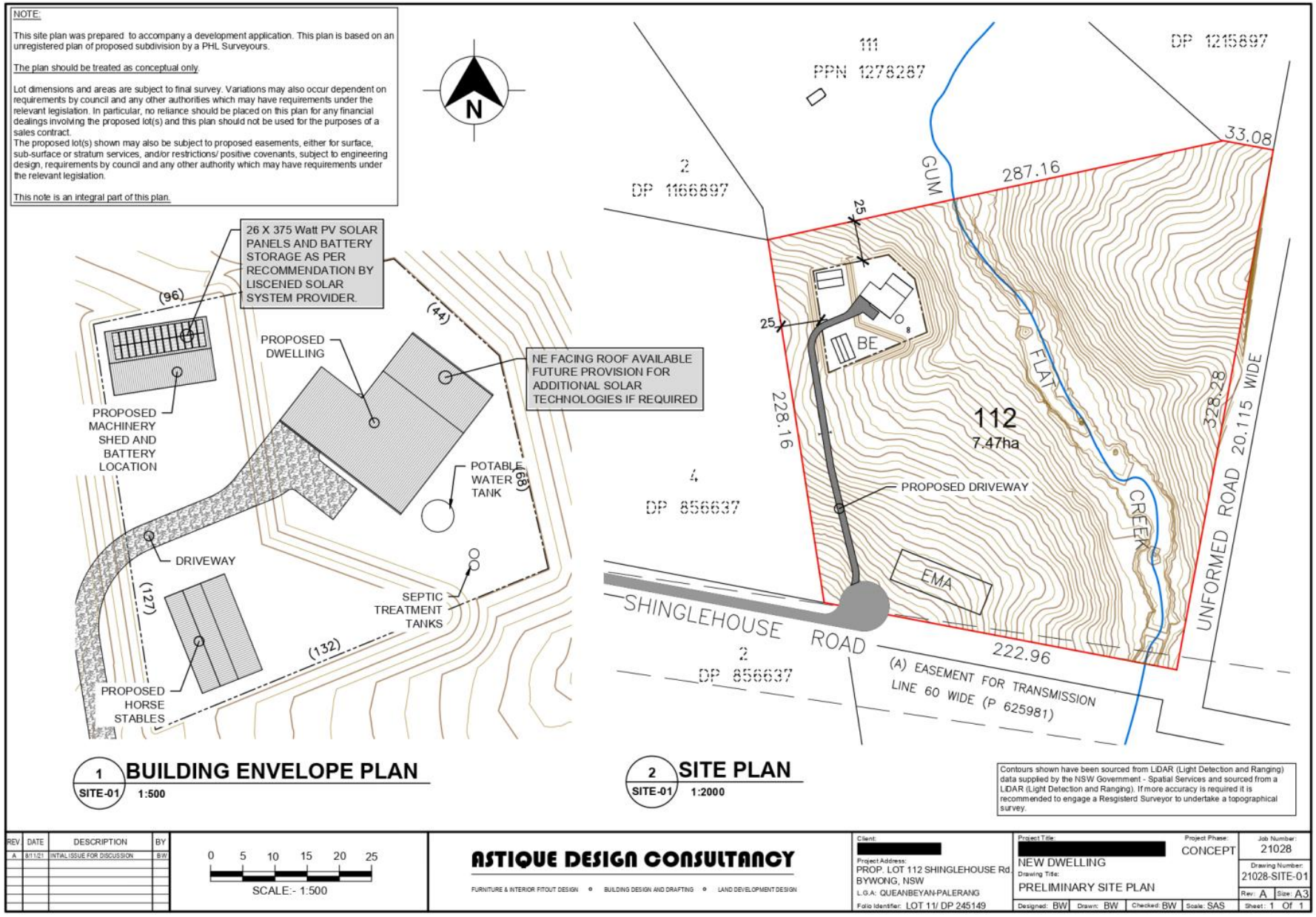
QUEANBEYAN-PALERANG REGIONAL COUNCIL

Council Meeting Attachment

9 NOVEMBER 2022

ITEM 9.1 MODIFICATION APPLICATION - DA.2020.1154.B - MODIFICATION OF CONSENT RELATING TO ENERGY SUPPLY - 44 BROOKS ROAD, BYWONG

ATTACHMENT 2 DA.2020.1154.B - PLANS - PROPOSED LOCATION OF SOLAR POWER SYSTEM - 44 BROOKS ROAD, BYWONG


NOTE:
This site plan was prepared to accompany a development application. This plan is based on an unregistered plan of proposed subdivision by a PHL Surveyours.
The plan should be treated as conceptual only.
Lot dimensions and areas are subject to final survey. Variations may also occur dependent on requirements by council and any other authorities which may have requirements under the relevant legislation. In particular, no reliance should be placed on this plan for any financial dealings involving the proposed lot(s) and this plan should not be used for the purposes of a sales contract.
The proposed lot(s) shown may also be subject to proposed easements, either for surface, sub-surface or stratum services, and/or restrictions/ positive covenants, subject to engineering design, requirements by council and any other authority which may have requirements under the relevant legislation.
This note is an integral part of this plan.
N
26 X 375 Watt PV SOLAR PANELS AND BATTERY STORAGE AS PER RECOMMENDATION BY LISCENED SOLAR SYSTEM PROVIDER.
NE FACING ROOF AVAILABLE FUTURE PROVISION FOR ADDITIONAL SOLAR TECHNOLOGIES IF REQUIRED
PROPOSED DWELLING
PROPOSED MACHINERY SHED AND BATTERY LOCATION
POTABLE WATER TANK
DRIVEWAY
SEPTIC TREATMENT TANKS
PROPOSED HORSE STABLES
(96)
(44)
(68)
(127)
(132)
111
PPN 1278287
DP 1215897
2
DP 1166897
33.08
287.16
25
25
GUM
BE
FLAT
112
7.47ha
228.16
328.28
UNFORMED ROAD 20.115 WIDE
PROPOSED DRIVEWAY
CREEK
4
DP 856637
EMA
SHINGLEHOUSE ROAD
2
DP 856637
222.96
(A) EASEMENT FOR TRANSMISSION LINE 60 WIDE (P 625981)
1 BUILDING ENVELOPE PLAN
SITE-01 1:500
2 SITE PLAN
SITE-01 1:2000
Contours shown have been sourced from LiDAR (Light Detection and Ranging) data supplied by the NSW Government - Spatial Services and sourced from a LiDAR (Light Detection and Ranging). If more accuracy is required it is recommended to engage a Resgisterd Surveyor to undertake a topographical survey.
REV DATE DESCRIPTION BY
A 8/11/21 INITIAL ISSUE FOR DISCUSSION BW
0 5 10 15 20 25
SCALE:- 1:500
ASTIQUE DESIGN CONSULTANCY
FURNITURE & INTERIOR FITOUT DESIGN • BUILDING DESIGN AND DRAFTING • LAND DEVELOPMENT DESIGN
Client:
Project Address:
PROP. LOT 112 SHINGLEHOUSE Rd
BYWONG, NSW
L.G.A: QUEANBEYAN-PALERANG
Folio Identifier: LOT 11/ DP 245149
Project Title:
NEW DWELLING
Drawing Title:
PRELIMINARY SITE PLAN
Project Phase: CONCEPT
Designed: BW Drawn: BW Checked: BW Scale: SAS
Job Number: 21028
Drawing Number: 21028-SITE-01
Rev: A Size: A3
Sheet: 1 Of 1

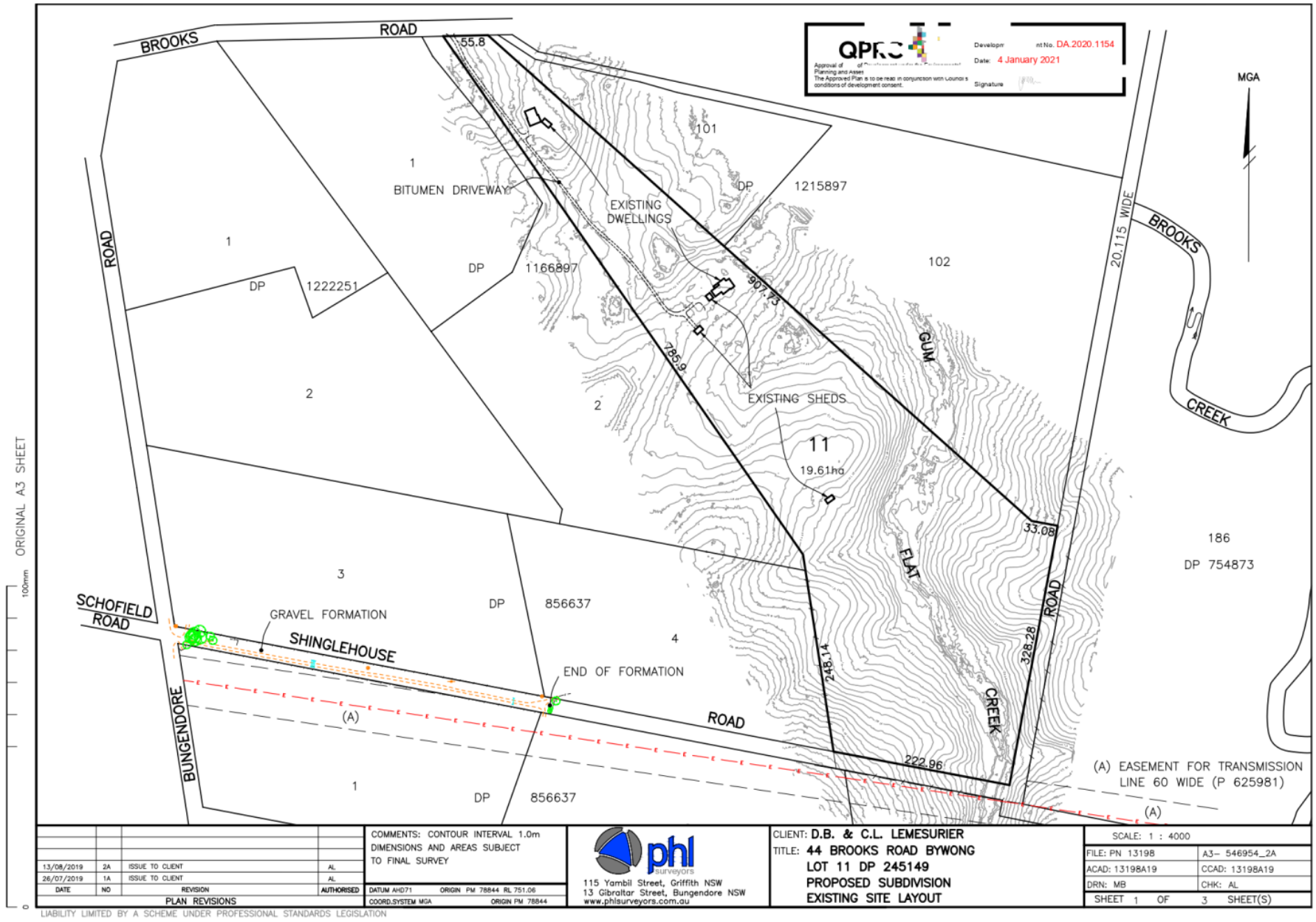
QUEANBEYAN-PALERANG REGIONAL COUNCIL

Council Meeting Attachment

9 NOVEMBER 2022

ITEM 9.1 MODIFICATION APPLICATION - DA.2020.1154.B - MODIFICATION OF CONSENT RELATING TO ENERGY SUPPLY - 44 BROOKS ROAD, BYWONG

ATTACHMENT 3 DA.2020.1154 - STAMPED SUBDIVISION PLANS - 44 BROOKS ROAD, BYWONG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QPRC
Development No. DA.2020.1154
Date: 4 January 2021
Signature
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101
1
BITUMEN DRIVEWAY
EXISTING DWELLINGS
DP 1215897
1
DP 1222251
DP 1166897
102
20.115 WIDE
BROOKS CREEK
907.73
785.9
GUM FLAT CREEK
2
2
EXISTING SHEDS
11
19.61ha
33.08
186
DP 754873
ROAD
3
DP 856637
SCHOFIELD ROAD
GRAVEL FORMATION
SHINGLEHOUSE
4
END OF FORMATION
248.14
328.28
BUNGENDORE ROAD
(A)
ROAD
222.96
(A) EASEMENT FOR TRANSMISSION LINE 60 WIDE (P 625981)
(A)
1
DP 856637
ORIGINAL A3 SHEET
100mm
0
13/08/2019 2A ISSUE TO CLIENT AL
26/07/2019 1A ISSUE TO CLIENT AL
DATE NO REVISION AUTHORISED
PLAN REVISIONS
COMMENTS: CONTOUR INTERVAL 1.0m
DIMENSIONS AND AREAS SUBJECT TO FINAL SURVEY
DATUM AHD71 ORIGIN PM 78844 RL 751.06
COORD.SYSTEM MGA ORIGIN PM 78844
phl surveyors
115 Yambil Street, Griffith NSW
13 Gibraltar Street, Bungendore NSW
www.phlsurveyors.com.au
CLIENT: D.B. & C.L. LEMESURIER
TITLE: 44 BROOKS ROAD BYWONG
LOT 11 DP 245149
PROPOSED SUBDIVISION
EXISTING SITE LAYOUT
SCALE: 1 : 4000
FILE: PN 13198 A3– 546954_2A
ACAD: 13198A19 CCAD: 13198A19
DRN: MB CHK: AL
SHEET 1 OF 3 SHEET(S)
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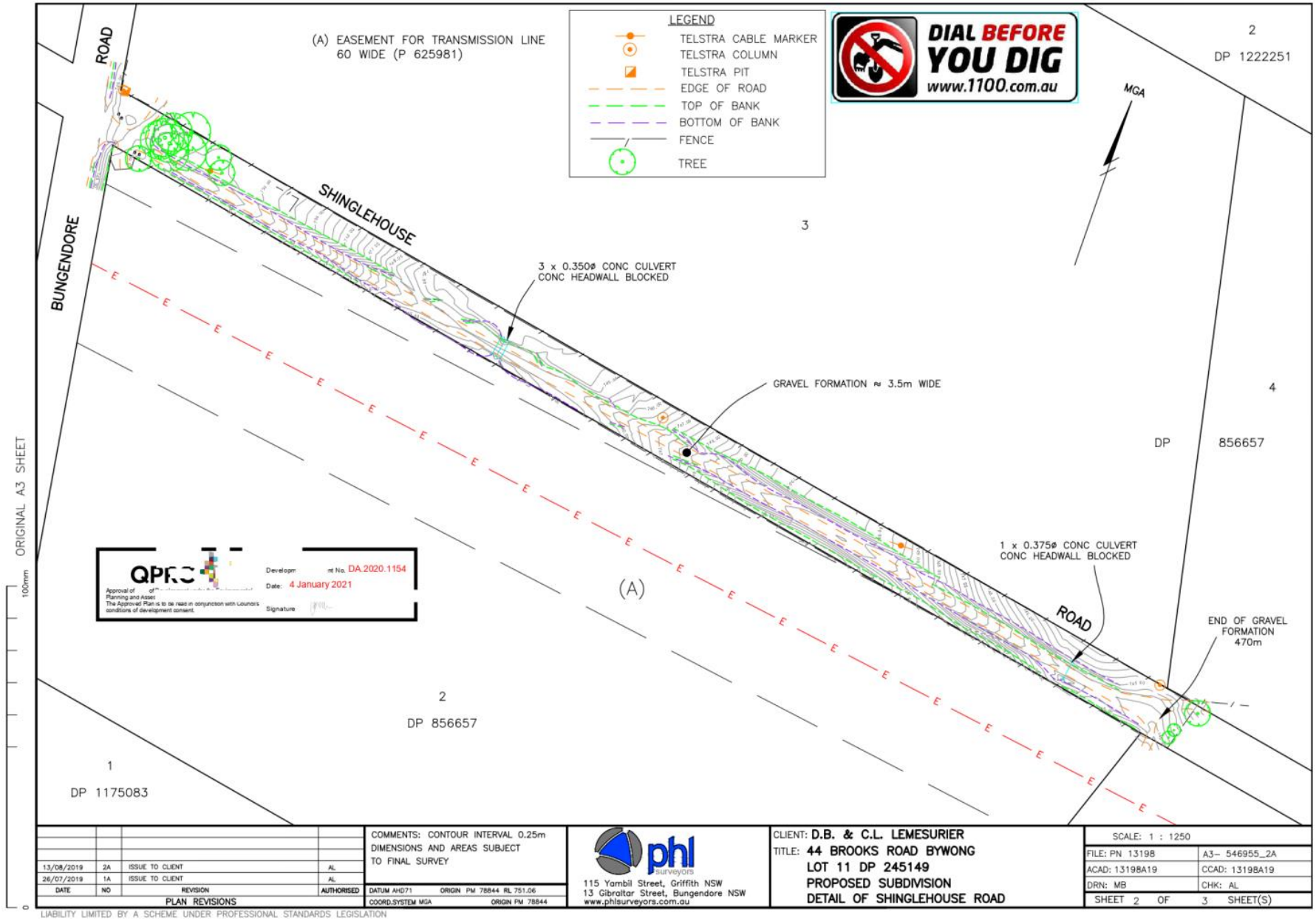
LEGEND
TELSTRA CABLE MARKER
TELSTRA COLUMN
TELSTRA PIT
EDGE OF ROAD
TOP OF BANK
BOTTOM OF BANK
FENCE
TREE
DIAL BEFORE YOU DIG
www.1100.com.au
(A) EASEMENT FOR TRANSMISSION LINE 60 WIDE (P 625981)
ROAD
BUNGENDORE
SHINGLEHOUSE
3 x 0.350ø CONC CULVERT CONC HEADWALL BLOCKED
GRAVEL FORMATION ≈ 3.5m WIDE
1 x 0.375ø CONC CULVERT CONC HEADWALL BLOCKED
END OF GRAVEL FORMATION 470m
MGA
2
DP 1222251
3
4
DP 856657
(A)
2
DP 856657
1
DP 1175083
QPRC
Development Application No. DA.2020.1154
Date: 4 January 2021
Signature
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0
COMMENTS: CONTOUR INTERVAL 0.25m
DIMENSIONS AND AREAS SUBJECT TO FINAL SURVEY
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26/07/2019 1A ISSUE TO CLIENT AL
DATE NO REVISION AUTHORISED
PLAN REVISIONS
DATUM AHD71 ORIGIN PM 78844 RL 751.06
COORD.SYSTEM MGA ORIGIN PM 78844
phl surveyors
115 Yambil Street, Griffith NSW
13 Gibraltar Street, Bungendore NSW
www.phlsurveyors.com.au
CLIENT: D.B. & C.L. LEMESURIER
TITLE: 44 BROOKS ROAD BYWONG
LOT 11 DP 245149
PROPOSED SUBDIVISION
DETAIL OF SHINGLEHOUSE ROAD
SCALE: 1 : 1250
FILE: PN 13198
A3– 546955_2A
ACAD: 13198A19
CCAD: 13198A19
DRN: MB
CHK: AL
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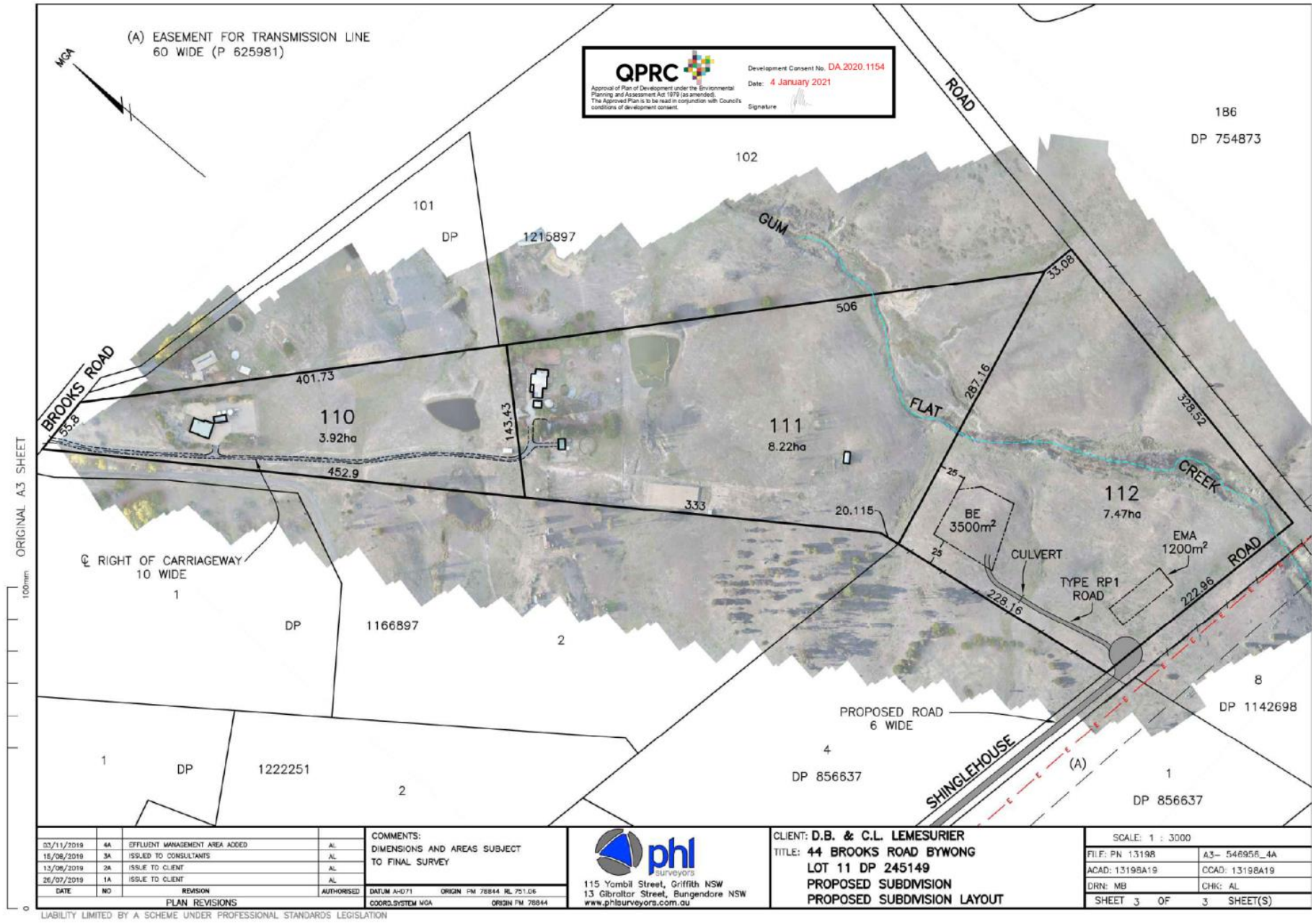
(A) EASEMENT FOR TRANSMISSION LINE
60 WIDE (P 625981)
MGA
QPRC
Development Consent No. DA.2020.1154
Date: 4 January 2021
Signature
ROAD
186
DP 754873
102
101
DP 1215897
GUM
506
33.08
BROOKS ROAD
401.73
55.8
110
3.92ha
143.43
111
8.22ha
FLAT
287.16
328.52
CREEK
452.9
333
20.115
25
BE
3500m²
25
112
7.47ha
EMA
1200m²
CULVERT
TYPE RP1
ROAD
228.16
222.96
ROAD
℄ RIGHT OF CARRIAGEWAY
10 WIDE
1
DP 1166897
2
8
DP 1142698
PROPOSED ROAD
6 WIDE
4
DP 856637
SHINGLEHOUSE
(A)
1
DP 856637
1
DP 1222251
2
ORIGINAL A3 SHEET
100mm
0
03/11/2019 4A EFFLUENT MANAGEMENT AREA ADDED AL
15/08/2019 3A ISSUED TO CONSULTANTS AL
13/08/2019 2A ISSUE TO CLIENT AL
26/07/2019 1A ISSUE TO CLIENT AL
DATE NO REVISION AUTHORISED
PLAN REVISIONS
COMMENTS:
DIMENSIONS AND AREAS SUBJECT
TO FINAL SURVEY
DATUM AHD71 ORIGIN PM 78844 RL 751.06
COORD.SYSTEM MGA ORIGIN PM 78844
phl surveyors
115 Yombil Street, Griffith NSW
13 Gibraltar Street, Bungendore NSW
www.phlsurveyors.com.au
CLIENT: D.B. & C.L. LEMESURIER
TITLE: 44 BROOKS ROAD BYWONG
LOT 11 DP 245149
PROPOSED SUBDIVISION
PROPOSED SUBDIVISION LAYOUT
SCALE: 1 : 3000
FILE: PN 13198
A3- 546956_4A
ACAD: 13198A19
CCAD: 13198A19
DRN: MB
CHK: AL
SHEET 3 OF 3 SHEET(S)
LIABILITY LIMITED BY A SCHEME UNDER PROFESSIONAL STANDARDS LEGISLATION

QUEANBEYAN-PALERANG REGIONAL COUNCIL

Council Meeting Attachment

9 NOVEMBER 2022

ITEM 9.3 QUEANBEYAN SEWAGE TREATMENT PLANT UPGRADE BUSINESS CASE

ATTACHMENT 1 DRAFT QUEANBEYAN-SEWAGE TREATMENT PLANT UPGRADE FINAL BUSINESS CASE

we are insw Infrastructure New South Wales

Final Business Case

Final Business Case

DESIGNED FOR USE IN NSW GOVERNMENT CAPITAL PROJECTS

Queanbeyan Sewage Treatment Plant Upgrade

Queanbeyan-Palerang Regional Council

25 October 2022

Document Information

	Position
Project Name:	Queanbeyan Sewage Treatment Plant Upgrade
Senior Responsible Officer:	Phil Hansen
Agency Head:	Rebecca Ryan
Delivery Agency:	Queanbeyan-Palerang Regional Council
Gateway Review Process:	QPRC Business Case Gate 3

Document Version Control

Project specific document history			
Version	**Amendment**	**Amendment Date**	**Amended by**
A	Draft for QRPC review	2/09/2022	David Perry
B	Initial Issue	24/10/2022	David Perry

Supporting Documentation

Project-specific documentation (other than this report)			
Version	**Title**	**Amendment Date**	**Amended by**
Rev B	Queanbeyan Sewage Treatment Plant Upgrade Project – Options Selection Report	November 2019	Hunter H2O
Rev C	Queanbeyan Sewage Treatment Plant Upgrade Project – Concept Design Report	October 2020	Hunter H2O
Rev B	Queanbeyan Sewage Treatment Plant Upgrade Project – Concept Design Addendum	April 2022	Hunter H2O
	Queanbeyan Sewage Treatment Plant – Environmental Impact Statement - Revised EIS	April 2022	Arup
	Queanbeyan Sewage Treatment Plant – Environmental Impact Statement – Revised EIS Amendment Report	September 2022	Arup
Rev 3	Integrated Water Cycle Management Strategy and Financial Plan	16 October 2022	GHD

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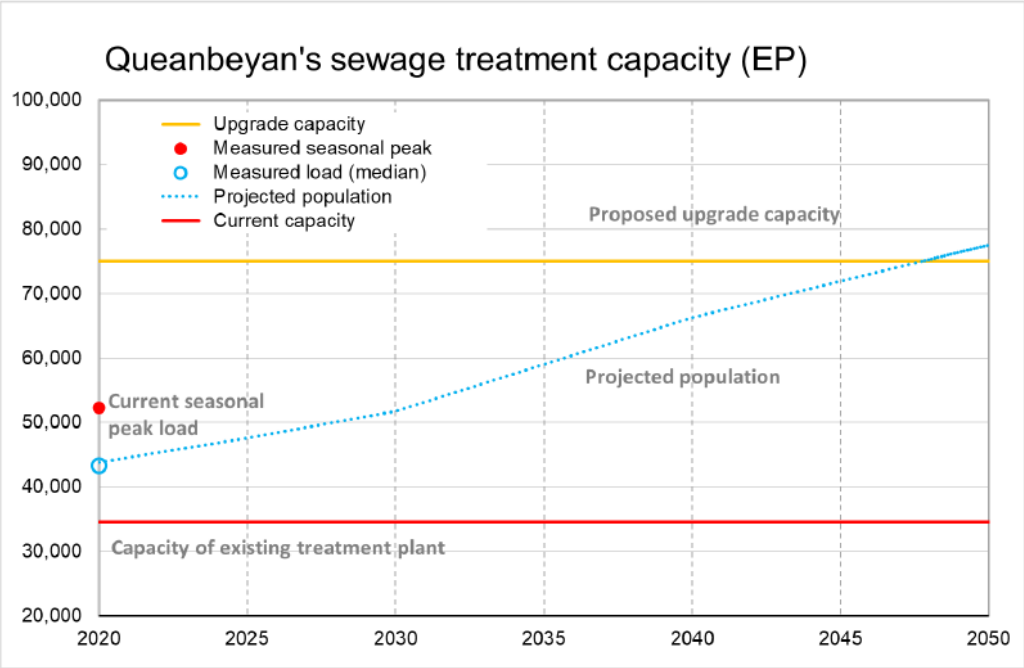
1. EXECUTIVE SUMMARY

Project need

Queanbeyan-Palerang Regional Council (QPRC) is responsible for the management and operation of the Queanbeyan Sewage Treatment Plant (QSTP) that provides treatment to sewage from Queanbeyan prior to discharge into the Molonglo River approximately 9 km upstream of Lake Burley Griffin.

Queanbeyan's existing sewage treatment plant was initially constructed in the 1930's with the most recent major upgrade being completed in the 1980's. The existing treatment plant is overloaded and at the end its service life and needs replacing. Due to its age, the plant is experiencing structural failure, reduced equipment reliability and maintenance issues.



Current sewage inflows exceed the treatment capacity of the existing treatment plant

Queanbeyan's existing sewage treatment plant is overloaded and operating well above its design capacity which limits the ability of the plant to achieve the treatment levels required prior to discharge into the Molonglo River. The existing treatment plant has an assessed capacity to treat sewage from an equivalent population (EP) of 34,500 EP. An assessment of inflow completed in 2019 estimated that the plant was receiving a median load of 43,400 EP and a seasonal peak load of 52,000 EP. The population served by the QSTP is forecast to continue to increase as new and already approved developments connect to sewer. This will increasingly overload the existing STP. An assessment of future needs estimates that the QSTP will be required to treat an equivalent population of 73,000 EP by 2045.

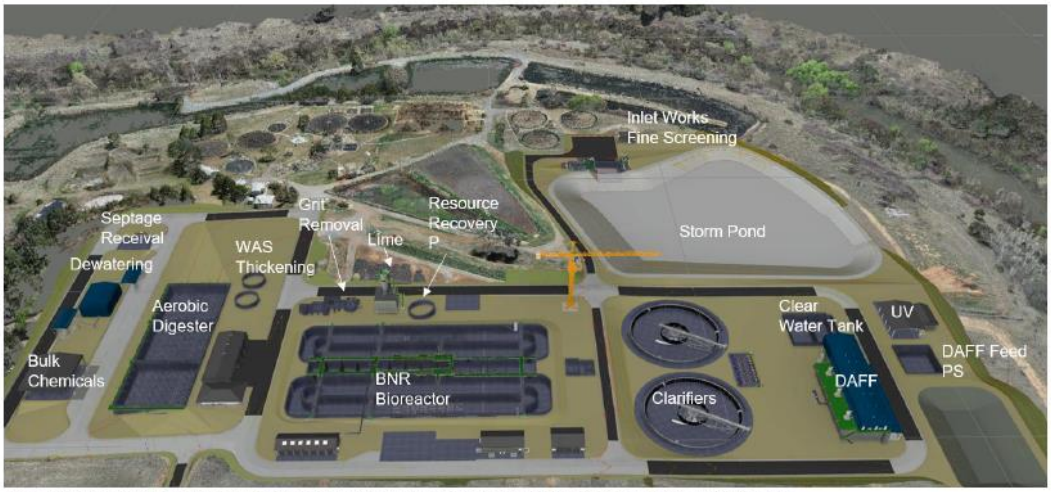
QPRC operates the Queanbeyan STP under the terms of an Environmental Authorisation granted by the EPA under the Environmental Protection Act 1997. During the most recent annual reporting period (2021/22) the effluent discharged into the Molonglo River from QSTP failed to meet the water quality requirements of this authorisation on multiple occasions for thermotolerant coliforms, suspended solids and ammonia.

Continued operation of the existing treatment plant as Queanbeyan's population grows presents an increasing risk that the STP continue to fail to meet the EPA regulatory Environmental Authorisation requirements for effluent discharged to the Molonglo River. The resulting pollution could result in adverse impacts on aquatic species in the Molonglo River and Lake Burley Griffin, environmental prosecution, and substantial reputational damage.

Project description

The Queanbeyan STP upgrade project will replace the existing sewage treatment plant with a modern robust and reliable treatment facility that will provide additional capacity and improve treatment reliability. The upgrade provides 75,000 EP of treatment capacity to support growth and development in Queanbeyan including currently approved development.

The upgrade provides a tertiary treatment standard including filtration and UV disinfection that will improve the quality of the treated effluent discharged into the Molonglo River upstream of Lake Burley Griffin and enable QPRC to continue to meet its regulatory requirements. The treatment plant has been designed to be expandable by 50% to a total of 112,500 EP if required in the future.



The proposed Queanbeyan STP Upgrade is located above flood level on the existing site

The QSTP will be constructed on the existing lease area that is located above the nominated flood level for the site, reducing the risk of damage to assets during flooding. The location enables the existing STP to continue to provide treatment during the construction, testing and commissioning of the new facility, which is estimated to take two years.

Cost and funding

Preliminary cost estimates for the QSTP upgrade have been developed from a risk-based engineering cost estimate during the design phase. The P90 cost estimate for the total project cost including contingency and escalation allowance is $160M as summarised in the table below.

Sub-Project	Budget Request ($ ex. GST))
Construction Costs	101,465,500
QPRC Costs	26,449,000
Base Estimate	**127,914,500**
Contingency for Risks (P90)	15,475,000
Project Estimate (P90)	**143,389,500**
Escalation	18,916,500
Total Outturn Cost (P90)	**162,306,000**

A cost benefit analysis has been conducted to estimate whether the economic benefits generated exceed the project costs. The analysis returned a Benefit to Cost Ratio of 1.42 which supports the project.

Funding for the replacement of the Queanbeyan STP has been considered in QPRC's Integrated Water Cycle Management (IWCM) Plan for Queanbeyan which is the strategic planning instrument that provides a framework for Council to determine long-term strategic planning for water and wastewater management.

The project will be funded through contributions from QPRC's Sewer Fund, Section 64 developer charges, loan funding and government grants as summarised below. QPRC has received a $3M grant from the NSW Government through the Safe and Secure Water Program (SSWP). Financial modelling completed for the IWCM has found that QPRC will require a minimum additional grant funding of 25% of the construction phase (i.e. an additional $36M in grant funding).

Income source	Income source contribution ($)
Sewage fund	76,114,500
Section 64 Developer Contributions	7,000,000
Loan	40,000,000
NSW Government Safe and Secure Water Program grant	3,000,000
Additional grant funding	36,191,500
Total	**162,306,000**

The IWCM includes a financial analysis that assesses the impact of proposed water and sewer capital expenditure programs on the financial position of the Council over a twenty-year period and the impact to the water and wastewater typical residential bill (TRB) to deliver the service. The analysis also considers the forecast cashflow and account balances under external funding scenarios for 0%, 25% and 50% for specific QSTP asset support only.

The IWCM recommends that that the project be funded by:

- An additional 25% grant funding ($36M) for the QSTP upgrade in 2023/24 and 2024/25
- Loan funding of $40M over the two-year period 2023/24 and 2024/25
- Rate increases across two stages: an initial increase of 6.5% for six years followed thereafter by annual rate increases aligned to the consumer price index (2.5%)

Project status and next steps

QPRC has completed the detailed design and tender documentation for the upgrade and will be in a position to advertise a call for expressions of interest for construction of the work as early as April 2023 or whenever funding and planning approvals are confirmed. Early vendor engagement has been used to select and establish contracts for the supply and delivery of key equipment packages for the upgrade to minimise procurement delay risks.

A final Environmental Impact Statement for the project has been submitted and a development application for the work can be lodged with the ACT Government in February 2023 once the EIS has been determined.

The project team will continue to progress work to assist the project becoming ready for construction. Key actions include:

- Seeking additional grant funding contributions from both the NSW and ACT Governments
- Obtaining development approval from the ACT Government
- Progressing discussion with the ACT EPA regarding the operating and licencing requirements for the new facility
- Undertaking further early vendor engagement and tendering for equipment supply for the works
- Progressing early works design, approval and construction for items including power supply upgrade and potable water supply that facilitates construction of the upgrade
- Progressing design and approval of the Mountain Road upgrade including land acquisition of Nimrod Road and part of Mountain Road.
- Confirming client resources for managing the construction phase.

2. DESCRIPTION OF PROBLEM, SERVICE NEED OR OPPORTUNITY

2.1 Background

Queanbeyan-Palerang Regional Council

The Queanbeyan-Palerang Reginal Council local government area is located in the southern tablelands adjacent to Canberra and 250 km southwest of Sydney. The area's population is approximately 64,000 and is expected to grow to around 82,000 by 2036.

Queanbeyan-Palerang Reginal Council (QPRC) is an independent, statutory body responsible for administering its local government area under the Local Government Act 1993 (NSW).

The city of Queanbeyan is located on the ACT boarder, approximately 15 km south-east of Canberra and 10 km from Canberra Airport.

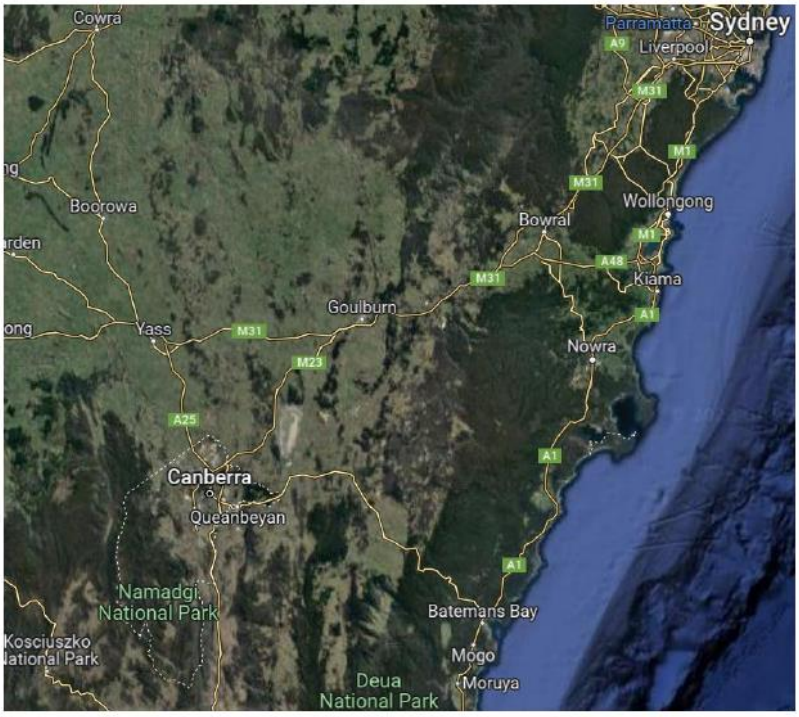


Figure 1: Location of Queanbeyan

Queanbeyan's sewerage treatment system

QPRC is responsible for the management and operation of the sewerage system that serves Queanbeyan. This includes the:

- Queanbeyan sewerage collection network and pumping stations
- Morisset and Jerrabomberra sewerage trunk mains; and
- Queanbeyan sewage treatment plant.

The Queanbeyan sewage treatment plant (QSTP) is located on the banks of the Molonglo River in Jerrabomberra ACT and treats sewage from both Queanbeyan and Oaks Estate in the ACT. Treated effluent from QSTP is discharged to the Molonglo River approximately 9 km upstream of Lake Burley Griffin.

QSTP provides treatment to a catchment that includes urban, light commercial, light industrial and some rural residential properties, including the NSW neighbourhoods of Crestwood, Jerrabomberra, Karabar, Queanbeyan, Queanbeyan East, Queanbeyan West, and Greenleigh, and the ACT suburb of Oaks Estate. The Queanbeyan sewerage collection network includes a gravity collection system with 15 pump stations, approximately 286 km of pipeline and two major trunk mains that convey sewage to the QSTP. Googong Township located about five kilometres south of Queanbeyan has its own water recycling plant and does not contribute to the QSTP.

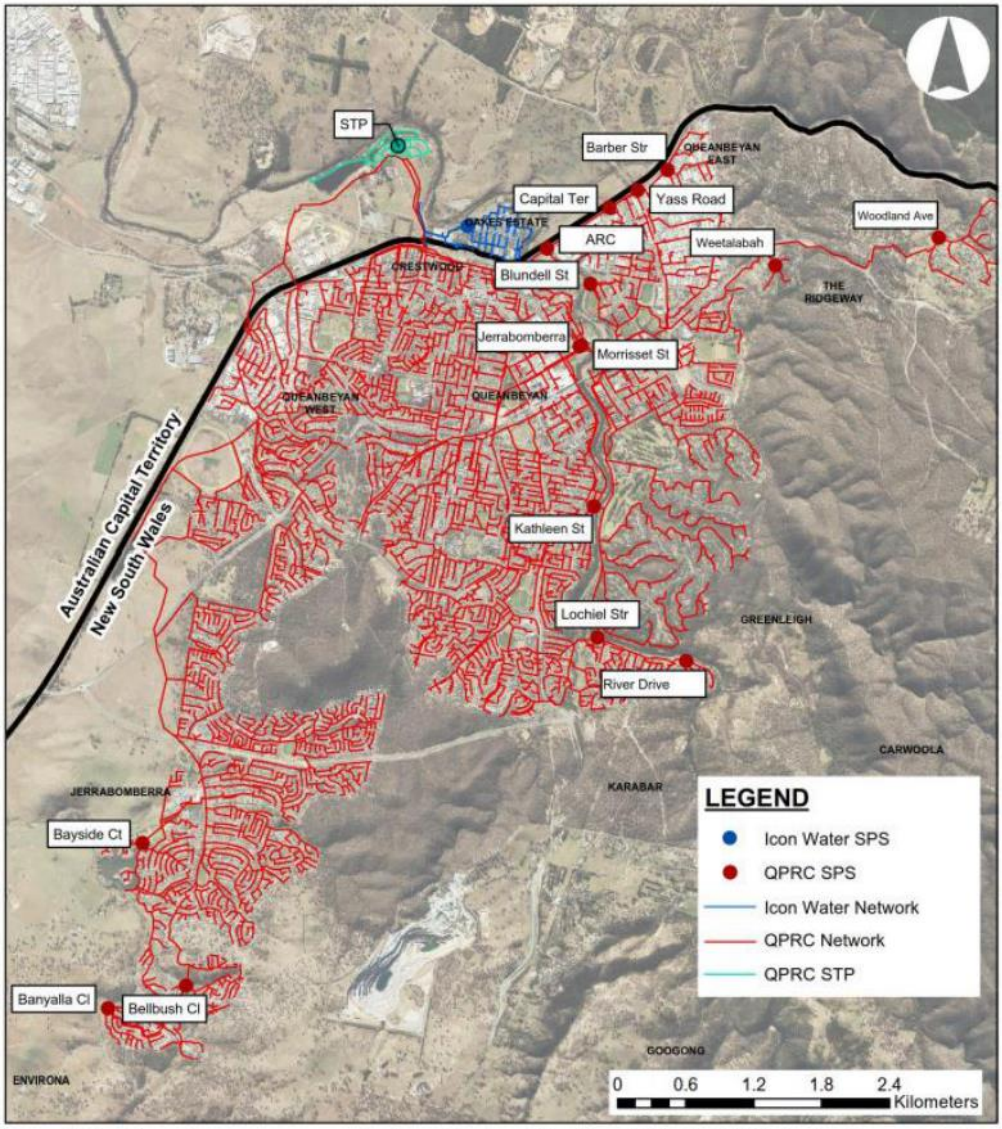


Figure 2: The Queanbeyan sewerage collection network and location of QSTP. QSTP also treats sewage collected from the Icon Water sewage collection network within Oaks Estate.

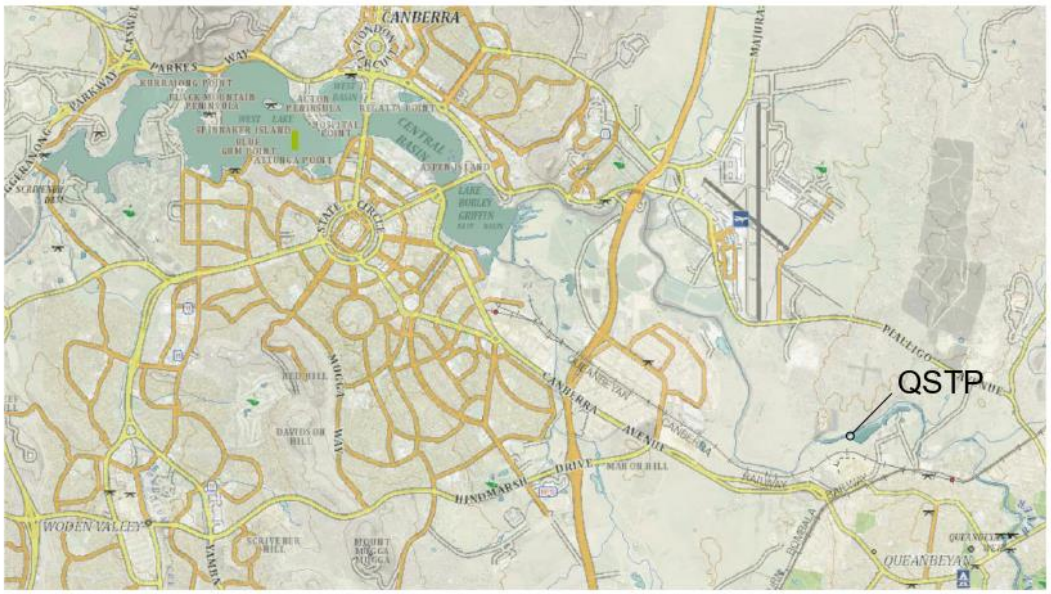


Figure 3: Treated effluent from QSTP is discharged to the Molonglo River approximately 9 km upstream of Lake Burley Griffin.

2.2 Description of Problem, Service Need or Opportunity

Why is the upgrade needed?

Queanbeyan's existing sewage treatment plant is overloaded and operating above its capacity. The QSTP upgrade project is required to provide sewage treatment capacity to support the continued growth and development of Queanbeyan and to provide ongoing protection of the environment.

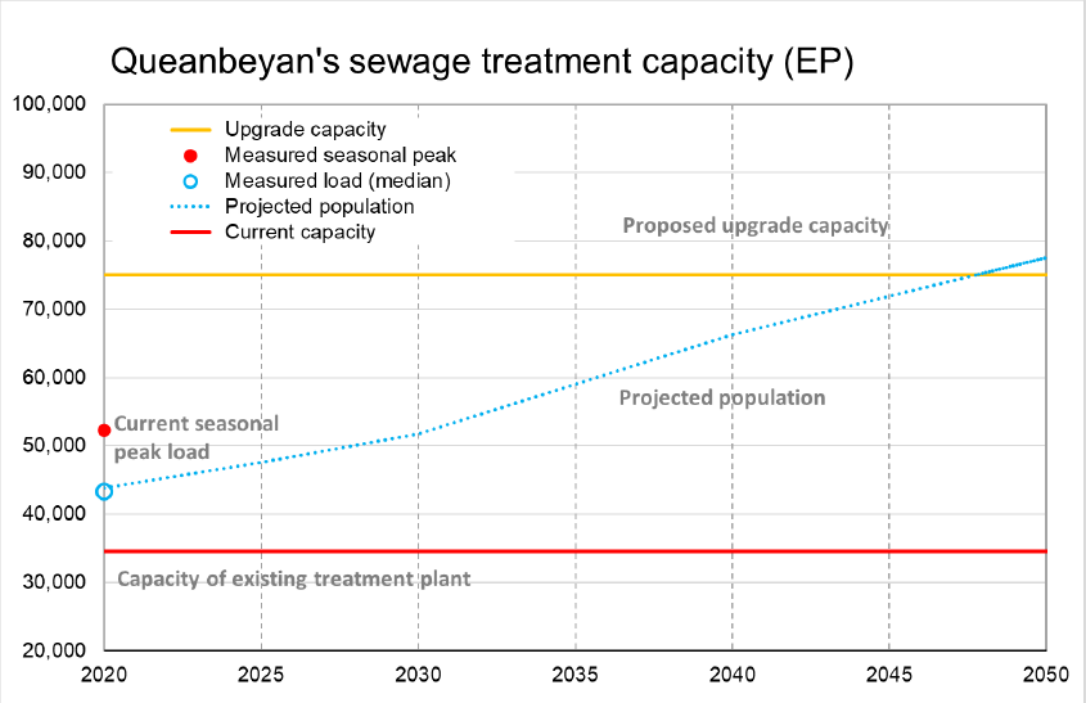


Figure 4: Queanbeyan sewage treatment capacity requirements. Current loads exceed the capacity of the existing treatment plant.

Queanbeyan's existing sewage treatment plant was constructed in the 1930s and was last upgraded in the 1980s. With population growth, the existing treatment plant currently treats sewage from a population that exceeds its capacity.

The capacity of a sewage treatment plant is expressed in terms of an equivalent population (EP):

- The existing treatment plant has an assessed capacity of 34,500 EP
- A 2019 assessment of sewage data estimated that the existing treatment plant receives a median sewage load of 43,400 EP
- Queanbeyan's sewage load varies seasonally with an estimated peak load of 52,300 EP.

An assessment of the future needs undertaken as part of the Integrated Water Cycle Management Plan (IWCM) estimates that the QSTP will be required to service a projected population of 73,000 EP by 2045 and 77,000 EP by 2050.

Queanbeyan's population is projected to grow at a rate of approximately 1.7% per annum. This growth is anticipated to occur as a result of both infill development as well as the extension of the sewage network to new growth areas including South Jerrabomberra, Jumping Creek, Tralee, The Poplars and Environa. These areas are expected to be connected over the next 25 years, with the first allotments in South Jerrabomberra coming on-line in 2022.

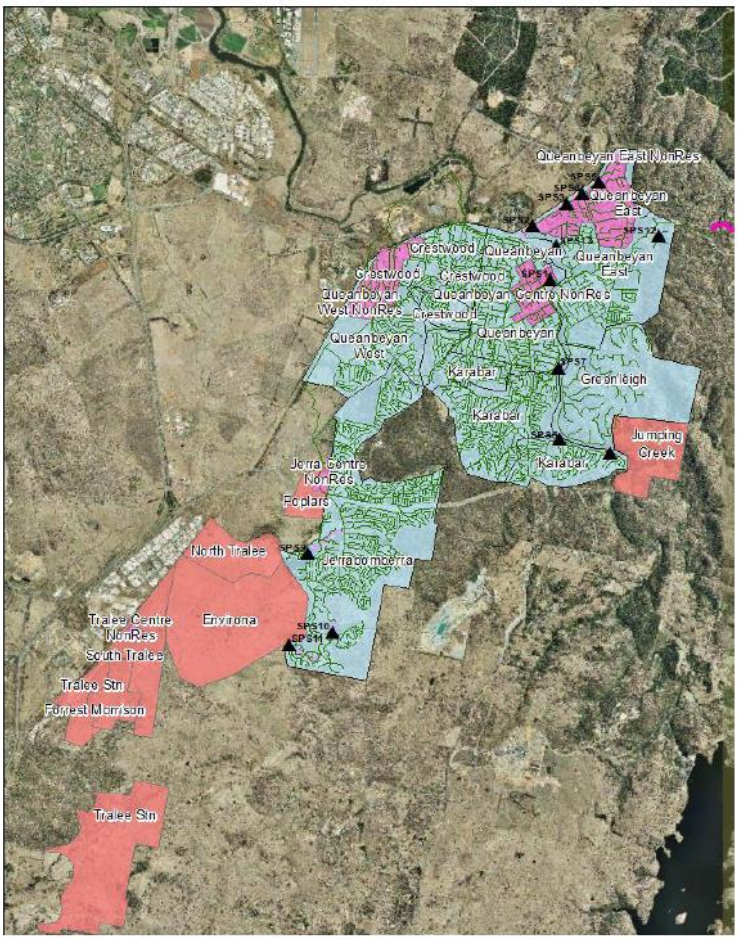


Figure 5: Identified growth areas included in the QSTP Master Plan and IWCM.

Treated effluent from QSTP is discharged to the Molonglo River upstream of Lake Burley Griffin. QSTP has been identified as the only significant point source discharging upstream of the Lake. Ongoing operation of the existing treatment plant presents a risk that the existing treatment systems may be overloaded as a result of either continued population growth, or high flow events, resulting in the discharge of partially treated effluent causing pollution of the Molonglo River and Lake Burley Griffin. This risk of deferring the upgrade is discussed further in the subsequent sections of this chapter.

2.3 Existing Level of Service

Queanbeyan's existing sewage treatment plant

QSTP was initially constructed in the 1930's and has been progressively added to over time with the most recent major upgrade being completed in the 1980's. The treatment plant includes a combination of different technologies from different eras. Parts of the plant, such as the trickling filter process are original and some parts (anaerobic digestion) have been shut down due to asset issues.

The existing treatment assets are at the end of their service life and need replacing. A condition assessment of the STP undertaken in 2015 to inform the Masterplan identified that all stages of the treatment process would be redundant or require significant refurbishment within a 25-year timeframe (GHD, 2016).

While maintenance and works have been regularly undertaken on the QSTP, the plant is no longer fit-for-purpose and is experiencing structural failure, reduced equipment reliability, obsolescence, and maintenance issues.

QPRC operates the Queanbeyan sewage treatment plant under the terms of an Environmental Authorisation granted under the ACT Environmental Protection Act 1997. During the most recent annual reporting period (2001/22) the QSTP failed to meet the water quality requirements of this authorisation on multiple occasions for thermotolerant coliforms, suspended solids and ammonia. These failures relate to the condition of the current asset and its capacity limitations to treat the flows currently being received.

The maturation ponds are a key asset in achieving effluent quality and there is a risk that these lagoons may fail again as occurred in 2010 due to flooding.

Figure 6: Queanbeyan's existing sewage treatment plant

Process capacity constraints

An engineering assessment of the process capacity of the existing treatment facility is provided in the attached *Queanbeyan Sewage Treatment Plant – Process Capacity Assessment* (Hunter H2O, 2022). The assessment identified that the process capacity of the existing facility is challenged in many areas and continued operation of the existing facility presents a risk of the facility failing to meet the treated effluent quality requirements required by the facilities EPA licence conditions.

Ammonia is an acute toxicant present in treated effluent and can affect many fish and macroinvertebrate species. The ammonia concentration from the QSTP is regulated by ACT EPA based on the condition of the receiving waters. The capacity assessment identified that the treatment processes that remove ammonia are currently at capacity with QPRC's operating data showing evidence that ammonia removal performance is already degrading. There is a reasonable risk that ammonia in treated effluent discharged to the Molonglo River from QSTP may fail to meet the regulatory licence limits required by the EPA as the incoming sewage load on the treatment plant increases further with population growth, or if critical equipment fails or is out of service. This may lead to adverse impacts on aquatic species near the discharge location.

Specific capacity issues identified by the review included:

- Installed aeration is at capacity when stable nitrogen removal is considered
- The activated sludge reactors can just sustain the biomass necessary for ammonia removal. The reactors are not large enough to support further load increases with population growth
- The clarifier system is at capacity and is likely to just be able to reliably treat the peak dry weather flows for the current population. There is insufficient clarifier capacity to treat flows that occur in wet weather. In wet weather the operators will likely need to strategically bypass the activated sludge reactors so the ammonia removal process is not lost as a result of the treatment biomass being washed out from the clarifiers.
- The sludge lagoons which stabilise sludge have a low sludge retention time and may fail to stabilise sludge as loads increase which will increase the risk of odour and return more soluble organic load to the activated sludge plant
- The maturation ponds which provide disinfection are currently meeting the licence with some reserve. However, a significant failure of the upstream secondary treatment process may limit the ability of the maturation ponds to provide required treatment and cause their capacity limit to be reached earlier.
- The maturation ponds are located within the 1 in 100 flood level and could be damaged in flood events. Damage to the maturation ponds during flooding may result in the release of effluent and accumulated sludge to the river. There is a risk that disinfection would limits may not be met if the ponds were damaged, depending on the extent of repairs necessary.
- Provided the maturation ponds are available it is expected phosphorus removal will continue to meet the current EPA licence limits provided the upgrade occurs within 4 years (i.e., by 2026).

In addition to these process capacity constraints, the existing STP is also operating beyond its intended hydraulic capacity. This results in screened sewage routinely bypassing the treatment process during wet weather conditions. Bypassing occurs as a result of higher wet weather flows. Screened sewage is diluted with treated effluent in maturation ponds before discharging to the Molonglo River.

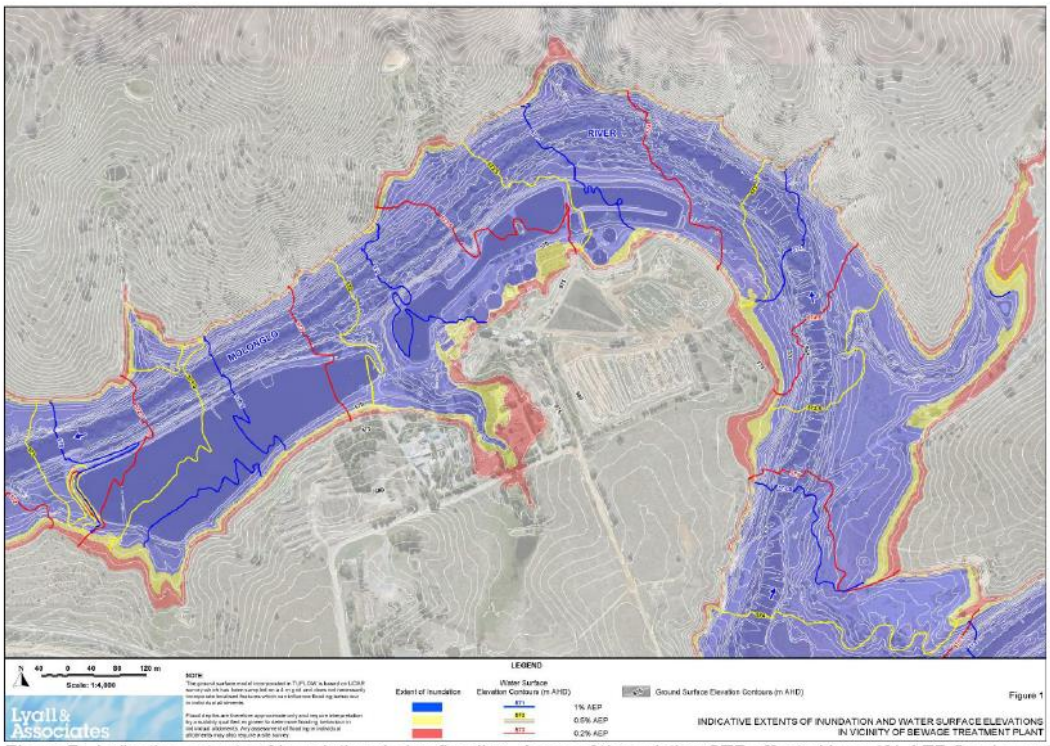


Figure 7: Indicative extents of inundation during flooding. Areas of the existing STP affected by a 1% AEP flood event are shaded blue.

2.4 Consequences of Deferral

Due to the apparent capacity constraints of Queanbeyan's existing sewage treatment plant and the continued population growth within the sewerage service area, the QSTP Upgrade should proceed with some urgency.

Should the QSTP Upgrade be deferred, Queanbeyan's existing sewage treatment plant will continue operating above its capacity in an overloaded state. There will be no sewage treatment capacity available for further population growth within Queanbeyan, or to connect additional development areas to Queanbeyan sewerage network. QPRC may be required to halt future development to prevent further overloading of the existing STP.

Continued operation of the existing treatment plant with continued population growth presents an increasing risk that the STP will fail to provide the level of treatment required to meet the EPA regulatory licence conditions for effluent discharged to the Molonglo River. The resulting pollution could result in adverse impacts on aquatic species in the Molonglo River, environmental prosecution, and substantial reputational damage.

Other impacts of deferring the upgrade:

- Increasing sewage bypassing of treatment facilities during wet weather due to hydraulic capacity constraints as the population continues to grow and sewage flows increase
- Increasing risk of poor effluent quality discharged to the Molonglo River and breaches of environmental operating requirements due to process capacity constraints which limit the ability of the facility to effectively treat nitrogen, phosphorus, solids and pathogens as the population continues to grow and sewage flows increase
- Increasing risk of environmental harm of poorly treated or untreated sewage entering the Molonglo River and Lake Burley Griffin
- Additional sewage treatment capacity is unavailable for areas connected to QSTP and may restrict further growth and development of these areas
- Higher operating costs associated with the poor plant condition and operating constraints
- Continued risk exposure to asset and environmental damage during flood events
- Continued risk of mechanical and electrical plant as these assets are at the end of operating life.

2.5 Previous Studies

Supporting studies

Planning for the QSTP Upgrade has been underway since 1995, when Queanbeyan City Council engaged MWH to report on the capacity of the existing STP and options to upgrade the facility to provide for population growth.

A summary of six planning reports investigating the need to upgrade the Queanbeyan's STP between 1995 and 2011 is provided in the appendices. These investigations have been used as background to support the identification of the preferred upgrade option by the major studies discussed below.

2016 Masterplan for Sewage Treatment Plant Upgrade

In 2014, Queanbeyan City Council engaged GHD to prepare a masterplan for the QSTP Upgrade project that was subsequently published in 2016 (GHD, 2016). The masterplan identified that the preferred for providing sewage treatment facilities for Queanbeyan was to construct of a new 60,000 EP capacity STP on the existing site.

The masterplan study was wide-ranging. It confirmed the need and drivers for the upgrade of QSTP, set out an initial design basis in terms of capacity and water quality objectives and treatment standards, investigated the feasibility of providing treatment of sewage currently treated by Icon Water's Fyshwick STP, and included an assessment of upgrade options. The masterplan study confirmed that the preferred approach was to locate the treatment facility on the existing STP site.

The masterplan discussed three alternatives for the Queanbeyan STP:

- The Base Case - Do Nothing
- Build a new STP
- Restore the STP and expand as needed to provide sufficient capacity.

The Base Case - Do Nothing option was not considered feasible due to the significant environmental and human health impacts associated with not upgrading the existing treatment facility. Risks and consequences of not proceeding with the project have been discussed in section 2.3 and 2.4 of this Business Case.

A condition assessment of existing asset condition was undertaken to inform the option of augmenting the capacity of the existing facility by reusing existing treatment structures. The assessment identified only limited components of the existing STP that could plausibly be used as structures. Many parts of the plants were considered not fit for reuse due to poor condition and being in areas affected by a 100-year average recurrence interval (ARI) flood.

A Multi Criteria Assessment confirmed that building a new STP on the existing site was the preferred option based on whole of life cost, constructability, operability, sustainability, future proofing and community acceptance and affordability. The whole life net present value of costs of the options were similar and in order of $100 M. The option of reusing assets showed no significant capital investment saving compared to the build new options. The selection of treatment technology was not significant to the outcome.

The masterplan was placed on public exhibition in November 2016 for a period of six weeks. Submissions on the masterplan were received from key NSW and ACT regulators, as well as ACT and Region Catchment Management Group, Professor Ian Falconer and Icon Water.

QPRC endorsed the masterplan recommendation to construct a new treatment facility on the existing STP site.

Option Selection, Concept Design and EIS

In 2019, Hunter H2O was engaged as the principal design consultant to prepare the design and tender documentation for construction of the QSTP upgrade.

Under Section 60 of the NSW *Local Government Act* 1993, QPRC requires ministerial approval for the construction or modification of water or sewage treatment works. The selection of treatment technology and development of the Concept Design has been undertaken following the Section 60 approval pathway prescribed by the NSW Department of Planning and Environment (DPE).

The Concept Design development pathway included the following stages:

- Confirmation of capacity requirements and design criteria - Queanbeyan Sewage Treatment Plant Upgrade Project Design Criteria and Assumptions Report (Hunter H2O, 2019)
- Options study and selection of the treatment technology - Queanbeyan Sewage Treatment Plant Upgrade Project Options Selection Report (Hunter H2O, 2019)
- Concept design of the selected option – Queanbeyan Sewage Treatment Plant Upgrade Project Concept Design Report (Hunter H2O, 2020)
- Safety in design review of WHS aspects (including HAZOP and CHAIR principles)
- Environmental Impact Statement (ARUP, 2020)
- Amendment of the proposed concept to address issues raised through the EIS consultation process - Queanbeyan Sewage Treatment Plant Upgrade Project Concept Design Addendum (Hunter H2O, 2022).

Three secondary treatment technology options were developed for the upgrade:

- Oxidation ditch with continuous gravity clarification
- Membrane Bioreactor (MBR)
- Intermittently Decanted Extended Aeration (IDEA).

The 2019 review of capacity requirements and design criteria identified that the upgrade should provide treatment capacity for an equivalent population (EP) of 75,000 and be designed to meet the water quality objectives of the existing Environmental Authorisation licence.

An Options Selection workshop held with NSW DPE reviewed the treatment options using an MCA that considered whole of life cost, effluent quality, operating complexity, maintainability, robustness, power and chemical use. The preferred process for the QSTP upgrade was identified as an oxidation ditch with gravity clarifiers, tertiary granular filter media filter, UV disinfection, aerobic sludge digestion and biosolids dewatering. Further details are provided in the Queanbeyan Sewage Treatment Plant Upgrade Project Options Selection Report (Hunter H2O, 2019)

The treatment process proposed for the upgrade was refined through the development of a Concept Design and Environmental Impact Statement. Consultation with regulators and key stakeholders during this period identified that the treated effluent discharged to the Molonglo River from QSTP would be required to have very low concentrations of phosphorus to minimise the potential impact of the facility on the water quality in Lake Burley Griffin.

Further refinements to the upgrade made to address feedback received from key regulators and stakeholders and the findings of the EIS included:

- Designing the upgrade to enable the treatment capacity to be expanded in the future by an additional 50% from 70,000 to 112,000 EP
- Upgrading the filtration process to a dissolved air flotation filter (DAFF) to further reduce phosphorus in the effluent
- Upgrading the secondary treatment to provide enhanced biological phosphorus removal to reduce the ongoing operating cost of providing low phosphorus in the effluent
- Adding a lime dosing facility and lime clarifier were added to the process to provide enhanced chemical phosphorus removal to further reduce the operating costs associated with producing treated effluent with very low soluble phosphorus concentrations. The phosphorus recovered from the treatment process remains bioavailable for agriculture, providing a benefit to the circular economy.

3. POLICY AND STRATEGIC ALIGNMENT

3.1 Policy Context

The QSTP Upgrade aligns with key policy directions and government priorities/outcomes. The tables below describe the alignment of this project with various Government strategic policies.

Table 1: QPRC strategic policies and alignment

QPRC Policy	Alignment
QPRC Strategic Directions Paper 2017 • Improve infrastructure, with appropriate and well-maintained assets and major projects delivered in growth areas • Deliver quality services which meet community needs, interests and ability to pay	The project is aligned with QPRC's identified strategies by: • Providing essential infrastructure required for the community • Providing sewage treatment with capacity that responds existing and future growth of Queanbeyan • Providing treatment infrastructure that responds to community needs for reliable and sustainable treatment • Affordable wastewater treatment in terms of both capital and operational costs • Improving infrastructure by decommissioning assets at end of life that no longer provide cost effective value.
The Queanbeyan-Palerang Regional Economic Development Strategy Aims to drive economic growth and to deliver a dynamic and globally competitive regional economy. It also focuses on actions to address challenges and opportunities in Regional NSW. Goals to enable regional economic development, include • Strategy 3: Grow the Population and Internal Markets of the Region. This outlines the opportunity to *Provide enabling infrastructure for new industrial and housing developments*	The Project contributes to the delivery of this goal by: • Providing essential wastewater treatment services with capacity to enabling growth for industrial and housing developments • Improving State productivity and creating a stronger regional community by enabling economic activity that would otherwise be constrained by failing wastewater service infrastructure

The Community Strategic Plan 2018-2028 • 3.1.4 We actively promote and implement sound resource conservation and good environmental practice • 3.1.5 We ensure the future planning for the region is well coordinated and provides for its sustainable management • 4.1.3 We plan for and provide for the management of sewage, stormwater and recycled water within the communities of our region • 4.1.4 We actively promote and implement sound resource conservation and good environmental practice for our waste management systems • 4.1.6 We undertake planning to ensure infrastructure is prepared for future growth.	The project contributes to achieving these Service Objectives by: • Improving the reliability of treatment to produce an effluent that minimises impacts to the receiving environment. • Providing treatment capacity based on planning for the region including the ability to expand capacity in the future. • Providing a level of treatment that provides recycled water and is suitable for future expansion as additional recycled water users are identified. • Implementing biological phosphorus removal that minimises chemical use and recovers phosphorus in a form that is biologically available for agriculture. • Producing a biosolids product that is suitable for agricultural reuse as a soil conditioner and source of nutrients. • Identifying climate change risks and implementing climate adaptation measures • Removing the treatment infrastructure from within the 1 in 100 year flood plain

Table 2:: NSW Government strategic policies and alignment

NSW Government Policy	Alignment
The 2017 NSW Government's (Planning and Environment) South East and Tablelands Regional Plan 2036 states the following priorities for QPRC: • Work with the ACT Government to improve road and active transport connectivity and public transport integration; manage water, sewage, waste and renewable energy on a regional scale; plan and collaborate on major contiguous developments; plan for infrastructure requirements to support population growth; and support major events. • Protect and enhance the area's high environmental value lands, waterways and water catchments.	The project is aligned with the identified strategies and their aims to improve waterways and catchments, supply, and security, by providing: • Improved wastewater treatment plant capacity, reliability, and security of supply to enable the community to be more liveable and more attractive for tourism and industry etc. • Affordable wastewater treatment in terms of both capital and ultimately reducing operational costs; and • A high-quality wastewater treatment that more reliably meets relevant EPA and health standards and reduces risks to noncompliance.
The Infrastructure NSW Making it Happen in the Regions: Regional Development Framework includes the following as a priority: • Aligning effort to support growing regional centres.	The Project contributes to the delivery of this priority by: • Providing essential wastewater treatment services with capacity to enabling growth for industrial and housing developments • Improving State productivity and creating a stronger regional community by enabling economic activity that would otherwise be constrained by failing wastewater service infrastructure

The **NSW Regional Development Framework** is the overarching document that "*provides a scaffold for better coordination, decision making and effort on the ground*" for coordinating investment throughout regional NSW. The framework highlights the NSW Governments commitment to regional NSW towns and the infrastructure required to support economic growth. Throughout the NSW Regional Development Framework document there are many themes, commitments, and initiatives which both support regional development, public health, and essential services notably: • "We want to ensure that the people of regional NSW have the best access to essential services and infrastructure in regional Australia." • "All people in regional NSW should and will have access to essential services and infrastructure including hospitals, schools, roads, water, police and emergency services. This is our commitment to ensuring that no one in regional NSW should have to choose between where they live and work and having access to the most essential services."	The Project is aligned with the themes, commitments, and initiatives of the NSW Regional Development Framework by providing regional NSW residents with essential service infrastructure. The essential sewage treatment service infrastructure delivered by the project maintains and improves: • The public health and wellbeing of the Queanbeyan region • Investment and community growth within the Queanbeyan by attracting new industries and businesses. • Economic growth by providing good quality essential services.
The **Infrastructure NSW State Infrastructure Strategy Update 2014** identified an NSW Government strategic objective to "*Ensure that drinking water and wastewater services in all regional NSW towns meet contemporary standards*" In addition, the State Infrastructure Strategy Update 2014 acknowledges that "*A lack of or inadequate water supply and sewerage services are the single most important factors in protecting public health and reducing faecal pollution in receiving waters.*".	The Project contributes to the delivery of the objective by: • Planning for the future, including achieving long-term wastewater treatment capacity, building resilience and redundancy into the wastewater infrastructure in Queanbeyan.
The NSW State Plan identifies Premier and State Priorities for safer communities, building infrastructure, increasing housing supply, creating jobs and encouraging business investment.	The Project contributes to Premier and State Priorities by: • Improving wastewater treatment ability, quality and safety to ensure the safety of the community's health. • Construction of long-term infrastructure assets for the region and local community. • Supporting increasing housing supply in the catchment. • Supporting business investment in new business park developments the catchment. • Supporting the creation of jobs.

Table 3: Federal Government/NCA strategic policies and alignment

Federal Government Policy	Alignment
The National Capital Plan includes the following Principles to achieve its Objectives: • 2.3.1 Sustainability Objective One – Environmental sustainability and open space: – Ecological communities, threatened flora and fauna species, water catchments and water quality will be protected and supported by sustainable resource management. – Development will respect environmental values including water catchments and water quality and ensure resilience to the impacts of climate change. • 2.4.2 Liveability Objective One – Urban Design and Heritage: – New development, including public spaces, should: – exemplify sustainability principles	The project is aligned with the Principles contained in the National Capital Plan by: • Improved wastewater treatment plant capacity, reliability, and security of supply to enable the community to be more livable and more attractive for tourism and industry etc. • Affordable wastewater treatment in terms of both capital and ultimately reducing operational costs; and • A high-quality wastewater treatment that more reliably meets relevant EPA and health standards and reduces risks to noncompliance.
The Lake Burley Griffin Water Quality Management Plan 2011 requires the NCA to implement the following actions arising from the management of pollutants: • Respond quickly to reported events of sewer overflow and implement control measures. • Liaise with relevant regulatory bodies to ensure adequate controls on treated sewer discharges into the river, and for compliance. • The NCA will ensure liaison with the ACT Environment Protection Authority and other ACT authorities with regard to sewage entering the catchment, and compliance with management standards within the catchment.	The project is aligned with the actions contained in the Lake Burley Griffin Water Quality Management Plan by: • Improving the reliability of treatment plant and reducing the occurrence of untreated sewage overflows • Incorporating the issues and concerns raised by the NCA and ACT Government into the level of treatment included in the design.

Table 4: ACT Government strategic policies and alignment

ACT Government Policy	Alignment
The QPRC and ACT Government Letter of Intent around the ACT-NSW Memorandum of Understanding for Regional Collaboration contains the following principles and priorities for engagement: • Optimising best of region outcomes • Pursuing borderless approach to key infrastructure • Sharing information and data to inform planning and policy development and initiatives • Collaboration on policy and planning opportunities to consider management of water, sewage, waste and renewable energy on a regional scale • Understanding the infrastructure requirements to support population growth	The project is aligned with the principles and priorities of the MOU by: • Work was undertaken early in the project with Icon Water to assess the opportunity for a regional sewage treatment plant. • Contribution to the ACT Government's Lake Burley Griffin hydrological model to assess impacts of STP effluent on the receiving environment • Designing a high-quality wastewater treatment that more reliably meets relevant EPA and health standards and reduces risks to noncompliance improving the environmental outcome for the receiving waters in the ACT.
The ACT and Region Catchment Strategy 2016 – 2046 includes the Regional Development Theme with a goal to 'Make human settlement across the ACT and Region resilient and sustainable and ensure that human impacts on downstream catchments are manageable.' The strategy notes that Wastewater and sewage management capacity will continue to be a challenge for a growing region and sewage treatment can be a constraint.	The Project contributes to this Strategy by: • Designing a high-quality wastewater treatment that more reliably meets relevant EPA and health standards and reduces risks to noncompliance improving the environmental outcome for the receiving waters in the ACT. • Supporting increasing housing supply in the catchment. • Developing coordinated approach to provide cost effective infrastructure with greater economies of scale.

3.2 Place Based Considerations

The QSTP Upgrade project provides essential infrastructure that supports Queanbeyan as a connected and prosperous economy. This supports Queanbeyan's position in in the region outlined in the *NSW Planning and Environment South East and Tablelands Regional Plan* with:

- Connections with Canberra for jobs and services
- Access to Canberra Airport as a tourism and export gateway and
- Support of tourism to Kosciusko National Park, ski resorts and Snowy Mountains region.

The project provides treatment capacity to support projects in the QSTP catchment that the NSW Government has committed investment funding:

- The South Jerrabomberra Regional Jobs Precinct located within the Poplars Innovation Precinct
- $23M investment to improve infrastructure within the business park via the Growing Local Economies Fund
- $7.5M investment for water and sewer services (ie pipework to connect into the existing network) to fast track housing development (1,500 lots) in South Jerrabomberra via the Housing Acceleration Fund
- Construction of a new 500 student high school in Jerrabomberra
- $10M towards the $30M regional sports complex to be constructed in South Jerrabomberra via the Regional Sports Infrastructure Fund.

These infrastructure projects drive an increased load on the Queanbeyan STP and have been accounted for in the base case assumptions.

3.3 Principles, Objectives and Critical Success Factors

Project Principles

The project will be delivered in line with the following Principles:

- Overall Project:
  - The STP upgrade will use proven technology that creates an opportunity to enhance water quality in the Molonglo River and Lake Burley Griffin and continue to make this environmental flow available for climate change resilience.
  - Through the creation of the STP we will work to ensure a process for treated water now and into the future, catering for population growth and the expansion of the plant.
  - In a unique collaboration with three jurisdictions, this project will bring several arms of government together to create an upgraded sewage treatment plant catering for a variety of users into the future.
  - The project enables improved resource recovery for biosolids produced from the STP. The proposed technology recovers phosphorus from the wastewater in a from which remains biologically available for use in agriculture. Improvements in biosolids management including reuse of historical biosolid stockpiles will provide a healthier and cleaner environment for our residents now and into the future.
  - We want to secure wastewater treatment needs now and into the future.
- Project costs:
  - We will balance water quality, operator, and cost factors in design.
  - Be transparent and open about costs and funding.
  - Consult stakeholders on the effect of costs on rates and charges and the impact on user charges and fees, especially those residents living outside the Queanbeyan area.
  - We will engage with residents and ratepayers about the impacts on costs and funding for Council in a transparent and honest way. Our aim is to give a complete picture of the impacts on costs.
- Water quality, environment and sustainability:
  - QPRC is committed to an upgraded STP that serves our community well into the future.
  - QPRC will consider environmental impacts during construction and long-term operations, adopting environmental measures along the design journey.
  - The upgraded STP will ensure all environmental standards are met or exceeded.
  - A high level of water quality, the biodiversity of receiving waterways and Lake Burley Griffin recreational activities will be protected. The upgraded STP will enhanced control and resilience over water quality outcomes.
  - We will enhance the riparian environment through extended landscaping options along the Molonglo River corridor after decommissioning the maturation ponds which will be no longer required for treatment. Returning the riparian zone to their natural state as river floodplain ecology.
  - The Golden Sun Moth ecological habitat on the site will be protected.
  - Indigenous and European heritage of the area will be communicated through installation of signage in an area along the river corridor that is accessible to the public.
  - This STP upgrade will seek to achieve an Infrastructure Sustainability rating standard of 65-75 (excellent), ensuring this facility will meet Council's sustainability goals now and into the future.
- Construction and project staging:
  - The design, construction and commissioning of the STP will take place over several years. At each stage of the project, QPRC is committed to sharing information about the regulatory requirements for the project and key decisions.
  - We will work closely with stakeholders and community to minimise impacts from construction of the upgrade STP. We will ensure construction is managed so it's not disruptive, for example staging our work, or notifying you in advance. Some night work may be required during construction. We will provide advance notice and actionable tips to those impacted.
- Long term operations:
  - We are designing with the long term in mind. This facility will be operational for decades to come and is able to be expanded further to extend that lifespan. We consider reliability, maintenance and access aspects when designing key attributes for safe and friendly operations.
  - We seek to mitigate energy costs of the treatment process through designing to minimise energy where possible, selection of energy efficient equipment, and manage energy use through the use of accessible dashboards.

- We will look to design flexibility and agility to change and adapt to and respond during the future.
- We will look to balance and minimise the use and type of chemicals and waste for operations.
- We will develop a cost benefit analysis to provide a best value outcome.

Project Objectives

The objective of the Proposal is to provide a robust, reliable and sustainable STP that protects public health and the environment for future generations. The Proposal will deliver a robust and reliable sewage treatment solution that provides for both immediate and medium term needs whilst pragmatically considering future needs.

The upgrade proposed represents a solution that provides value for money, achieves targeted sustainability and public health outcomes, and would continue to meet regulatory requirements.

The new STP shall meet regulator and stakeholder requirements, and to achieve an Infrastructure Sustainability Council (ISC) rating of 'Excellent'.

QPRC have identified additional benefits of the Proposal, including:

- Securing Queanbeyan's sewage treatment needs for future growth
- Improved ability to control the water quality discharged to the environment and to protect public health
- Improved odour and noise outcomes
- Improved workplace health and safety for workers and visitors to the facility
- Providing improved treatment reliability
- Providing improved protection of the treatment plant against flooding and climate change sustainability
- Providing a source of recycled water that can be used for applications such as dust suppression
- Providing a local facility to receive and treat septage waste collected from domestic septic tanks and aerated wastewater treatment systems
- Improved treatment of the biosolids produced by the treatment process to a quality that is suitable for agricultural reuse
- Providing improved treatment of the waste screening and grit materials generated during the treatment process
- Providing improved traffic access to the treatment plant by sealing the access road.

Key Performance Indicators (KPIs)

Critical Success Factors for the project are summarised in the table below.

Table 5: Critical Success Factors

KPIs	Benefit Owner	Measure	Data Source	Metric Type
Meeting Queanbeyan's sewage treatment needs for future population and economic growth	QPRC	Providing sewage treatment for Queanbeyan population to 2038	ABS Census Inflow measurement	Financial
Improved control the water quality discharged to the environment and to protect public health	ACT / NCA	Reduced number of licence exceedances per annum Fewer closures of LBG per annum Fewer algal blooms in LBG per annum	QSTP annual EPA reporting NCA LBG management data	Non-financial

KPIs	Benefit Owner	Measure	Data Source	Metric Type
Improved workplace health and safety for workers and visitors to the facility	QPRC	Reduced LTIs, incidents and near misses	QPRC WHS records	Non-financial
Improved treatment reliability	QPRC	Effluent quality consistently within regulatory limits Reduced maintenance costs No fines for failure of treatment process	QPRC financial records ACT EPA non-compliance records	Financial
Improved protection of the treatment plant against flooding and climate change sustainability	QPRC	Achievement of Excellent ISC rating Zero inundations of treatment processes up to the 1% AEP flood event	Records from flood events	Non-financial
Provision of a source of recycled water that can be used for applications such as dust suppression	QPRC	Recycled water usage	Recycled water usage records	Non-financial
Provision of a local facility to receive and treat septage waste collected from domestic septic tanks and aerated wastewater treatment systems from within the QPRC LGA	Septage tank owners and septage removal operators	Septage receival sales	Septage receival sales records	Non-financial
Improved treatment of the biosolids produced by the treatment process to a quality that is suitable for agricultural reuse	QPRC / third party biosolids users	Quality records of biosolids testing Uptake of biosolids by third parties other than landfill	Biosolids testing and disposal records	
Improved traffic access to the treatment plant by sealing the access road	ACT TCCS	Reduced maintenance costs	ACT TCCS financial records	Financial
Provision of a sustainable sewage treatment solution	QPRC	Achievement of Excellent ISC rating	ISC Rating	Non-financial

KPIs	Benefit Owner	Measure	Data Source	Metric Type
Existing plant does not fail	QPRC	New plant operational prior to failure of existing plant	ACT EPA annual reporting records	Non-financial
New solution is affordable	Rate payers	Rate increases to pay for new plant are affordable	Rate rise data	Financial
		Project delivered within approved budget	QPRC financial records	

3.4 Project Alignment with Principles, Objectives and Critical Success Factors

Table 6: Project work benefits alignment

Policy or Plan	Strategic Objective	Project Alignment			
		A robust and "Best for Region" solution	Represents value for money	Achieves targeted sustainability and public health outcomes	Meets regulatory requirements
QTSP Master Plan	Capacity required for current and future population growth	✓			
	New STP to provide a level of service that conforms to industry best practice for the protection of public health and the environment	✓	✓	✓	✓
	STP design that meets regulator/stakeholder concerns/requirements			✓	✓
	Optimisation of STP design to achieve Infrastructure Sustainability Council of Australia (ISCA) rating of 'Excellent' or 'Leading'.	✓		✓	
QPRC Strategic Directions Paper 2017	Improve infrastructure, with appropriate and well maintained assets and major projects delivered in growth areas	✓	✓		
	Deliver quality services which meet community needs, interests and ability to pay	✓	✓	✓	
Infrastructure NSW South East and Tablelands Regional Plan 2036	Work with the ACT Government to improve road and active transport connectivity and public transport integration; manage water, sewage, waste and renewable energy on a regional scale; plan and collaborate on major contiguous developments; plan for	✓	✓		✓

	infrastructure requirements to support population growth; and support major events				
	Protect and enhance the area's high environmental value lands, waterways and water catchment			✓	✓
NSW Regional Development Framework	People of regional NSW have the best access to essential services and infrastructure in regional Australia	✓		✓	✓
	All people in regional NSW should and will have access to essential services and infrastructure			✓	✓
Infrastructure NSW State Infrastructure Strategy Update 2014	Ensure that drinking water and wastewater services in all regional NSW towns meet contemporary standards	✓		✓	
	A lack of or inadequate water supply and sewerage services are the single most important factors in protecting public health and reducing faecal pollution in receiving waters	✓		✓	
Premier and State Priorities	Priorities for safer communities, building infrastructure and encouraging business investment	✓	✓		

4. PROJECT OPTIONS

4.1 Description of Proposed Project

Overview

The previous studies outlined in section 2.5 identified that the preferred option for the project was to upgrade the QSTP at the existing site.

The QSTP Upgrade will replace the existing sewage treatment plant which is approaching the end of its asset life with a modern treatment facility that provide reliable treatment. The upgrade provides 75,000 EP of treatment capacity allowing for growth and development in Queanbeyan and will improve the quality of the treated effluent discharged into the Molonglo River upstream of Lake Burley Griffin.

The facility has been designed to provide a simple and robust process that provides reliable treatment, removal of nitrogen and phosphorus and treatment of storm flows.

An overview of the process showing major treatment processes is shown below. The treatment facility includes screening and grit removal, storage and return of storm flows, activated sludge providing biological nitrogen and phosphorus removal, gravity clarifiers, tertiary filtration using a dissolved air flotation filter (DAFF) and UV disinfection. Treated effluent is discharged via an on-bank discharge structure adjacent to the Molonglo River.

The project produces recycled water that will be used onsite for process water and hose points. The project includes a recycled water fill point to supply water to tankers for offsite uses such as dust suppression.

Waste sludge produced by the treatment process will be stabilised in an aerobic digester and dewatered with centrifuges to produce a biosolids product that is suitable for reuse. Phosphorus removed from the wastewater is captured in the biosolids in a form that is biologically available for agricultural use.

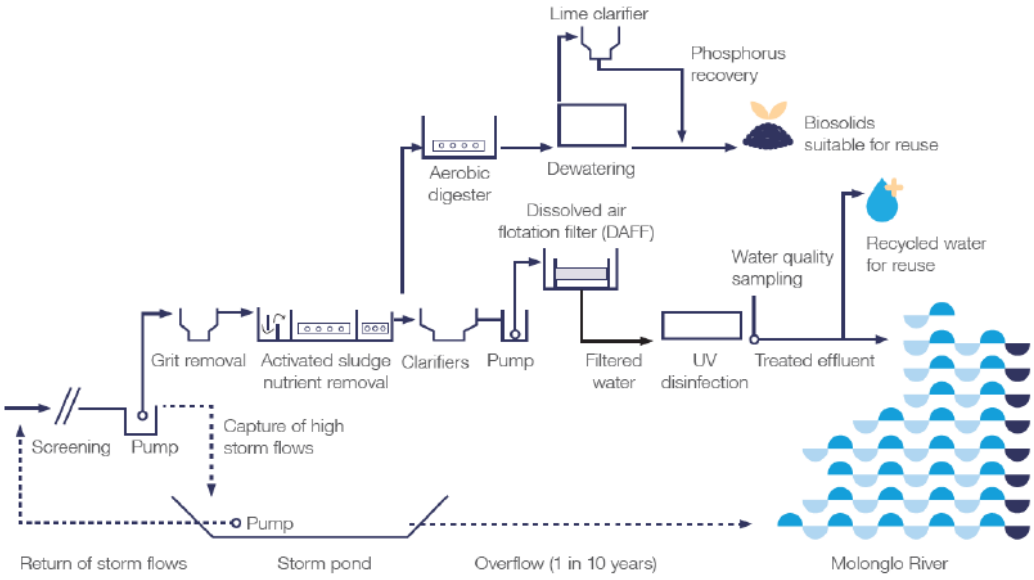


Figure 8: Overview of the proposed QSTP treatment process - the treatment process produces a disinfected effluent with low nitrogen and phosphorus concentrations.

Table 7: Summary of treatment units included in the upgrade

Process stage	Details
Inlet works screening	Band screen – fully automated 5 mm 2-dimensional screening of all flows Collected screenings are washed and dewatered, then stored in skip bins for disposal
Inlet pump station	Lifts screened flow to treatment
Storm pond	30 ML storm pond stores screened flows during storm flow events where the inflow exceeds the treatment capacity. Stored storm flows are returned to treatment during lower flow periods
Grit removal	Grit vortex system – removes grit from the sewage. Grit is washed and dewatered, then stored in skip bins for disposal
Bioreactor	Biological phosphorus removal configured reactor. Anaerobic zones followed by two oxidation ditches and two final aerobic zones. Provides biological nitrogen and phosphorus removal.
Clarification	Two 40 m clarifiers provide settling and clarified effluent. The clarifiers are also designed to provide treatment of storm flows using the solids contact process.
Filter lift pump station	Lifts flow to filtration
Tertiary DAF and filtration	Tertiary treatment dissolved air flotation and granular media filtration using dual coal / sand media – this tertiary treatment removes fine solid particles producing a polished effluent.
Disinfection for river discharge	Ultraviolet (UV) disinfection is provided to the polished final effluent before discharge to the Molonglo River.
Disinfection for Recycled Water	Recycled water receives filtration, UV disinfection and chlorination. Recycled water is suitable for use around site and for offsite uses approved by QPRC.
Aerobic digestion	Waste sludge is thickened and then stabilised using an aerobic digestion process. The process produces a stable biosolids produce that is suitable for reuse.
Biosolids dewatering and handling	Two centrifuges dewater the biosolids. Dewatered biosolids are out-loaded into truck bodies for transport offsite.
Septage receival facility	The STP facility includes a septage receival facility that is designed to receive septage pumped out from domestic septic tanks and domestic aerated wastewater treatment systems. The septage is delivered to site by licenced operators. The facility is not suitable to receive other liquid trade waste.
Recycled water facility	Standpipe facility providing recycled water for approved offsite use

Phosphorus removal

Phosphorus is a key contaminant of concern for the receiving environment of the Molonglo River and Lake Burley Griffin. The treatment process removes phosphorus using a combination of the following processes:

- The bioreactor and clarifier system provides both biological and chemical phosphorus removal to remove the bulk of the phosphorus.
- Lime and ferric dosing systems are dosed at multiple locations to provide enhanced chemical phosphorus removal.
- Dissolved air flotation and dual media filtration (DAFF) provides tertiary filtration to further remove particulate phosphorus and provide effluent polishing to the very low phosphorus concentrations required.

Site arrangement and civil works

The new QSTP will be constructed on the existing lease area to the southeast of the existing treatment process. The selected site location provides a predominantly level area where the new treatment process may be constructed while maintaining operation of the existing STP throughout the construction period.

The location QSTP Upgrade is primarily situated above the nominated design flood level, reducing the risk of damage to major structures, mechanical and electrical equipment during flood events.

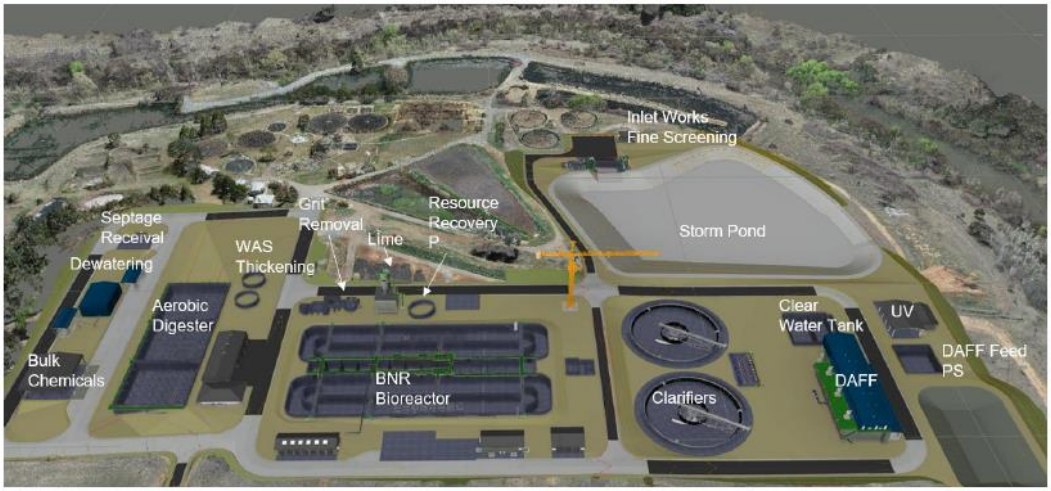


Figure 9: Overview of the Queanbeyan STP Upgrade (existing plant in background)

The site layout has been developed in consultation with QPRC and informed by site investigations including survey, services location, geotechnical, ecological, contamination and heritage investigations. Key considerations in development of the layout include:

- Locating the hydraulic grade line and height of structures to ensure bioreactor, clarifiers and UV are positioned at ground level (i.e. top of structure is at handrail height generally) to simplify operation and reduce costs associated with access to elevated structures and lift pumping
- Minimising hydraulic losses of major pipe runs through the treatment process to minimise ongoing operating costs
- Providing adequate space for operation and maintenance access and below ground pipework and electrical conduit service corridors
- Site operation, monitoring and security requirements
- Construction sequencing
- Avoiding disturbance of an area to the south of the site identified as potential habitat for the critically endangered Golden Sun Moth.

Sewage is conveyed to the existing site from the sewerage network through the Jerrabomberra trunk main from the west and the Morisset trunk main from the south. The project includes connecting to these two trunk mains within the site and installing connecting mains to transfer sewage to the new inlet works. The location of the cut-in to the Morisset trunk main has been located outside the identified Golden Sun Moth zone.

The area to the south of the proposed build area is available to be used as the contractor compound during the construction phase. Other areas of the site will be used for stockpiling of excavated material during construction.

Consideration of future expansion requirements

The QSTP upgrade provides a treatment capacity of 75,000 EP. Design of the upgrade has also given consideration to the needs of a future stage 2 upgrade to expand the QSTP treatment capacity by 50% to 112,500 EP. The considerations included in the current project include:

- Consideration of space requirements, hydraulic requirements and connection points of future processes
- Consideration of environmental constraints for the Stage 2 upgrade
- Installing stage 2 capacity now for treatment units that would be difficult to retrofit later such as the inlet works, grit removal and UV disinfection unit hydraulic capacity.

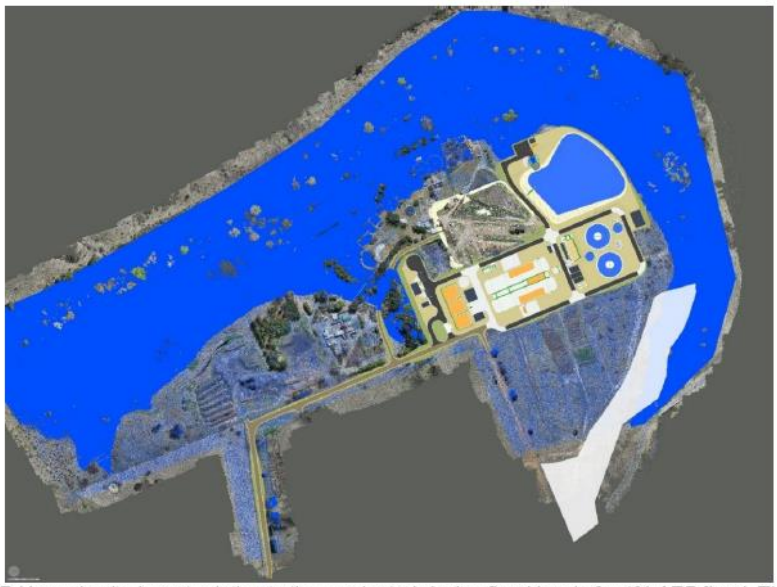


Figure 10: QSTP Upgrade site layout relative to the nominated design flood level of a 1% AEP flood. The design has additionally considered an allowance for climate change.

Decommissioning and removal of Maturation Ponds

The existing treatment plant includes three maturation ponds located on the southern bank of the Molonglo River. The three maturation ponds have an area in the order of 7.6 ha and a volume approaching 200 ML.

The maturation ponds are located within the extents of the 1% AEP flood zone and are at risk of failure during flood events.

The maturation ponds will not form part of the treatment process once the new treatment plant has been constructed and commissioned. As part of the project, the ponds are to be decommissioned, accumulated sludge removed and infilled. Vegetation will be planted in the remediated maturation pond area to extend the Molonglo River riparian zone. QPRC has developed a landscape plan for the area in consultation with the community.

Figure 11: The existing QSTP Site.

Mountain Road upgrade

QSTP is accessed via Mountain Road. The existing access road is unsealed and is in poor condition.

The project includes an upgrade of Mountain Road from the existing intersection with Railway St to accommodate access for larger vehicles and provide suitable road conditions for the increase in operational traffic associated with the upgraded treatment facility.

The key features of the Mountain Road upgrade work are:

- Road widening
- Pavement reconstruction including subsurface drainage
- Construction of swale drainage along the road
- Reconstruction of an existing culvert
- Construction of a cul-de-sac prior to the QSTP entry gate.

The road upgrade work is being developed in consultation with ACT Transport Canberra and City Services (TCCS) and will become their asset.

Power supply upgrade

The power supply authority for the site (Evoenergy) has advised that there is insufficient power supply capacity for the new plant and an upgrade of the high voltage power supply to the site is required. A scope of work for the high voltage power supply has been developed in consultation with Evoenergy. The work required includes:

- Replacement of the existing 11 kV overhead power lines along Mountain Road and across the site with a diverted underground service to provide clear access to the proposed construction areas and safe access for construction vehicles during construction.
- Removal of redundant overhead power lines that cross the existing site.
- Installation of a temporary underground power supply to maintain power supply to the existing QSTP during the construction period.
- Installation of a temporary power supply to the proposed contractor compound area for construction power.

Potable water supply upgrade

Potable water is supplied to the existing STP by a 100mm water main along Nimrod which is owned and operated by Icon Water. Icon Water has advised that there is insufficient water supply pressure at the site to meet ACT firefighting requirements. As part of the project, the potable water main will be upgraded from 100mm to 150mm.

Decommissioning of the existing STP

During commissioning of the new facility, sewage flows will be cut over from the existing STP to the facility. As part of the scope of the project, the existing STP facility is to be decommissioned and made safe. This includes management and removal of residual sludge and grit from the process, cleaning and removal and disposal of mechanical and electrical plant. The scope of the project does not include demolition of the existing STP structures.

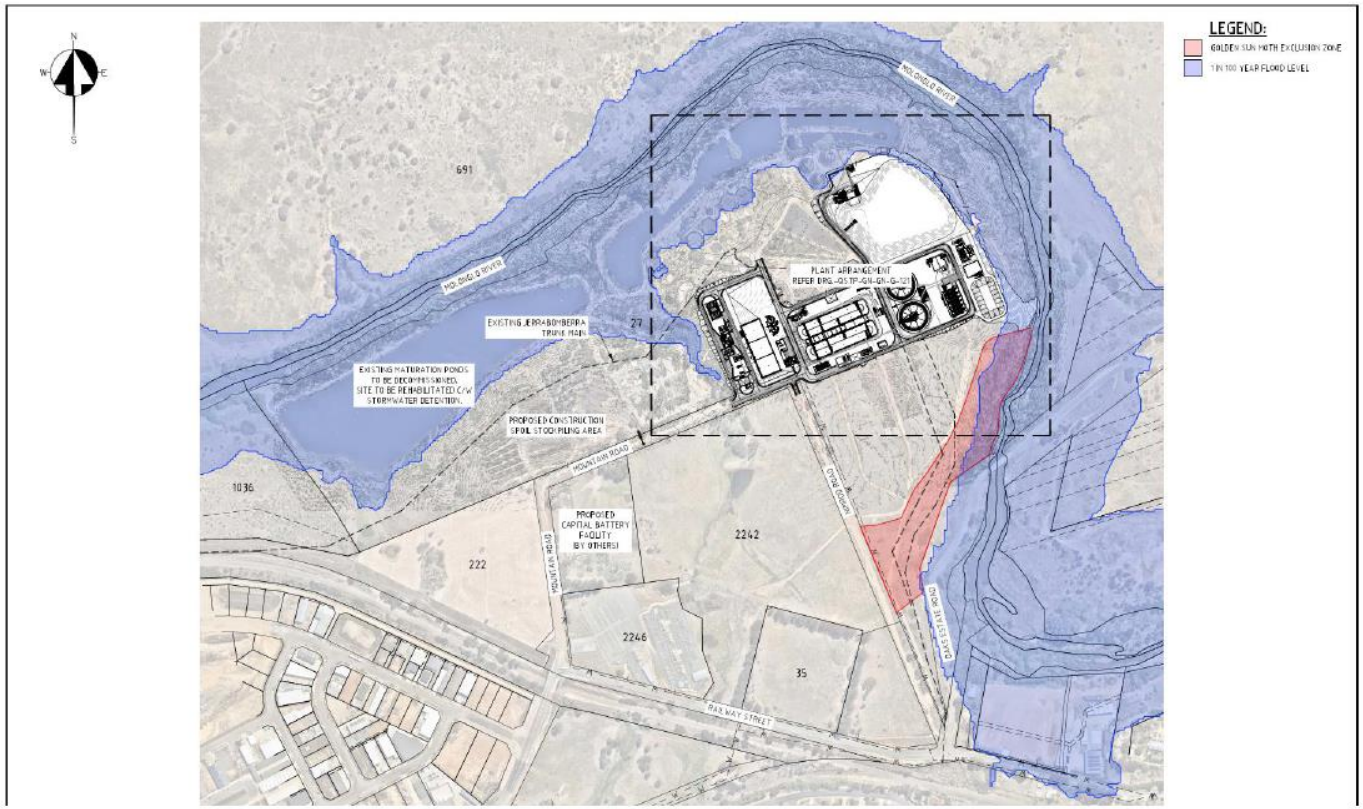
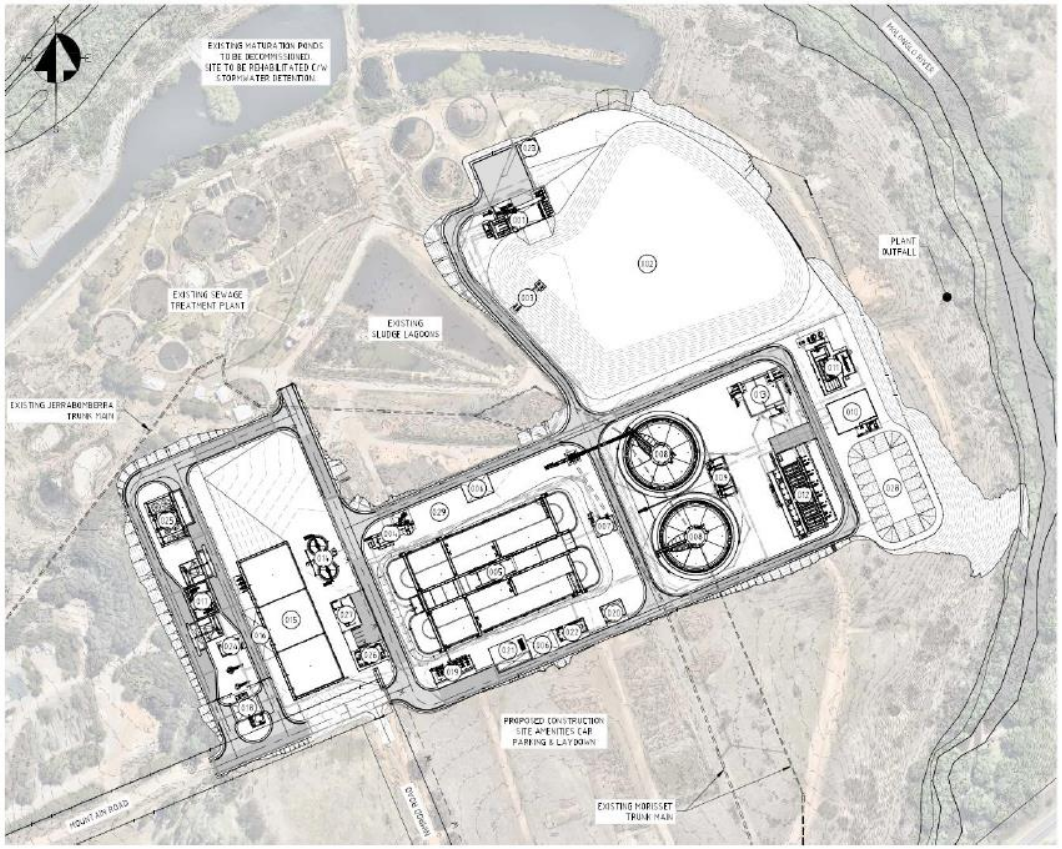


Figure 12: Proposed location for construction of the QSTP upgrade. The location has been selected with consideration of flooding constraints, potential archaeological deposits and endangered Golden Sun Moths.



STRUCTURE LIST	
ITEM NUMBER	DESCRIPTION
001	INLET WORKS
002	STORM POND (30 ML)
003	STORM RETURN PUMPING STATION
004	GRIT REMOVAL FACILITY
005	BIOREACTOR
006	BIOREACTOR AERATION GRID WASH DOWN AREA
007	MIXED LIQUOR SPLITTER
008	CLARIFIERS
009	RAS PUMPING STATION
010	FILTER LIFT PUMPING STATION
011	UV DISINFECTION FACILITY/ELECTRICAL SWITCHROOM
012	DAFF (DISSOLVED AIR FLOTATION FILTERS)
013	DIRTY BACKWASH TANK/CLEAR WATER TANK
014	WAS THICKENERS
015	AEROBIC DIGESTER
016	AEROBIC DIGESTER AERATION GRID WASH DOWN AREA
017	DEWATERING FACILITY
018	SEPTAGE RECEIVAL/RECYCLE WATER FILL STATION
019	BLOWER FACILITY
020	CHAMBERED ELECTRICAL SUBSTATION
021	ELECTRICAL GENERATOR & DIESEL STORAGE
022	MAIN ELECTRICAL SWITCHROOM
023	INLET SWITCHROOM
024	SLUDGE HANDLING SWITCHROOM
025	CHEMICAL DOSING FACILITY
026	AMENITIES
027	WORKSHOP
028	STORMWATER DETENTION BASIN
029	LIME CLARIFIER/LIME SILO

Figure 13: Site arrangement of the QSTP Upgrade

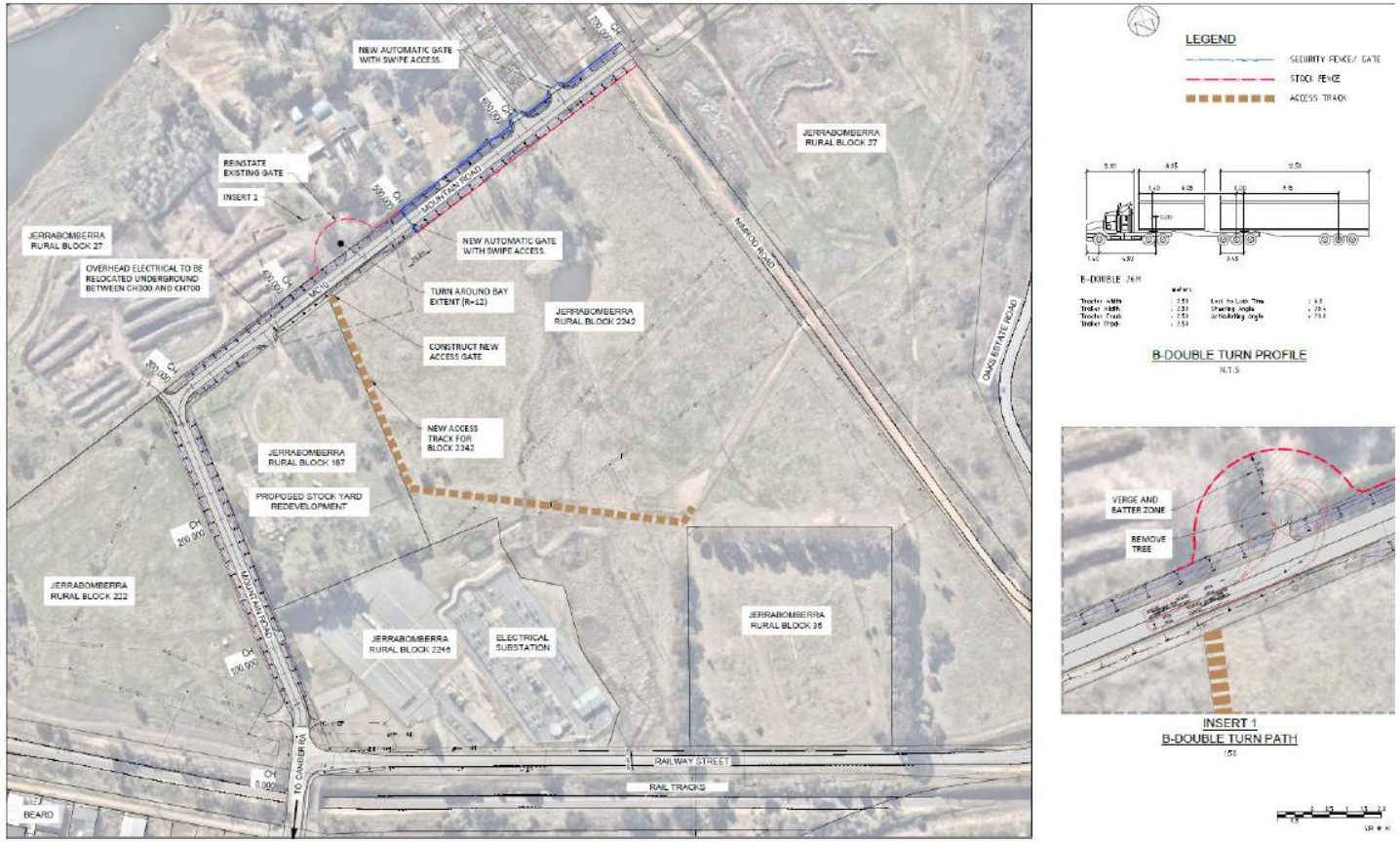


Figure 14: Planned upgrade to the Mountain Road access road to the QSTP

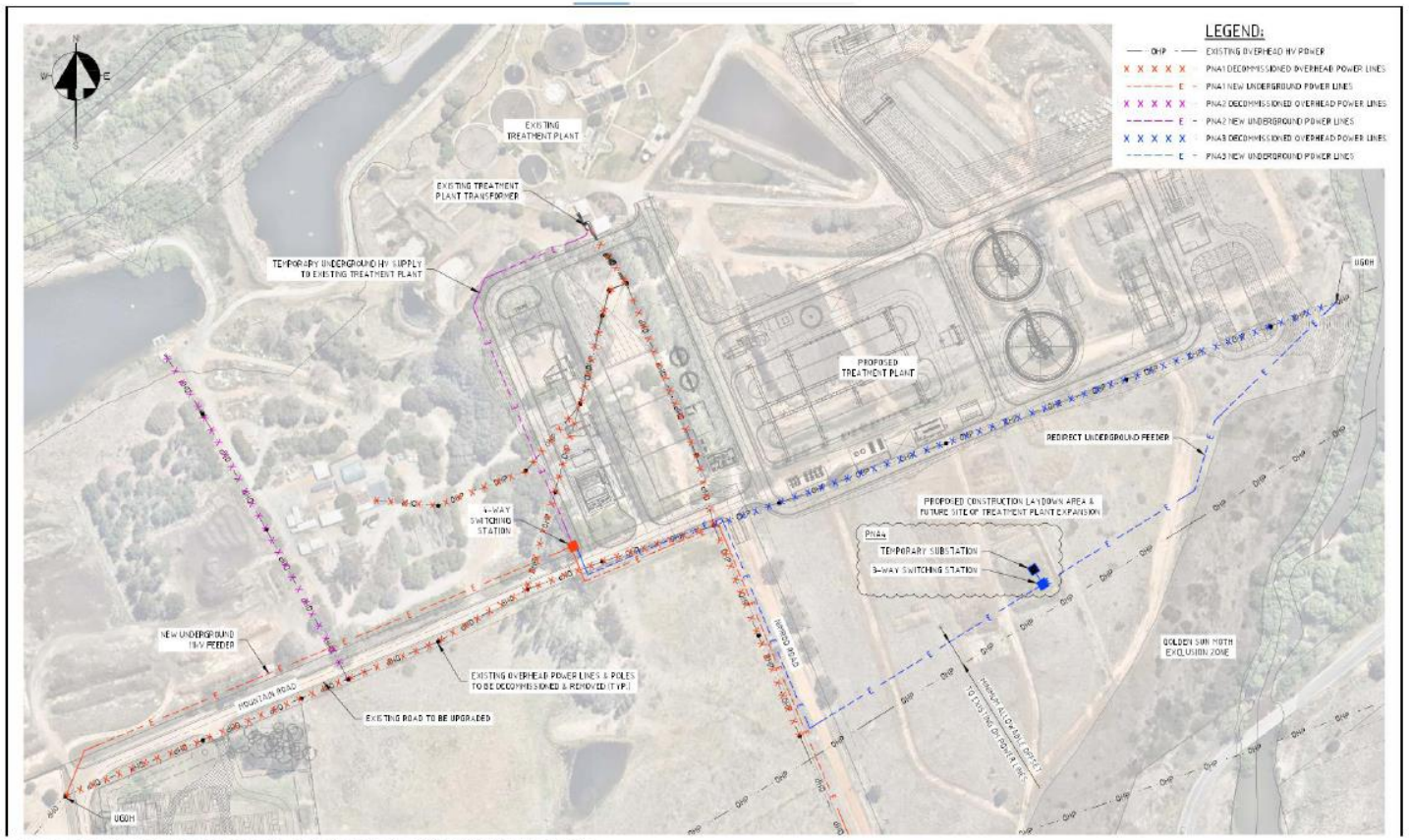


Figure 15: Power supply upgrade requirements of the QSTP Upgrade

4.2 Related Projects and Decisions

The QSTP upgrade project is interrelated to the following government decisions and projects that are being progressed separately.

Development Application Approvals

The QSTP upgrade provides treatment capacity for new connections to the Queanbeyan sewerage system. This additional treatment capacity services new development applications approved by QPRC as well as developments that are already approved but have not yet connected. This includes developments in the South Jerrabomberra area.

STP Site Lease Renewal

The site of the existing and proposed QSTP is Block 27 Jerrabomberra ACT is located in the ACT. QPRC has a 99 year lease on the block that commenced in 1 April 1938 and expires 31 March 2037.

To secure QPRC's investment in the new STP on the site, QPRC has requested a lease extension from the ACT Government. Negotiations on the new lease are ongoing as there are historical boundary survey issues that are being addressed as well as the previous construction of an ACT road across the existing STP site.

Consolidation of Nimrod Road and part of Mountain Road into Block 27 Jerrabomberra ACT

QPRC has made a Direct Sale application to the ACT to close Nimrod Road and part of Mountain Road and consolidate these areas into the existing leased area. If the purchase were to proceed, Nimrod Road would be closed to traffic but would be maintained as an emergency egress and for access to the power supply easement.

The approximate timeframe for consideration of the direct sale application by the ACT Minister for Planning and Land Management is November 2022.

Deregistration of the Maturation Ponds

The two larger maturation ponds at the QSTP site are registered as dams under the ACT Utilities Technical Regulation Act. Prior to decommissioning the maturation ponds, they must be de-registered as dams.

The Utilities (Technical Regulation) (ACT Dam Safety Code) Approval 2018 stipulates the steps to be undertaken to decommission dams, including the requirement to seek approval from the UTR. Information to be provided to the UTR includes details of significant adverse risks to the community during dam decommissioning, and how QPRC will mitigate these risks so as to be acceptable. This may include the preparation of a Dam Safety Emergency Plan or similar.

Once the UTR has approved the proposed methodology, the UTR will delist the dams and remove them from the ACT Dam Register.

Augmentation of the Queanbeyan Sewerage Network

QPRC is preparing an Integrated Water Catchment Management Strategy (IWCM Strategy) to comply with NSW Department of Planning and Environment requirements. The IWCM Strategy will address regional issues relating to provision of sewerage services. Work completed to date on QPRC's IWCM has identified that augmentations to Queanbeyan's sewerage network including an upgrade to the Jerrabomberra trunk sewer will be required as a separate future project.

4.3 Impact and Integration with other Government Assets and Services

The Project will integrate with the existing Queanbeyan sewerage network operated by QPRC and the Oaks Estate sewerage network operated by Icon Water. The project includes works within the site to divert the incoming mains from these networks to the new facility.

As outlined in the project description, the works also integrates with the following assets and service:

- EVO Energy electricity network – the high voltage power supply will be upgraded to supply the new facility as part of the project
- ICON (ACT Government) potable water mains – the water supply will be upgraded as part of the project
- ACT TCCS (Roads ACT) Mountain and Nimrod Roads – Mountain Road will be upgraded as part of the project. Nimrod Road would be closed and incorporated into the leased site.

The project is not expected to impact any other government assets or services.

Plans for mitigating disruption to the service provided by the existing QSTP during the project are discussed in Disruption Management in Section 4.5.

4.4 Enabling or Ancillary Works

Enabling works for the main treatment plant upgrade include:

- The upgrade to Evoenergy's high voltage power supply to the site
- The upgrade of the potable water supply to the site
- The upgrade to Mountain Road
- Relocation of surface artefacts identified as part of aboriginal heritage investigations at the site.

4.5 Disruption Management

The construction of the new QSTP has been planned to ensure minimal impact on the continued operation of the existing STP works. The site for construction of the new facility has been located so that the existing facility can continue to operate during construction. Construction has been staged and planned to ensure the treatment of sewage and compliance with the existing environmental requirements will not be compromised by the construction activities. Construction planning will include preparation of a detailed cut-over plan to ensure continued treatment services during the cut over from the existing facility to the new treatment plant.

Early works will include the relocation of services including a number of power poles along Mountain Road and the power supply to the existing site. These works will be undertaken in order to provide clear site access for construction phase. Disruptions to other customers will be managed by EvoEnergy, in consultation with QPRC.

The Mountain Road upgrade will include road closures and disruptions to traffic. This will be managed by QPRC, in consultation with Transport Canberra & City Services (TCCS). Initial consultation has already occurred with TCCS and this will continue.

As the project develops the project action register will be continually reviewed and revised to capture potential disruptions and associated mitigation/management strategies. The full current extent of expected impacts to current government assets, services and the wider community as a result of the construction of the proposed project together with management strategies are summarised in Table 8.

Table 8: Impacted Stakeholders

Impacted Asset or Stakeholder	Impact	Financial Impact to Stakeholder	Management Strategy
Trunk sewers from sewerage network	Temporary stoppage of flows to the works required at times for essential cut-in work to the network.	Internal cost risk.	Shutdown plans to be developed using temporary pumping, storage and night works as required.

High voltage power supply - EvoEnergy network	Re-alignment of power supply may result in interruptions to supply to Evoenergy customers.	Evoenergy to manage	Evoenergy to manage this impact as they will be engaged to undertake the work.
Power supply to existing STP	Potential interruptions to power supply to existing QSTP	Internal cost risk.	Install new temporary power supply to existing STP. Utilise existing STP back-up generator if required. Ensure adequate diesel supply for back-up generator during cut-over of new temporary power supply.
Mountain and Nimrod Road	Disruption to traffic access. Damage to road surface from construction vehicle movements. (Note there are only three properties accessed via these two roads.)	Cost to reinstate road to pre-construction condition. Cost to implement traffic controls on the road.	Coordinate road works with TCCS and adjoining land users. Provide alternate access for surrounding land users if required. Implement Traffic Management Plan.
ICON Potable Water Main	Water supply to adjacent horse paddock and QSTP during cut-over of new water supply main.	Cost to provide alternative water supply to horse paddock.	Coordinate timing of cut-over with existing STP operations and adjacent horse paddock.
Existing STP Operations	Land currently used for biosolids drying is required to site the new STP. Considerable site land is required for shifting of excavated material.	Internal cost risk.	Relocate existing biosolids. Have backup for off-site disposal in place for biosolids generated during construction.
Capital Battery	Disruption to site access. Road upgrade affects Capital Battery site access. Dust from QSTP works vehicle movements on Mountain Road impacts Capital Battery site.	Nil.	Cross agreement between QPRC and Capital Battery.
ACT Rural Services / Territory Agistment	Impact access to their site.	Potential cost to provide alternate site access.	Provide alternative access to their site if required.
Oaks Estate Residents (ACT) Beard Industrial Estate (ACT) Queanbeyan Residents (NSW)	Noise, dust and odour emitted during construction	Potential cost of addressing complaints.	Construction contractor to prepare and implement a CEMP including ESCP. Undertake site surveillance to ensure contractor is implementing the CEMP and controls are effective.
Molonglo River and Lake Burley Griffin	Lake closures for recreational activities and reduced visual amenity due to release of contaminants from the site as a result of construction activities	Loss of economic activity from cancelled events and reduced tourism.	Require contractor to prepare and implement CEMP including WQMP. Undertake site surveillance to ensure contractor is implementing

			the CEMP and controls are effective. QPRC to continue to maintain and operate the existing QSTP.
Canberra Airport	Cranes required for construction.	Impacted to airport flight schedules.	Obtain Canberra Airport/CASA approval for cranes.

5. COST AND FUNDING

5.1 Budget Request

The preliminary cost estimates for the QSTP upgrade have been developed using a line-item cost estimate and Monte Carlo simulation to achieve a risk-based cost estimate for the QSTP Upgrade project. The simulation uses lower and upper bounds that vary depending on the confidence (and risk) levels of each estimated line item. Typical lower bounds for inbuilt contingency are -20% and upper bounds are +30%. For this stage of estimate, a medium confidence level has been used.

Using the Monte Carlo simulation, the P90 cost estimate for total project cost is $162.3M (refer to Table 9).

Table 9: Total outturn cost estimate summary

Sub-Project	Budget Request ($ ex. GST))
Construction Costs	101,465,500
QPRC Costs	26,449,000
Base Estimate	**127,914,500**
Contingency for Risks (P90)	15,475,000
Project Estimate (P90)	**143,389,500**
Escalation	18,916,500
Total Outturn Cost (P90)	**162,306,000**

Further breakdown of the project cost estimate is provided in Table 11 below.

5.2 Proposed Funding

QPRC Funding sources

Existing Income Streams

Funding for QPRCs sewer operations comes from a dedicated sewerage business of Council. The Business income is from the following sources:

- Sewerage rates – annual fees per sewerage connection
- Developer contributions – Developer charges are up-front charges that QPRC can levy under section 64 of the Local Government Act 1993 to recover part of the infrastructure costs incurred in servicing new development or additions and changes to existing development
- User charges and fees
- Interest.

The income of the sewer fund from the above sources for the 2021-22 financial year was $15m.

We note that the expected income from the sale of recycled water (via the recycled water standpipe) and disposal of septage (via the septage receival facility) would be negligible and have not been included above.

The amount charged for each of the above may be varied by QPRC from time to time to recover the costs required for operation, maintenance, renewal and upgrade of the sewerage system.

The Sewer fund currently holds reserves that have been collected for the purposes of asset replacement, operation and maintenance. The current value of the Queanbeyan sewer fund reserve attributed to the QSTP catchment is $58m. The Sewer fund currently holds property in the Queanbeyan CBD that could be sold with the income returned to the Sewer Fund. The reserve does not hold enough funds to cover the entire cost of the project, nor can it expend all of its funds on this project alone. A separate Integrated Water Cycle Management (IWCM) Plan project is currently reviewing the long-term operations cost requirements for the part of the business

that sits within the catchment for the QSTP. The IWCM has reviewed the required charges for sewerage rates to meet the projected operation, maintenance, renewal and upgrade costs.

Loan Funding

The Sewer fund can take out and repay loans to cover the cost of works. Loan repayment would be covered by the Sewer fund income streams.

QPRC proposes to utilise loan funding to cover the gap between other funding sources and the CAPEX cost required for the STP upgrade. The source of loan funding for this project would be NSW Treasury Corporation.

There are limits on how much QPRC can borrow based on all of its operations. QPRC's long term financial plan allows for loan funding of $40m for the sewer fund.

External Funding Sources

QPRC was successful in receiving a grant from the NSW Government through the Safe and Secure Water Program (SSWP) in 2019 for the preparation of a Business Case. The SSWP will contribute up to $3M towards the estimated $13.8M cost of this project phase.

The IWCM financial modelling has found that QPRC will require a minimum grant funding of 25% of the construction phase cost (~$36m) for the project to proceed. QPRC is continuing to approach various levels of Government for grant funding opportunities with this project with a view to minimising the impact to rates. Government funding opportunities that are being explored include:

- NSW Government:
  - Accelerated Infrastructure Fund Round 3
  - Safe and Secure Water Program construction funding
  - Election promise
- ACT Government:
  - ACT Government contribution through TCCS for the Mountain Road upgrade
  - ACT Government contribution towards the higher treatment standards (above NSW best practice) being required as part of the ACT approvals and regulation process benefiting water quality in Lake Burley Griffin
- Federal Government contribution towards the higher treatment standards (above NSW best practice) being required to benefit water quality in Lake Burley Griffin.

CAPEX Funding Allocation

Table 10 outlines the proposed allocation of funding sources for each phase of the project. All costs exclude GST.

Table 10: CAPEX funding allocation across project lifecycle

Project Phase	Budget ($)	Income Source	Income Source Contribution ($)	Phase Status
IDENTIFY	222,500	Sewerage fund	222,500	Complete
PLAN – Masterplan, Concept Design and Business Case	7,294,000	Sewerage fund	5,644,000	Complete except for business case
		SSWP	1,650,000	
DEVELOP – Reference Design, EIS, DA and Detailed Design	7,501,500	Sewerage fund	6,151,500	In progress
		SSWP	1,350,000	
DELIVER - Construction	112,686,500	Sewerage fund	63,886,500	Not started
		Section 64 Contributions	7,000,000	
		Loan	5,608,500	

		Grants	36,191,500	
CLOSE	210,000	Sewerage fund	210,000	Not started
Contingency	15,475,000	Loan	15,475,000	N/A
Escalation	18,916,500	Loan	18,916,500	
TOTAL	162,306,000		162,306,000	

5.3 Cost Planning, Contingency and Management (P90/50 real and outturn)

A risk-based engineering cost estimate for the QSTP Upgrade Project was developed during the design phase of works. The cost estimate includes both direct and indirect costs, including construction management, contractor profit, project management, commissioning, and project contingency. Sunk costs have been included in QPRCs Costs.

Detailed quantities have been extracted from the detailed 3D model of the proposed upgrade. Costs have been developed using the following primarily first principle methods and the following sources:

- Rawlinson's Construction Handbook 2020 and other first principle estimating tools
- Supplier quotes sourced specifically for the proposed upgrade and this estimate
- Known contract rates and quotes from previous relevant wastewater plant construction projects
- Rates from independent estimator and contractor databases.

Where appropriate, Building Price Indices have been applied to bring rates in line with financially current values. An estimate for electrical, control and instrumentation (ECI) costs have been made using 20% of the total civil and mechanical works which is consistent with a design of this level.

The cost estimate is based on the procurement model indicated by QPRC and assumes that the project will be delivered in Construct Only model by a Principal contractor.

The base cost estimate breakdown is provided in Table 11 below.

Table 11: Base cost estimate breakdown

Item	Costs
CONSTRUCTION COSTS	
STP Upgrade	**$ 93,556,500**
Contractor Costs - Construction Support, Administration and Management	$ 11,372,500
Preliminaries / Early Works	$ 6,220,500
Inlet Works and Inlet Lift Pumping Station	$ 4,133,000
Stormwater Catch Pond 1	$ 2,864,000
Grit Facility with Flow Splitter	$ 1,728,500
Foul Water Pumping Station	$ 151,500
Oxidation Ditches + Bioreactor / Anaerobic zone	$ 15,289,500
Scum Pumping Station	$ 182,000
WAS Pumping Station	$ 191,500
Clarifier System (including Mixed Liquor Chamber)	$ 6,735,000
RAS Pumping Station	$ 662,500
DAF System	$ 1,821,500
Dual Media Filters (1-6), Clear Water Tank and Storage Shed	$ 7,670,000
Filtrate Pumping Station	$ 1,239,500

UV Disinfection System incl UV pit and PS	$	2,312,000
Dirty Backwash Tank	$	679,500
Recycled Water System	$	326,000
WAS Thickener System	$	937,000
Aerobic Digester	$	4,913,500
Dewatering Facility incl Liquid Polymer Building	$	2,067,500
Lime Clarifier	$	787,000
Lime Silo	$	790,000
Blower Room (Oxidation Ditch and Air Scours)	$	664,000
Primary Switchroom	$	290,500
Chemical Dosing Facility	$	1,188,500
On-bank Outfall Structure	$	370,000
Hose Reels	$	50,000
Potable Water	$	208,000
Amenities Building	$	308,500
Workshop building	$	247,500
STP Interior Road and Restoration Works	$	4,149,000
Site Stormwater and Drainage	$	513,000
Electrical, Instrumentation and Control	$	12,493,500
Other Works	**$**	**7,909,000**
Mountain Road Upgrade	$	2,145,500
Maturation Pond Decommissioning	$	600,000
Molongolo River Bank Stabilisation	$	300,000
Network Modifications - Incoming Main Realignments & SPS Interior Relining	$	3,255,000
Upgrade of HV Power Supply to Site	$	1,608,500
Total Construction Cost	**$**	**101,465,500**
QPRC PROJECT DELIVERY COSTS		
Investigation, Design and Approvals, Project Management and Construction Management	$	26,449,000
BASE ESTIMATE	**$**	**127,914,500**

5.4 Ongoing Maintenance, Operating and Service Costs

Ongoing Operating and Maintenance Costs

The estimated operating costs include chemical purchases, electricity, biosolid costs, and operational labour and laboratory costs.

The power unit rate used of $0.2 / kWh was based on a review of QSTPs existing power costs.

Market rates were used for chemical purchases and biosolids, these included:

- Caustic soda (50%) $395/tonne
- Ferric Chloride $486/tonne
- Polymer $7.25/kg
- Sodium Hypochlorite (12%) $340/tonne
- Lime Slaked $232/tonne
- Biosolids Transport $20/WT
- Biosolids Reuse $85/WT

The estimated maintenance cost is based on a nominal percentage of project costs. Maintenance was set at 3 % of capital cost per year for Mechanical and Electrical, and 0.3 % for Civil.

The operating, maintenance and lifecycle costs are presented in Section 0

5.5 Commercial Off-set

Opportunities for commercial off-set, beyond development Section 64 contributions, have not been considered for this project as part of this business case.

However, the design of the treatment plant will allow for commercial off-set opportunities to be investigated by QPRC in the future, including:

- Supply of large scale recycled water – subject to financially and regulatorily feasible demand (other schemes have locally failed due to the excessive cost to produce and transport recycled water to end users)
- Supply of biosolids for reuse – subject to sourcing an interested third party.

5.6 Cost Planning and Management

Cost Planning Management

The project cost management is aligned to the delivery stage of the project and QPRCs Project Framework. Under QPRCs Project Framework, project cost are prepared and reviewed as follows:

- Project identification (order of magnitude) – complete
- Strategic options estimate (unit rates) – complete
- Preliminary concept estimate (unit rates) – complete
- Detailed estimate (hybrid unit rates/first principles) – used for this business case
- Pre-tender estimate (hybrid unit rates/first principles) – prepared prior to tendering at completion of detailed design.

A special feature of this project is procurement including early vendor engagement for 3D design and purchase of specialist equipment in advance of the engagement of a Principal contractor. This method of procurement has allowed the designers to work with the equipment suppliers to make the design highly bespoke with lower risk of changes during construction due to the contractor's selection of the equipment varying to the designer's assumptions. The Project currently has nine early vendor engagements executed that have allowed for greater certainty in equipment pricing as the costs are locked in now. The early vendor pricing has been included in the detailed estimate.

QPRC is actively engaged in monitoring actual project costs compared with the project budget. Between the major estimating milestones above and then during construction, QPRC undertakes the two following activities:

1. Monthly progress reporting on project expenditure with a comparison of baseline budget, current budget and actual costs; and
2. Updating the current project budget to incorporate project cost changes through QPRCs change management process.

The final check in QPRCs cost planning is to ensure that the final project costs and ongoing operational costs meet the estimates. This process is undertaken during project closure documented in a project closure report and as part of QPRCs Benefits Realisation Plan discussed further in Section 8.8 of this report.

Contingency Management

The project has adopted a probabilistic risk-based cost estimating approach for capital costs. Risk has been accounted for in the cost estimate through the use of line item ranging and discrete risk events. The contingency has been calculated for varying probabilities via Monte Carlo simulation.

Cost risk events included in the cost estimate are identified through the project risk management processes (described in Section 8.5). The project risk assessment is updated progressively throughout the project and principally at major delivery milestones including Masterplan, concept design, reference design and detailed design. Risks are also identified through the project change procedures. This approach to identifying cost risks means that as the project progresses cost risk are reviewed, removed and added based on the current design and stage of the project. Additionally, throughout the construction phase of the project, the value of contingency can be monitored via the cost risks that remain active.

The contingency is owned by QPRC. Approval to release contingency is done through QPRCs Project Board via monthly progress reporting and financial delegation contract variation approvals processes.

The remaining contingency is reported on via QPRCs monthly project reports.

Milestone Payments

Project lifecycle costs have been projected over a 30 year period in Section 6.5. Detailing these costs allows QPRC to ensure it has secured sufficient funds each financial year to support the project for a 30-year period, with a particular focus on the timing for larger payments.

6. VALUE FOR MONEY ASSESSMENT

6.1 Demand Assessment

The existing STP is estimated to have a design equivalent population (EP) of 34,500 and is currently aged and overloaded.

Hunter H2O developed estimations of sewage loading as part of the Design Criteria and Assumptions Report completed in 2019 which found that the plant was servicing approximately 52,000 EP, with the service population expected to grow to 77,000 by 2050, the sewage load on the QSTP is expected to increase steadily with infill and increased population density. The existing plant is considerably under designed for the current population; the issues associated with this overloading will continue to be exacerbated as the population grows. The plant is also contending with a number of age-related issues. The overloading of the plant and infrastructure issues pose a significant environmental risk to Lake Burley Griffin, as well as a regulatory and reputational risk to QRPC.

The proposed upgrade will have capacity to service 75,000 EP and is not expected to require augmentation or upgrade for at least 15-20 years. The adopted design also allows for future expansion to the treatment train to service up to 112,500 EP.

6.2 Final Cost Benefit Analysis

A Cost Benefit Analysis (CBA) has been undertaken to estimate whether the economic benefits generated as a result of the new treatment plant exceed the associated project costs. The CBA compares the Project Case, against the Base Case, which represents current condition. This is to capture the impact of avoidance of failure scenarios and other impacts that result from the existing treatment plant continuing to be operated at current capacity.

Benefits and costs are in real terms; a real discount rate has been applied to reflect the long-term social opportunity cost of capital.

Assumptions

The economics modelling approach was compliant with the *Infrastructure Australia (IA) Assessment Framework* as well as the *NSW Safe and Secure Water Program Guidelines*.

Table **12** outlines key assumptions and parameters applied within modelling calculations.

*Table **12**: Key model assumptions*

Element	Value	Unit	Notes / Source
Economic Factors			
Price base	FY2022	*date*	The analysis has been undertaken in real, FY2022 dollars.
Analysis Period	30	*years*	IA Assessment Framework
Escalation factors	Where inputs were not in the price base year, the parameter was escalated to FY2022.	*%*	ABS CPI Sydney (Index Numbers; All groups CPI; Sydney; A2325806K)
Project Timeline Inputs			
Capital costs start date	01 Jan 2023	*date*	QPRC
Construction end date	31 Oct 2025	*months*	QPRC
Operations start date	01 Mar 2025	*date*	Decommissioning of maturation ponds to occur between March– October 2025
Discount rate			
Discount rate	7%	*%*	IA Assessment Framework

Assumptions and limitations

Due to limitations around data availability, and accurately capturing the failure scenarios, there are several failures and impacts that could not be captured within the CBA. These impacts would likely contribute significantly to the economic viability of the project. It should also be noted that the loss of economic growth associated with the Base Case would be substantially larger than the proxy values adopted in this analysis.

Options

Four options were developed and assessed for suitability in the QPRC QSTP Upgrade Project Masterplan (GHD, 2016). A multi-criteria analysis (MCA) was used that tested a variety of weighted criteria to compare the options.

The MCA considered whole of life cost estimates, constructability, operability, sustainability, future proofing, and overall delivery risk. A "Build New" strategy was identified as the preferred option. This is the Project Case within this economic analysis.

Base Case

The Base Case represents a "Do Minimum" scenario in which the existing infrastructure is retained, without alteration, at its design capacity of 34,500 EP.

Project Case

The Project Case involves building a new STP that would service an EP of 75,000. The location of the upgraded plant will be integrated onto the existing site, and the existing plant decommissioned.

Capital and Operating Costs

Capital Costs

A summary of capital costs is shown below in Table **13**. Note that escalation was removed from the costs, and they are therefore expressed in real terms.

*Table **13**: Capital costs (real, $m June 2022) – Source: **QSTP - Engineering Cost Estimate – Rev B.pdf***

Cost Element	Value ($m, 2022)
Direct Construction Costs	88.88
Indirect Costs	6.99
Contractor's Margin	5.58
Client's Costs	26.45
Contingency	15.48
Total Cost (P90)	143.39

Capital costs have been distributed in alignment with the construction period outlined in Table 11.

Operating & Maintenance Costs

The operating (opex) cost profile has been assumed to increase with the projected population growth and the resulting incoming flow. Opex costs as provided are inclusive of the following items:

Operational costs

- Power
- Chemicals
- Biosolids
- Labour
- Laboratory.

Maintenance costs

- Civil
- Mechanical
- Electrical.

Major Maintenance

- UV lamp replacement
- UV Service
- Diffuser Membranes
- Blower Filters
- Inlet Works
- Centrifuge - minor
- Centrifuge - major
- Clarifier and WAS Thickener.

Lifecycle replacement

Mechanical **Project benefits**

Table **14** summarises the project impacts assessed as part of this economic analysis. This is made up of two main benefit groups:

- **Failure scenarios**: As the current STP is operating beyond capacity, it presents risks around plant failure.
- **Downstream benefits**: These are the impacts to the wider community that are associated with operating the plant at its current capacity.
- **Other benefits**

*Table **14**: CBA Benefits*

Benefit	Description
Failure scenarios	
Plant Capacity Failure	This benefit assesses the avoided cost from the current capacity exceedance as a result of additional population or critical equipment failure. This could lead to release of ammonia into the river which is toxic to aquatic life, and result in significant costs due to the number of fish affected, civil fines and reputational damage.
Maturation Pond Failure	This benefit captures the avoided costs of maturation pond bank failure from flooding events that can result in mass releases to the Molonglo River. The two rainfall events captured for this failure were a 1 in 20-year and a 1 in 100-year event.
Downstream benefits	
Ecology and Biodiversity Protection	This benefit measures the willingness to pay for the prevention of the loss of riverine habitat.
Recycled Water Schemes	This benefit measures willingness to pay to contribute to recycled water to improve environmental outcomes.
Social Cost of Water Borne Disease	This benefit measures the prevention of waterborne diseases. The difference between this cost in the Base Case and Project Case becomes a cost saving used in the CBA.

Benefit	Description
Economic Growth	To measure this benefit, a proxy has been applied. This has been captured through measuring the Council's inability to approve development and housing growth due to insufficient services. As such council rates and developer charges have been used as a proxy.
Biosolid Value Add	This benefit measures the value through the creation of productive outputs from the treatment facility. Although resulting biosolids from the facility are unlikely to be sold, they represent a productive outcome.
Receiving 10% Water Quality Change	This benefit measures willingness to pay to receive water quality improvement. It was assumed that there would be a moderate improvement in water quality, resulting in an improvement of 10%.
Other	
Residual Value	This benefit measures the value of the QSTP at the end of the appraisal period based on the estimated asset life and a straight-line depreciation

Summary Results

Table 15 below summarises the Central Case BCR results using a 7% discount rate.

*Table **15**: Central Case, Summary Table (PV $, millions)*

Item	Summary ($, millions)
Costs (discounted)	
Construction Cost	125.44
Incremental Operational Costs	(12.41)
Benefits (discounted)	
Plant Capacity Failure [Avoided Costs]	13.70
Maturation Pond Failure [Avoided Costs]	13.13
Ecology and biodiversity protection	1.03
Recycled Water Schemes	1.56
Social Cost of Water Borne Disease	80.86
Economic Growth	5.15
Biosolid Value Added	11.98
Residual Value Profile	10.28
Receiving 10% Water Quality Change	23.34
Total (discounted)	
Total Costs	113.03
Total Benefits	**161.01**
Analysis	
NPV	47.98
BCR	1.42

Findings

Over the 30-year appraisal period, the Project Case provided a total benefit value of $161 million against a total cost of $113 million, resulting in a BCR of **1.42** and an NPV of $48 million.

These results should not be taken as an isolated assessment and should be read in conjunction with the case for change outlined in Section 2 to gain a full appreciation of the benefits gained through the upgraded plant.

Sensitivity Analysis

Sensitivity testing was undertaken on key assumptions and inputs to reflect the inherent uncertainty associated with the Project and future conditions.

The table below summarises the sensitivity analysis tests undertaken along with the Central Case results. The analysis indicated that the Project Case returned a BCR above 1 under all sensitivity tests except when a discount rate of 10% is applied.

*Table **16**: Sensitivity Analysis Results*

Element	NPV ($, millions)	BCR
Central Case	47.98	1.42
Discount Rate (4%)	144.80	2.28
Discount Rate (10%)	(1.17)	0.99
Costs (-20%)	70.59	1.78
Costs (+20%)	25.38	1.19
Benefits (-20%)	15.78	1.14
Benefits (+20%)	80.18	1.71

Applying a 4% discount rate resulted in the highest BCR with a value of 2.28 while a 10% discount rate gave the lowest BCR value of 0.99, highlighting the overall economic viability of the project.

6.3 Value Management

Value management has been undertaken throughout the lifecycle of the QSTP Upgrade Project, prior to completion of each phase of the Project.

This has included:

- Project challenge review
- Client reviews / operator review.
- DPIE independent review
- Consultation with Suppliers about value management opportunities
- Design of the upgrade allows for a future stage 2 for key structures enabling a longer lifetime.

6.4 Financial Appraisal

A financial appraisal has been undertaken on the proposed QSTP upgrade. Per arrangements for the existing STP, the project's required revenue will be realised through levying sewage charges on households within QPRC's jurisdiction. The quantum of levies at household level will be determined under a separate analysis being undertaken by QPRC[1]. As such, the financial appraisal herein is focused on determining:

1. The aggregate annual revenue requirement for QSTP to ensure the plant can operate sustainably and without further cash injection throughout its life. The revenue requirement will be used to inform the further determination of levies to be charged to ratepayers, and which is a separate exercise from this business case, and
2. The sustainability of QPRC's proposed financing mix for the QSTP, including quantifying the equity contribution required from QPRC.

Financial vs. economic appraisal

The financial appraisal's focus is on the cash flows and funding / financing need of QSTP. It aims to determine whether the project is financially viable (i.e., that projected revenues are sufficient to cover all costs of the project during the operating phase), and that upfront project funding / financing has been properly considered.

In contrast, the economic appraisal in this business case has a wider focus on societal impacts of the QSTP.

Table 17 below summarises the main differences between the financial and economic appraisals.

*Table **17**: Comparison of focus of financial vs. economic appraisal*

	Economic appraisal	Financial appraisal
Focus	Demonstrate Value for Money and return to society of options – relative to the base case	Demonstrate affordability and funding implications
Perspective	Society	Queanbeyan-Palerang Regional Council
Flows	Benefits and costs in real terms	Revenues and costs in nominal terms
Discount rates	Real discount rate – reflects long term social opportunity cost of capital	Nominal discount rate – reflects the cost of capital of the funding entity

Approach to the financial appraisal

To align with the operating model of the existing QSTP and with QPRC's mandate, the financial appraisal was developed on the assumption of a need for full cost recovery over the assumed life of the plant. In line with existing arrangements, the project sponsor has been assumed to be QPRC.

Based on the above, the analysis has been centred around developing an understanding of the whole-of-life costs of the QSTP, including their quantum and timing. These costs include upfront capital costs, ongoing operating costs and the periodic costs of refurbishing or replacing any assets and equipment in line with their useful lives. Debt service obligations resulting from QPRC's proposed financing mix were also incorporated.

A fixed annual revenue requirement, which would be subject to CPI adjustment, was determined under a principle of ensuring the project should be breakeven, on a whole-of-life basis, by the end of its useful life. Analysis of resulting annual cash flow was then undertaken and adjustment made to the revenue requirement in each year where the unadjusted project cash flow was negative.

[1] QPRC is developing the "Integrated Water Cycle Management – Strategy and Financial Plan" with assistance from GHD

Procurement model

Per the discussion on procurement and delivery strategy as outlined in Section 7 of this business case document, the financial appraisal has been based on the assumption that the QSTP would be delivered as a traditional government project, with QPRC being the responsible agency or project sponsor. Under this approach, it has been assumed that QPRC would retain responsibility for the design, construction, financing, and operations and maintenance of QSTP.

The procurement approach considered in the financial assessment is summarised in Figure 16.

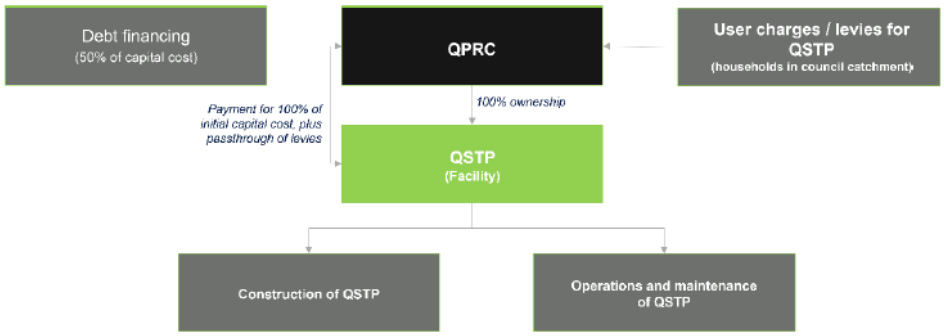


*Figure **16**: Proposed procurement model structure for QSTP*

General assumptions

The following table outlines general assumptions that were used in financial modelling of the project, such as timeline, inflation, discount rate and revenue assumptions. Detailed assumptions for capital and operating costs estimates, and associated contingencies, are outlined in Section 5, with summarised costs shown given below.

The separate IWCM analysis to determine QSTP's impact to household rates will be based on consistent assumptions.

*Table **18**: General financial appraisal assumptions*

Parameter	Value	Source
Weighted Average Cost of Capital (WACC)	5.9%	NSW Treasury 2020-21 Annual Report
Price base year	FY 2022	Current year
Model frequency	Annual (Financial year – 01 July to 30 June)	Assumption
Evaluation period	30-year operational period	Infrastructure Australia Assessment Framework
Inflation	**Revenues:** 2.14% per annum aligned to CPI **Capital and Operating cost:** 2.14% per annum aligned to CPI	NSW CPI (5-yr historical average), Australian Bureau of Statistics
Asset life and depreciation	**Civil works** have an 80-year asset lifetime, depreciated using the straight-line depreciation method. **Mechanical** and **Electrical works** have a 20-year asset lifetime, depreciated using the straight-line depreciation method.	QSTP Engineering Cost Estimate, Hunter H2O
Construction start date	01 Jan 2023	QPRC

Construction end date	31 Oct 2025	QPRC
Operations start date	01 Mar 2025	QPRC
Financing mix	Capital costs to be financed as follows: • 50% financed by debt, to be raised by QPRC, and • 50% financed by equity, to be provided by QPRC and/or state government contributions from NSW and ACT	QPRC, supported by preliminary discussions between QPRC and NSW TCorp
Interest rate on debt	5.5%	QPRC

QPRC has based this business case on financing 50% of capital costs of the project with debt to be procured through TCorp. Equity finance will comprise the remaining 50%. Subject to agreement with the NSW and/or ACT governments for co-contributions (refer Section 5.2), QPRC has access to the following funds to cover the equity requirement, totalling $83.0 million.

*Table **19**: Possible sources of funding for QPRC's equity contribution to QSTP*

Funding type	Value	Source
SSWP Business Case Grant	$3,000,000	QPRC
Section 64 Contributions	$7,500,000	QPRC
QPRC Sewer Fund	$72,500,000	QPRC

Costs

Capital costs

Construction costs and associated contingency adjustments have been derived by QPRC and its engineering consultant and are summarised in Table 20 below. Total construction costs are estimated at $143.4 million in 2022 values. Detailed discussion on the costs, how they were established, and the approach to estimating an appropriate contingency to determine a P90 estimate, is provided in Section 5.3 of this document.

Per analysis undertaken by QPRC and its engineering consultant, the construction period will be from FY2023 to FY2025, and as such construction costs have been escalated at CPI to reflect anticipated nominal capital costs. An adjustment to reflect the high labour and materials costs in the current construction market have been included in base costs outlined in Section 5.3 and CPI was therefore seen as an appropriate escalation factor to apply for the purposes of the financial appraisal.

*Table **20**: Capital and construction cost estimates*

Description	Value	Source / rationale
Direct Construction Costs	$88,880,000	QSTP Engineering Cost Estimate, Hunter H2O
Indirect Costs	$6,990,000	
Contractor's Margin	$5,580,000	
Client's Costs	$26,450,000	
Contingency (11%)	$15,480,000	
Total QSTP Construction Cost (P90) ($, 2022)	**$143,390,000**	
Escalation (@ CPI)	$10,770,000	Arup modelling
Interest During Construction (IDC)	$8,057,000	Arup modelling

Total Capital Cost (nominal $)	**$162,217,000**

QPRC and its engineering consultant consider that construction costs are expected to be incurred in line with the following spend profile:

- 18% in FY2023
- 35% in FY2024
- 35% in FY2025, and
- 12% in FY 2026.

Goods and Services Tax (GST) has been added to the nominal construction cost of the QSTP.

It has been assumed that 50% of total capital costs would be financed by debt raised by QPRC, which in turn would incur interest charges during the project's construction term and before revenue generation commences. This would give rise to interest during construction (IDC). IDC has been calculated and added to total capital cost. This required an iterative calculation given the circular relationship between capital cost and IDC.

Total capital cost in nominal terms, including inflation and IDC, is expected to be $162.2 million.

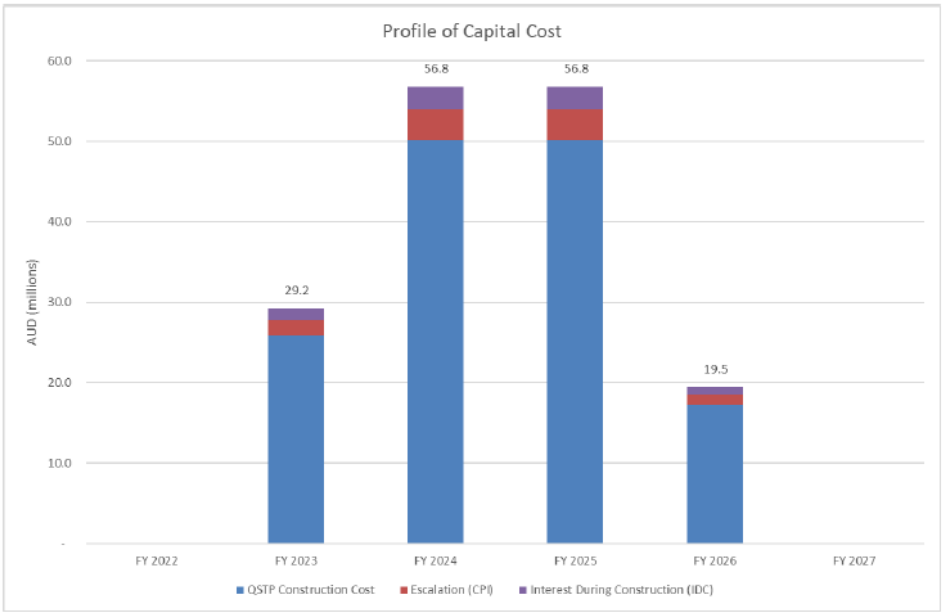


*Figure **17**: Capital cost spend profile*

Operating costs

An operating cost profile has been developed by QPRC and its engineering consultant with cost expected to increase over the operating period, in line with the projected increase in population and the resulting incoming sewage flow to the plant.

A summary of operating cost estimates is presented in Table **21** below. Note that figures in Table **21** reflect costs as at the start of the operating period in 2023, and for the purpose of the financial assessment were escalated at CPI thereafter for the remainder of the 30-year operating period.

*Table **21**: Operating cost estimates ($, 2023)*

Description	Value	Source / rationale
Power cost	$736,852	QSTP Engineering Cost Estimate, Hunter H2O
Chemicals cost	$547,667	
Biosolids cost	$541,452	
Labour cost	$240,000	
Laboratory cost	$250,000	
Civil cost	$168,885	
Mechanical cost	$270,981	
Electrical cost	$352,962	

Figure **18** below shows the anticipated operating cost profile over the 30-year operating term, which has been aligned with anticipated population growth in the QPRC catchment.

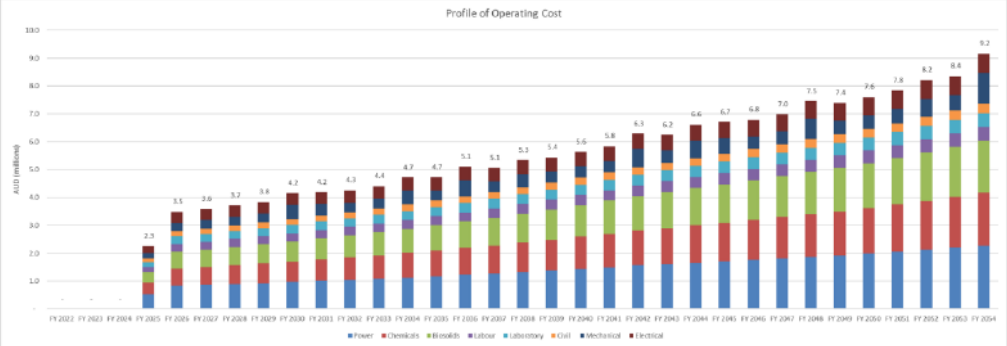


*Figure **18**: Profile of Operating Costs*

Power, Chemicals and Biosolids in aggregate represent approximately 65% of QSTP's total annual operating cost. Operating costs are estimated at approx. $3.5 million in FY2026, the first full year of operations, growing to $9.2m by FY2054 from a combination of cost escalation and growth in underlying population. The aggregate nominal operating cost across the model period is $171.5m.

Lifecycle replacement costs

The equipment and assets that make up the QSTP are anticipated to require periodic replacement at regular intervals. QPRC and its engineering consultant estimate that a series of minor replacement works ranging from every one to seven years will be required as summarised in the top part of Table **22**. In addition, a significant lifecycle cost associated with replacement of mechanical plant will be required in FY2045, around 20 years into the operating term, as shown in the lower part of Table **22**.

*Table **22**: Lifecycle replacement cost estimates ($, 2022)*

Description	Value and frequency	Source / rationale
Lifecycle replacement costs		
UV lamp cost	$151,296 every 6 year(s)	QSTP Engineering Cost Estimate
UV Service cost	$10,278 every 1 year(s)	QSTP Engineering Cost Estimate
Diffuser Membranes cost	$63,920 every 7 year(s)	QSTP Engineering Cost Estimate
Blower Filters cost	$12,656 every 1 year(s)	QSTP Engineering Cost Estimate

Inlet Works cost	$12,877 every 1 year(s)	QSTP Engineering Cost Estimate
Centrifuge – minor cost	$11,000 every 2 year(s)	QSTP Engineering Cost Estimate
Centrifuge – major cost	$31,000 every 5 year(s)	QSTP Engineering Cost Estimate
Clarifier and WAS Thickener cost	$4,800 every 2 year(s)	QSTP Engineering Cost Estimate
Major lifecycle replacement cost		
Mechanical plant replacement cost	$25,277,135 ($ nominal) in FY 2045	QSTP Engineering Cost Estimate

Total lifecycle replacement costs are estimated at $28.7 million across the 30-year operating term, with mechanical replacement reflecting the majority of this, at $25.3 million in FY2045.

CPI escalation has been applied to the above costs in line with estimated timing of spend.

Figure 19 and Figure 20 below show the anticipated spend profile (quantum and timing of spend) for each of the replacement cost items in Table 20.

*Figure **19**: Profile of lifecycle replacement costs*

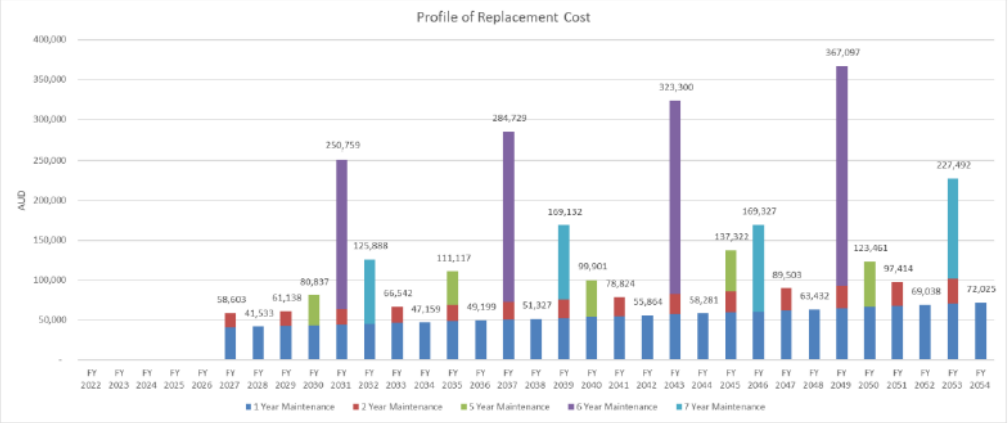
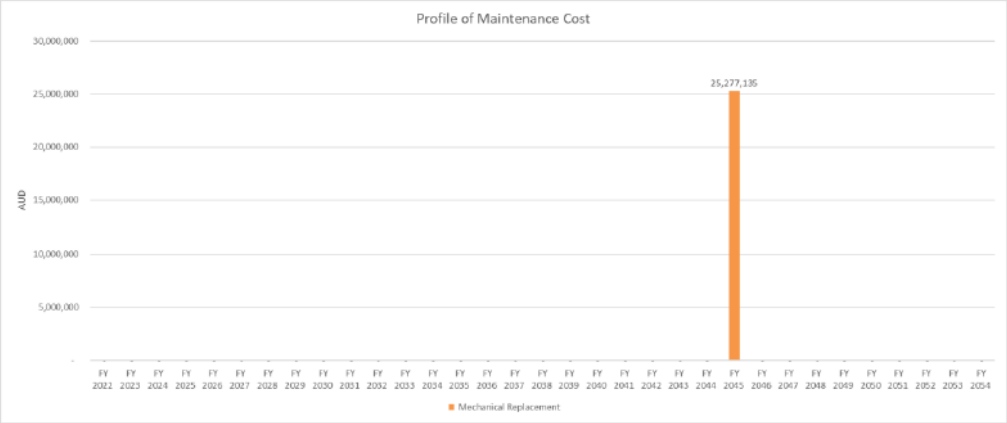


*Figure **20**: Profile of Maintenance Costs*



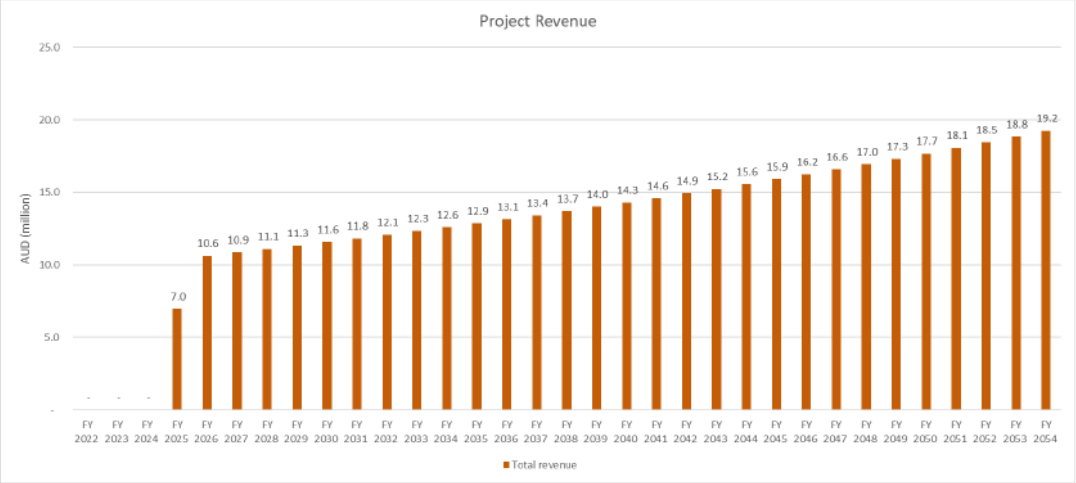
Revenue requirement

The approach to the financial appraisal was to determine the revenue required to cover all costs of the project, including debt service. QPRC has advised no return would be required on its equity contribution.

Therefore, the financial model was used to solve backwards for a year one revenue, that when escalated at CPI over the operating term, would meet all project costs as outlined in the preceding sections, and result in a net cumulative cash position of zero.

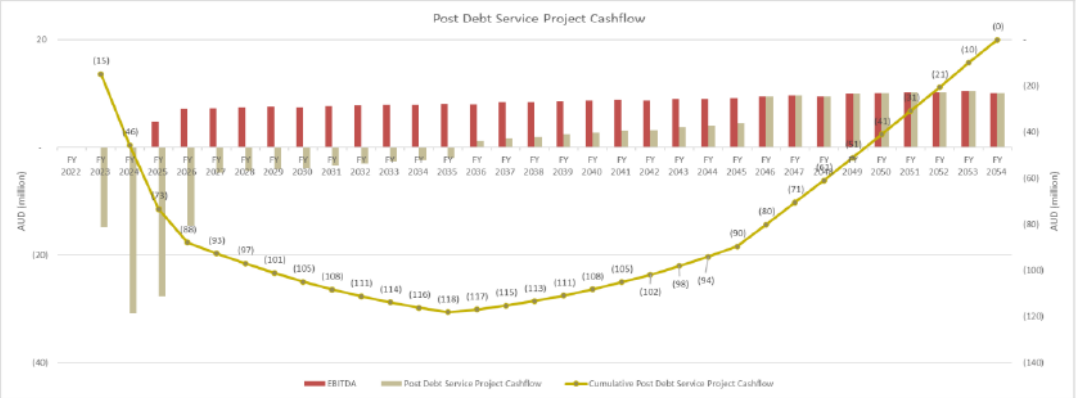
Under this scenario, required revenues would be approx. $10.6 million (nominal) in FY2026, being the first full year of operations, escalating to $19.2 million by FY2054. See Figure **21** below.

*Figure **21**: Revenue across model period*



However, in looking at year-on-year post debt service cash flows of the project under this revenue scenario, the first several years of the QSTP's operating period would see negative cash flow outcomes which would not be practically sustainable. Figure **22** below demonstrates this.

*Figure **22**: Post debt service nominal and cumulative cash flow*

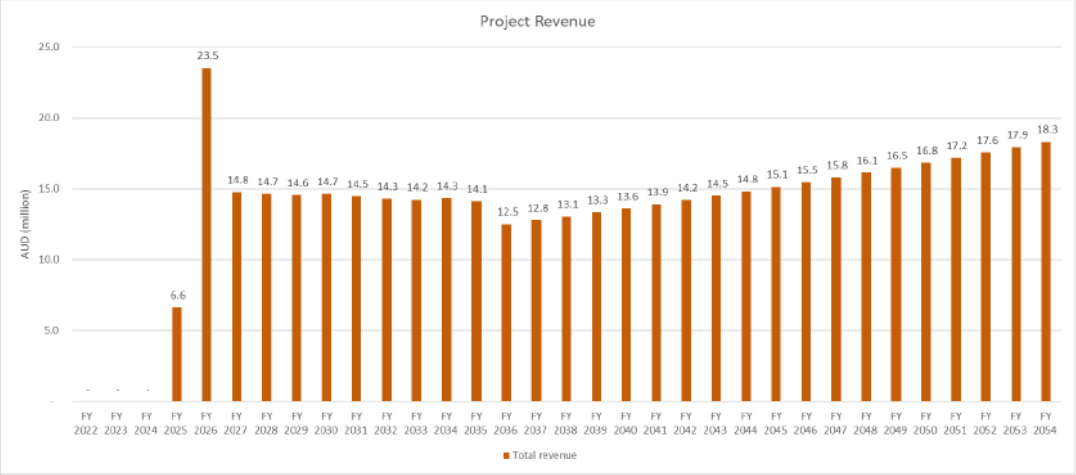


The cumulative negative cash flow during the operating period based on this revenue scenario is anticipated to be approx. $31.9 million. If additional upfront funding was available to the project in this amount (e.g., by way of a capital grant), then no further adjustment to revenue would be required.

In the absence of an upfront grant, an uplift was applied to revenues between FY2025 and FY2035 to ensure a minimum breakeven cash position was achieved across these years.

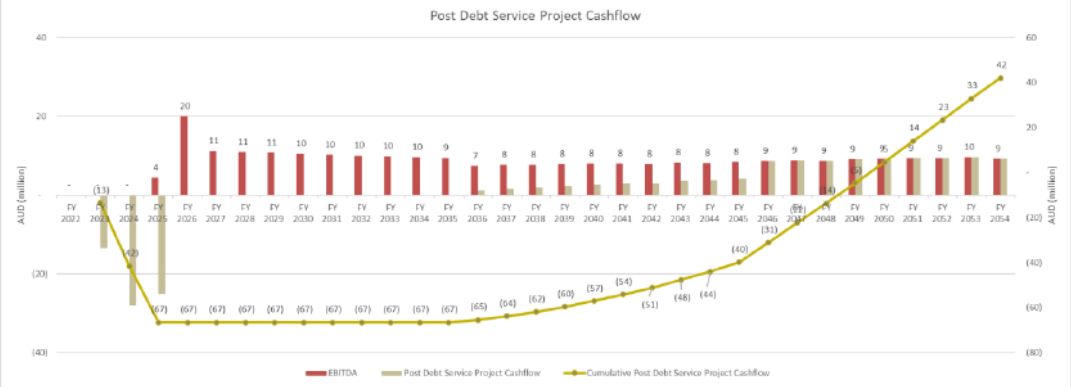
Figure 23 shows the revised required revenue profile after an adjustment is applied to the first 10 years of operations. Unless otherwise financed by QPRC, household levies would likely be higher in the QSTP's first 10 years as a result, then reduce over time as the revenue adjustment is no longer required and as the number of households in the QPRC catchment grows over time.

*Figure **23**: Revenue across model period – uplift across FY2025 and FY2035*



The resulting post debt service cash flow is shown in Figure **24** and demonstrates the project would not generate negative cash flow during the operating period.

*Figure **24**: Post debt service nominal and cumulative cash flow – after applying revenue adjustments in first 10 years*



Given upwards revenue adjustments in the first 10 years of operations, the project would accumulate approximately $42 million of cash by the end of the 30-year operating term. While it would be possible to reduce rates (and therefore project revenue) in the final 10 or so years to achieve an aggregate project cash flow position of zero, it may be prudent to allow the project to generate this anticipated surplus to provide ability to deal with any risk events that may occur, or else to undertake necessary lifecycle upgrades required at or soon after FY2054.

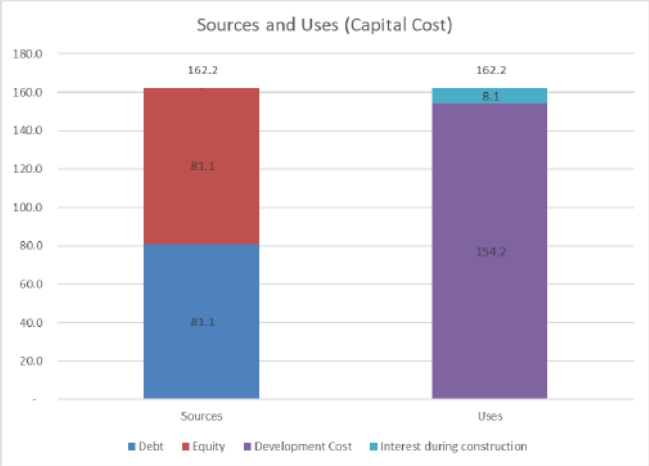
Outcomes of financial appraisal

The total capital cost for this project is estimated at $162.2 million with the equity portion of 50% amounting to $81.1 million.

The project would need to generate aggregate revenues of $449.8 million over its life, realised through levies charged to households in the QPRC catchment, in order to cover all operating expenses, lifecycle replacement costs and debt service obligations.

There may be opportunity to reduce the revenue requirement and resulting household rates. Specifically, in the event funding from the NSW and ACT governments is made available, QPRC would be able to reduce the amount of upfront debt financing employed. This in turn would reduce the associated debt service obligations during the operating term, resulting in lower required revenues and lower rates to households in the QPRC catchment.

*Figure **25**: Sources and uses of financing*



Sensitivity analysis

Due to the early stage of project development, a detailed sensitivity analysis has been completed to understand the impact that uncertainties around the project and its parameters may have.

Table **23** summarises the sensitivity analysis undertaken with respect to the Base Case, as presented above (Figure **24**), and applying a WACC of 5.9%. The analysis demonstrates the project's revenue requirement and funding shortfall are most sensitive to movements in capital costs.

*Table **23**: Sensitivity analysis ($ nominal, unless otherwise stated)*

Sensitivity	Project NPV	FY2025 revenue	FY2026 revenue	Aggregate revenue	Funding shortfall
Central Case	($57.2m)	$6.6m	$23.5m	$449.8m	$0.0m
WACC (+2%)	($67.9m)	$6.6m	$23.5m	$449.8m	$0.0m
WACC (-2%)	($37.7m)	$6.6m	$23.5m	$449.8m	$0.0m
Capital Costs (+20%)	($69.1m)	$7.4m	$27.5m	$505.4m	$14.3m
Capital Costs (-20%)	($45.3m)	$5.9m	$19.6m	$394.1m	$0.0m
Maintenance and Operating Costs (+20%)	($56.8m)	$7.2m	$24.3m	$484.1m	$0.0m
Maintenance and Operating Costs (-20%)	($57.6m)	$6.0m	$22.8m	$415.4m	$0.0m

6.5 Financial Impact Statement

QPRC has prepared a draft Integrated Water Cycle Management (IWCM) Plan for Queanbeyan. The NSW IWCM strategic planning instrument provides a framework for Council to determine long-term strategic planning for water and wastewater management. The IWCM only addresses the QSTP catchment of the former Queanbeyan City Council (QCC) local government area (LGA) as the Palerang LGA already has separate IWCM strategies.

The IWCM includes a financial analysis to assess the impact of the proposed water and sewer capital expenditure programs on the financial position of the Council over a twenty-year period. The IWCM financial analysis identifies the impact to the water and wastewater typical residential bill (TRB) to deliver the service. The analysis also considers the forecast cashflow and account balances under external funding scenarios for 0%, 25% and 50% for specific QSTP asset support only.

The IWCM recommends that:

- 25% grant funding sought QSTP upgrades in 2023/24 and 2024/25 in addition to the $2.7m already granted for 2022/23
- Loan funding of $40m over the two-year period 2023/24 and 2024/25
- Rate increases budget for across two stages;
- Initial increase of 6.5% for six years.
- Balance (14 years) annual rate increase aligned to consumer price index (2.5%).

A Financial Impact Statement (FIS) for the proposed funding model is displayed figureTable **24** below. This statement aims to ascertain the budget impact for the current financial year and five subsequent forecast financial years. It is based on the impacts to the entire sewer fund.

In interpreting the FIS, the following should be noted:

- All monetary values are escalated (i.e. reflect nominal values)
- 'Future years' are for the period FY2023 to FY2041
- The profile of project costs in forecast years is subject to change in line with actual population growth in QPRC's catchment
- All project costs include contingency and reflect P90 outcomes, and
- Depreciation costs have not been included as this is a non-cash item.

Table 2 *Recommended Sewer funding scenario*

Sewer Scenarios	Recommended Scenario
	25% Grant request, $40m Loans
Opening Balance - Section 64	$7,000,000
Opening Balance - Sewer Fund	$58,000,000
Interest Rate - Debt	6.00%
Interest Rate - Earnt	1.00%
Loan Term (years)	20
Rate increases	6yrs/0 yrs/14 years
Rate Increase - Initial period	6.50%
Rate Increase - second period	
Rate increases - balance of 20 years	2.50%
CPI - Sewer	2.50%
Capital cost CPI (CPI+Margin	1.00%
Grant Funding - Percentage ask of eligible	0.00%
Grant Funding - Net Percentage	16.72%

	Grant Funding	Loan Funding	Closing Balance
2021/22	0	0	59,604,903
2022/23	2,700,000	0	70,493,332
2023/24	17,648,432	20,000,000	44,233,581
2024/25	18,543,306	20,000,000	13,879,918
2025/26	0	0	11,502,257
2026/27	0	0	17,206,724
2027/28	0	0	8,949,438
2028/29	0	0	18,032,995
2029/30	0	0	27,566,075
2030/31	0	0	15,562,936
2031/32	0	0	11,402,223
2032/33	0	0	6,191,701
2033/34	0	0	10,440,744
2034/35	0	0	23,269,450
2035/36	0	0	36,733,177
2036/37	0	0	51,827,066
2037/38	0	0	61,502,430
2038/39	0	0	77,556,785
2039/40	0	0	94,338,828
2040/41	0	0	113,318,603
	$38,891,738	$40,000,000	

Table 24: Financial Impact Statement ($m nominal, reflects P90 costs)

	FY 2021-22	FY2022-23	FY2023-24	FY2024-25	FY2025-26	FY2026-27	Future years beyond FY2027-28	Total
Operating								
Maintenance Cost [1]	-	-	-	-	-	($0.1m)	($28.6m)	(28.7m)
Depreciation [2]	-	-	-	-	-	-	-	-
Third Party Assets [3]	-	-	-	-	-	-	-	-
Other Operating Expenses [4]	-	-	-	($2.3)	($11.2m)	($12.7m)	($284.4m)	($310.6m)
Revenue (if any) [5]	-	-	-	$7.0m	$25.2m	$15.6m	$425.4m	$473.2m
Net operating Expenditure [6] = (1+2+3+4 - 5)	-	-	-	$4.7m	$14.0m	$2.8m	$112.4m	$133.9m
Funding provisions (budget) [7]	-	-	-	-	-	-	-	-
Surplus/(Shortfall) - Operating [8] = (7-6)	-	-	-	$4.7m	$14.0m	$2.8m	$112.4m	($33.5m)
Capital								
Is the project Tier 1 rating?								
Project Costs [9]	-	($29.7m)	($61.7m)	($64.7m)	($22.3m)	-	-	($178.4m)
Contingency [10]	-	-	-	-	-	-	-	-
Savings/Benefits [11]	-	-	-	-	-	-	-	-

	FY 2021-22	FY2022-23	FY2023-24	FY2024-25	FY2025-26	FY2026-27	Future years beyond FY2027-28	Total
Net Cash flow Required (12) = (9+10 -11)	-	($29.7m)	($61.7m)	($64.7m)	($22.3m)	-	-	($178.4m)
Confund (13)	-	-	-	-	-	-	-	-
Restart/Rebuild NSW (14)	-	-	-	-	-	-	-	-
Approved/Released (14a)	-	-	-	-	-	-	-	-
Reservation (14b)	-	-	-	-	-	-	-	-
SIC or HAF (15)	-	-	-	-	-	-	-	-
Existing State funding provisions (16) = (13+14+15)	-	-	-	-	-	-	-	-
Existing Federal Funding (17)	-	-	-	-	-	-	-	-
Others including Local Government (18)	-	$29.7m	$61.7m	$64.7m	$16.1m	-	-	$172.2m
Total Existing funding provisions (19) = (sum of 16 to 18)	-	$29.7m	$61.7m	$64.7m	$16.1m	-	-	$172.2m
Surplus/(Shortfall) - Capital (20) = (19-12)	-	-	-	-	($6.2m)	-	-	($6.2m)
Total Surplus/(Shortfall) (21) = (8+20)	-	-	-	**$4.7m**	**$7.8m**	**$2.8m**	**112.4m**	**$127.7m**

7. COMMERCIAL ANALYSIS

7.1 Procurement and Delivery Strategy

A Procurement Plan for the project was prepared in June 2020 as part of the PLAN phase of project delivery and has been reviewed as the project progressed. The Procurement Plan considered alternative delivery systems that were suitable for the characteristics and risks of delivering this project. The adopted procurement strategy is summarised in Table 25.

The key features of the procurement strategy are:

- The project will predominantly be delivered using a single contract using a Design – Bid – Build delivery approach.
- A Detailed Design will be prepared to document the project technical requirements and facilitate review by regulatory stakeholders
- The project will be delivered using a Construct Only contract using a Principal Contractor
- Council undertake early engagement with suppliers and award contracts for supply of equipment without installation for key equipment with equipment to be installed by the Principal Contractor
- Council will nominate subcontractors in selected specialist areas to be engaged and managed by the Principal Contractor
- New South Wales Government GC21 General Conditions of Contract will be used for the contract
- Council will invite open Expressions of Interest for the purpose of establishing a list of three prequalified tenderers (with a reserve) who will be invited to tender for the Construct Only contract.
- The prequalified tenderers will participate in an Early Tender Involvement process consisting of a small number of briefing workshops to ensure appropriate allocation of risk (technical and commercial) and address constructability issues.
- Tenders for the Construct Only contract will be evaluated based on price and non-price evaluation criteria.
- Equipment supply contracts will be novated to the Principal Contractor
- Contract supervision and technical support by QPRC and Hunter H2O.

Table 25: Summary of the QSTP procurement strategy

	Item	Adopted Strategy
Design	Contract system	Detailed design and construct only by a principal contractor
	Equipment selection	QPRC will use an early vendor engagement approach to select key equipment for the works: • An open tender will be used to invite tenders for key equipment packages • Equipment suppliers will be engaged using AS 4911 General conditions of contract for the supply of equipment without installation • Suppliers will provide certified equipment data that will be included in the design and operating system for the plant • Equipment supply contracts will be novated to the principal contractor under the construction contract for installation, testing and commissioning.
	General conditions of contract	GC21
Tender	Tendering	2-stage tender with an EOI to establish a panel of prequalified contractors who will be invited to submit tenders for construction of the works.

		A targeted early tenderer involvement (ETI) phase will be held prior to requesting a priced tender. The ETI phase is to assist briefing selected tenderers on the works and to ensure appropriate allocation of technical and commercial risk and address constructability issues.
Construction	Staging / early works	There are opportunities for early work. Identified early works packages that provide advantage to QPRC: • Equipment Supply Packages (noted above) – there is opportunity for QPRC if required to accelerate program by commencing fabrication of key equipment. • Realignment of High Voltage power lines • Installation of upgrade to ICON potable water supply • Removal of existing waste and asbestos from site • Service diversions (water/communications/broadband)
	Subcontractors	Consideration will be given to nominating a limited number of subcontractors where there is overall advantage to the project, for example: • Pre-approval of a panel of concrete providers • Nomination of QPRC telemetry provider panel • Nomination of specialist subcontractors such as protective coatings
	Construction resources	Construction contract supervision, quality control, inspections and engineering support. Training and commissioning support.

Early Vendor Engagement

As part of the procurement strategy, QPRC will use an early vendor engagement approach to select key equipment that will form part of the ungraded sewage treatment plant. This approach gives QPRC control over the selection of equipment that they will own and operate and provides an open and competitive procurement process for equipment suppliers.

As part of the early vendor engagement approach:

- Procurement for key equipment packages will be undertaken in accordance with QPRCs Procurement Policy by either an open tender or Request for Quotation
- QPRC will assess equipment supply tenders and select equipment suppliers
- Equipment suppliers will be engaged by QPRC using AS4911 General Conditions of Contract for the Supply of Equipment Without Installation
- Suppliers will provide certified equipment data for the selected equipment that will be incorporated in the detailed design and operating system for the plant
- Equipment supply contracts will be novated to the principal contractor under the construction contract for installation, testing and commissioning.

The equipment supply packages identified for early vendor engagement are identified in Table 26. QPRC has already entered into several of these contracts.

Table 26: Early vendor engagement equipment supply packages

Proposed Equipment Supply Package	Procurement Method	Status
Screening and screening washing equipment	Open tendering	Contract awarded to Hydroflux Epco Pty Ltd
Grit removal and grit washing equipment	Open tendering	Contract awarded to VoR Environmental Australia Pty Ltd

Bioreactor and digester aeration, mixer systems and air scour blowers equipment	Open tendering	Contract awarded to Xylem Water Solutions Australia Limited
Clarifier equipment	Open tendering	Contract awarded to Hydroflux Epco Pty Ltd
Scum harvester equipment	Open tendering	Contract awarded to VoR Environmental Australia Pty Ltd
UV disinfection equipment	Open tendering	Contract awarded to Xylem Water Solutions Australia Limited
WAS thickener equipment	Open tendering	Contract awarded to Hydroflux Epco Pty Ltd
Chemical dosing skid equipment	Open tendering	Contract awarded to Trility Solutions Australia Pty Ltd
Centrifuge equipment	Open tendering	Contract awarded to GEA Westfalia Separator Pty Ltd
Lime silo and dosing equipment	Open tendering	Not yet advertised
Chemical storage tanks	3 written quotes via formal RFQ process. May be publicly advertised.	Not yet advertised
Diesel storage and conditioning system	3 written quotes via formal RFQ process. May be publicly advertised.	Not yet advertised

9. PROJECT MANAGEMENT

9.1 Project Management, Program and Milestones

Project framework

The Project is being delivered in accordance with QPRC's Project Framework. The Project Framework is consistent with a gateway approach to project delivery with completion of the project in five phases as outlined in Figure 26. The initial phases of Identify and Plan have been completed and work is proceeding on the Develop phase.

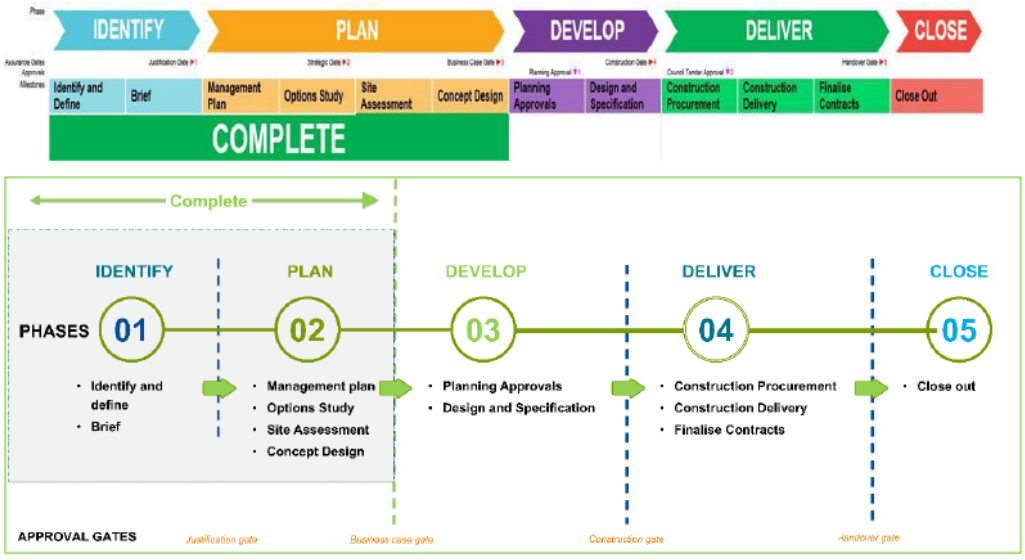


Figure 26: Project stages and progression

Figure 27 provides further details of the current project activities. The project is currently seeking planning approval for the Environmental Impact Statement (EIS) and completing detailed design and tender documentation to enable construction tendering to commence.

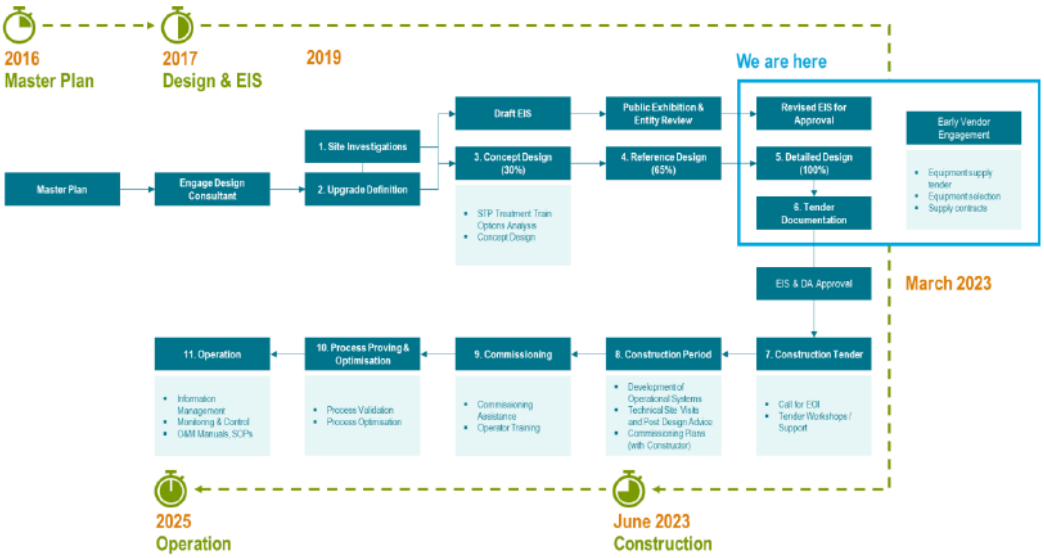


Figure 27: Project Activity Timeline

Milestones

Major project milestones are shown in Table 27.

Table 27: Project milestones

Project Milestones	Target Completion Date	Completion Date
Concept Design complete		Jun 2020
Environmental Impact Statement (EIS)		
Draft EIS submission		Dec 2020
Revised EIS submission		Apr 2022
EIS approval	Dec 2022	
Detailed Design and Tender Documentation complete	Sep 2022	
ACT UTR D&C Operating Certificate issued	Oct 2022	
Development Application approval	Mar 2023	
NSW DPE Section 60 approval	Mar 2023	
ISC Design Rating obtained	Apr 2023	
Construction Contract award	Jun 2023	
Plant commissioning complete	Aug 2025	
ACT UTR Provision of Service Operating Certificate issued	Aug 2025	
Maturation pond decommissioning, landscaping and project completion	Mar 2026	
ISC As-built Rating obtained	Mar 2026	

Construction phase resource plan

The construction of the QSTP upgrade will be undertaken by a Principal Contractor. QPRC's Projects and Contracts team will manage the construction phase with contract management and technical support from consultants. QPRC's Utilities team will continue to operate the existing QSTP throughout construction and will participate in training and commissioning of the new facility.

QPRC's resource plan for the construction and commissioning phase is summarised in Table 28.

Table 28: Construction phase resource plan

Role	Tasks	Resource	Timing
Project Management	• Project management • Project reporting • Consultant contract administration • Coordination with Regulators • Coordination of stakeholder and community engagement • Coordination with internal QPRC functions	QPRC QSTP Project Manager	Duration of construction
Principal's Senior Executive	• Input to GC21 contract requirements as required	QPRC Manager, Contracts and Projects	Duration of construction
Principal's Approved Person (PAP)	• Contract management – management of the GC21 contract on behalf of the Principal. • Manage communications, RFI, meetings, issuing instructions, release of hold points • GC21 monthly meeting and minutes • Assessment of payment claims etc. • Progress reporting	QPRC and consultant resources	Duration of construction
Project/Contract Administration Support	• Administration • Record keeping	QPRC and consultant resources	Duration of construction
Site Engineer	• Assist PAP	QPRC and consultant resources	Duration of construction
Site Surveillance	• Site surveillance and records	QPRC and consultant resources	Duration of construction
Survey	• Record construction progress • Review of Contractor survey submissions • Input to works as executed documentation	Consultant / Subcontractor	Duration of construction
Existing STP Operations Liaison	• Coordinate interface with existing operation • Site access to existing STP • Interruptions to service • Input to selected RFI	QPRC – Utilities Team	Duration of construction

Role	Tasks	Resource	Timing
	• Review of cut-over plans / commissioning • Coordination of attendance of operator training • Preparation for asset handover to operations team		
Owner's Engineer	• Site liaison with QPRC contract management • Verification that construction conforms to the design • Change management • Respond to contractor RFI • Clarifications / advice • Attend GC21 monthly meetings • Visual records / dilapidation • Management of ISC data • Review of shop drawings • Witness hold-point inspections • Factory acceptance testing • Site acceptance testing • WAC – As built drawings	Hunter H2O through existing contract	Duration of construction
Testing and Commissioning Decommissioning of existing STP	• Prepare commissioning plan • Witness the testing and pre-commissioning by Contractor • Facilitate proof of performance testing • Assist in process optimisation • Oversight of decommissioning of the STP • Training	Hunter H2O commissioning team QPRC operations staff Contractor resources (leading hand, mechanical, electrical, automation)	Testing and pre-commissioning during construction Commissioning (3-4 month cut-over, commissioning & proof of performance period)

9.3 Project Governance

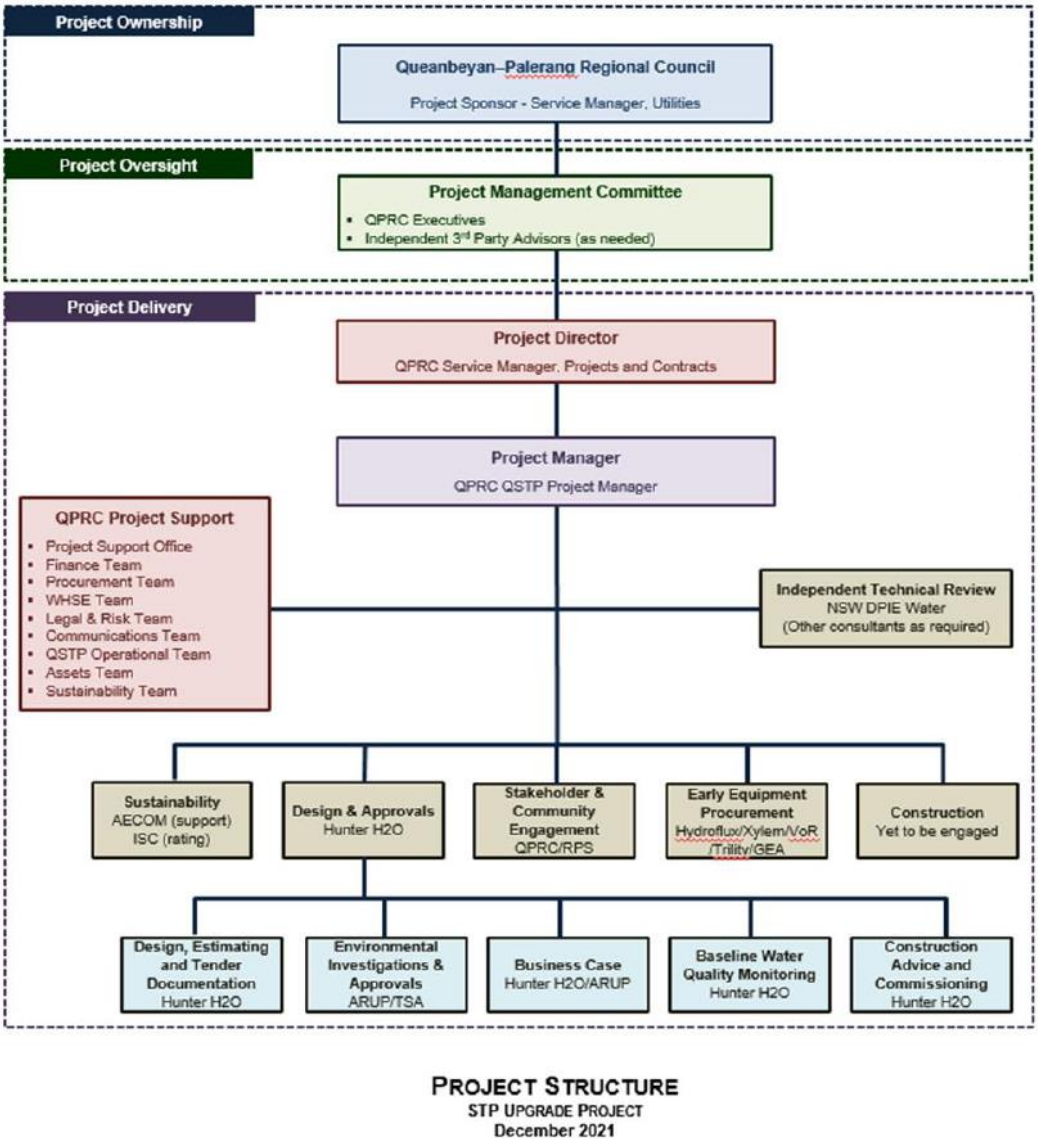


Figure 28: Project governance structure

Figure 28 illustrates QPRC's governance structure for the project.

QPRC's Service Manager Utilities is responsible for the delivery of sewer services including operation and maintenance of the Queanbeyan STP and management of the Queanbeyan sewer fund. The Service Manager Utilities holds the role of Project Sponsor. As Project Sponsor, the Service Manager Utilities is responsible for directing the scope and requirements of the project and approving acceptance of assets within this area.

Project delivery is provided by QPRC's Contracts and Projects service area, who have appointed a Project Director and Project Manager for project delivery.

QPRC has engaged several consultants to assist in delivering the project. These engagements include:

- Hunter H2O to complete the QSTP upgrade design, approvals, technical construction input and commissioning
- AECOM to oversee the ISC design and as-built ratings submissions
- RPS to assist with community engagement.

QPRC will also engage a competent contractor for QSTP upgrade construction.

A Project Management Committee provide oversight of the project including reviewing progress, project issues and changes.

The ACT Utilities Technical Regulation requires QPRC to appoint an Independent Certifier for the project. The NSW Department of Planning and Environment Water Group has agreed to fulfil this role in parallel with their technical review role as part of the NSW Local Government Act Section 60 approval process.

Project roles and responsibilities are further detailed in Table 29.

Table 29: Project roles and responsibilities

Role	Personnel	Responsibilities
Queanbeyan-Palerang Regional Council	Councillors (via Council Meeting)	• Approve budget and funding • Approve engagement of service providers (consultants / contractors) engaged by tender • Approval of dealings in land
Project Management Committee (PMC)	Council Executive	• Reviewing and approving project deliverables where required by the Project Framework • Approve project budget allocation • Approve gateway and hold point release recommendations • Point of escalation for matters raised by Project Director • Resolve issues outside the Project Director's delegated authority
QPRC Project Sponsor	Service Manager – Utilities, Gordon Cunningham	• Endorsing the project scope definition • Endorsing changes to the project scope • Endorsing the Basis of Design • Reviewing deliverables • Liaising with regulators • Approving asset acceptance process (for assets within their control)

Role	Personnel	Responsibilities
QPRC Project Director	Service Manager – Projects and Contracts, Derek Tooth	• Overseeing delivery of the Project in accordance with QPRCs Project Framework and the QPRC Project Sponsor's requirements • Monitoring project performance • Establish project delivery structure and strategy • Establish project goals and KPIs • Facilitate gateway and hold point reviews and recommend release • Approve communications with external stakeholders and community • Approve project expenditures and cash flow • Approve changes to delivery strategy / approach, scope, schedule, budget • Ensure project controls are implemented and maintained (time, cost, quality, risk) • Approve acceptance of project deliverables (on recommendation by Project Manager) • Point of escalation for matters raised by Project Manager • Resolve issues outside the Project Manager's delegated authority

Role	Personnel	Responsibilities
Project Manager	QSTP Project Manager, Simon Boulton	• Delivering the project in accordance with the requirements of the Project Framework and the Project Management Plan • Focal point of all communication • Ensuring that the Project Sponsor, Project Director and PMC are consulted in accordance with the requirements of the Project Framework • Prepare risk-based project budgets and submit for review and approval • Procure service providers as needed • Administer service provider contracts • Ensure service providers comply with Council policies (including Environment, QA, WHS, Sustainability, Procurement) • Undertake audits and reviews in compliance with approved assurance plans • Approve tender evaluation reports and prepare report to Council for resolution • Plan, coordinate, oversee service provider inputs (timetable, cashflow, outputs etc) • Prepare, implement and manage the approved risk management plan • Oversee (as needed) third party technical reviews • Review and recommend endorsement (acceptance) of project outputs • Monitor and report project progress performance to the Project Director • Prepare gateway and hold point release documents • Prepare regulator approval applications / documents • Oversee / coordinate sustainability reviews • Oversee / coordinate stakeholder and community engagement • Ensure project achieves appropriate sustainability outcomes • Ensure project outputs comply with approved objectives and KPIs
Key QPRC Project Support Staff	Sponsor Representative Utilities, Brenden Belcher Sponsor Representative Operations, Victoria Corling Assets Specialist, Andrew Grant Sustainability, Cameron Pensini	• Providing speciality support to the team • Reviewing and advising on Design • Reviewing and advising on assets acceptance process • Reviewing and advising on proposed changes in scope • Providing advice from the IWCM to support the project Business Case • Assisting with the provision of information to support the sustainability ratings

Role	Personnel	Responsibilities
Design, Approvals, Technical Construction Input and Commissioning	Hunter H2O	Design consulting services including: • Site Investigations • Basis of Design • Concept Design • Reference Design • Detailed Design • Regulatory Approvals • Tender Documentation • Tender Period Services • Construction Phase Services • Baseline Water Quality Monitoring
Sustainability Rating Authority	Infrastructure Sustainability Council	• Provide Design and As-Built sustainability ratings assessment
Sustainability Rating Support Services	AECOM	• Assist and advise QPRC to obtain Infrastructure Sustainability Council Design and As-Built ratings
Independent Technical Review	NSW DPE, Water - Utilities	• NSW Section 60 approval • Independent Certifier for the ACT Utilities Technical Regulator Design and Construct Operating Certificate
Community Engagement Consultant	QPRC Engagement Team assisted by RPS	• Undertake community engagement activities as directed by the Project Manager • Maintain complaints register • Maintain project website • Provide customer service first point of enquiry • Prepare and assist in implementing the Stakeholder and Community Engagement Plan • Provide progress reports as directed by the Project Manager
Contractor	TBA	• Construct the works, including completing any design, as required • Provide progress reports as directed by the Project Manager

9.4 Asset Ownership and Management Plan

Asset Management

The project is being delivered in accordance with QPRCs Asset Management Policy, Capital Work Projects Asset Information Requirements Directive and Sewerage Asset Management Plan.

The key elements of infrastructure asset management identified in the Sewerage Asset Management Plan are:

- Taking a life cycle approach
- Developing cost-effective management strategies for the long term
- Providing a defined level of service and monitoring performance
- Understanding and meeting the demands of growth through demand management and infrastructure investment
- Managing risks associated with asset failures
- Sustainable use of physical resources
- Continuous improvement in asset management practices.

Additionally, QPRC is giving consideration to the following elements in delivering this project:

- Whole of life costs, including option, equipment and materials selection
- Deconstruction, disassembly and adaptability of infrastructure in the future
- Robustness and reliability
- Compatibility with QPRCs existing fleet
- Ability of QPRC to operate equipment.

The project will produce the following deliverables to assist with management of the assets in the future:

- Decommissioning plan for the existing STP
- Operation and maintenance manuals for the new STP, including operator training
- Work as executed documentation, including an asset schedule and capitalisation costs
- Deconstruction plan for the new STP.

Assets

The asset register in Table 30 shows details of the asset owner, operator and maintainer for all assets delivered through this project. The register also identifies assets that will be retired as a result of the project.

QPRC are the owners, operators and maintainers of the existing QSTP and will be for the proposed QSTP upgrade.

Assets that will be retired as part of the project include the three maturation ponds located within the extents of the 1% annual exceedance probability (AEP) flood zone and are at risk of failure during flood events. The maturation ponds will not form part of the treatment process once the new treatment plant has been constructed and commissioned. As part of the upgrade project, it is proposed that the ponds (and their associated equipment) are decommissioned, and the area remediated to extend the riparian zone along the Molonglo Riverbank.

All current infrastructure associated with the existing STP will also be retired following commissioning of the new STP and deconstructed in a subsequent project. The land made available through the later decommissioning of the existing STP will be earmarked for an additional storm pond during a planned, future plant expansion.

The project impacts assets owned by others, including roads owned by the ACT Government, the electricity network infrastructure owned by EVO Energy and the potable water supply owned and operated by ICON Water.

Table 30: Asset register showing new and retired assets

Asset	Owner	Operator	Maintainer
New or upgraded assets			
Sewage Treatment Plan, including treatment process, roads, buildings, services, utilities and landscaping	QPRC	QPRC	QPRC
HV Electricity Network	Evo Energy	Evo Energy	Evo Energy
Upgraded Mountain Road (road reserve)	ACT Government (TCCS)	ACT Government (TCCS)	ACT Government (TCCS)
Upgraded Mountain Road (within proposed lease boundary)	QPRC	QPRC	QPRC
Nimrod Road (within proposed lease boundary)	QPRC	QPRC	QPRC
200mm potable water main to meter	ICON Water	ICON Water	ICON Water
Retired Assets			
Existing STP, including buildings and treatments processes	QPRC	n/a	n/a
HV electricity network	Evo Energy	n/a	n/a
Electricity supply to existing STP	QPRC	n/a	n/a
100mm potable water main to meter	ICON Water	n/a	n/a

9.5 Stakeholder Management Plan

QPRC has recognised the importance of engaging with its communities to deliver services and infrastructure, and collaboratively plan for the future. The *QPRC Sewage Treatment Plant Upgrade Project Stakeholder Communications and Engagement Plan* (RPS, 2002) has been prepared to set out the strategic approach the communications and public engagement tasks required to support the design, selection and commissioning of the upgraded STP. The plan ensures appropriate information and opportunities to contribute to project outcomes are available at each stage. The plan provides detailed action plans for each stage of the project that describe the audiences, tools, key messages, risks and timetable for delivering communications and engagement activities. The QPRC Community Engagement Team will oversee and approve the development of the detailed action plans. The plan will be revised and updated at critical project milestones to reflect feedback and learning from engagement activities.

Stakeholders

People, organisations and agencies who are directly or indirectly impacted by the project as well as agencies and institutions with regulatory or decision-making roles for the project and are presented in Table 31 and Table 32.

Table 31: External Stakeholders

Stakeholder	Interests or impacts arising from project
Political	
Federal Member Eden Monaro State Member for Monaro Mayor and Councillors QPRC Funding providers ACT Government	• Progress of the STP project • Management of community feedback and complaints • Ministerial requests relating to the project
Federal Government	
National Capital Authority	• Manages the water surface of Lake Burley Griffin and perimeter areas on National Land such as Commonwealth Park and the Parliamentary Triangle • Manages a comprehensive water quality program to monitor the environmental status of Lake Burley Griffin and advise users about changes in the water quality conditions arising from floods, droughts, elevated bacteria, and algal condition • Treated effluent discharged from QSTP may affect waterways managed by the NCA. • National Capital Plan • Australian Capital Territory (Planning and Land Management) Act 1988 • Commonwealth Places (Application of Laws) Act 1970-1973
Australian Government Department of Agriculture, Water and the Environment	• Custodian of the Environment Protection and Biodiversity Conservation Act 1999, which establishes a requirement for, and a system of, environmental assessment and approval by the Commonwealth government. • Consultation will be determined if there is a significant impact on matters of national environmental significance
State Government (ACT and NSW)	
Environment, Planning and Sustainable Development Directorate (EPSDD)	• Continued engagement in particular reference to the Environmental Impact Statement and Development Application. • Custodians of the Lake Burley Griffin Management Plan 2011 - Also now incorporates previous ACTPLA roles, such as

	governance of the Planning and Development Regulations 2008, the Heritage Act 2004, the Tree Protection Act 2005, and the ACT Territory Plan • EPSD maintains several roles in relation to the management of water, heritage, sustainability, and nature conservation in the ACT • Planning and Development Act 2007 • Planning and Development Regulation 2008 • ACT Territory Plan • Environment Protection Act 1997 • Environment Protection Regulation 2005 • Nature Conservation Act 2014 • Fisheries Act 2000 • Heritage Act 2004 • Lakes Act 1976 • Climate Change and Greenhouse Gas Reduction Act 2010 • Water Resources Act 2007 • Public Unleased Land Act 2013
ACT Utilities Technical Regulator (ACT UTR)	• Technical regulation is provided by the Technical Regulator under the Utilities (Technical Regulation) Act 2014. Technical regulation is concerned with the operation of utility services and the protection and maintenance of their networks. • Issues operating certificates under the Utilities (Technical Regulation) Act 2014.
ACT Environment Protection Authority (ACT EPA)	• Custodian of the Environment Protection Act 1997, which provides for the protection of the environment including heritage, noise, odour, waste, wastewater, air, contaminated sites, hazardous materials and water quality. • Key stakeholder for approval process • Continued engagement and consultation required
NSW Environment Protection Authority (NSW EPA)	• Custodian of the Protection of the Environment Operations Act 1997, which defines and specifies licence conditions. • Continued engagement as stakeholder for operation and activities in NSW.
ACT Waste Regulator	• Continued engagement with regard to operation of the existing composting facility until such time as this operation ceases
ACT Transport Canberra and City Services Directorate (TCCS)	• Continued engagement as stakeholder for the Mountain Road Upgrade and other aspects • Tree Protection Act 2005 • Waste Management and Resource Recovery Act 2016 • Waste Management and Resource Recovery Act 2017 • ACT Waste Management Strategy 2011-2025
ACT Health	• Consultation required as stakeholder • Custodian of the Public Health Act 1997 • Consultation with regard to public health aspects of reuse of recycled water offsite
ACT Economic Development Directorate	• Focus on land release and development, and works to facilitate business development, investment, sporting, tourism and events • Focused on economic performance of ACT and its link to the built environment

	• Consultation is required
NSW Health	• Referral in association with Recycled Water use and Section 60 under the Local Government Act • Continued engagement as stakeholder • Public Health Act 2010 • Local Government Act 1993 • Australian Guidelines for Water Recycling (AGWR) Phase 1, 2006
NSW Department of Planning, Environment and Industry (DPIE), including Crown Lands	• Continued engagement as stakeholder • Environment Protection and Biodiversity Conservation Act 1999 • Approval for modification of a sewage treatment plant under Section 60 of the Local Government Act 1993 • Interests in technical suitability and value for money • Provides terms and limits on approvals and the obligations for the construction of the project • Custodian of the Environmental Planning and Assessment Regulations 2000, which defines the nature of the infrastructure in terms of statutory obligations - Part 4 and Part 5. • Continued engagement as regulator • Local Government Act 1993 • Australian Guidelines for Water Recycling (AGWR) Phase 1, 2006 (if recycled water is produced)
NSW Cross Border Commissioner	• Consultation required due to cross-border nature of the STP Project • The office of the NSW Cross Border Commissioner identifies and helps resolve issues that occur by being located near a state border
Local Councils	
Queanbeyan-Palerang Regional Council	• Design, Construction and operation of the STP • Environmental management plans relevant to QPRC responsibility • Community Engagement Plan – design, construction • The project team management of feedback and complaints
Council committees: Economic Advisory Committee Consultative Committee on Aboriginal Issues Environment and Sustainability Advisory Committee	• Design, Construction and operation of the STP • Environmental management plans relevant to QPRC responsibility • Community Engagement Plan – design, construction
Affected Regional Utility Providers	
ActewAGL	• Concerns for network once constructed • Inform and involve in STP Upgrade Project
Indigenous Groups	
Aboriginal and Torres Strait Islander peoples Ngambri and Ngunnawal Local Communities as traditional owners of the land Buru Ngunnawal Aboriginal Corporation	• Management of previously identified heritage sites (if identified) • Management of heritage artefacts (if identified) • Construction and operational impacts on heritage sites (if identified)
Environmental Groups	

Molonglo Catchment Group Queanbeyan Landcare Inc	• Management of flora and fauna in accordance with environmental management plans and protected species management plans • Water quality monitoring plans and results • Future construction and operation impact on local flora and fauna
Local Community Groups	
Oaks Estate	• Nearby residents • Potential concerns about impacts such as visual, noise, dust, truck movements • Positive odour reduction as a result of the work
Oaks Estate Progress Association	• Provided comment on Heritage Report
Lake Burley Griffin Users Rowing ACT	• Recreation users of the Lake • Advocates for clean water
Canberra Anglers Association	• Fishing Club based in Canberra • Recreation and advocates for safe water ways
Queanbeyan residents and ratepayers Jerrabomberra Residents Association	• Cost of the project • Protection of water quality • Design construction and operation impacts of the STP e.g., traffic, vibration, visual, amenity, flora and fauna (if any) • Management of Molonglo River and rehabilitation of current site • Continued engagement and consultation are required.
Friends of Jerrabomberra Wetlands	• Collaborate with local residents and conservation, management, heritage, education, Aboriginal and Torres Strait Islander, and recreational groups in the restoration and maintenance of the wetlands.
Capital Woodlands and Wetlands Conservation Trust / Jerrabomberra Wetlands	• Established to ensure the Mulligans Flat Woodland Sanctuary and Jerrabomberra Wetland Nature Reserve are sustainably managed to provide rich and diverse environments for current and future generations • Jerrabomberra Wetlands are near the STP site, therefore • there is potential for the discharge to impact these wetlands
Molonglo Catchment Group	• Molonglo Catchment Strategy 2004-2024 • Umbrella organisation for existing Landcare and other natural resource management organisation who facility and support local groups across the region.
Canberra Ornithologists Group	• Encourage interest in, and develop knowledge of, the birds of the Canberra region. • Promote and coordinate the study of birds and promote the conservation of native birds and their habitats
Waterwatch	• Part of a national community water quality monitoring program that brings together people from all parts of the community to raise awareness, educate, monitor, restore and protect waterways.
Business	
Canberra Airport	• Canberra airport is a key stakeholder, mainly interested in minimising bird strikes to aeroplanes • Communication and engagement is required
Media	

Queanbeyan Age/Chronicle Canberra Times ABC radio and television WIN TV City News Canberra Weekly Other radio channels	• STP Project Progress • STP Project Cost • Management of complaints • Design and environmental impacts on the STP project (if any)

Table 32: Internal Stakeholders

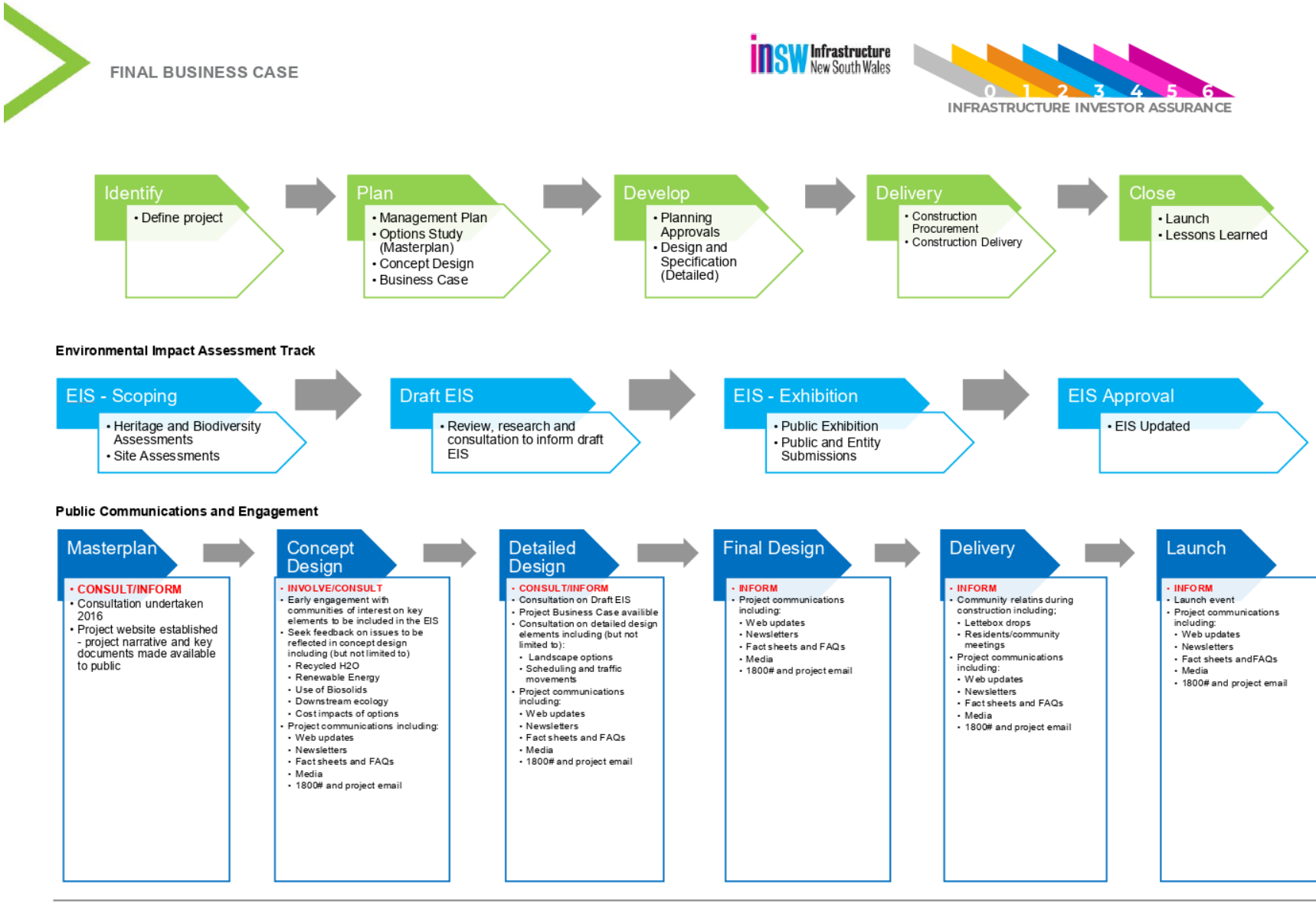
Stakeholder	Interest and responsibilities for the project
QPRC Staff	
Councillors	• Approval of scope & budget in Council's strategic, delivery and operational plans and as proposed in the business case • Progress of the STP (including time, cost and environment) • Acceptance of tenders • Management of community feedback and complaints
Sustainability Officer	• Designs meet ISC sustainability requirements • Progress of the STP (Including time, cost and environment)
Utilities Staff	• Ensure operations comply with relevant regulatory and STP project requirements • Ensure timely notification is provided to the project team/comms team on operational activities • Ensure the team understands their requirements with relation to engaging with the local community, stakeholders and media
Operators	• Ensure operations and training are efficient through transition of services • Be informed and involved of the STP design and construction
Project Support (Various)	• Provide advice and support on technical aspects of procurement, design, construction and operation of the STP project specifically regarding risk, WHS, audit, Environment and Finance
QPRC customer service staff	• Provided with adequate information to respond to simple enquiries (Q&A)
Service Manager, Finance Portfolio General Manager, Organisation Capability	• Responsible for financing of the project, including loans and grant acquittal
Service Manager, Workforce Portfolio General Manager, Organisation Capability	• Responsible for the management of QPRC staff, including the impact the new STP will have on current employees
QPRC staff	• Be informed of progress of the upgrade

Engagement Approach

The communications and engagement activities for the project are based on providing a clear and consistent project narrative and ongoing information is to build a sense of trust amongst stakeholders and the community.

The program diagram below shows the main communications and engagement activities planned for each stage of the project.

Project consultation during formation of the project included consultation during development of the Master Plan and Concept Design. Further consultation activities have been undertaken as part of the Environmental Impact Track which included public exhibition of the project Environmental Impact Statement and targeted engagement with interested stakeholders.


FINAL BUSINESS CASE
INSW Infrastructure New South Wales
0 1 2 3 4 5 6
INFRASTRUCTURE INVESTOR ASSURANCE
Identify
• Define project
Plan
• Management Plan
• Options Study (Masterplan)
• Concept Design
• Business Case
Develop
• Planning Approvals
• Design and Specification (Detailed)
Delivery
• Construction Procurement
• Construction Delivery
Close
• Launch
• Lessons Learned
Environmental Impact Assessment Track
EIS - Scoping
• Heritage and Biodiversity Assessments
• Site Assessments
Draft EIS
• Review, research and consultation to inform draft EIS
EIS - Exhibition
• Public Exhibition
• Public and Entity Submissions
EIS Approval
• EIS Updated
Public Communications and Engagement
Masterplan
• CONSULT/INFORM
• Consultation undertaken 2016
• Project website established - project narrative and key documents made available to public
Concept Design
• INVOLVE/CONSULT
• Early engagement with communities of interest on key elements to be included in the EIS
• Seek feedback on issues to be reflected in concept design including (but not limited to)
• Recycled H2O
• Renewable Energy
• Use of Biosolids
• Downstream ecology
• Cost impacts of options
• Project communications including:
• Web updates
• Newsletters
• Fact sheets and FAQs
• Media
• 1800# and project email
Detailed Design
• CONSULT/INFORM
• Consultation on Draft EIS
• Project Business Case availible
• Consultation on detailed design elements including (but not limited to):
• Landscape options
• Scheduling and traffic movements
• Project communications including:
• Web updates
• Newsletters
• Fact sheets and FAQs
• Media
• 1800# and project email
Final Design
• INFORM
• Project communications including:
• Web updates
• Newsletters
• Fact sheets and FAQs
• Media
• 1800# and project email
Delivery
• INFORM
• Community relatins during construction including:
• Lettebox drops
• Residents/community meetings
• Project communications including:
• Web updates
• Newsletters
• Fact sheets and FAQs
• Media
• 1800# and project email
Launch
• INFORM
• Launch event
• Project communications including:
• Web updates
• Newsletters
• Fact sheets andFAQs
• Media
• 1800# and project email

Key stakeholder issues

Consultation and engagement with stakeholders is ongoing. Table 33 gives a summary some of the key issues raised by stakeholders to date and how they have been integrated into the proposed project. Due to the nature of the project, project stakeholders often have overlapping interests and issues.

Table 33: Engagement approach at each phase of the project

Issue raised	Stakeholder	How this is addressed by the project
• Sewage bypassing treatment during high wet weather flows	• ACT EPA	• Additional storm treatment capability included in the treatment process. • Two-dimensional screening of all flows. • 30 ML Storm Pond included to capture and return storm flows • Solids contact process enables a higher flowrate to be treated.
• A high quality of treated effluent is required due to the receiving environment	• ACT EPA	• Tertiary treatment upgraded to DAFF process to provide higher solids capture and filtration performance.
• The existing maturation ponds are within the flood zone and present a risk of pollution	• ACT UTR • ACT EPA	• Existing maturation ponds to be decommissioned by the project
• Soluble phosphorus is a key pollutant of concern as it is linked to an increased risk of blue green algae in Lake Burley Griffin	• ACT EPA • NCA • ACT Healthy Waterways • ACT & Region Catchment Coordination Management Group • Community representations	• The proposal as outlined in the Draft EIS has been amended with additional processes added to facilitate biological phosphorus removal and enhanced chemical phosphorus removal including phosphorus recovery. • An additional receiving water quality impact assessment study has been completed including modelling of Lake Burley Griffin.
• Wildlife in the area needs to be managed to minimise the risk to aircraft at Canberra Airport	• Canberra Airport	• A wildlife landscaping plan has been prepared in consultation with the community. The proposed landscaping minimises the risk of attracting large birds that may pose a risk to aircraft.

9.6 Project Risk Management

Project risk is being managed in accordance with Council's Risk Management Policy and Directive.

A project risk register has been prepared for the Queanbeyan STP Upgrade Project and has been updated throughout the lifecycle of the Project, at the end of each phase.

Risk Identification and Assessment

Risks were originally identified during the project initial and planning phases and reviewed during the master planning phase.

Following the master planning phase and during the implementation of QPRCs Project Framework, the project team developed a risk breakdown structure which was developed then workshopped on 10 May 2017. From the risk breakdown workshop the risk register, and assessment was reviewed and updated.

A further risk workshop was facilitated at the commencement of the design process on 28 March 2019 and included key internal staff, consultants and the ACT EPA. Following this workshop the risk register and assessment was updated.

The risk register has continued to be reviewed and updated as the project has progressed, with key reviews undertaken at the completion of the concept design, during reference design and during detailed design.

The following risk areas were adopted for the project:

- Scope
- Time
- Quality
- WHS
- Sustainability
- Interdependency
- Regulatory
- Stakeholder
- Environmental
- Site Conditions
- Governance
- Procurement
- Resources
- Financial
- External
- Other.

Assessment of risks has been determined in accordance with QPRC's likelihood and consequence matrix as shown in Figure 29. The likelihood and consequence rating criteria were developed to be project specific.

RISK ASSESSMENT REGISTER MATRIX

LIKELIHOOD	CONSEQUENCE 1 Very Low	2 Low	3 Medium	4 High	5 Very High
1 Rare	Low	Low	Low	Moderate	Moderate
2 Unlikely	Low	Low	Moderate	Moderate	High
3 Possible	Low	Moderate	Moderate	High	High
4 Likely	Moderate	Moderate	High	High	Extreme
5 Almost Certain	Moderate	High	High	Extreme	Extreme

Figure 29: Likelihood consequence risk rating matrix, QPRC Risk Management Directive 2019

As a local government authority, QPRC has an obligation to its stakeholders to ensure that it does not accept high levels of risk that might impact on community wellbeing and amenity, or the ongoing viability of QPRC. Accordingly, QPRC generally has a low appetite for unmitigated risks across all of its day to day operations.

QPRCs risk appetite is documented in the Risk Management Directive and presented below in Figure 30

Risk Rating & Control Approach		
Initial Risk Rating		Control Measure
L	Low	Withinh Council's risk appetite - monitor through in place management and operational controls.
M	Moderate	A decision by the Portfolio Geenral Manager is required on whether to accept the level of risk or implement further controls. Responsibility for managing the risk must be assigned
H	High	A decision by the Portfolio General Manager and Chief Executive Officer is required on whether to accept the level of risk or implement further controls. Responsibility for managing the risk must be assigned including reuiqred frequency for reviewing and updating the risk assessments.
E	Extreme	Critical Risk - The risk level exceeds Council's risk appetite - further treatments are required and risk management strategy must be developed and responsibility for its application assigned.

Figure 30: Risk appetite, QPRC Risk Management Directive 2019

Risks which fall outside of QPRCs risk appetite have been mitigated within the risk assessment until they fall within QPRCs risk appetite.

The risk register is presented in Appendix C.

Implementing Mitigations

The Project Manager will ensure that the planned risk controls are implemented, their effectiveness monitored, and corrective actions taken where the effectiveness of the controls needs improvement.

Reporting

Key risks and emerging issues are reported on monthly to the Project Management Committee.

Review

The risk breakdown structure, risk assessment and control measures will be reviewed and updated in accordance with the schedule given in Table 34.

Table 34: Risk Assessment Review Schedule

Review Schedule	Extent	Responsibility
At the end of each milestone during Plan and Develop Phases	Entire risk register Pass updated risk register to estimating team to update the project contingency	Project Manager
Monthly during Delivery Phase	Review risks with initial ratings greater than medium Review risks with residual ratings greater than medium Add any new risks Pass updated risk register to estimating team to update the project contingency	Project Manager

9.7 Compliance

QPRC are responsible for the following sewerage services:

- Making a sewage network available for connection in areas within NSW
- The collection and conveyance of sewage through the Queanbeyan sewerage network and Morisset and Jerrabomberra Trunk mains
- Treatment and disposal of sewage at the QSTP.

QPRC is regulated under Part 3, Division 2 of the *NSW Local Government Act 1993* for the provision of sewage services including sewage collection, conveyance, treatment and disposal. This applies to QPRC regardless of whether the activities are carried out in NSW or the ACT and includes regulation of the QSTP. This regulation is administered by NSW Department of Planning Industry and Environment (DPIE) and its successors.

Under Section 60 of the *Local Government Act 1993*, QPRC are required to obtain ministerial approval for the construction the QSTP project. The Section 60 approval provides an independent assessment of the proposed works to ensure they are fit for purpose and provide robust, safe, cost-effective and sound solutions that meet public health and environmental requirements. DPIE has been consulted and involved in the review process during the project options, concept design and detailed design stages of the project as required to receive Section 60 approval. DPIE will continue to be involved in the project as required.

QPRC operate the Queanbeyan STP which is located on ACT land in accordance with the terms and conditions of the Crown Lease that was granted to Queanbeyan City Council in 1938 by the Commonwealth Government.

The Utilities Technical Regulator (UTR), under *ACT Utilities (Technical Regulation) Act 2014*, are responsible for granting the Design and Construct operating certificate and the Provision of Service operating certificate for the utility services provided by the Queanbeyan Sewage Treatment Plant provided the application reasonably satisfies Section 46 of the Utilities (Technical Regulation) Act 2014. To meet this requirement QPRC has prepared a Regulatory Plan for the design and construction of QSTP.

QPRC has been granted an exemption from the requirement for a licence in relation to the Utilities Act 2000. QPRC has additional record keeping and reporting requirements as part of the *Utilities (Licencing) Exemption 2021 Disallowable instrument DI2021-24* in relation to this agreement.

The ACT Environmental Authority, under the *Environmental Protection Act 1997*, authorises QPRC to provide treatment of wastewater from Queanbeyan's sewer network and discharge effluent to the Molonglo River in accordance with the Environmental Authorisation 0417 in accordance with the approved Environmental Management Plan. ACT EPA have been consulted during the design process. QPRC will continue to consult with ACT EPA throughout the upgrade process as necessary. The project will prepare a commissioning plan to demonstrate that the new treatment plant process is able to achieve compliance with the environmental authorisation. Once the upgrade is commissioned, QPRC will develop an Environmental Management Plan for the new QSTP in collaboration with ACT NSW.

The NSW Environmental Authority, under the *Protection of the Environment Operations Act 1997 (POEO Act)*, provides environmental regulation of the QSTP network located in NSW. NSW EPA have been consulted during the design process. QPRC will continue to consult with NSW EPA throughout the upgrade process as necessary.

The design and construction will be in accordance with the appropriate Australian Standards, including the following:

- AS1170.1 Permanent, Imposed and other Actions
- AS1170.2 Wind Loads
- AS1170.3 Earthquake Actions in Australia
- AS2159 Piling – Design and Installation
- AS2870 Residential Slabs and Footings
- AS3600 Concrete Structures
- AS3735 Concrete Structures for Retaining Liquids
- AS3700 Masonry Structures
- AS4100 Steel Structures.

All structures for this project are being designed for Importance Level 3 (Wastewater Treatment Facility), in accordance with Table 3.1 of AS/NZS 1170.0:2002: Structural Design Actions – General Principles.

All buildings including prefabricated structures are required to be constructed in accordance with the Building Code of Australia (BCA) and relevant Australian Standards. A deemed to satisfy review of each building design will be undertaken in the reference design phase to establish relevant building classifications and clauses applicable under the BCA. Final BCA compliance and certification responsibility would be included in the Construction Contractors scope by a private certifier for all buildings.

Recycled water treatment and usage will meet the requirements in the NSW Guidelines for Recycled Water Management Systems (NSW Department of Primary Industries, Office of Water, May 2015) and in the Australian Guidelines for Water Recycling (AGWR) (NRMMC, 2006).

All works must be undertaking in compliance with NSW and ACT Work Health and Safety Laws, and QPRCs Health Safety Environmental and Quality Policy. On-site ACT laws apply.

ACT Municipal infrastructure design standards apply to the development and the road upgrade.

Achievement of Infrastructure Sustainability Council target rating of Excellent.

9.8 Change Management

The major changes associated with the project and their management controls are presented in Table 35.

Table 35: Change elements and management controls

Change Element	Management Controls	Responsible Role
New STP processes, operation, maintenance and control software	• Involvement of operation team in design • Plain English functional description • Operator training • Prepare operation and maintenance manual • Engage designer/commissioning team to provide post-handover support	Project Manager
Changes to environmental authorisation (EA) discharge limits, sampling and reporting requirements	• Involvement of operational team in Environmental Authorisation negotiations • Engagement with the EPA to confirm requirements • Operator training	Project Manager
Changes to environmental authorisation requirements during commissioning of the new STP and decommissioning of the existing STP	• Involvement of operational team in Environmental Authorisation negotiations • Engagement with the EPA to confirm requirements • Operator training	Project Manager
Changes to Provision of Service Operating Certificate requirements	• Involvement of operational team in preparation of Regulatory Plan • Engagement with the UTR to confirm requirements • Operator training	Project Manager
Changes to the Operational Environmental Management Plan (OEMP) due to changes to EA and DA conditions	• Involvement of operational team in preparation of the OEMP • Engagement with the EPA to confirm requirements • Operator training	Project Manager
Obligations of the ISC Rating	• Operator training • Embedding the ISC obligations within the O&M manuals and QPRC processes	Project Manager
Changes to landscape	• Include obligations and management practices in OEMP • Prepare landscape management plan • Operator training	Project Manager
Impacts to QPRCs sewer fund	• Undertake a financial analysis to determine the impact of the project on the sewerage fund and the need to increase sewage rates • Engage with the Utilities team, Finance team and assets team • Incorporate the funding model into the IWCM Plan • Develop a business case	Project Manager
Decommissioning of the existing STP	• Develop a decommissioning plan • Involve the operational team in development of the decommissioning plan • Briefing between the decommissioning team and the operational team on the plan	Project Manager

	• Coordinate between the decommissioning team and operational team	
Changes to land boundaries	• Liaise with all impacted stakeholders/adjoining landowners to understand their needs • Update QPRCs records • Include any new assets in asset register • Include new assets in maintenance schedules • Brief operational team on new boundaries and assets	Project Manager
Changes to access roads	• Liaise with all impacted stakeholders/adjoining landowners to understand their needs in design development • Communicate with stakeholders on implementation timeline and impacts • Coordinate with the road authority • Provide as constructed assert data to the road authority	Project Manager
Changes to site access and security	• Liaise with stakeholders who require access to the site to understand their needs during design • Operator training • Brief other stakeholders who require access on the new protocols/systems	Project Manager
Changes to workplace	• Involvement of operational team, security team, digital team, buildings team in preparation of the design to understand needs • Involvement of operational team, security team, digital team, buildings team in set up of the workspaces • Operator training	Project Manager
Changes to power supply	• Involvement of operational team in preparation of the design • Engagement with EVO Energy to confirm requirements • Operator training • Provision of as constructed asset data to EVO Energy • Engagement of suitably qualified maintenance contractors	Project Manager
Changes to potable water supply	• Involvement of operational team in preparation of the design • Engagement with ICON Water to confirm requirements • Operator training • Provision of as constructed asset data to ICON Water	Project Manager
Changes to waste disposal and recycling	• Involvement of operational team, waste team in preparation of the waste and recycling plan • Operator training • Advise existing waste contractors of changes • Engage new waste contractors if required	Project Manager
Changes to operational and maintenance supply needs	• Involvement of operational team in preparation of the design • Operator training • Advise existing supply and maintenance contractors of changes to delivery and maintenance requirements • Engage new supply and maintenance contractors if required	Project Manager

Change to QPRC assets	• Engage with assets team during the design to document asset requirements in contract documentation • Provide record of new, decommissioned and altered	Project Manager

9.9 Benefits Realisation Plan

QPRC has prepared a Benefits Management Plan (BMP) that is consistent with the NSW Government Benefits Realisation Management Framework (2018) and supplements the Project Business Case. The BMP outlines the governance structure, benefits and plan to manage, report on and evaluate benefits.

The key project benefits and dis-benefits have been incorporated onto a Benefits Register and include;

- Benefits:
  - Meeting Queanbeyan's sewage treatment needs for future population and economic growth
  - Improved control over the water quality discharged to the environment and to protect public health
  - Improved odour and noise outcomes
  - Improved workplace health and safety for workers and visitors to the facility
  - Improved treatment reliability
  - Improved protection of the treatment plant against flooding and climate change sustainability
  - Provision of a source of recycled water that can be used for applications such as dust suppression
  - Provision of a local facility to receive and treat septage waste collected from domestic septic tanks and aerated wastewater treatment systems
  - Improved treatment of the biosolids produced by the treatment process to a quality that is suitable for agricultural reuse
  - Improved traffic access to the treatment plant by sealing the access road
  - Provision of a sustainable sewage treatment solution
  - Existing plant does not fail
- Dis-benefits:
  - QPRC will need to raise sewer rates above current levels to pay for the loan.

The benefits register includes details of the metric, data source and measurement targets for each benefit.

The Project Manager will monitor the implementation of the BMP as the project progresses. Tracking of benefits realisation progress will be recorded by the Project manager in the Benefits Register.

The Project Manager will report on implementation of the BMP as part of the monthly project reporting.

The BMP will be reviewed:

- With any review of the Project Management Plan and/or risk management plan
- Following any changes to the project scope
- Prior to completion of works and commissioning of the asset.

9.10 Sustainability

QPRC has a strong commitment to delivering on the principles of ecologically sustainable development and has an extensive legislative and policy framework that highlights this commitment for providing services to its customers. Additionally, QPRC has become a member of the Infrastructure Sustainability Council (ISC) and has committed to pursue Infrastructure Sustainability (IS) ratings under the IS Rating Scheme for the delivery of the Queanbeyan STP Upgrade (the Project). This will drive a culture of sustainable decision-making to benefit the wider Queanbeyan community.

QPRC has adopted the ISC Rating Tool and aims to achieve an "Excellent" Design and As-Built Ratings for the STP with a score in the range of 65 to 75.

To manage this process and ensure that the sustainability objectives are achieved, the project will follow the requirements laid out in the QPRC Queanbeyan STP Upgrade Project Sustainability Management Plan (SMP).

Key Sustainability Targets

Council's Sustainable Design Policy for Council Buildings sets out seven goals. Table 36 outlines project specific targets (and related IS credits) that align with each of the goals. Specific targets are identified related to energy, water and waste goals. Achieving the range of credits required for an Excellent IS rating will support the broader policy goals related to sustainability leadership, reduced operating costs, reduced environmental footprint and increasing sustainability awareness.

Table 36: Sustainability Targets

Goal	Target	Relevant IS Credit
Reduced energy consumption, water use and waste	15% reduction in GHG emissions compared to the base case through modelling (design) and monitoring (construction). 10% reduction in total water use compared to the base case. Opportunities to reuse spoil are identified and implemented, targeting a >80% (by volume) of spoil to be reused. Minimise total waste to landfill through waste avoidance initiatives and prioritisation of reuse and recycling, targeting >40% by volume of office waste to be recycled.	Ene-1 Wat-1 Was-1 Was-2
Demonstrating community leadership in implementing renewable energy and passive solar design	20% substitution of non-renewable energy using renewable energy.	Ene-2
Using alternative water sources and improving stormwater quality	50% substitution of potable water use using non-potable water.	Wat-2
Continued Council growth and development with reduced environmental footprint	Embedding consideration of environmental, social and economic factors when selecting suppliers/services using multicriteria analysis.	Pro-1, Pro-2
Reduced on-going operating and maintenance costs	"Excellent" IS Design and As-Built Rating.	Ene, Wat, Was credits Eco-1 and Eco-2 Sta-3

Sustainability in Design

The design will be completed by HH2O who will produce a fully detailed and documented design to achieve the targeted "Excellent" Design Rating with a score in the range of 65 to 75.

A "Sustainability in Design" workshop (slides and minutes provided in Appendix B) with HH2O was held on 15 May 2019, when the designers were first contracted, to develop sustainability initiatives to be embedded in planning and design.

During detailed design, the design team, with the support of AECOM and QPRC, will develop minimum sustainability requirements to include in the terms of reference for the construction contractor to achieve the As-Built rating. This will include a section on the Construction and Environmental Management Plan requirements as well as materials and equipment specifications.

Sustainability in Procurement

Project procurement will align with QPRC's Procurement Policy and the IS V1.2 criteria for procurement (Pro-1, Pro-2, Pro-3 and Pro-4). HH2O have identified sustainability opportunities with QPRC early in the design process. This

early identification of opportunities has allowed for forward commitment procurement and early identification of supply chains to make more informed, sustainable decisions, particularly when selecting materials.

Decision makers will seek to prioritise local procurement and recycled or environmentally labelled materials where cost effective. Suppliers will be requested to provide details of their sustainability policy and its implementation and should also be compared for social, environmental and financial appropriateness using multi-criteria analysis to select the most sustainable option. Finally, supplier sustainability performance will be monitored for the duration of contract against sustainability targets and non-compliance should be actively managed.

Sustainability in Construction

The main works construction package will be delivered through a Construct Only contract where the Detailed Design is managed by the Owner (QPRC) with early tenderer involvement then Construct by Contractor. This delivery model means that suitable contractors can participate in the design review which should increase the collaboration between designers and the contractors leading to better sustainability outcomes. At the beginning of construction, the SMP will be handed over to the construction contractor to be updated with their input.

Similar to the sustainability in design workshop, a sustainability in construction workshop will allow QPRC and the contractor to identify where key efficiencies can be made in construction methodology. These efficiencies, combined with following the specifications outlined in their contract, will help the contractor achieve the IS As-Built rating. The contractor will need to provide evidence for the IS credits to assist in delivering the As-Built rating.

9.11 Stakeholder Endorsement

Stakeholder endorsements for the project are presented in Table 37.

Table 37: Stakeholder Endorsements

Stakeholder	Related Outcome Interest	Endorsement
NSW Office of Water	NSW Regulator of QPRCs sewerage network under Section 60 of the Local Government Act 1993. Required to approve the project.	
ACT Utilities Technical Regulator	ACT Regulator of QPRCs STP operation under the Utilities (Technical Regulation) Act 2014. Required to issue operating certificate for design and construction, and operation.	
QPRC Councillors	QPRC budget and tendering approval	
ACT Environment Protection Authority	Issues QPRC with an Environmental Authorisation to discharge effluent to the environment in the ACT under the Environment Protection Act 1997	
ACT Transport Canberra and City Services	Asset Owner of Mountain Road which will be upgraded as part of the proposal	
EVO Energy	Owner of the electricity supply network for the STP which requires upgrading and adjustment as part of the proposal	

10. REFERENCES

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11. APPENDIX A – SUMMARY OF PREVIOUS STUDIES

This appendix provides a summary of early planning studies investigating the need to upgrade the Queanbeyan STP.

MONTGOMERY WATSON (JULY 1995) "QUEANBEYAN WPCC FUTURE NEEDS"

In 1995, Montgomery Watson prepared a report outlining upgrade options for the Queanbeyan STP. The following conclusions were drawn for the STP:

- Augmentation may be required to meet increasing populations and possible new discharge limits. Overall, it was highlighted that the STP is most restricted on its ability to meet total nitrogen requirement.
- Hydraulically, it was found that the STP could treat up to an average dry weather flow (ADWF) of up to 10.7ML/d.
- A 4-stage Bardenpho activated sludge process was recommended for long term secondary treatment if a more stringent total nitrogen requirement needs to be met. A stage-wise implementation strategy with interim operation was recommended. Addition of plastic media to the activated sludge plant was identified as a short-term strategy to provide some additional treatment capacity.
- For wet weather flow treatment, it was recommended that a fourth secondary clarifier be provided for peak flows.
- Disinfection of the maturation pond effluent was suggested to reduce the risk of bacteriological problems in wet weather.
- It was further suggested that the disused sludge lagoon could be used for flow equalization.

Finally, three wastewater management strategy / options were investigated, including both centralized and decentralized treatment options. A centralized system was recommended to reduce the number of operating plants and provide a more operable solution. Some on-site package plant could be employed to meet local needs if required.

SKM (DECEMBER 1995) "CRITICAL APPRAISAL OF QUEANBEYAN WPCC FUTURE NEEDS REPORT"

In 1995, SKM conducted a critical appraisal of the Montgomery Watson report based on further information that were available between the two reports. The report provides recommendations on minor, short term upgrades as well as longer term upgrades. It also provides a capacity assessment of the existing plant. The following conclusions were drawn:

- The trickling filters could handle a flow of 3.8 ML/d whilst achieving their original function of nitrification. It is noted that media characteristics and structural integrity of the trickling filters were not discussed.
- It was suggested a reduction of SVI (200 to 100 mL/g) could potentially increase the capacity of the activated sludge plant from 11.2 ML/d to 14.3ML/d. Addition of selector tanks at the head of the activated sludge plant was suggested as a potential measure to improve sludge settleability.

SKM (NOVEMBER 1996) "QUEANBEYAN WPCC WET WEATHER FLOW TREATMENT STRATEGY"

In 1996, QCC commissioned SKM to prepare a position paper on "Wet Weather Flow Treatment Strategy" for Queanbeyan STP. The paper examines treatment strategy to deal with wet weather flow in light of its potential impact on the downstream water quality, namely Molonglo River and Lake Burley Griffin. As part of the report, a number of previous water quality investigations were reviewed. The following conclusions were drawn with regard to the impacts of pollutant loads:

- Phosphorus loads (both diffused and point sources) were identified as the principal cause for eutrophication in Lake Burley Griffin
- Nitrogen (inclusive of nitrogen oxides, total Kjedahl nitrogen and ammonia) have been found to be of secondary concern to phosphorus with respect to limiting algal growth in downstream waterways
- Most of the sediments in Lake Burley Griffin originate from the Molonglo River. Secondary release of phosphorus from sediment, especially after a flood event, was identified as potential cause for eutrophication.

The paper highlighted the following:

- Phosphorus is the key parameter in terms of treatment objective for the STP

- Secondary treatment objectives for the STP include removal of suspended solids and ammonia (as a result of toxicity impact).

As a result of these previous water quality investigations, Queanbeyan STP has gone through a number of phosphorus discharge reduction programs in the 1980's and 1990's. At the time of SKM's study, the effluent phosphorus level was at the very low range of 0.1-0.2 mg/L. It was estimated that Queanbeyan STP contributed less than 4% of the total phosphorus loads to Lake Burley Griffin, of which only 18% of this is due to wet weather bypasses. Bypass events was noted to occur between 5 to 10 times in a year. In fact, water quality monitoring both upstream and downstream of the STP suggested that the STP exerted relatively minor impacts on the river system.

Nonetheless the report went on to assess the benefits of providing extra secondary treatment capacity to handle storm flow of up to 3, 5 and 7 ADWF's. The analysis in the report was hindered by the lack of peak hourly flow data. It was concluded that there is a diminished return in providing treatment exceeding 3 to 5 ADWF's. Treatment of flows up to 3 average dry weather flow (ADWF) was suggested to be a reasonable target to minimize the impact of wet weather bypasses.

Overall this paper highlights the importance of phosphorus removal for the STP and the importance of a critical assessment (based on hourly data) of the peak hydraulic capacity of the secondary treatment system, especially with regard to the solids and hydraulic capacity of the secondary clarifiers.

MWH (December 2008) "Queanbeyan Sewage Treatment Plant Future Needs Study"

In 2007 QCC commissioned MWH to prepare a report of the Queanbeyan STP Future Needs to cater for population growth to 40,000EP within the next 20 years. The report examined the existing STP treatment capacity and condition. The report recommended a number of upgrades to the existing facility be considered, including decommissioning and replacement of several existing processes, the installation of new additional processes and the expansion fo some existing processes to cater for a future inflow of 11.6ML/day for a 40,000EP population and full treatment of up to 3 time the average dry weather flow (ie 34.8ML/day) . It also recommended further studies be undertaken and a concept design be prepared to finalise details of the upgrade works.

Hunter Water Australia (HWA) (May 2010) "Queanbeyan STP Options Report"

In 2010 HWA were engaged to review the recommendations of the MWH 2008 report and explore other options. The report identified that the MWH strategy would only provide QPRC minor additional capacity and improved effluent quality whilst relying on ageing infrastructure.

The report recommended in order to assess "value for money" the MWH option be further developed and costed. It should then be assessed against modern technology full activated sludge plants designed for a high level of nitrogen as well as phosphorus removal. All options should be assessed against a common set of criteria which includes life cycle cost and a range of non-financial criteria relevant to QCC.

Hunter Water Australia (August 2011) "Queanbeyan Sewage Treatment Plant Upgrade Options Assessment Summary Report"

In 2011 HWA were engaged to undertake an upgrade options assessment. Building on HWAs 2010 report, this report reviewed the upgrade drivers, developed the MWH proposed upgrade solution and compared it via a multicriteria analysis against other upgrade options.

The report identified a preferred upgrade for Queanbeyan STP comprises of the following components;

- Abandonment of the existing inlet works and construction of a new inlet works facility
- Either expansion of the existing sludge drying beds or construction of new mechanical dewatering infrastructure (to be determined during subsequent design stages)
- A MBR activated sludge process using best biological design principles with combined biological/chemical phosphorus removal, single sludge stream and aerobic sludge digestion.

The preferred upgrade was recommended to provide treatment for 43,780 EP population and up to 3 x ADFW in the secondary process with inlet works capacity of 5.5 x ADWF.

GHD (September 2016) "Queanbeyan Sewage Treatment Plant Upgrade Project: Masterplan for Sewage Treatment Plant Upgrade"

In 2014 QCC engaged GHD to prepare a Masterplan for Sewage Treatment Plant Upgrade. The Masterplan provided a more detailed rand current review of sewage treatment needs in the Queanbeyan and the surrounding areas, providing an update of both the current population and future population growth aligned with more recent planning documents. The Masterplan sets out the design basis for proceeding with the upgrade of the STP, including consideration of:

- Best for region solution including future growth
- Existing and future sewage infrastructure
- Sustainability, including environmental constraints, water quality and solids management
- Approvals
- Treatment technologies
- Upgrade options:
  - Option 1 - Build new (existing STP fully decommissioned)
  - Option 2 - Build new and reuse existing components where feasible
  - Option 3 - Renew existing and augment

Multi Criteria Analysis (MCA) was undertaken of the options considered for 60,000 EP capacity (including growth predicted within 10-15 years). Six criteria were used being:

- Cost (NPV 50 yrs)
- Constructability, including quality, environmental and safety risks, timeframe for completion, likelihood of exceeding discharge licence conditions and extent of temporary works.
- Operability, including potential for increase in operating costs, ability to operate, WHS for operational staff, extent of autonomy and remote capability.
- Sustainability, including impact on environment, ability to reuse effluent and biosolids and ability to capture gas and resource recovery.
- Future Proofing, including achieving licence, increasing capacity and accommodating unexpected increases in flows or influent quality.
- Community Acceptance and Affordability, including impact on rates and QPRC financial position and QPRC reputation.

The criteria were weighted via a workshop which resulted in the following weightings for the selected criteria below.

Table 38: MCA criteria weighting

Table 12-2 MCA Criteria Weighting

Criteria	Weighting
Cost	14%
Constructability	4%
Operability	15%
Sustainability	13%
Future Proofing	17%
Community Acceptance and Affordability	37%

The criteria were then scored by the participants of the workshop with results and ranking as shown below.

Table 39: MCA results and rank

Table 12-3 MCA Results and Rank

Criteria	Options					
	Option 1A	Option 1B	Option 2A	Option 2B	Option 3A	Option 3B
Cost	4.9	4.9	4.8	4.9	5.0	4.9
Constructability	4.3	4.3	2.7	2.7	2.3	2.3
Operability	4.3	4.0	3.3	3.0	3.3	3.0
Sustainability	4.3	4.3	4.0	4.0	4.0	4.0
Future Proofing	3.7	4.3	3.7	4.3	3.7	4.3
Community Acceptance and Affordability	3.7	3.7	2.7	2.7	2.2	2.2
Normalised Score	99	100	83	85	79	80
Rank	2	1	4	3	6	5

The MCA normalised scores indicate that Options 1A and 1B are difficult to separate and represent the preferred options. Options 2A and 2B similarly have close scores but are clearly separated in their ranking at 3rd and 4th and Options 3A and 3B also have close scores and are 5th and 6th in their ranking. The sub options of A and B based on the process selection can be seen to have no impact on the selection of the upgrade approach.

The sensitivity of the MCA outcome was then tested for the following criteria weighting scenarios:

- All criteria equally weighted
- Each criterion in turn considered the most important with 50% weighting and all other criteria with 10% weighting each.

Irrespective of the scenario selected above, the Options 1A and 1B always ranked the highest indicating that the selection is not particularly sensitive to the weightings adopted for the various criteria.

The "Build New (existing STP fully decommissioned)" upgrade approach was adopted by QPRC as the preferred option for concept design and planning approvals.

Hunter H2O (December 2019) "Queanbeyan Sewage Treatment Plant Upgrade Project Design Criteria and Assumptions Report"

In 2019 Hunter H2O were engaged by QPRC to undertake design work for the proposed new Queanbeyan STP based on the preferred option from the Masterplan. Design work commenced with a review of the design criteria and assumptions which are documented in this report. Critically, a significant review of the EP projections was undertaken. The EP review identified that given the expected completion timeframe for the project of 2024 that there would only be 6 more years before 60,000 EP would be reached and a further upgrade would be required. The report recommended proceeding with concept design for the project based on a 75,000 EP population providing for population projects 15 years after the plant is constructed.

Hunter H2O (November 2019) "Queanbeyan Sewage Treatment Plant Upgrade Project Options Selection Report"

In 2019 Hunter H2O as part of their design engagement with QPRC prepared an options selection report. This report identified the various treatment options available and compared them via a multi criteria analysis that considered whole of life cost, effluent quality, operability / complexity, maintainability, robustness, power and chemical use. Primarily, three secondary treatment options were developed for the upgrade for comparison:

- Oxidation ditch with continuous gravity clarification
- Membrane Bioreactor (MBR) and
- Intermittently Decanted Extended Aeration (IDEA).

The preferred secondary treatment process selected for the Queanbeyan STP upgrade is an oxidation ditch with gravity clarifiers, tertiary granular media filter, UV disinfection, aerobic sludge digestion and sludge dewatering. The plant will be configured to adopt full biological phosphorus removal in future.

Key benefits of the selected process are:

- High ammonia removal to meet regulatory requirements
- Potential high total nitrogen removal or high nitrate production if required to protect Lake Burley Griffin
- Good treatment of storm flows
- Simple and robust process with many examples of successful implementation
- Multiple suppliers are available to provide replacement parts and equipment servicing
- Fewer chemicals are required than an MBR option and the same number of chemicals required as the IDEA option.

12. APPENDIX B - QUEANBEYAN SEWAGE TREATMENT PLANT – PROCESS CAPACITY ASSESSMENT

13. APPENDIX C – PROJECT RISK REGISTER

QUEANBEYAN-PALERANG REGIONAL COUNCIL

Council Meeting Attachment

9 NOVEMBER 2022

ITEM 9.4 QUEANBEYAN CBD WAYFINDING STRATEGY

ATTACHMENT 1 QUEANBEYAN CBD WAYFINDING STRATEGY

QPRC

Queanbeyan CBD Wayfinding Strategy

2022

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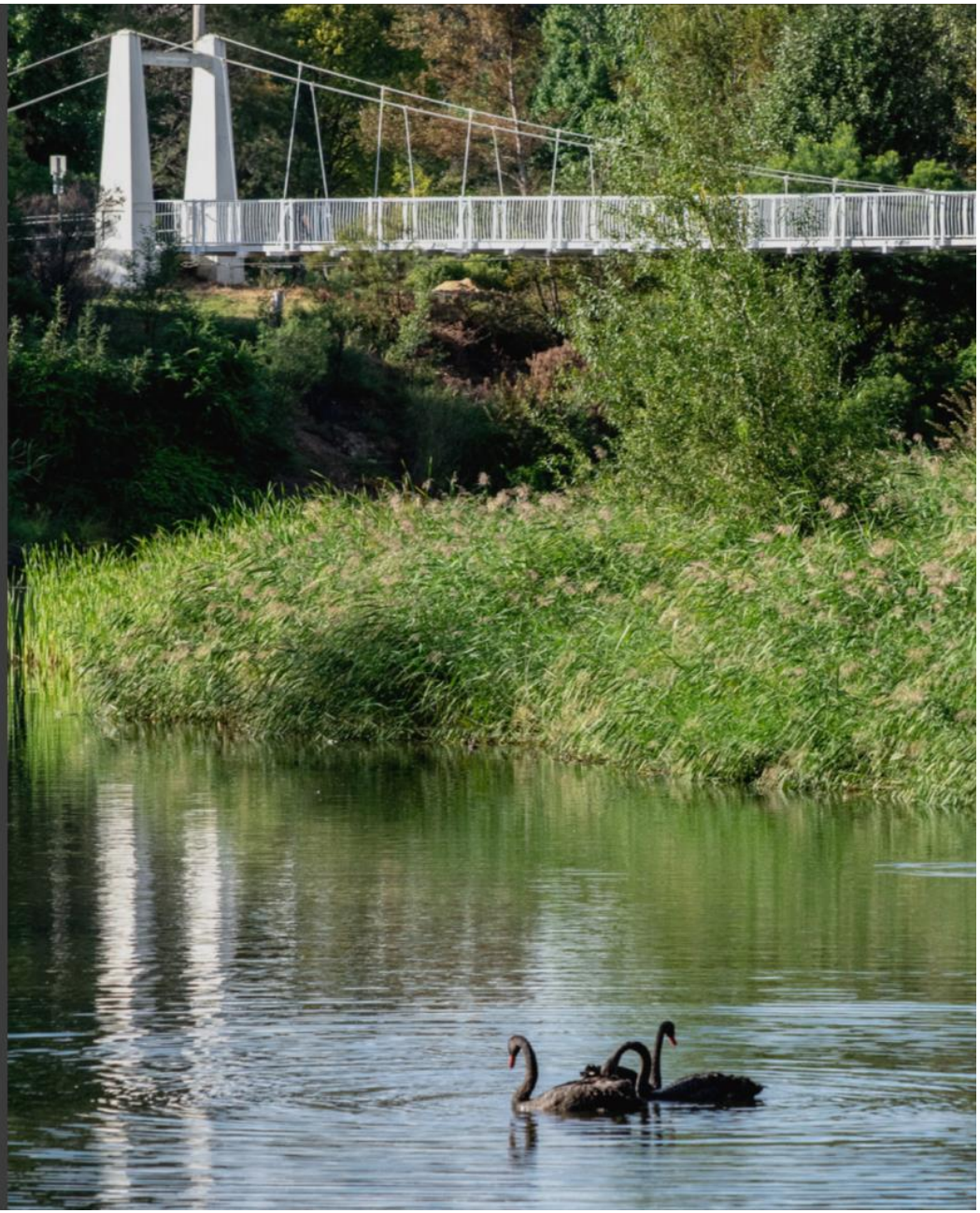
arterial

Acknowledgement of Country

Queanbeyan-Palerang Regional Council and Arterial Design would like to acknowledge the traditional custodians of the Queanbeyan-Palerang area and pay our respects to elders past, present and emerging. We acknowledge the stories, traditions and living cultures of our First Nations peoples on this land and commit to building a brighter future together.



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Design Principles

Signage Placement

Introduction

This Queanbeyan CBD Wayfinding Strategy should respectfully acknowledge the Ngambri Ngunnawal people as traditional owners and custodians of the Queanbeyan-Palerang area and engage directly with the Ngambri Local Aboriginal Land Council as the representative body.

The aim of this strategy is to produce clear, consistent and visually appealing wayfinding signage to improve pedestrian connectivity and navigation throughout the Queanbeyan CBD. The wayfinding should enhance new development within the CBD and promote walking & cycling as a dominant mode of transport. Walking and cycling not only promote community health and well-being, but increase foot traffic and encourage longer stays for surrounding retail and hospitality businesses.

What is Wayfinding Signage?

Wayfinding signage assists people in navigating their journey, helping them determine where they are in relation to their destination, and what the best route is to take. It can also invite people to explore somewhere new, or encourage new ways of travelling. Wayfinding consists of tools to assist with orientation and navigation, such as maps, directional indicators and location information.

Positioned within the public realm, pedestrian wayfinding signage is different to other types of signage such as, interpretation, advertising, road signs etc.

STRATEGY OBJECTIVES

- Establish a visual identity for the Queanbeyan CBD wayfinding that is clean and 'future proof', utilising contemporary graphic design principles
- Highlight and respond to both the rich history and the planned future development of the city
- Create clear pedestrian navigation throughout the CBD to reduce car-dependency
- Clear, accessible and attractive navigation for tourists, increasing number of visitors to the city
- Maximise linkages between high profile and lesser known destinations, precincts and attractions through an enhanced pedestrian network.
- The design concept provided is adopted by QPRC and executed throughout the Queanbeyan CBD at a high standard

PROJECT OUTCOMES

- Overall increased walking and cycling throughout the CBD
- A pedestrian centred public realm, with increased safety and access between key destinations
- A connected community
- Increased use of Queanbeyan parks, river front and community facilities
- Improved night-life
- Activated main streets and lane-ways with increased foot traffic and incentive to sit and linger
- A thriving local economy with vibrant tourism and cultural engagement
- A strong Indigenous presence within the wayfinding system, with integration of accurate cultural place names, accompanied with a live feed of digital education resources accessed through QR codes.

Design Principles

CONSISTENCY

This strategy aims to produce a unified sign suite across the Queanbeyan CBD, ensuring the consistent use of fonts, colours, map and icon illustrations and placement of the signs. Consistent signage establishes a visual character for the city and acts as a recognisable marker for easy navigation.

TIMELESS

The aim is to produce a clean and minimal 'future proofed' design that won't become outdated. Appropriate use of basic design principles such as proportion, hierarchy & colour, will ensure a successful and eye-catching outcome. The option to update the information panel or refresh the colours used should also be considered in the design, allowing for the signs to remain current.

Signage Placement Example

A portion of the CBD has been mapped out to demonstrate potential sign locations. When selecting sign locations, it is important to consider pedestrian routes, key destinations and entry thresholds, in particular where visitors from interstate/overseas will be entering the CBD. Each sign type has specific requirements for it's placement, please see pages 9-10 for more details.

- A - 'You Are Here' Directional Totem
- B - Medium Directional Totem
- C - Small Directional Totem
- D - Directional Pole
- E - Wall Mounted Sign
- F - Trail Marker

Signage placement map developed from Queanbeyan Masterplan, pedestrian access and building placement indicative of future development

02

Concept Design

Queanbeyan CBD Wayfinding Strategy

OVERVIEW
Sign Family
Typography
Indigenous Representation
Legibility & Viewing Heights
Colour Palette
Local Navigation Map
Icons
Directional Information

Sign Family

A family of 6 signs have been designed at a conceptual level, allowing for adaptation to suit the quickly evolving needs of Queanbeyan's CBD. The signs are broken up into two intended roles, informational and directional.

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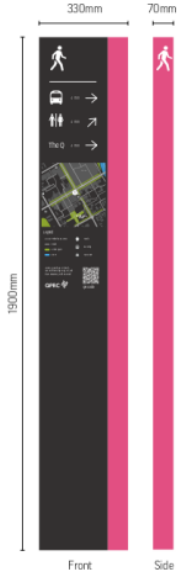
A

'YOU ARE HERE' DIRECTIONAL TOTEM

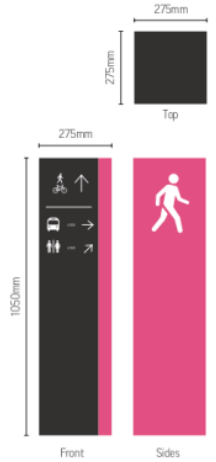
This is the most detailed signage option, including a map graphic to identify where the pedestrian stands. These should be positioned at key pedestrian destinations, such as plaza spaces or forecourts, gathering places often used for events, or open spaces with high visitor rate with a 'sit and linger' appeal.



B

MEDIUM DIRECTIONAL TOTEM

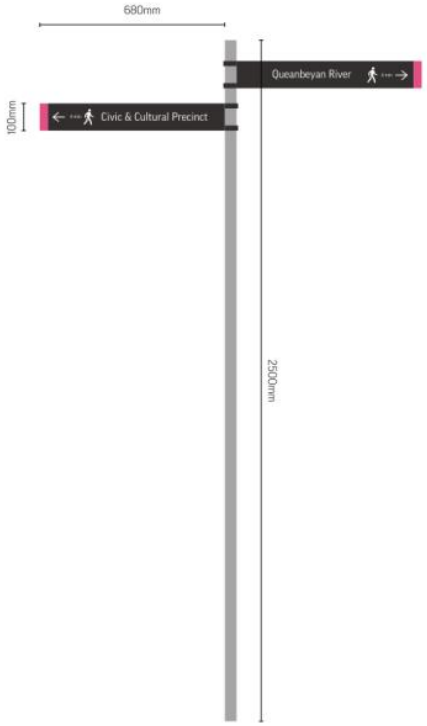
A simplified version of the "'You are here' directional totem". It is best positioned in smaller plaza areas or high traffic arrival points. With a simplified, 3 minute walking map, this totem sign should be positioned in urban areas with a number of destinations and amenities in close proximity.



C

SMALL DIRECTIONAL TOTEM

A further simplified version of the larger directional totems. It is suitable for navigation along trails or positioned within open spaces. This is particularly used to point pedestrians towards amenities or key destinations.



D

DIRECTIONAL POST

Should be used as reassurance for pedestrians, positioned at key nodes where multiple pedestrian paths intersect. The directional post is particularly useful where sight-lines to the noted destination are interrupted or too far away.

E

WALL MOUNTED

Additional re-assurance of amenities and destinations, positioned where sight-lines are lacking, such as at the entry to a laneway.

F

PAVEMENT/ TRAIL MARKER

A simple, singular directional marker positioned on the ground in the centre of a path or trail. This provides additional assurance between larger directional signs, particularly if there is a significant gap between them.

Typography

Good Pro has been selected for use across the sign family, as it is clear, legible and has a significant range of customisations within the font family.

Width to height ratio
Recommended: 65–95%
Good Pro Medium: 73.5%
Good Pro Light: 67%

CAPITAL LETTER TO LOWERCASE LETTER RATIO
Recommended: 65–75%
Good Pro Medium: 74%

LETTER WIDTH TO HEIGHT RATIO
Recommended: 10–15%
Good Pro Medium: 11.6%

References
Smithsonian Guidelines for Accessible Exhibition Design

Aa Bb Cc Dd Ee Ff Gg
Hh Ii Jj Kk Ll Mm Nn
Oo Pp Qq Rr Ss Tt Uu
Vv Ww Xx Yy Zz

Good Pro Light

Aa Bb Cc Dd Ee Ff Gg
Hh Ii Jj Kk Ll Mm Nn
Oo Pp Qq Rr Ss Tt Uu
Vv Ww Xx Yy Zz

Good Pro Medium

Indigenous Representation

Inclusion of Ngambri Ngunnawal content in the wayfinding strategy will demonstrate Councils pledge to respecting and acknowledging the stories, traditions and living cultures of our First Nations peoples on this land and commit to building a strong visual identity together in the spirit of reconciliation.

Arterial Design has established a respectful relationship with highly regarded cultural knowledge holders and members of the Ngambri Local Aboriginal Land Council. We have identified opportunities for a strong Indigenous presence within the wayfinding system and can collaborate directly with the traditional owners to deliver integration of accurate cultural place names. Further in depth consultation is required to 'walk country' (physically or digitally) with traditional owners to collate a list of location words aligned with the list for the Queanbeyan CBD Wayfinding Strategy Draft, particularly for sign graphics that can link pedestrians to additional Indigenous literature via the QR code. It It would also be more appropriate to use the language word first, then the English name in that order.

For example:

Indigenous name **Jullergang**

Location name **Queanbeyan River**

QR code may be included within the sign graphics, positioned below the map or location details. Qr code must remain clearly visible and within reach for easy scanning.

It is to be regularly updated when information becomes available digitally, in consultation with the Ngambri Local Aboriginal Land Council.

Legibility & Viewing Heights

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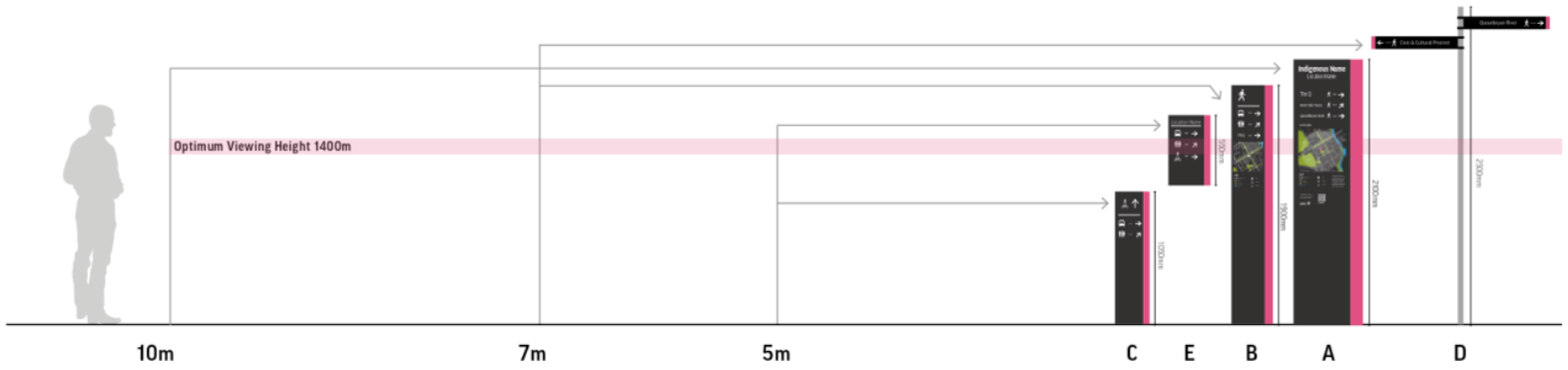
Legibility & Viewing Heights

Sign type	Text	Font size	Maximum viewing distance
A	Location Name	Good Pro Medium 113pt	10 meters
	Destinations	Good Pro Regular 85pt	7 meters
B	Destinations	Good Pro Regular 85pt	7 meters
C	Icons	75mm (h)	5 meters
D	Location Name	Good Pro Regular 85pt	5 meters
	Icons	50mm (h)	5 meters

References
Neely, G. and McCutcheon, W. (DATE) Access Ability on rgd-accessibledesign.com



Colour Palette

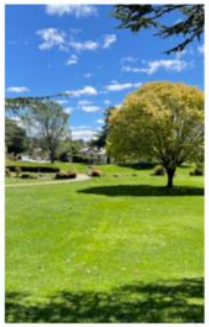
Generated from site exploration

Colour Code: 3C3C3B

Off black to be used for sign base

Colour Code: E34F82

Colour Code: 9EBF2E



Colour Code: E8472E

Colour Code: 42A8E8

Accent colour can be substituted for any of the following colours

Local Navigation Map

5 Minute Walk Radius

HEADS UP MAP

The purpose of a head's up map, is to ensure the user can easily orientate themselves while facing the sign and find what is ahead and within their immediate vicinity. Orientating the map to the direction the user is facing, is aligned with many common mapping systems such as car navigation, that many users will likely be familiar with.

MAPPING STYLE

This example map suggests what could be included in a 5 minute walk radius map. The aim of this map is to highlight to pedestrians where they stand in relation to the surrounding CBD with a clear 'you are here' label. Any notable amenities or destinations within a 5 minute walk radius (400m) should be included.

Optional icons to include

TOILETS

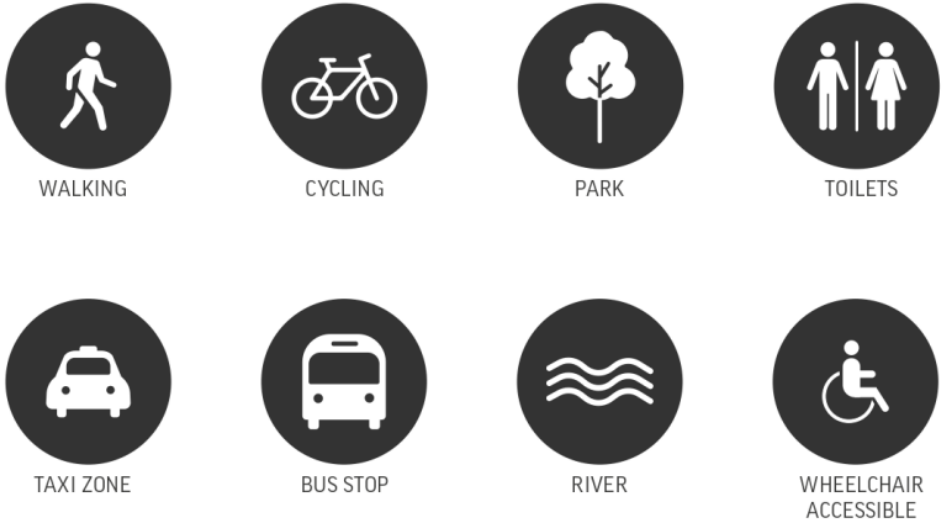
TAXI ZONE

BUS STOP

Local Navigation Map developed from Queanbeyan Masterplan. Pedestrian access, amenities and building placement indicative of future development

Icons

Additional icons may be added to the suite, however must be consistent, following similar curves and line thicknesses to the icons provided.

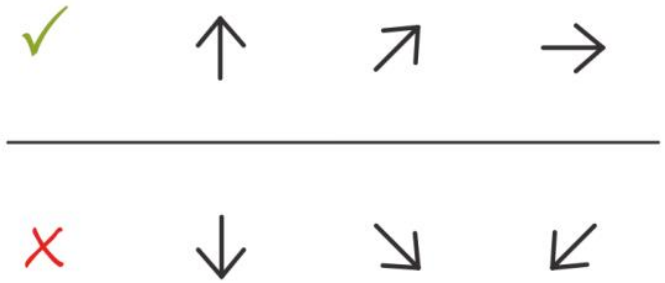


A QR code may be included on a sign with an accompanying map, linking pedestrians to a digital version of the map on their smart-phone.

Directional Information

ARROWS

Arrows are used to direct pedestrians towards a destination. Avoid using arrows that point downwards to reduce confusion, downward arrows should only be used to direct pedestrians below ground such as through an underpass or down a below-ground staircase. The most commonly used directions are forwards, left, right or forwards on a 45˚ angle.



WALK TIMES

Walk times have been included next to destinations as an incentive to encourage more walking across the CBD, highlighting how achievable the distances are. Choosing to include times rather than distances ties in with sustainable transport principles.

Use this formula to calculate walk-times:

80 meters distance = 1 minute walking

Implementation

Queanbeyan CBD Wayfinding Strategy

03

OVERVIEW
Accessibility & Safety
Installation
Maintenance
Signage Lighting
Location Schedule Example

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Accessibility & Safety

There are a variety of factors to consider when deciding on the placement of a wayfinding sign to ensure safety and functionality.

ORIENTATION

- Consider the direction the sign is facing, is it in the best position to be easily read by pedestrians or cyclists?
- Where possible, position graphic face of sign away from direct sunlight to reduce fading.

ACCESSIBILITY

- Ensure sign is clear from obstructions such as landscaping, urban infrastructure or parked cars
- A minimum of 1000mm clearance is required around any freestanding signs to accommodate for wheelchairs, prams and pedestrian traffic flow.
- Applicable standards and codes including the Australian Standards and the Department of Transport's guidelines for designing wayfinding systems.
- Compliance with the Disability and Discrimination Act 1992 and AS 1428.

Installation

Use highly durable and low maintenance materials for fabrication.

Maintenance

Signs should be regularly inspected for loose fittings, vandalism and that the information displayed is current and legible. Signs are expected to weather and fade overtime so they must be updated once the information becomes unclear or the appearance is deemed unsuitable.

Signage Lighting

Options

There is the potential to include lighting within the fabrication and installation of the wayfinding suite. In alignment with the concept design provided, it is recommended that lighting be fitted inside the sign frame, illuminating any information laser cut from the sign face, as seen in the examples to the left. Only prominent text should be selected to be laser cut, such as sign headings, main location names and large icons. Information such as maps and small text (below 30pt) should not be laser cut, instead can be illuminated using a light wash across the face of the sign or an external light source nearby.

Location Schedule Example

Code	Sign Type	Orientation (direction facing when looking at sign)	Indigenous Name (top of sign)	Location Name (Below Indigenous name)	Associated Destination Names	Direction of Arrows	Walking Times	Map Type	Pavement Surface	Footing Type	Location	Comments
S01	A	North	Pending Traditional Owners Consultation	Civic & Cultural Plaza	Queanbeyan River	Right		5 min Radius				
					Show-grounds	Left						
					Riverside Plaza	Up-Right						
					Crawford St Dining	Up						
S02	A	South		Queen Elizabeth II Park	'The Q'	Up-Right		5 min Radius				
					Queanbeyan River Trail	Up						
					Riverside Plaza	Right						
S03	B	North		Proposed Public Square	Queanbeyan River			3 min Radius				
					Civic & Cultural Plaza							
S04	B	South-East		Monaro & Crawford St Intersection	Riverside Plaza			3 min Radius				
					Central Park							
					'The Q'							
S05	D	North-West		Monaro & Crawford St Intersection	Riverside Plaza	Right		N/A				
					Central Park							
					'The Q'							
S06	D	North-West		Monaro & Crawford St Intersection	Riverside Plaza	Right		N/A				
					Central Park							
					'The Q'							


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QUEANBEYAN-PALERANG REGIONAL COUNCIL

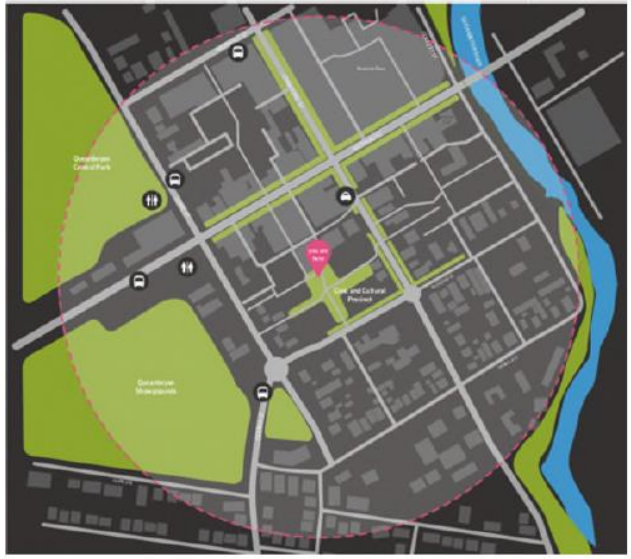
Council Meeting Attachment

9 NOVEMBER 2022

ITEM 9.4 QUEANBEYAN CBD WAYFINDING STRATEGY

ATTACHMENT 2 CONSULTATION REPORT - QUEANBEYAN CBD WAYFINDING STRATEGY

Queanbeyan CBD Wayfinding Strategy - Public exhibition



qprc.nsw.gov.au

Ref: Doc Set ID XXXXXXXX

Executive Summary of engagement report:

The Queanbeyan CBD Wayfinding Strategy was placed on public exhibition between 14 September 2022 and 13 October 2022. The draft strategy was placed on YourVoice for this period. Notices on Council's Facebook page and e-newsletter advised the public of opportunities to view the strategy and provide comments. The intent of this community consultation was to gain feedback on the proposed strategy prior to adoption by Council.

The key recommendations from the public exhibition are as follows:

1. Note the support for the strategy.
2. Proceed with adoption od the Queanbeyan CBD Wayfinding Strategy

Participation in engagement:

Community consultation was conducted from 14 September 2022 to 13 October 2022 through YourVoice. The community were invited to provide any comments on the draft strategy. The consultation was advertised through the registered users of YourVoice and a post was placed on Council's Facebook page directing interested parties to Council's YourVoice link. The draft strategy was available for viewing and download.

There were 71 visits to the exhibition page and 32 downloads of the document.

4 submissions of the online survey were completed. No other submissions were received from the public.

The limited survey responses do not provide any meaningful demographic information.

Comments received:

Table 1 provides a summary of common issues raised by the survey, accompanied by staff response.

Table 2 presents the submissions made to the survey via YourVoice.

Table 1 – Issue summary

Issue	Summary	Response
Support	All four submissions indicated general support for the draft strategy.	• Noted • No change required
Specific requests	Questions were raised re specific routes and locations.	• Noted • Specific routes and locations are not proposed in this strategy; they will be addressed at the time of implementation subject to further consultation. • No change required

Table 2 - Submissions

Respondent	Do you have any comments on the draft Queanbeyan CBD Wayfinding Strategy?	Staff Response
4448151	Great idea, as long as not too many signs in vicinity. Or include info from THOSE signs to reduce the number of signs nearby. I just don't like pink, as long as there's other colours as well, not all pink. Colour co-ordinate areas maybe..???	Noted
4448297	The totems are nice. I already know how to get around the Queanbeyan CBD. How do I safely walk from Tennyson Mews to Queanbeyan East Primary with children without getting run over, or taking a detour to the river? Will shopowners be required to take this on board so you can find your way safely into Kmart?	Noted. Specific routes not addressed in the scope of the draft strategy.
4448406	Three comments: 1. The draft has no specifics about WHERE the signs are to be located, nor WHAT destinations are to be included on the signs. Will you be calling for suggestions at some later stage? 2. On the example map there are a number of green lines marked on some, but not all, streets. What do these represent? I could find no key. 3. I am very glad to see the in-front-at-the-top policy for maps. The old North-at-the-top policy is hard to use, especially when there is no easy way to determine the North direction on the ground (we don't all have a compass handy!)	1. Specific routes not addressed in the scope of the draft strategy. Yes, actual locations and content will be confirmed with public consultation prior to implementation. 2. Green lines are the primary streets in the CBD, clarification will be provided on the signage that is implemented. 3. Noted
4455612	With my community hat and rate payer hat on I would like say that it is great that this signage is now being put in place around Queanbeyan. A couple of suggestions: 1. I would like to firstly suggest that the park at 100 Morisset Street Queanbeyan sometimes nick named the 'Sunshine Club park' be given an appropriate name to acknowledge the Indigenous history of the area. The park had some lovely artworks that have were designed in consultation with the local Indigenous group erected when the BBQ area was put in but a new sign with a name was never put up. It used to have a sign at the entry to the dirt car park which was erected by Qbn Landcare many years ago but has since been removed. 2. Secondly I would like to ask if possible if any signage is put up at this park with directional information, that Queanbeyan parkrun information could be added. The	Noted. Actual locations and content will be confirmed with public consultation prior to implementation.

Respondent	Do you have any comments on the draft Queanbeyan CBD Wayfinding Strategy?	Staff Response
	parkrun has been going at this spot for over 5 years now and we have around 100 + people attend every Saturday. It is a free 5km timed walk or run held every Saturday at 8am. It is completely organised by volunteers. The parkruns are held all over the world and are a major tourist attraction. We have visitors come every week from Overseas and from across Australia who come to not only experience our beautiful course along the river but also to get their 'Q' of parkruns. We would love to encourage more walkers and runners to join in as it is a great community event that encourages people to get active. https://www.parkrun.com.au/queanbeyan/ https://www.parkrun.com.au/ There is a parkrun at Braidwood and also a new one at Mount Jerrabomberra so now have 3 in the QPRC local Government area. ACT have 8. https://www.parkrun.com.au/braidwoodshowground/ https://www.parkrun.com.au/jerrabomberramountainreserve/	