

##### 2023 Water Price Review

# Supporting Paper 7: NCC tariff structure and prices

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1. Executive summary

Barwon Water proposes to set NCC tariffs as follows (in 2022/23 dollars):

Table 1 NCC tariffs

|  | **2018-23** | **2023-28** |
| --- | --- | --- |
| **Service** | **Greenfield** | **Infill** | **Greenfield** | **Infill** |
| Water (inc. RW) | 3,348 | 675 | 3,680 | 736 |
| Sewer | - | - | 539 | 108 |
| Total per residential lot | 3,348 | 675 | 4,219 | 844 |
|  |  |  |  |  |
| Fyansford Water (inc. RW) | 2,396 | - | 2,396 | - |
| Fyansford Sewer | 1,007 | - | 1,007 | - |
| Total per residential lot | 3,403 | - | 3,403 | - |

1. Purpose and scope

The purpose of this supporting paper is to describe and explain Barwon Water’s proposed new customer contribution (NCC) prices and tariff structures for the next regulatory period.

It is consistent with and complemented by the NCC framework document to be published on our website following the 23-28 Pricing Determination by ESC. [2023-28 NCC Framework (A19784556)]

## How this document aligns with ESC Guidance

Barwon Water has applied the NCC pricing principles in determining proposed NCCs for the next regulatory period. This document accompanies the NCC model that we have provided as part of our submission, and describes the data sources and input assumptions that are included in the model. This includes:

* details about how the forecast developer contributions have been derived
* how past outcomes for contributions have been considered
* assumptions about future growth
* financial parameters that are consistent with the financial model template.
1. Reviewing the approach to determining NCCs

# Our approach to determining NCCs

### Model

The model used to calculate proposed NCCs is the same as that used for the previous price determination. The model is a version of the Capital Contribution Model published on the ESC’s webpage for NCC’s guiding resources, applied over a 30-year period.

At a high level, the model uses 30 year period of forecast capital and operating costs associated with servicing growth, and future revenue from the new customers forecast to connect over that period. Barwon Water received advice from Utilities Regulation Advisory (URA) recommending this approach. This is the only difference with the approach adopted for the current price period (2018-23) which included 10 years of legacy growth related capex, 10 years of forecast capex, and a growth forecast for 10 years that tapers off five percent every year after year 10.

It is proposed that the new NCC prices will apply on the 1st July 2023 and remain flat thereafter.

### Iterations and Industry Review

Barwon Water has been involved with a broader VicWater working group with URA on NCC modelling. Preliminary modelling utilising URA’s ‘average incremental cost’ approach was undertaken, however this resulted in very high NCC’s. Given the status of the URA approach in the context of timeframes for our price submission, and given the very high NCC price that would result from this approach, Barwon Water has opted in favour of retaining the ESC’s model.

The team has modelled numerous iterations using the ESC’s NCC model. These include variations of:

* 10, 15, 20 & 30 year analysis period
* 10, 15, 20 & 30 year capex/growth
* Legacy & no legacy capex
* Split for North Western Geelong Growth Area (NWGGA) and remaining growth
* Splits for water supply and sewerage treatment zones
* smooth pricing versus year 1 jump then flat pricing

It has been found through this modelling that even small changes in key inputs, such as growth, tariffs, WACC or capex, cause material changes to the NCC charge.

### Outcomes arising from developer contributions in the current regulatory period

The current regulatory period has been characterised by continued rates of growth that are amongst the highest in Victoria. This was further exacerbated by increased regional migration, driven by the onset of the coronavirus pandemic. Barwon Water experienced higher rates of new customer connections than forecast, both in greenfield and infill development.

Growth in connections was amongst the highest on record in our region in 2020-21, but subsequently stabilised to be more consistent with forecast levels in 2021-22. The boost to growth initially provided by the pandemic (e.g. regional migration to escape Melbourne lockdowns, and trends in working from home) has more recently been replaced by constraints such as higher interest rates, rising inflation and material and labour shortages. There is anecdotal evidence of some developers being unable to fulfil their contracts because of rising delivery costs.

While some of the challenges to development remain prevalent (e.g. higher material costs, labour shortages, rising interest rates), we anticipate continued growth broadly consistent with the rates forecast in the financial model.

1. How forecast developer contributions have been derived

# Assumptions about future connection growth

New connections are forecast as follows:

* From 170,759 actual water connections in 2021/22, a total of 121,393 new connections are forecast to be added in the next 30 years (after this financial year). This reflects the same growth rate adopted in our demand modelling (refer to demand supporting document for detailed growth analysis).
* From 159,119 actual sewer connections in 2021/22, a total of 110,507 new connections are forecast to be added in years 1-30.
* Growth in recycled water connections is based on the last five years of actual data, with 1,525 new connections forecast to be added per year.

Table 2 New Water Connections

|  |  |  |  |
| --- | --- | --- | --- |
| **Year** | **FY** | **%** | **New Conn** |
| 0 | 2022-23 | 2.21% |  3,851  |
| 1 | 2023-24 | 2.16% |  3,849  |
| 2 | 2024-25 | 2.12% |  3,861  |
| 3 | 2025-26 | 2.11% |  3,923  |
| 4 | 2026-27 | 2.07% |  3,934  |
| 5 | 2027-28 | 2.00% |  3,888  |
| 6 | 2028-29 | 1.97% |  3,907  |
| 7 | 2029-30 | 1.94% |  3,919  |
| 8 | 2030-31 | 1.91% |  3,921  |
| 9 | 2031-32 | 1.84% |  3,867  |
| 10 | 2032-33 | 1.79% |  3,815  |
| 11 | 2033-34 | 1.77% |  3,837  |
| 12 | 2034-35 | 1.74% |  3,842  |
| 13 | 2035-36 | 1.72% |  3,862  |
| 14 | 2036-37 | 1.73% |  3,950  |
| 15 | 2037-38 | 1.67% |  3,897  |
| 16 | 2038-39 | 1.64% |  3,888  |
| 17 | 2039-40 | 1.64% |  3,933  |
| 18 | 2040-41 | 1.58% |  3,865  |
| 19 | 2041-42 | 1.58% |  3,926  |
| 20 | 2042-43 | 1.58% |  3,988  |
| 21 | 2043-44 | 1.58% |  4,051  |
| 22 | 2044-45 | 1.58% |  4,115  |
| 23 | 2045-46 | 1.58% |  4,181  |
| 24 | 2046-47 | 1.58% |  4,247  |
| 25 | 2047-48 | 1.58% |  4,314  |
| 26 | 2048-49 | 1.58% |  4,382  |
| 27 | 2049-50 | 1.58% |  4,451  |
| 28 | 2050-51 | 1.58% |  4,522  |
| 29 | 2051-52 | 1.58% |  4,593  |
| 30 | 2052-53 | 1.58% |  4,666  |

Table 3 Meter Sizes and Number of Lots

|  |  |  |  |
| --- | --- | --- | --- |
| **Slit** | **Meter Size** | **Apportionment** | **Number of Lots** |
| **Greenfield** | 20mm | 99.92636% | 1 |
|  | 25mm | 0.01983% | 2 |
|  | 32mm | 0.04815% | 3 |
|  | 40mm | 0.00000% | 6 |
|  | 50mm | 0.00283% | 10 |
|  | 80mm | 0.00000% | 40 |
|  | 100mm | 0.00000% | 70 |
|  | 150mm | 0.00283% | 200 |
|  |  |  |  |
| **Infill** | 20mm | 70.7431% | 1 |
|  | 25mm | 12.3045% | 2 |
|  | 32mm | 4.7984% | 3 |
|  | 40mm | 1.4591% | 6 |
|  | 50mm | 0.7371% | 10 |
|  | 80mm | 0.0903% | 40 |
|  | 100mm | 0.0000% | 70 |
|  | 150mm | 0.0000% | 200 |

Table 4 New Sewer Connections

|  |  |  |  |
| --- | --- | --- | --- |
| **Year** | **FY** | **%** | **New Con** |
| 0 | 2022-23 | 2.21% |  3,506  |
| 1 | 2023-24 | 2.16% |  3,504  |
| 2 | 2024-25 | 2.12% |  3,515  |
| 3 | 2025-26 | 2.11% |  3,572  |
| 4 | 2026-27 | 2.07% |  3,581  |
| 5 | 2027-28 | 2.00% |  3,540  |
| 6 | 2028-29 | 1.97% |  3,554  |
| 7 | 2029-30 | 1.94% |  3,567  |
| 8 | 2030-31 | 1.91% |  3,568  |
| 9 | 2031-32 | 1.84% |  3,520  |
| 10 | 2032-33 | 1.79% |  3,472  |
| 11 | 2033-34 | 1.77% |  3,493  |
| 12 | 2034-35 | 1.74% |  3,497  |
| 13 | 2035-36 | 1.72% |  3,516  |
| 14 | 2036-37 | 1.73% |  3,596  |
| 15 | 2037-38 | 1.67% |  3,548  |
| 16 | 2038-39 | 1.64% |  3,540  |
| 17 | 2039-40 | 1.64% |  3,580  |
| 18 | 2040-41 | 1.58% |  3,519  |
| 19 | 2041-42 | 1.58% |  3,574  |
| 20 | 2042-43 | 1.58% |  3,631  |
| 21 | 2043-44 | 1.58% |  3,688  |
| 22 | 2044-45 | 1.58% |  3,747  |
| 23 | 2045-46 | 1.58% |  3,806  |
| 24 | 2046-47 | 1.58% |  3,866  |
| 25 | 2047-48 | 1.58% |  3,927  |
| 26 | 2048-49 | 1.58% |  3,989  |
| 27 | 2049-50 | 1.58% |  4,052  |
| 28 | 2050-51 | 1.58% |  4,116  |
| 29 | 2051-52 | 1.58% |  4,182  |
| 30 | 2052-53 | 1.58% |  4,248  |

## Opex

The NCC model includes the incremental operating expenditure (opex) to service forecast new connections. This comprises the cost of bulk water supply, sewage treatment, and asset maintenance.

### Bulk water opex

The following assumptions have been adopted to describe future opex:

* Water supplied from the Melbourne Geelong Pipeline (MGP) has a marginal cost of $460/ML for years 1 to 3, before reducing to $370/ML for years 4 to 14 after completion of projects to extend the capacity and reach of the pipeline (W1503 MGP Booster Pump Station and W1504 Extension of reach of MGP to Pettavel Basin).
* Water assumed to be supplied from desalination has a marginal cost of $2,620/ML for years 15 to 30.
* Costs are incrementally staggered, such that only new customers from year 15 pay for the increased cost of bulk water assumed to be supplied from desalination.
* The cost to supply recycled water is $780/ML for years 1 to 30.

### Sewage treatment

Black Rock sewerage treatment costs are included at $460/ML for years 1 to 9, before decreasing to $220/ML for years 10 to 30 post upgrade of the plant (which will improve its operating efficiency).

### Maintenance costs

Maintenance costs are assigned as a proportion of capital expenditure (capex) based on the following assumptions:

* A 77/23 split between civil and mechanical and electrical (M&E).
* Opex for civil assets calculated as 0.15% of capex value, and 1.65% for M&E assets. Overall this is 0.495% of capex ((77\*0.15%) + (23\*1.65%)).
* For example, capex of $100M capex has an annual maintenance opex of $0.495M.
* Maintenance costs are allocated for gifted assets and capex projects.

## Capex

As outlined in section 3.1, Barwon Water proposes to include 30 years of capex in the NCC model.

Capex is split into three categories for NCCs: Water, Recycled Water & Sewer.

### 10 year CWIP (Years 1-10)

Refer to the capex supporting document for details about Barwon Water’s capital program in the next period. Barwon Water prepares and maintains a 10 year rolling capital works program, and thus it is reasonably straightforward to establish the expenditure associated with growth in years 1-10. All projects with the primary project driver, growth, in the 10 year CWIP are included.

### Apportionments to 10 year CWIP (Years 1-10)

As only one driver can be assigned to each project in the CWIP, some growth projects are split across other categories such as improved service, compliance or renewal.

This section details projects included in the NCC model where the project driver is growth, but the investment will also deliver some benefits to existing customers. These benefits include improved water system resilience, security of supply, reliability, improved asset life etc. Apportionments are made to exclude some capex from the NCC model where costs should be borne in part by existing customers.

Year 1-10 CWIP Water project apportionments to NCCs:

* W1158 - Bellarine Transfer Main Stage 6 [70%]
* W1039 - Bellarine Transfer Main Stage 5b [70%]
* W1227 - Indented Head St Leonards Feeder Main Stage 4 [50%]
* W1167 - Indented Head St Leonards Feeder Main Stage 3 [50%]
* W1142 - Jan Juc Feeder Main Replacement [20%]
* W1146 - Northern Feeder Main Stage 4 [70%]
* W1376 - Bakers Lane Tank Augmentation [50%]
* W1375 - Bannockburn to Teesdale Transfer Main [50%]
* W1377 - Inverleigh Feeder Main [50%]
* W1164 - Highton Feeder Main Stage 2 [50%]
* W1394 - Lovely Banks - Carrs Rd Pump Station Aug [20%]
* W1506 - Inverleigh south west feeder main [50%]
* W1507 - Shelford feeder main upgrade [50%]
* W1508 - Teesdale high level system upgrade [50%]

The following projects have been identified as having a growth driver, but are not associated with new customers and thus have been excluded from the NCC model.

* W1021 - Developer Constructed Retic - W [zero]
* W1234 - 13th Beach Resort WS Improv Stage 2 [zero]
* W1498 - Forest St Bridge Replacement [zero]
* W1182 - Queenscliff Transfer Main Replacement [zero]
* W1332 - Golden Plains Food Precinct Water Stg 2 [zero]
* W1225 - Pettavel Basin New Disinfection Works [zero]
* W1275 - Swanston Street Reticulation Improvement [zero]
* W1484 - SNAB – Marengo Pilot [zero]
* S1005 - Developer Constructed Retic – S [zero]
* S1267 - Developer Constructed Pressure Sewer Sys [zero]

### Year 11-30 Capex

As Barwon Water’s capital program is only 10 years, it becomes more challenging to establish the projected spend in years 11-30. For the purposes of this model we made the following assumptions to establish this spend profile:

* Northern & Western Growth Areas (NWGGA)

The Asset Planning department has prepared a program of works associated with the NWGGA area. This consists of three capital projects (W1502 / R1240 / S1314), which provide forecast spend associated with the life of the projects and includes expenditure from years 11-30.

* Extrapolated Median Actual Growth Spends

For years 11-30, Asset Planning analysed actual median spends in previous pricing periods, alongside the growth rates during those periods. We have then used this to extrapolate future expenditure by adopting the median costs for periods of growth that align most closely with the same characteristics of growth expected to occur in the future. For example:

* Years 11 to 20 (or 2034-43) are expected to see a growth rate, building activity and capital spend similar to that seen in the 2018-23 period. We have therefore taken the median actual spend for sewer and water over that historical period and adopted it for the period 2034-43.
* Years 21 to 30 (2043-2053) are expected to see a growth rate, building activity and capital spend typical of the 2013-2018 period. This is because the forecast growth in connections reduces later in the 30 year period down to lower numbers seen during this period. Therefore we have taken the median actual spend for sewer and water over that period and adopted it here.
* No additional recycled water costs outside NWWGA

For recycled water it is expected that all expenditure in years 11-30 will be associated with the NWGGA area, as Armstrong Creek will be fully built out. Therefore only NWGGA includes recycled water, with the costs reflected in the forecast NWGGA projects.

Based on these assumptions, the resulting expenditure forecast for years 11-30 is shown below.

|  |  |  |  |
| --- | --- | --- | --- |
| Period | Sewer | Water | Comment |
| Years 11-20 | $15.57M/year | $7.12M/year | Median actual spend for 2018-23 |
| Years 21-30 | $8.69M/year | $4.81M/year | Median actual spend for 2013-18 |

## Other Inputs

### Gifted Assets

The value of gifted assets has been assumed to be $4,903 for sewer and $2,973 for water and recycled water, per connection. This is based on analysis of historical data and is consistent with the value adopted in our financial model.

The total value of gifted assets is calculated as the number of new connections multiplied by the value per connection.

Depreciation on gifted assets is based on 70 year asset class life.

### WACC

The weighted average cost of capital (WACC) adopted in the model is 2.7%, this is based on the rate in the financial model.

### Tariffs & Revenue

We are not proposing any change to our existing tariff structure, which includes a fixed water charge, a variable water charge, a fixed sewer charge, a variable sewer charge, and a variable recycled water charge. This structure applies to both residential and non-residential customers, except that residential customers do not pay a volumetric sewer charge.

The NCC model assumes:

* Residential water consumption of 160 kL/connection per year, and recycled water consumption of 56 kL/connection per year. There is no residential volumetric sewer charge (hence no assumptions about residential sewage discharge).
* Non-residential water consumption of 756 kL/connection per year, recycled water consumption of 168 kL/connection per year, and sewage discharges of 718 kL/connection per year (95% of water consumption).
* No change in tariffs in 2023-28 and an increase of 0.16 per cent per year in 2028-2038.
* Water connections factor in meter sizes based on historical lots in Table 3.

Revenue from NCCs is the number of new connections multiplied by the NPV per lot NCC charge in the model.

### Tax

Tax is based on the corporate tax rate of 30%. For periods when it is forecast that BW will be in a tax paying position, tax is calculated as the net taxable income multiplied by the tax rate.

### Value of Franking Credits (as a Proportion of Face Value)

The value of franking credits remains the default 50%.

### Greenfield Infill Split

Growth in new customer connections is divided between Greenfield and Infill development, where these are described as follows:

* Greenfield: subdivision of a large parcel of previously undeveloped land that may be developed in many stages, or a development remote from existing infrastructure. Greenfield developments require the construction of new assets, excluding small mains extensions.
* Infill: involves the development of a property surrounded by existing infrastructure. Infill developments are already serviced by all services required for further development, and can be further subdivided.

The logic supporting the separate greenfield and infill NCCs proposed is summarised below:

* Analysis of the capital expenditure program indicated that only 25% of new customers are associated with infill developments
* It is more cost effective for Barwon Water to service infill than greenfield developments, and so it is appropriate for different NCCs to apply to these two types of development
* The new NCCs provide more efficient signals to developers about the relative costs of installing water and sewerage infrastructure in greenfield and infill developments
* The approach of having separate NCCs for greenfield and infill developments is consistent with the Melbourne metro water authorities’ current practices.

The forecast split of development across greenfield and infill is based on the average of the last 11 years of actual data. The split adopted is 75% Greenfield and 25% Infill, based on an annual average of 2,652 Greenfield connections and 907 Infill connections respectively (Table 4).

Table 5 Historical distribution of actual annual greenfield (first row) and infill connections second row)

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2011/12 | 2012/13 | 2013/14 | 2014/15 | 2015/16 | 2016-17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | **Average**  |
|  2,064  |  2,072  |  1,989  |  1,499  |  2,298  |  1,872  |  3,289  |  3,919  |  3,407  |  3,265  |  3,500  |  **2,652**  |
|  745  |  793  |  833  |  791  |  761  |  763  |  806  |  882  |  1,094  |  1,512  |  1,000  |  **907**  |
|  2,809  |  2,865  |  2,822  |  2,290  |  3,059  |  2,635  |  4,095  |  4,801  |  4,501  |  4,777  |  4,500  |  **3,559**  |

The model uses a goal seek to calculate the greenfield and infill charges, that will provide the total revenue required for the period based on 25% of lots being infill and 75% of lots being greenfield.

1. Proposed NCC charges and how they will be applied

For the next regulatory period, Barwon Water proposes to continue a standard charge for the whole region, excluding Fyansford (which has an established negotiated NCC). The details are set out below.

## Standard NCC

For the next regulatory period, Barwon Water proposes to continue the Standard NCC for ‘Infill’ developments and ‘Greenfield’ developments. As already noted the Standard NCC is applicable to all of Barwon Water’s existing serviced areas and planned growth areas (except Fyansford, as detailed further below).

The table below sets out the proposed NCCs for the next regulatory period, alongside the NCC applying in 2022-23.

Table 6: Current and proposed Standard NCCs (in $real 2022-23)

| **Service** | **Current Standard NCC for the 2018-2023 regulatory period**  | **Proposed Standard NCC for the next regulatory period**  |
| --- | --- | --- |
| **Greenfield** | **Infill** | **Greenfield** | **Infill** |
| Water (inc. Recycled) | $3,348 | $675 | $3,680 | $736 |
| Sewerage | $0 | $0 | $539 | $108 |
| Total per residential lot | $3,348 | $675 | $4,219 | $844 |

The following points are noted in relation to the proposed Standard NCCs:

* The water (including recycled water) Greenfield NCC for the next regulatory period is a marginal increase on the charge in the current period.
* We are proposing to introduce a sewer NCC in the next period.
* Proposed charges are increasing due to several factors: forecast capex increasing, WACC decreasing, opex increasing and growth rate decreasing over time.
* Proposed charges are based on pricing flat for the period, consistent with the engagement undertaken with stakeholders and developers.

## Fyansford

A negotiated charge was developed for the Fyansford area in previous pricing submissions. The negotiated charge was developed because the developer of Fyansford was unable to construct (and fund) some reticulation assets that under normal circumstances they would have been responsible for.

The Fyansford area is geographically separate from other areas of Geelong and as such was more straightforward to ring fence. As at the start of the 2023 pricing period, the development is approximately 70% complete and as such Barwon Water proposes to maintain the same negotiated NCC.

Table 7: Fyansford Negotiated New Customer Contributions (in $real 2022/23)

|  |  |  |
| --- | --- | --- |
| **Service** | **Current NCCs applying in 2022-23** | **Proposed NCCs for the next regulatory period** |
| Water | $2,396 | $2,396 |
| Sewerage | $1,007 | $1,007 |
| Total per equivalent residential lot | $3,403 | $3,403 |

1. How consultation with developers has informed proposed charges

Barwon Water undertook engagement with the land development industry and customers (including consultants) to inform them about the proposed NCC to apply from 2023 to 2028, as well as any proposed changes to the NCC framework, and provided opportunity for feedback.

Engagement involved the following key steps:

* Initial mail out in late April / early May 2022 advising of upcoming NCC consultation and opportunities to register interest.
* An online forum on the draft prices with 24 developers attending live and seven views of the recording. A follow up email with the draft NCC framework, recording and slides (with the draft prices) was sent 19 May 2022.
* The draft documents made available for comment have been downloaded more than 190 times since the online forum
	+ 105 downloads of the draft NCC framework
	+ 58 downloads of the NCC slides from the webinar
	+ 34 downloads of the NCC webinar Q&As
	+ 3 formal submissions from consultants or developers
* The draft updated NCC Framework document is hosted on Barwon Water’s web page.
* Phone calls and one-on-one briefings have been conducted as requested.

While there have been high rates of engagement with the material that has been made available, very limited feedback has been received directly from developers about the proposed changes to NCCs. While NCCs have increased on the previous period, developers are generally understanding about the drivers for this increase, which is relatively marginal and not as material as other factors influencing costs for developers. Additional informal feedback has highlighted the importance to developers that growth related infrastructure is implemented in a timely manner to ensure that that this does not constrain growth.

Given the opportunity provided for engagement on our proposed charges, the limited direct feedback can be reasonably interpreted as acceptance of the NCCs proposed.