



Rouse Hill recycled water services

Development Servicing Plan 2021

Sydney
WATER

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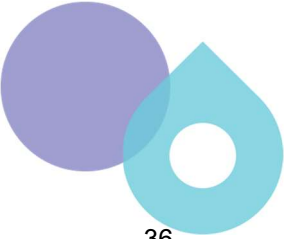




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1 Executive summary

This Development Servicing Plan (DSP) sets out the price for connecting a new development to our Rouse Hill recycled water scheme. The prices have been prepared using the method set by the Independent Pricing and Regulatory Tribunal's (IPART) in their 2019 Determination¹ (the 2019 Determination).

Using the methodology in the 2019 Determination, the revised recycled water infrastructure contribution for the Rouse Hill Recycled Water system is \$4,232 (\$2021-22) per Equivalent Tenement (ET). This is a reduction of around 6% or \$280 per ET compared to the previous charge. The charge will be adjusted each year based on movements in the Consumer Price Index (CPI), with the first adjustment to apply from 1 July 2022.

A detached or semi-detached single residential dwelling is charged as one ET. Table 1-1 summarises the contributions for other developments that have a different level of demand compared to a single residential dwelling. Non-residential developments will have the option to request that infrastructure contributions be calculated using a site-specific estimate of recycled water use (ie, a flow-based charge).

Table 1-1 Recycled water infrastructure contributions for different development densities

Development type:	Residential (\$/dwelling)									Non-residential (\$/ET)
Density (dwellings per pure net hectare*)	0 – 20	21 – 35	36 – 50	51 – 65	66 – 80	81– 95	96 – 125	126 - 155	> 155	
Contribution (\$2021-22)	\$4,232	\$3,217	\$2,158	\$1,777	\$1,523	\$1,439	\$1,270	\$1,142	\$931	\$4,232

* Pure net area equates to developable area

¹ Maximum Prices for Connecting to a Recycled Water System – Final Determination July 2019



2 Development Servicing Plan methodology

Part 2 of this Development Servicing Plan (DSP) outlines the regulation of recycled water infrastructure contributions and explains the way the contribution has been calculated.

2.1 Introduction

2.1.1 Infrastructure contributions and Development Servicing Plans

The *Sydney Water Act 1994* allows Sydney Water Corporation (Sydney Water) to recover the cost of infrastructure that is needed to provide services to properties. The contributions are a means by which Sydney Water can recover the cost of providing infrastructure to service urban development.


Sydney Water levies infrastructure contributions for recycled water services in accordance with IPART's 2019 Determination. The information we have used to calculate infrastructure contributions must be set out in a DSP (this document).

2.1.2 Regulation of infrastructure contributions

IPART is an independent authority that regulates the pricing of declared government monopoly services. IPART may set a maximum price for a government monopoly service, or it may instead decide to set a methodology that must be used to calculate the price.

In the 2019 Determination, IPART set a methodology that must be used to determine the maximum price that can be charged for a new development connecting to a recycled water system. Our application of that methodology must be documented in a DSP, be placed on public exhibition for stakeholder comment, and registered with IPART.

IPART can also regulate recycled water usage charges but has declined to set a regulated usage charge for any of our recycled water schemes. Under the current regulatory framework, Sydney Water must propose a recycled water usage price and IPART will then assess our proposal against a set of pricing principles. IPART will only step in to regulate or set a price where it decides our proposed price is not consistent with their pricing principles. In our April 2020 response to IPART's price determination, we proposed that recycled water usage prices at all schemes would be set at



90% of the non-drought drinking water usage price. IPART accepted this proposal in their June 2020 final determination. There is currently no recycled water service charge for the Rouse Hill scheme.

2.1.3 Payment of a recycled water infrastructure contribution

As a condition of development consent, the consent authority (usually council) requires a developer to make satisfactory arrangements with Sydney Water for the provision of water related services to a new development. To identify the necessary arrangements, a developer must submit to Sydney Water an application for a Section 73 Compliance Certificate.

Upon receiving the application for a Compliance Certificate, Sydney Water investigates the impact that a proposed development is likely to have on its systems. Sydney Water then issues a Notice of Requirements under s74 of the Sydney Water Act. This sets out the conditions that a developer must satisfy before Sydney Water issues a Section 73 Compliance Certificate. For areas with recycled water services, the Notice of Requirements will include the infrastructure contribution payable and/or works that a developer must construct before the services are made available.

2.1.4 Dispute resolution

A developer who is dissatisfied with the way in which Sydney Water has applied IPART's methodology may lodge a complaint with Sydney Water. The dispute process is set out in section 31 of the *Independent Pricing and Regulatory Tribunal Act 1992* (the IPART Act). The first step in this process is to notify Sydney Water of the complaint.

Following a review by Sydney Water, if a developer is still dissatisfied it may request that the matter be reviewed by way of arbitration. An arbitrator is to be appointed by agreement between the developer and Sydney Water and the costs of the arbitration are to be borne equally.

2.1.5 Disclaimer

This DSP and the infrastructure contributions it contains have been prepared by Sydney Water to meet the requirements of the 2019 Determination and have been prepared using the latest available information.



2.2 Regulation - principles and calculation method

2.2.1 Principles of the regulation

In the 2019 Determination, IPART set a methodology for fixing the maximum price for connecting a new development to a recycled water system. The principles underlying IPART's methodology are that contributions should:

- enable the full recovery of relevant costs
- reflect variations in the costs of servicing different developments
- result in new development areas meeting the costs of the services provided
- cover only expenditure that can be clearly linked to development.

2.2.2 The calculation method

The 2019 Determination requires infrastructure contributions to be calculated using the following steps:

- Calculate the present value of the existing and future assets used to provide services in the DSP area
- Deduct the present value of the future net operating result expected to be incurred by providing the services to the DSP area
- Deduct the present value of the cost offsets associated with the recycled water scheme
- Divide the above result by the present value of the number of the benefiting developments in the DSP area.

The contribution rate is expressed as a dollar amount per Equivalent Tenement (ET), where one ET is equal to the assumed demand of a typical residential detached or semi-detached dwelling. The total contribution payable by any given development therefore depends on the assessed number of ETs in that development. The underlying NPV method ensures that, all else being equal, the price paid by each new connection will be the same price (\$/ET) regardless of when the connection occurs.

IPART's formula for calculating recycled water infrastructure contributions (which they describe as Incremental Developer Charges) is shown below.

$$IDC_R = \frac{K}{L_1} - \frac{NPV(R_i - C_i)}{L_2} - \frac{PV(S_i + EB_i + GD_i + AOC_i) + PV(ACC_j)}{L_1}$$

for i = financial years 1,...n and for j = financial years 1,...m

Where:

IDC_{RW} means the Incremental Developer Charge (recycled water infrastructure contribution) per ET to be serviced by the connection;

K means the Present Value of the Capital Charge for Assets (Existing and New) that will serve the relevant DSP area;

L_1 means the Present Value of the number of ETs in the DSP Area for the Capital Charge and Cost Offset (new customers from 1 January 2007);

L_2 means the Present Value of the number of ETs for the Reduction Amount (new customers over 30 years from the current year);

R_i means the future periodic revenues to be received from supplying the Recycled Water Service to new customers in the DSP Area in each financial year i;

C_i means the future operating, maintenance and administration costs of providing new customers in the relevant DSP Area with the services provided by the Recycled Water System in each financial year i

S_i means any subsidy or funding received from another external source received in each financial year i for the provision of the recycled water connection service;

EB_i means the External Benefit in each financial year i;

GD_i means costs associated with a Recycled Water System or part of a Recycled Water System which is the subject of a Government Directive in each financial year i;

AOC_i means Avoided Operating Costs in each financial year i;

ACC_j means Avoided Capital Costs in each financial year j;

n means the financial year which is 30 years from the financial year in which the relevant DSP was registered with IPART

m means a financial year that is at least 30 years from the financial year in which the DSP was registered with IPART



2.2.3 Review of DSPs and infrastructure contributions

This DSP was initially placed on public exhibition for a period of 30 working days. Sydney Water did not receive any submissions from the public during that time so, in consideration that many customers and partners have been dealing with COVID-related challenges, Sydney Water emailed all key stakeholders and provided a one-week extension for submissions. No submissions were received. The DSP was then finalised and registered with IPART. This DSP and associated infrastructure contribution will be reviewed at least once in each five-year period.

The infrastructure contribution price is subject to an annual adjustment in line with movements in the Consumer Price Index. The first adjustment will take effect from 1 July 2022.

2.2.4 Preparation of DSPs

The 2019 Determination identifies the minimum level of information to be included in each DSP. The information requirements relate to the description of the DSP area, demographic and planning assumptions, the standards of service provided, descriptions of assets and the calculation of infrastructure contribution.

2.3 Forecasting urban development rates

Recycled water infrastructure contributions are influenced by existing and forecast development that use up the capacity of assets, and the timing of future capital works to service growth. In addition, the operating revenue is likely to vary over time based on changes to drinking water prices in periodic pricing determinations, given we have decided to link the recycled water usage price to drinking water prices.

2.3.1 Existing development

Sydney Water has used its corporate billing and geographic information systems to determine the extent and type of existing development in the DSP area.

2.3.2 Forecasting residential development

Sydney Water has based our population and residential development forecast in the DSP area on the latest Department of Planning, Industry and Environment (DPIE) information.



2.3.3 Forecasting non-residential development

Commercial and industrial development forecasts have been based on development trends in the DSP area over the last twenty years. Forecast non-residential development has been limited to land currently zoned for commercial and industrial development in the Local Environment Plans of The Hills Shire and Blacktown City Council.

2.4 Forecasting system demand

2.4.1 Forecasting system demand

The growth forecasts for the Rouse Hill Project Area have been used to estimate future demand on the recycled water system. System design allowances have then been applied to identify infrastructure requirements to meet growth and to ensure standards of service are met. Demand has been expressed in terms of average day demand.


2.4.2 Defining an Equivalent Tenement

The 2019 Determination requires infrastructure contributions be expressed in terms of a dollar amount per ET. IPART defines one ET as a measure of recycled water consumption for an average residential dwelling.

In the previous 2006 Determination, IPART required that we adopt a fixed value of 110 kilolitres as the volume of recycled water used by an average residential dwelling over a year. This fixed value applied to all recycled water schemes, even if there was evidence that average demand was higher or lower.

The 2019 Determination removed the requirement to use a fixed value at all schemes, and instead allows for a scheme-specific value to be used. For this DSP we have used a figure of 78 kL a year for the average residential dwelling for the ET consumption. We have based our estimate of ET for Rouse Hill on the recycled water consumption records for freestanding and semi-detached residential properties in the area.

For the purpose of calculating infrastructure contributions we have assumed that an average residential dwelling is a single detached dwelling with a single 20 mm recycled water meter. As such, the design allowances for a single detached dwelling represent the demand of one ET.



All other residential development types are equated to a number of ET based upon the relative design allowances for that development type. For example, if the design allowance for a high-density residential flat is half that of a single detached dwelling, then the flat is considered to be 0.5 ET. All demands are equated to an ET for the purpose of calculating recycled water infrastructure contributions.

Non-residential properties including commercial and industrial developments and special uses such as schools and parks are equated to a number of ET based upon the relative design allowances for that development type based on forecast employee numbers.

2.5 Determining relevant assets

In accordance with the 2019 Determination, the infrastructure contribution calculation includes all recycled water assets that Sydney Water has funded or will fund to provide services to new development.

2.5.1 Existing assets

Sydney Water's financial, developer and geographic information systems were used to identify works that have been constructed to provide a benefit to future development.

- Headworks –the recycled water facilities at the Rouse Hill water recycling plant
- Major (trunk) works – include recycled water delivery pumping stations, drinking water top-up pumping stations, service reservoirs and large diameter recycled water distribution mains
- Distribution mains and lead-in mains which link local areas to the trunk system
- Reticulation mains which are required to deliver recycled water services at a local level within the Rouse Hill Recycled Water Scheme (excluding reticulation mains constructed by developers and handed over to Sydney Water free-of-charge).

2.5.2 Future assets

The 2019 Determination allows Sydney Water to recover the cost of assets that are yet to be constructed and which are identified as being necessary to service future development. The capital expenditure forecasts reflect updated costs prepared as part of recent business cases for Metro North West and Riverstone/Rouse Hill/Castle Hill Treatment Hub, and represent the efficient cost of new assets.

2.5.3 Standards of service

The standards of service for supply of recycled water are set out in the Customer Contract in Sydney Water's Operating Licence. These standards may vary over time with the renewal of the Operating Licence.

The current Licence is effective from 1 November 2019 to 30 November 2023. The Licence requires Sydney Water to ensure that the recycled water system and the recycled water supplied to customers comply with the *Australian Guidelines for Water Recycling 2006* as agreed by NSW Health.

2.5.4 Asset apportionment

The NPV methodology used to calculate infrastructure contribution has several advantages. An important feature of the method is that, everything else staying equal, each developer will pay the same relative contribution to infrastructure costs in a DSP area regardless of when they develop.

In the 2019 Determination, however, IPART changed the definition of ETs for the capital charge component to exclude ETs developed prior to 1 January 2007. In the absence of any other adjustments, this would have resulted in a material increase in the capital charge component for some schemes as the same costs would have been divided through by a smaller number of ETs.

After bringing this to IPART's attention in May 2021, the Tribunal resolved to issue a Clarification Notice under clause 2.2(b) of Schedule 6 of the 2019 Determination. The Notice took effect when it was published in the NSW Government Gazette, No 337 of 23 July 2021. According to the notice, Sydney Water is required to adopt the following interpretation when estimating the capital charge:


“any portion of an Asset attributable to Pre-2007 Equivalent Tenements is not a ‘relevant Asset’ for the purposes of clause 2.3(a)(1) of Schedule 4 to the Determination and should be excluded.”

In relation to cost offsets, IPART's notice also clarifies that Sydney Water must apply the following approach:

“When estimating the External Benefit (EB_i), Avoided Capital Costs (ACC_i) and Avoided Operating Costs (AOC_i) Cost Offset Variables, any part of these Cost Offset Variables attributable to Pre-2007 Equivalent Tenements should be excluded.”

Sydney Water considers that this clarification restores the original principles of the NPV method, and will ensure that capital costs, cost offsets, and ETs are assessed on a consistent basis. It does not materially change the resulting contribution charge for each ET of development.

To give effect to IPART's notice, we have calculated an apportionment factor that must be applied to capital costs and cost offsets. The apportionment factor is calculated as the present value of ETs developed to 1 January 2007 divided by the present value of all ETs in the scheme.



Based on development rates to date, this results in an apportionment factor of 55%. That is, the infrastructure contribution will exclude 55% of the value of capital costs (both existing and new assets) and cost offsets.

2.5.5 Valuation of existing assets

For all existing assets, Sydney Water has revised and updated previous MEERA value estimates.

2.5.6 Valuation of future assets

Capital expenditure for future works included in the calculation of infrastructure contributions reflect our best estimate of the efficient cost of those assets.

2.6 Operating result

The operating result equals the operating revenue from future development less the operating and maintenance costs associated with servicing this development. As required by the 2019 Determination, the forecast operating result is based on the expected urban development in the recycled water DSP area over the next thirty years from the year in which IPART is forecast to register the DSP.

2.6.1 Revenue

The operating revenue forecasts are based upon the 2020 Price Determination Final Report for drinking water and consequential link to recycled water pricing². Beyond the price path, the current service and usage charges have been assumed to remain constant in real terms. That is, the charges only change by the inflation rate. The operating revenues are based on average usage of 78 kL per ET.

² As noted in Section 11.3.1 of IPART's *Final Report, Review of prices for Sydney Water, June 2020*, we currently set the price of recycled water at 90% of the non-drought price for drinking water.

2.6.2 Operating and maintenance costs

The future operating and maintenance costs for the Rouse Hill Recycled Water Scheme are based on actual and estimated costs. The method of calculating costs identifies:

- the processes and activities required to produce the recycled water (eg treatment, distribution)
- the cost driver for each process/activity (eg electricity, chemicals)
- support costs (eg customer meter reading costs)
- corporate overheads (allocated proportional share of Sydney Water's corporate costs in line with the 2020 Price Determination)

The majority of the operating and maintenance cost components are variable and depend on throughput. For example, distribution pumping costs are calculated using the volume of water supplied, the kilowatts of power required and the unit costs of electricity. However, some operating cost components such as corporate overheads do not vary with throughput in the short-term. Under IPART's 2019 Determination however, the total corporate overheads allocated to the scheme must be split between existing and new ETs. As such, the proportion of corporate overheads included in the calculation of this DSP charge increases each year in line with increasing numbers of new ETs relative to total ETs.

In the final report that accompanied the 2019 Determination, IPART confirmed that recycled water infrastructure contributions are able to capture any scheme costs that are not recoverable by other means, subject to their being an overall nexus between new development and each cost item. In this DSP, we are recovering the net income tax liability that Sydney Water must pay on assets constructed by developers and handed over to us as an Asset Free-of-Charge (AFOC).

In line with statutory accounting rules, if an entity receives an asset but was not required to pay for it (AFOC), the value of those free assets is treated as income and will attract an income tax liability in the year of commissioning. The initial tax payment is only partially offset by future depreciation tax benefits over the life of the asset, resulting in a non-zero net cost. A similar tax liability applies to drinking water and wastewater mains handed over to us by developers, however we can recover that cost via general customer prices.

We have no avenue to recover the tax liability for recycled water reticulation mains, as we are unable to pass-on the costs of higher cost recycled water schemes to general customer prices. After accounting for future depreciation tax benefits, we estimate that the net tax liability on recycled water AFOC increases operating costs by around \$820 per ET, and this has been reflected in the total infrastructure contribution.

Total overall operating costs for the Rouse Hill Recycled Water Scheme increase in line with development forecasts, as shown in Table 4-7.

2.7 Cost offsets (avoided costs)

The 2020 Determination established a framework for recycled water charges that includes consideration of avoided or deferred costs.

IPART defines an avoided cost as the expected reduction in a public water utility's operating and capital costs from the temporary or permanent deferral of augmentation of infrastructure for the provision of potable water, wastewater and/or stormwater services, as a result of the provision of a recycled water, sewer mining or stormwater harvesting service (all other things being equal)³. In other words, cost savings made in water and wastewater systems due to the provision of recycled water services can be deducted or offset against recycled water infrastructure contributions. These avoided costs are then recoverable under general water or wastewater pricing.

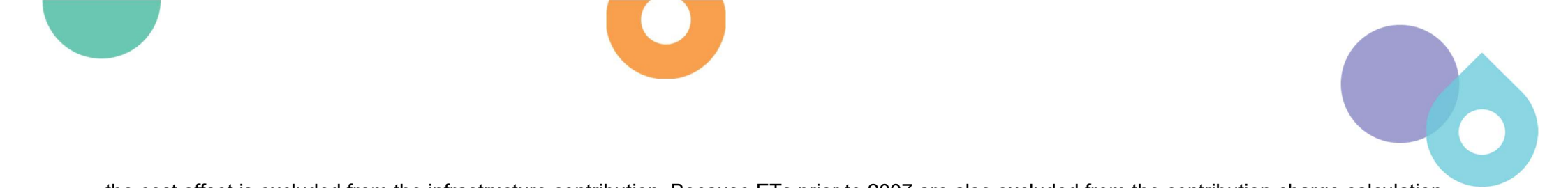
The Rouse Hill Recycled Water Scheme reduces the volumes of treated effluent and therefore nutrient loads being discharged to waterways draining to the Hawkesbury-Nepean River. Effluent flows from the Rouse Hill area increase with new development. However, Sydney Water must continue to meet the water quality requirements of the regulatory environmental planning approval for the Rouse Hill wastewater treatment plant (WWTP). To comply with the Environment Protection Licence, Sydney Water must either expand recycled water distribution or install additional nitrogen removal facilities at the WWTP.

In 2016, Sydney Water estimated the cost of the two options (with and without the expansion of Rouse Hill recycled water network) and calculated a wastewater avoided cost. By expanding the recycled water distribution, IPART determined that Sydney Water deferred expenditure of \$32 million (present value, \$2021-22) that would otherwise would have been spent on additional wastewater treatment processes. This amount is therefore included as an avoided cost in the infrastructure contribution calculation.

IPART also allowed potable water avoided costs attributable to expansion of the Rouse Hill Recycled Water Scheme to be \$3.8 million (present value, \$2021-22).

As outlined earlier, IPART has since clarified the 2019 Determination and requires that both capital costs and cost offsets must be apportioned to exclude the period prior to 1 January 2007, which aligns with the requirement to calculate the capital charge component using ETs after 1 January 2007. We have applied this clarification by calculating an apportionment factor that is calculated as the present value of ETs developed as at 1 January 2007 divided by the present value of ETs across the life of the scheme. This results in an apportionment factor of 55%, meaning that 55% of

³ IPART 2020, *Review of Prices for Sydney Water, Final Report*, p36



the cost offset is excluded from the infrastructure contribution. Because ETs prior to 2007 are also excluded from the contribution charge calculation, the use of the apportionment factor does not materially change the resulting charge. However, IPART require us to apply this adjustment.

After applying this apportionment factor, the total cost offset allowed for in the Rouse Hill recycled water infrastructure contribution is \$16.2 million (present value, \$2021-22) which acts to reduce the infrastructure contribution rate by around \$430 per ET.



3 Rouse Hill Recycled Water Scheme

This section provides information about the area served by the Rouse Hill Recycled Water Scheme and the infrastructure included in this DSP. The development and demand rates used in the calculation of the developer charge are also detailed.

3.1 Rouse Hill recycled water DSP

3.1.1 History of the Rouse Hill recycled water supply scheme

The Rouse Hill Project Area is served by a dual water supply system. Two parallel systems are provided, a potable (drinking water) supply for household uses such as drinking, cooking and washing, and a recycled supply for toilet flushing and outdoor uses such as garden watering. Recycled water is tertiary treated sewage effluent that has been further treated to make it suitable for non-potable uses. A dual supply has been provided because this was a requirement specified in the Determining Authority's Report subsequent to the Environmental Impact Assessment for Rouse Hill Sewage Treatment Plant.

The Rouse Hill recycled water system area is owned, operated and maintained by Sydney Water.

3.1.2 Boundaries and location

Recycled water from the Rouse Hill RWP is pumped to Kellyville, Parklea and Parklea North reservoirs via a pumping station (RP0306) located at the plant. Recycled water flows via gravity to customer properties, and the area or zones served by these three reservoirs define the boundary of the Rouse Hill Recycled Water DSP. The boundary of this DSP has not changed since the 2016 DSP, as there has been no changes in the boundary of the supply reservoir zones.

The Rouse Hill Recycled Water Scheme service area is described in Table 3-1 and shown in Figure 1 including population in 2020, 2030 and 2050 projected population. Forecast annual growth in ETs over the next 30 years is shown in Figure 2.

Table 3-1 Description of the Rouse Hill Recycled Water DSP Area

Area (hectares)	4,427
Local Government Area	The Hills Shire and Blacktown City Council
Estimated population 2020	110,819
2030	157,898
2050	173,156

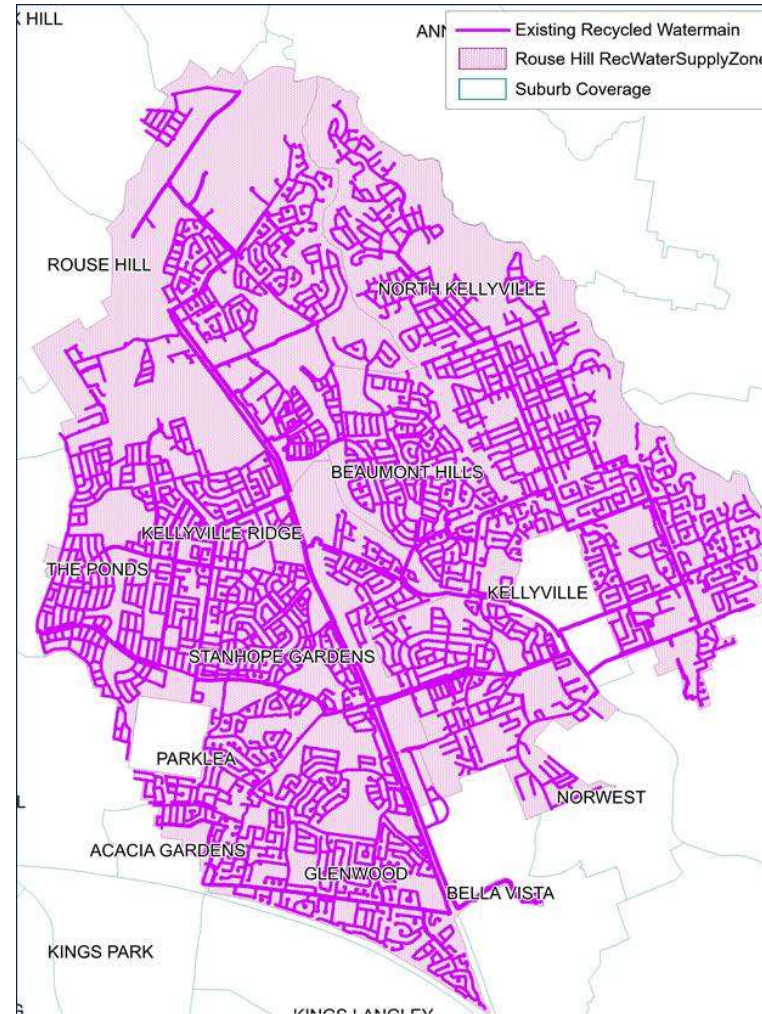


Figure 1 Rouse Hill recycled water DSP boundary

Figure 2 Forecast ET growth per year

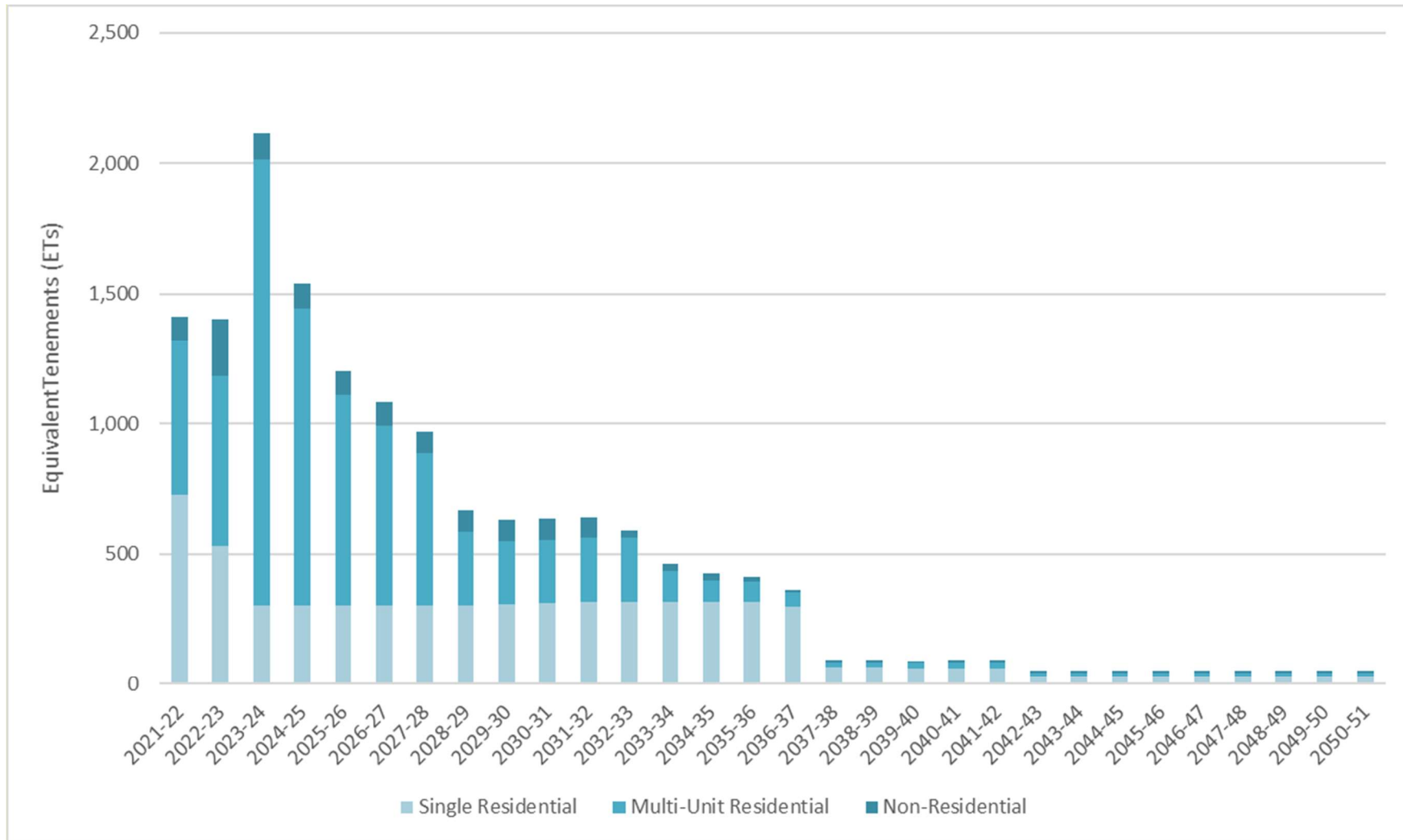
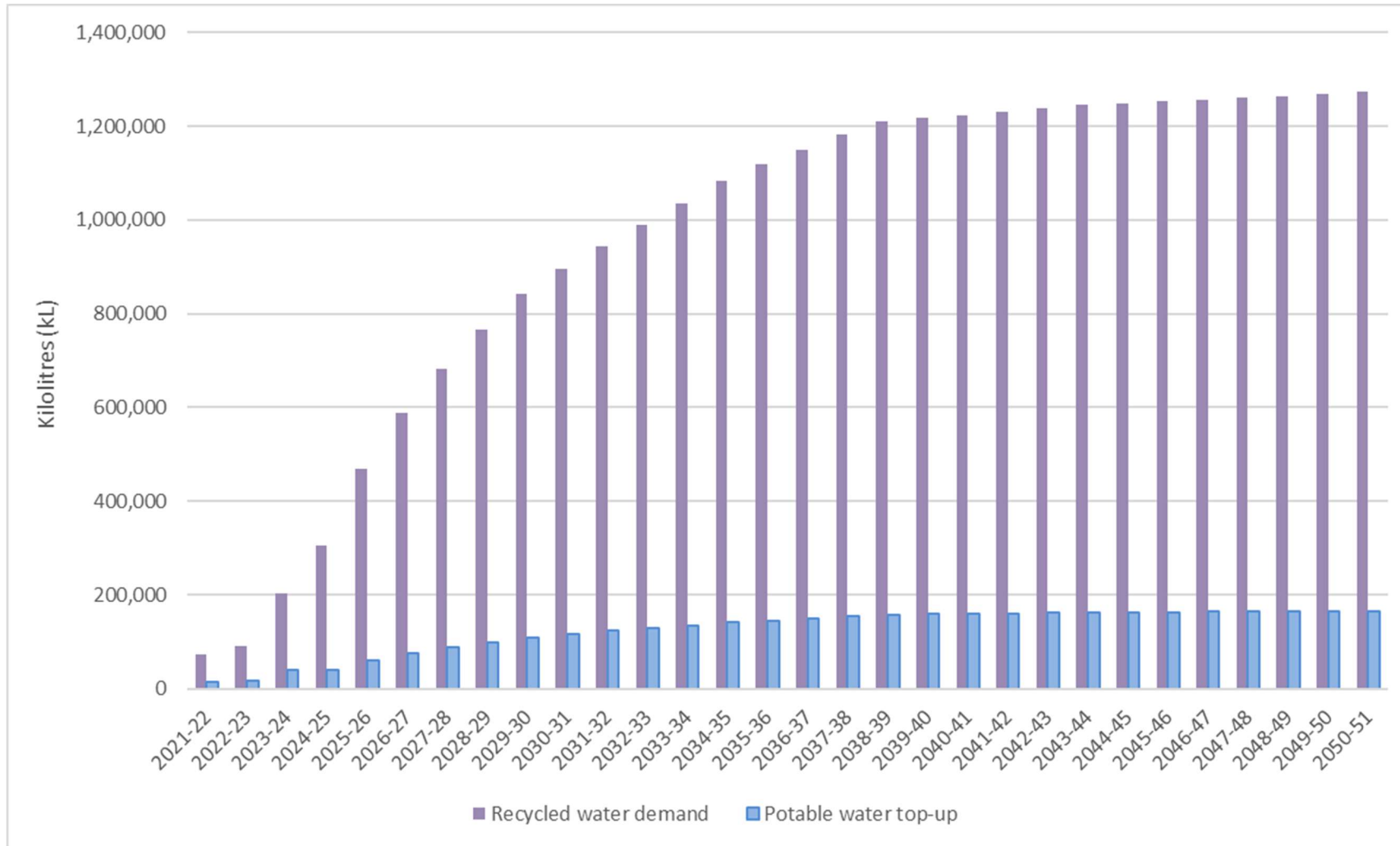


Figure 3 Cumulative recycled water demand from new customers (and need for potable top-up)



3.1.3 Recycled water infrastructure

The infrastructure includes:

- Headworks – such as the recycled water facilities at Rouse Hill wastewater treatment plant (WWTP)
- Major works – include recycled water delivery pumping stations, potable water top-up pumping stations, elevated service reservoirs and large diameter recycled water distribution mains
- Lead-in works – which link developer areas to the existing system, and
- Reticulation mains – which are required to deliver recycled water services within the Rouse Hill Project Area⁴.

The Rouse Hill Recycled Water Scheme is supplied by the recycled water plant located at the Rouse Hill WWTP. Tertiary treated effluent from the WWTP is treated in the recycled water plant by superchlorination and ultraviolet (UV) disinfection to meet the quality guidelines set by *The Australian Guidelines for Water Recycling: Managing Health and Environmental Risks* (2006).

Recycled water is pumped via RP0306 to service reservoirs at Parklea, Parklea North and Kellyville. It is then distributed to the Rouse Hill Project Area via recycled water trunk mains. When demand for recycled water exceeds supply the recycled water reservoirs are supplemented with drinking water. Each recycled water reservoir incorporates a drinking water top-up pumping station.

Most of the Rouse Hill Recycled Water Scheme has already been constructed. Future works will extend services to developments in North Kellyville and to release areas to the north of Parklea known as Second Ponds Creek and Area 20. These works are shown in Figure 4 (see Section 3.2.2).

We also have two major projects planned to deliver new infrastructure required for the Rouse Hill scheme. Pipe amplifications, upgrade of the RP0306 pumping station and installation of five pressure reduction valves (PRVs) - which are required to reduce the recycled water pressure below drinking water pressure.

We also plan to upgrade the wastewater treatment plant to increase plant capacity and reliability, which will indirectly benefit the recycled water plant. The wastewater treatment upgrades will be delivered under our North West Treatment Hub Phase 2 project, and no share of the cost has been allocated to the recycled water infrastructure contribution.

⁴ Reticulation mains constructed by developers and handed over as AFOC are not eligible to be recovered in the infrastructure contribution. Any contribution made by Sydney Water towards the cost of those assets has been captured in the capital charge. We also propose recovering the net tax liability that must be borne by Sydney Water due to these assets.

3.2 Assets

The assets included in the calculation of the Rouse Hill Recycled Water DSP have been identified and valued in accordance with the method described in Section 2.5.

3.2.1 Existing assets

Existing assets constructed to service development in the area covered by this DSP include the water treatment plant, reservoirs, mains and pumping stations. The values of these assets are included in the calculation of the infrastructure contribution and are described in Appendix 1.

3.2.2 Future assets

Planned future assets are shown in Figure 4, and include around 3.6 km of new or upgrade water mains and new associated pressure reduction valves (PRVs).

At the recycled water treatment plant, upgrades to the UV disinfection system will be required by 2024-25 and a new SCCT tank will be needed by 2029-30.

These assets have been identified based on the forecast development rates in the Rouse Hill Project Area.

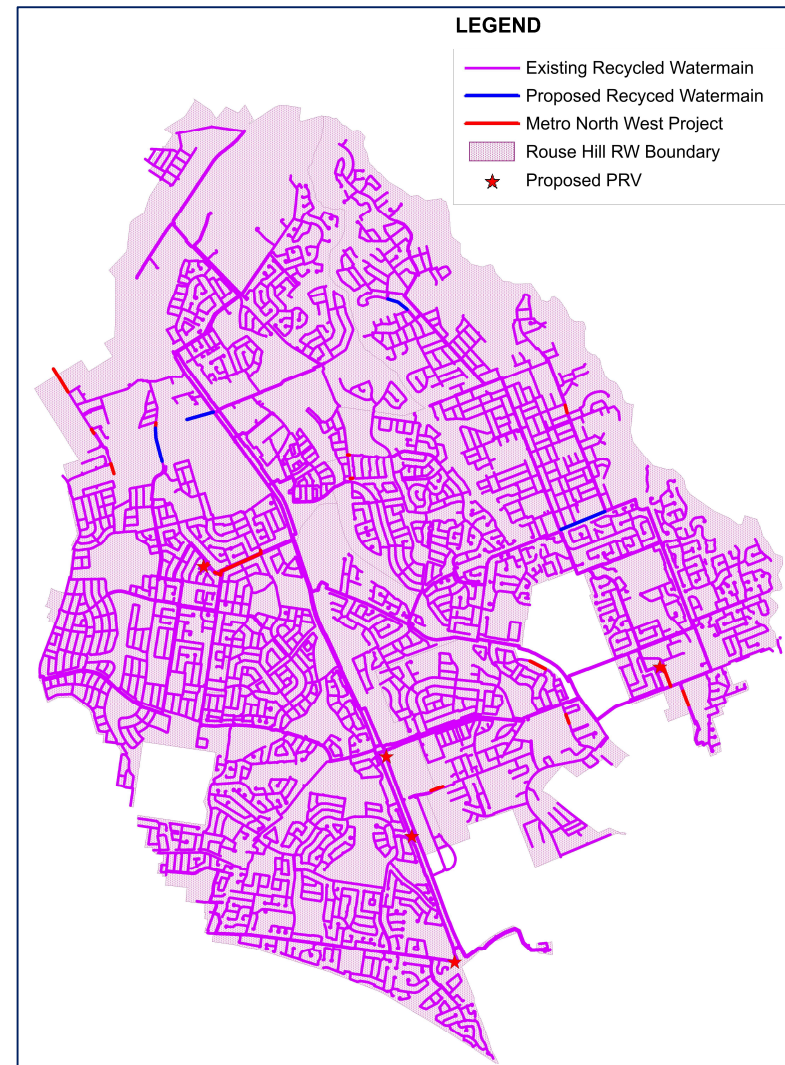
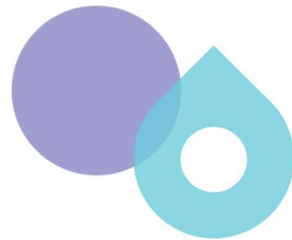


Figure 4 Proposed future infrastructure

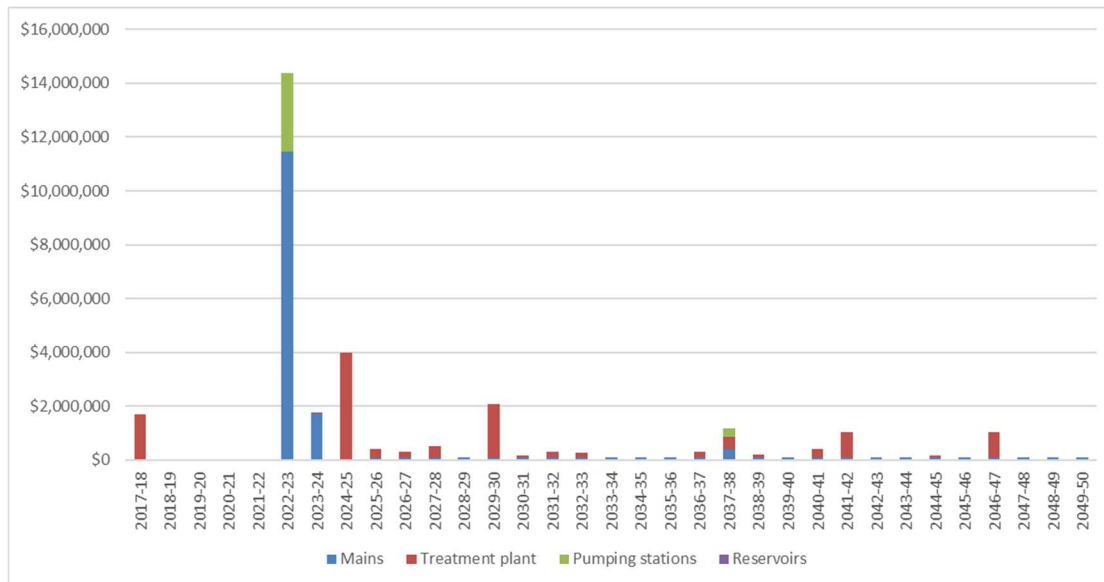


3.2.3 Asset renewals

The capital charge for future assets includes an allowance for various asset renewals and replacements over time, as existing assets reach the end of their life including:

- Replacement of recycled water meters from 2025-26 at a cost of around \$116,000 a year
- Renewal of pressure reducing valves (PRVs) every 15 years
- Renewal of pumps and other mechanical parts every 10 to 15 years
- Renewal of electrical components every seven to 10 years
- Building works to maintain structural integrity every 15 years

Figure 5 Forecast capital expenditure



4 Infrastructure contribution calculation

4.1 Key assumptions and inputs

This section sets out key assumptions in the calculation of the infrastructure contribution.

Table 4-1 - Inputs to the infrastructure contribution calculation model

Recycled Water Scheme	Rouse Hill
Present Year for Evaluation	2021-22
Real Pre-tax Rate of Return	4.2%
Recycled Water Charges	2021-22
Usage Charge (\$/kL)	\$2.12
Recycled Water Average Consumption	
ET Consumption (kL/year)	78
Multi Residential (kL/dwelling/year)	36
Asset Apportionment	
Present value of all ETs (past + future)	83,566
Present value of ETs before 1 Jan 2007	45,833
Present value of ETs post 1 Jan 2007 (L ₁)	37,733
Present value of ETs from 1 July 2021 (L ₂)	12,258

4.2 Capital charge

4.2.1 Existing assets

Table 4-2 Value of commissioned assets 1992-93 to 2021-22 (MEERA values)

	1992-93 to 1996-97	1997-98 to 2001-02	2002-03 to 2006-07	2007-08 to 2011-12	2012-13 to 2016-17	2017-18 to 2021-22
Mains	\$58,762,533	\$9,269,170	\$10,270,912	\$6,833,551	\$3,087,266	\$392,298
Treatment and pumping	\$17,546,771	\$360,828	\$0	\$13,438,091	\$0	\$0
Reservoirs	\$9,781,160	\$0	\$0	\$0	\$0	\$0

Table 4-3 Value of commissioned assets attributable to development post 1 January 2007 (MEERA values)

	1992-93 to 1996-97	1997-98 to 2001-02	2002-03 to 2006-07	2007-08 to 2011-12	2012-13 to 2016-17	2017-18 to 2021-22
Mains	\$26,443,140	\$4,171,126	\$4,621,910	\$3,075,098	\$1,389,269	\$176,534
Treatment and pumping	\$7,896,047	\$162,372	\$0	\$6,047,141	\$0	\$0
Reservoirs	\$4,401,522	\$0	\$0	\$0	\$0	\$0

The values in Table 4-3 are calculated as 45% of the corresponding value in Table 4-2, reflecting IPART's requirement that asset values and cost offsets relating to ETs prior to 1 January 2007 should be excluded from the infrastructure contribution calculations.

4.2.2 Future assets

Table 4-4 Value of uncommissioned assets (efficient cost)

	2017-18 to 2020-21	2021-22 to 2025-26	2026-27 to 2030-31	2031-32 to 2035-36	2036-37 to 2040-41	2041-42 to 2045-46	2046-47 to 2050-51
Mains	\$0	\$13,296,819	\$579,210	\$579,210	\$859,804	\$579,210	\$463,368
Treatment and pumping	\$1,691,498	\$7,295,105	\$2,634,636	\$348,551	\$1,383,953	\$973,893	\$922,635
Reservoirs	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Table 4-5 Value of uncommissioned assets attributable to development post 1 January 2007 (efficient cost)

	2017-18 to 2020-21	2021-22 to 2025-26	2026-27 to 2030-31	2031-32 to 2035-36	2036-37 to 2040-41	2041-42 to 2045-46	2046-47 to 2050-51
Mains	\$0	\$5,983,568	\$260,644	\$260,644	\$386,912	\$260,644	\$208,516
Treatment and pumping	\$761,174	\$3,282,797	\$1,185,586	\$156,848	\$622,779	\$438,252	\$415,186
Reservoirs	\$0	\$0	\$0	\$0	\$0	\$0	\$0

The values in Table 4-5 are calculated as 45% of the corresponding value in Table 4-4, reflecting IPART's requirement that asset values and cost offsets relating to ETs prior to 1 January 2007 should be excluded from the infrastructure contribution calculations.

4.2.3 Capital charge

Table 4-6 Capital charge calculation components

Recycled Water Scheme	Rouse Hill
(A) Present value of capital expenditure (K)	\$166,402,661
(B) Present value of ETs (L ₁)	37,733
Capital charge (A) / (B)	\$4,410 / ET

4.3 Net operating result

4.3.1 Revenue

All revenue is collected via a recycled water usage charge, which is set at 90% of the potable water usage price. Cumulative recycled water demand from new development was shown previously in Figure 3, and total revenue is simply annual recycled water demand multiplied by the recycled water usage price.

The present value of revenue from new developments is \$31,132,998.

4.3.2 Operating costs

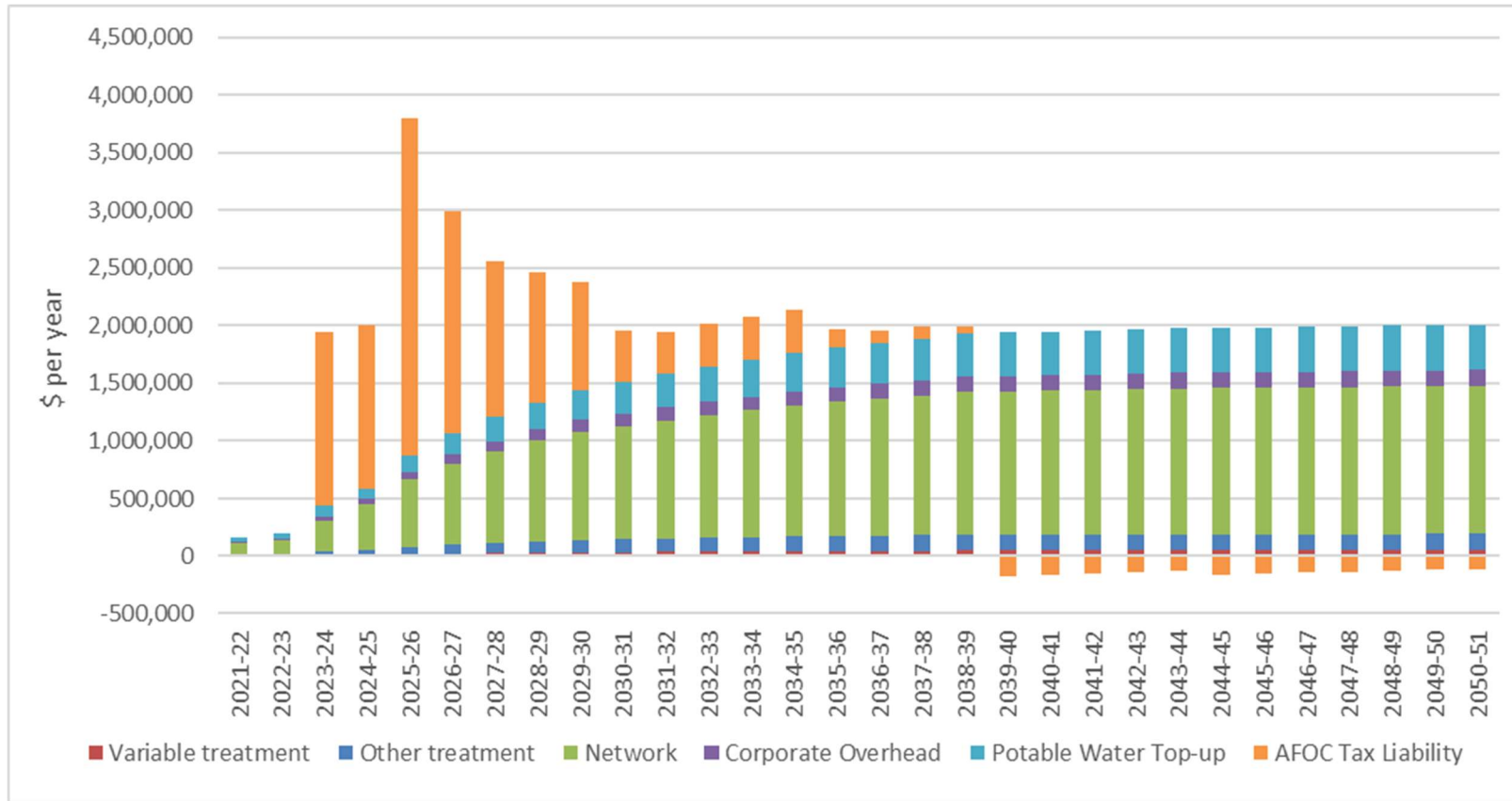
The operating costs of the Rouse Hill recycled water scheme include:

- Fixed and variable treatment costs
- Network related operating and maintenance costs (excluding renewals)
- An allocation of corporate overheads

- Potable water top-up (valued at the retail price of potable water, in order to maximise incentives to avoid potable top-up)
- Our net tax liability relating to assets free of charge

Our forecasts of future operating costs are summarised in Figure 6 below.

Figure 6 Forecast operating expenditure



4.3.3 Net operating result

The net operating result is shown in Table 4-7. As the amount of operating revenue we receive from new development is insufficient to recover the incremental operating costs created by that development, the short-fall must be added to the overall infrastructure contribution.

Table 4-7 Net operating result

Recycled Water Scheme	Rouse Hill
(D) Present value of revenue (R)	\$31,132,998
(E) Present value of operating costs (C)	\$34,197,368
(F) Present value of ETs (L ₂)	12,258
Net operating result ((D) + (E)) / (F)	-\$250 / ET

4.4 Infrastructure contribution price

The following table details the components of the infrastructure contribution calculation.

Table 4-8 - Components of the infrastructure contribution price (\$2021-22)

Capital charge	Net operating result	Avoided costs	Infrastructure contribution (\$/ET)
\$4,410	(\$520)	\$428	\$4,232

The following table shows the infrastructure contribution charge that would apply to developments where the density of new properties is greater than a typical detached single dwelling (0-20 dwellings per pure net hectare), as well as the ET charge that would be used to calculate a flow-based charge for non-residential developments.

Table 4-9 - Schedule of developer charges

Development type:	Residential (\$/dwelling)									Non-residential (\$/ET)	
	Density (dwellings per pure net hectare*)	0 – 20	21 – 35	36 – 50	51 – 65	66 – 80	81– 95	96 – 125	126 - 155		> 155
Contribution (\$2021-22)		4,232	3,217	2,158	1,777	1,523	1,439	1,270	1,142	931	4,232

*Pure net area equates to developable area

4.4.1 Comparison with previously applicable infrastructure contributions

From 1 July 2021 the infrastructure contribution for recycled water at Rouse Hill has been set at \$4,510 per ET.

The current price was calculated under IPART's previous recycled water determination which was made over fifteen years ago in 2006. IPART introduced several changes to the charge calculation methodology in 2019 to ensure the full net cost of delivering recycled water services could be recovered by a combination of infrastructure contributions and on-going customer charges.

The updated developer charge is \$4,232 per ET, which will apply once the final DSP has been registered with IPART. We expect this to occur in early October 2021. The updated infrastructure contribution rate is around 6% lower than the current rate. This largely reflects a reduction in the discount rate that is used in the calculation method, which has dropped from 5.9% in the 2016 Rouse Hill DSP to 4.2% in this DSP, offset by a variety of other changes in the assumptions we have used (eg, a more accurate figure for recycled water demand).

We consider the charge represents good value for the services provided. For example, in 2012, the Australian Water Recycling Centre of Excellence estimated that connection to recycled water supply at the Rouse Hill scheme resulted in an increase in property value of \$5,000 on average. In addition, Sydney Water estimates that connection to recycled water avoids a further \$7,000 expense which would otherwise be required to install and operate a rainwater tank to comply with the Building and Sustainability Index (BASIX).

Appendix 1 – Commissioned assets funded by Sydney Water

Table A1-1 Existing gravity and pressure mains – length of main installed by year

Diameter (mm)	100	150	200	250	300	375	400	450	500	560	600	750	Total
1992-93							17						17
1993-94				13	783	1,105		1,810			474	891	5,076
1994-95				679	1,459	1,872		3,131			6,334	886	14,361
1995-96				357	1,478	1,042		7,221			6,899		16,997
1996-97			4	1,533									1,537
1997-98					1,397	27							1,424
1998-99				47	211								258
1999-00			2,024	411	1,248	243		22			59		4,007
2000-01	4,480	1,373	866	694	756	996		770	45		26	57	10,064
2001-02	3,086	687	490	969	198		86						5,516
2002-03	52	40		33		61							186
2003-04				646	117								763
2004-05	194			252	800	1,062							2,308
2005-06			556	1,806	1,029	739		2,039					6,169
2006-07		37	11	187	1,085	644							1,964
2007-08		441	2,064	517	35	95							3,152
2008-09		878	570	839									2,287
2009-10			205	883	113	13		84			88		1,386
2010-11			281	621	95	562		1,069	9	94			2,732
2011-12			840	867	266	1,249							3,221
2012-13			967	359	71	219		19					1,634
2013-14			899	519									1,418
2014-15				956	8	168							1,132
2015-16			1,020	172		276							1,468
2016-17			145	119	217	234							715

Diameter (mm)	100	150	200	250	300	375	400	450	500	560	600	750	Total
2017-18			779	1									780
2018-19			112	177									289
Grand Total	7,812	3,457	11,832	13,658	11,366	10,607	103	16,165	54	94	13,880	1,834	90,862

Table A1-2 Existing gravity and pressure mains – MEERA value of installed mains by year (\$ millions, \$2021-22)

Diameter (mm)	100	150	200	250	300	375	400	450	500	560	600	750	Total
1992-93							0.031						0.00
1993-94				0.009	0.676	1.075		2.409			1.090	1.851	0.03
1994-95				0.479	1.226	1.822		4.179			12.486	2.300	7.11
1995-96				0.252	1.260	1.014		9.609			15.871		22.49
1996-97			0.003	1.121									28.01
1997-98					1.144	0.026							1.12
1998-99				0.033	0.083								1.17
1999-00			1.277	0.303	0.874	0.252		0.040			0.161		0.12
2000-01	0.450	0.189	0.185	0.203	0.625	0.891		1.025	0.093		0.071	0.190	2.91
2001-02	0.383	0.100	0.139	0.215	0.162		0.157						3.92
2002-03	0.002	0.002		0.023		0.059							1.16
2003-04				0.327	0.093								0.09
2004-05	0.051			0.069	0.712	1.046							0.42
2005-06			0.358	1.295	0.865	0.719		2.853					1.88
2006-07		0.002	0.002	0.043	1.033	0.716							6.09
2007-08		0.019	0.028	0.118	0.012	0.090							1.80
2008-09		0.014	0.065	0.644									0.27
2009-10			0.010	0.062	0.116	0.020		0.154			0.240		0.72
2010-11			0.044	0.472	0.117	0.574		1.488	0.019	0.217			0.60
2011-12			0.330	0.522	0.227	1.233							2.93
2012-13			0.479	0.253	0.036	0.232		0.034					2.31
2013-14			0.460	0.366									1.03

Diameter (mm)	100	150	200	250	300	375	400	450	500	560	600	750	Total
2014-15				0.422	0.006	0.142							0.83
2015-16			0.170	0.060		0.053							0.28
2016-17			0.021	0.076	0.150	0.129							0.37
2017-18			0.343	<0.000									0.34
2018-19			0.018	0.031									0.05
Grand Total	0.89	0.33	3.93	7.40	9.42	10.09	0.19	21.79	0.11	0.22	29.92	4.34	88.62

Note: assets only appear in this table if they have been fully or partly funded by Sydney Water.

Table A1-3 Pre-2007 Existing water pumping stations and water treatment plants

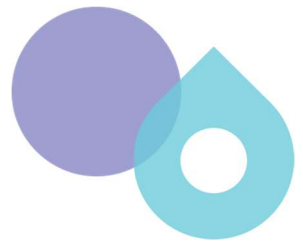
Commission Year	Asset Name	Asset Number	Purpose	Pump Configuration	Power (kw)	MEERA value included in DSP (\$2021-22) \$m
1995-1996	Parklea Pumping Station	WP0309	To service growth in Parklea, Glenwood, Stanhope and Acacia Gardens suburbs.	1x75, 2x124	323	4.7
1995-1996	Parklea North Pumping Station	WP0308	To service growth in Rouse Hill and Kellyville Ridge suburbs.	1x85, 2x110	305	2.9
1995-1996	Kellyville Pumping Station	WP0307	To service growth in Kellyville and Beaumont Hills suburbs.	1x26, 1x80	106	2.0
1995-1996	Recycled Water Pumping Station	RP0306	To service growth in Kellyville and Beaumont Hills suburbs.	1x110, 2x220	550	2.2
2001-2002	Recycled Water Treatment Plant					0.4
1993-1994	Land acquisition (at WTP facility)					1.7
1993-1994	Rechlorination Plant	RX0001	To chlorinate water			1.3
1993-1994	Rechlorination Plant	RX0002	To chlorinate water			1.3
1993-1994	Rechlorination Plant	RX0003	To chlorinate water			1.3

Table A1-4 Existing reservoirs

Commission Year	Reservoir Name	Reservoir Number	Purpose	Type	Size (ML)	MEERA value included in DSP (\$2021-22) \$m
1993-1994	Kellyville RS0447	RS0447	To service growth in Kellyville and Beaumont Hills suburbs.	Elevated	2	2.8
1992-1993	Parklea North RS0448	RS0448	To service growth in Rouse Hill and Kellyville Ridge suburbs.	Elevated	2	2.8
1993-1994	Parklea RS0449	RS0449	To service growth in Parklea, Glenwood, Stanhope and Acacia Gardens suburbs.	Elevated	2	2.8
1995-1996	Recycled Water Storage Tank including 0.44 MI		To service growth in Rouse Hill, Kellyville Ridge, Kellyville, Beaumont Hills, Parklea, Glenwood, Stanhope and Acacia Gardens suburbs.	Surface	1.25	1.3

Table A1-5 Post 2007 Existing recycled water treatment plant works and pumping stations

Commission Year	Asset Name	Asset Number	Purpose	Type	Size	DSP Cost (\$2021-22) \$m
2007-2008	UV system		Upgrade of recycled water treatment facility			3.4
2007-2008	Super chlorination tank		Upgrade of recycled water treatment facility			2.4
2007-2008	R.W storage		Upgrade of recycled water treatment facility	In Ground	6MI	1.8
2007-2008	Modification to R.W transfer pump		Upgrade of recycled water treatment facility			1.3
2007-2008	Pumping station upgrade	RP0306	To service growth in Rouse Hill			4.6



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