New Customer Contributions - Review Capital and Operating Expenditure

EXPENDITURE ASSESSMENT REPORT - MERTOPOLITAN URBAN WATER BUSINESSES

- Rev Final
- 16 April 2013

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Document history and status

Revision	Date issued	Reviewed by	Approved by	Date approved	Revision type
Rev A	29 March 2013	D Lynch	D Lynch	29 March 2013	Draft for ESC discussion
Rev Final	16 April 2013	D Lynch	D Lynch	16 April 2013	Final

Distribution of copies

Revision	Copy no	Quantity	Issued to
Rev A	email	1	ESC
Rev Final	email	1	ESC

Printed:	18 April 2013
Last saved:	18 April 2013 02:35 AM
File name:	NCC Expenditure Assessment Report_MetroWBs_RevFinal
Author:	Michael Bendeli, Mike Honeyman, David Lynch
Project manager:	Michael Bendeli
Name of organisation:	Essential Services Commission
Name of project:	New Customer Contributions - Review Capital and Operating Expenditure
Name of document:	Draft Expenditure Assessment Report - Metropolitan Water Businesses
Document version:	Final
Project number:	VW07061

1. Background

1.1. The Context

In August 2012, the ESC requested all 16 Victorian urban water businesses (metropolitan and non-metropolitan) to establish their proposed standard new customer contributions (NCCS) - for water, recycled water and sewerage services - for the Water Plan 3 (WP3) period in accordance with a set of pricing principles defined by the ESC. The NCCs proposed should reflect the incremental costs required to service growth.

1.2. The Scope of this Report

This report assesses the appropriateness, prudency and reasonableness of the capital and operating expenditure (and key related assumptions) used by the four *metropolitan urban retail water businesses* to underpin their calculations in the ESCs NCC model (or equivalent) and on which their proposed NCCs for their growth/development areas are based. These water businesses are listed in **Section 1.3.**

This review has been undertaken to specifically assess:

- Whether the capital expenditure included in the underlying NCC calculations relates to growth and the basis of the cost estimates is reasonable;
- Whether the methodology used is reasonable for apportioning capital expenditure that serves multiple purposes (e.g. compliance, renewals etc. as well as growth) to growth and to new customers;
- The relative merits of the proposed infrastructure and related capital expenditure in servicing specific catchments versus a broader area;
- Any capital expenditure from Water Plan 2 (WP2) that is included in NCC calculations (i.e. no double counting); and,
- The reasonableness of the incremental operating costs (and their relationship to growth).

The scope of this review does not include an assessment of the water business financial / economic models themselves (as provided to the ESC) nor of the appropriateness, fairness and reasonableness of the outputs of the models or the proposed NCCs themselves.

1.3. Metropolitan Water Businesses included in this Review

The four metropolitan urban retail water businesses whose NCCs have been reviewed are:

- Yarra Valley Water
- Western Water
- South East Water
- City West Water

[NB: Four non-metropolitan/regional urban water businesses were also reviewed and these have been reported on separately.]

1.4. Development of a new framework for new customer contributions

In 2012 the Essential Services Commission (ESC) consulted with the Victorian water industry and key stakeholders on the issues of the charging regime for the recovery of costs from parties making new connections to sewerage, water and recycled water networks. The intention was to have a new framework in place for the next regulatory period (Water Plan 3) that:

- Improved the clarity of charging regimes for new customer connections (NCC);
- Enabled water businesses to set locally appropriate NCC charges, following a consistent set or pricing principles;
- Avoid the disputes arising from application of the existing 'one size fits all' approach; and,
- Be consistent with the relevant statutory documents governing the water corporations.

Following the consultation exercise the ESC issued a Guidance Paper on New Customer Contributions in August 2012. The Guidance Paper includes information for the water businesses in the form of a New Customer Contributions Framework that broadly sets out the ESC's expectations of the key elements of the NCC models to be developed by the water businesses. In this way the water businesses can have some certainty about how the ESC intends to assess the NCC approach and meet requirements under clause 13 and 14(1) of the Water Industry Regulatory Order 2012. Whilst each water business has some flexibility to propose its own approach to the development of its standard NCCs, the ESC – through the price review and water plan process – approves the negotiating framework, the application of pricing principles by each water business and the "standardised" NCCs submitted in the Water Plan for each water business. SKM understands that all the water businesses have now provided the ESC with their proposed standard NCCs for the next regulatory period.

The ESC's NCC Framework consists of four main elements:

- Definition of the service covered by the NCC
- A charging model
- A set of pricing principles
- Supporting tools and guidance

1.5. Definition of service covered by NCC

The NCC service covers infrastructure and associated activities to connect an un-serviced property to water or wastewater services networks **or** to increase services to a serviced property.

1.6. Charging Model

The charging model used to determine the NCCs should consider both the incremental costs to the water business associated with making new service connections as well as the incremental benefits that it receives from those customers (increased revenue stream, wider customer base to spread fixed costs).

It is envisaged that the NCCs proposed would vary between individual water businesses and also between

- individual catchments (or growth areas) serviced by a water business;
- greenfields growth areas and brownfields (or infill) growth areas; and for

- individual services (water, alternative water and wastewater) provided by the water business.

While not explicitly stated it is assumed that these individual NCCs or contributions to NCCs should at least be identified with the potential for a water business to adopt "uniform" NCCs where it can be demonstrated that there is little material difference (across catchments and/or services) between the cost of servicing new connections and/or there is a strong stakeholder preference for such an approach. This is consistent with the intent and principles (including cost reflectivity) set out by the ESC.

1.7. Pricing principles

Each NCC proposed must meet the following minimum pricing principles. It must:

i. have regard to the incremental infrastructure and associated costs in one or more of the statutory cost categories;

ii. have regard to the incremental future revenues that will be earned from customers at that connection; and

iii. be greater than the avoidable cost of that connection and less than the standalone cost.

Water businesses may propose additional pricing principles so long as they are consistent with the NCC framework and the minimum pricing principles.

Incremental costs include the capital and operating costs (as well as tax and financing costs) that are incurred by the water businesses to service new customers. Typically the capital provided to service new customers is classified as growth capital.

Ultimately the intent is to have a charging model that applies a demonstrable fair and reasonable charge to new customer connections, in accordance with the Water Act.

1.8. Supporting tools and guidance

The ESC has provided a template negotiating framework that follows the main matters that water businesses are required to action (or notify customers of their requirements) to implement the NCC framework and comply with the statutory provisions of the Water Act.

The ESC has also provided a model NCC estimator that may be used to capture the calculation of standardised NCC charges.

2. Summary of Key Review Issues Arising

The detailed outcomes of the NCC assessment of the individual Metropolitan Urban Water Businesses (Yarra Valley Water, Western Water, South East Water and City West Water) are provided in **Sections 3** to **6.**

This section provides an overall commentary of selected key overall issues that have arisen during the review of the Metropolitan Urban Water Businesses NCCs and are of interest to the ESC. The majority of these issues are consistent with the key issues identified for the Non-metropolitan/Regional Urban Water Businesses (Barwon Water, Gippsland Water, Goulburn Valley Water and Wannon Water).

1. Uniform vs. Non-Uniform Standard NCCs

All reviewed Metropolitan Urban Water Business have identified to varying extents the variability in NCCs if non-uniform or area specific standard NCCs were to be implemented but have elected to primarily adopt a uniform standard NCC or some limited form of non-uniform standard NCCs approach as follows:

- Yarra Valley Water and South East Water have elected to adopt different standard NCCs (pricing zones) for discrete greenfield growth zones within their licensed operating area.
- City West Water has elected to adopt a single greenfield standard NCC (for the Outer Growth Zone)
- Western Water has undertaken extensive work in calculating non-uniform standard NCCs for each of its individual growth areas but has elected to adopt a uniform standard NCC for each of its services to apply across the whole of its operating area.
- Each Metropolitan Urban Water Business includes an 'infill' pricing zone to cover new customer connections outside the defined greenfield pricing zones. YVW and SEW have adopted a standard NCC for infill connections. CWW propose to negotiate infill NCCs on a case by case basis when additional capital expenditure is required (otherwise a zero NCC).

It is noted that many Metropolitan and Regional Urban Water Businesses have chosen to adopt a singular or uniform standard NCC that applies for the whole of their respective licensed operating areas – appreciating (from feedback provided to the metropolitan and regional urban water businesses) that their associated developers prefer a uniform standard NCC rather than individual growth area standard NCCs. Implicit in this is that, if cost reflectivity is a primary objective, then should desirably implemented over a longer term.

The selection of the proposed pricing zones brings into focus the appropriate granularity of non-uniform standard NCCs – whether cost reflectivity is optimally applied at a growth area level or some other sensible definition of pricing zones. Some pricing zones have been clearly defined (e.g. the extension of the UGB) and other proposed pricing zones include several geographically related growth areas (each with an ISP) or are used to cover the 'everywhere else' and infill developments.

The proposed pricing zones have been defined through a considered process by the Metropolitan Urban Water Business and appear reasonable. The level of granularity has been influenced by:

- The geography of the growth areas;
- The level of system interconnectedness (and the level of proposed investment in headworks and shared infrastructure);
- Alignment with LGAs and UDPs;
- Administrative simplicity (from the water business and stakeholder perspective); and
- Stakeholder acceptability or preference (especially from a developer perspective).

2. Variability in Quantum of Standard NCCs across Water Businesses

There is a differing level in the quantum of standard NCCs proposed across the Metropolitan Water Businesses - in aggregate for all services (water, sewerage, alternative water) or for each of the individual water, sewerage or alternative water services. This applies whether uniform or non-uniform standard NCCS are proposed or adopted.

Some factors that influence this variability in NCCs include:

- Differing levels of historical investment in infrastructure;
- Differing extent of availability of spare or unused capacity in existing infrastructure that can be used to service growth (from pre-investment generally and pre-WP2 investment in particular, as such pre-WP2 investments in growth infrastructure are not included in the NCC model currently);
- Proximity of growth areas to existing infrastructure – the more remote the growth is from existing infrastructure the greater the extent of new infrastructure to service it (e.g. longer pipes and/or a requirement for local water or sewage treatment plants);
- The nature and span of the water business operating area and the extent of interconnectedness of water and sewerage service infrastructure. For example (as occurs to some extent for the Melbourne metropolitan area) for growth in the west water services would be relatively more expensive as the water resources are sourced in the east and need to be transported long distances, while sewerage services would be relatively cheaper in the west because of the proximity to low cost sewage treatment in the west.
- Differing economies of scale – for example where growth rates are high whether in aggregate or for individual growth areas the costs of new infrastructure can be recovered over greater customer numbers and more rapidly;
- Differing extent of natural resources – for example those water businesses with access to relatively more abundant cheaper surface water resources would have an NCC advantage over water businesses which rely more heavily on alternative water sources including recycled water (for potable water substitution) and/or access to water from outside its catchment area.

3. Differing investment periods

A couple of the Metropolitan Urban Water Business have nominated to use shorter investment periods than the ESC's nominated 30 year forecast period (plus the 5 years of WP2) in their calculation of Standard NCCs.

- Yarra Valley Water has used a 20 year model (plus the 5 years of WP2)
- South East Water has used a 10 year model (plus the 5 years of WP2)
- Western Water has used a 10 year period – a two Water Plan period forward look (plus 5 years of WP2).

These Metropolitan Urban Water Business consider that there is a reasonable level of uncertainty around the growth rates and location of new connections and the specific CAPEX and OPEX expenditure required in the years beyond their forecasted investment period and so, from a fairness perspective, it is difficult to justify the inclusion of these costs and revenues in current NCCs.

The nomination of these shorter investment periods will need to be considered with regards to the consistency of approach from different water authorities and with regards to the materiality of any difference in the resulting standard NCCs.

4. The exclusion of major shared infrastructure in the NCCs

Some Metropolitan Urban Water Business have nominated to exclude major shared infrastructure expenditure from their NCC calculations. There is a perception that the CAPEX appropriate for recovery through the NCCs only includes growth distribution assets and not CAPEX for "headworks" assets - whether for water (e.g. if growth triggers a Melbourne Water capex investment for big transfer pipes and/or water treatment) or for sewerage infrastructure (whether Melbourne Water facilities and bulk transfer mains or STP growth capital expenditure of the individual retail water authorities).

Where such infrastructure can be identified as actual incremental growth infrastructure, it would appear reasonable to include these costs in the calculation of the Standard NCCs, apportioned appropriately to different pricing zones. It is appreciated that the inclusion of these costs may have a material impact on the magnitude of the Standard NCCs and affordability may need to be considered/tested.

5. Benefit and equity assumptions influencing the magnitude of Standard NCCs

Some Metropolitan Urban Water Businesses have incorporated various assumptions or factors within their calculations that influence the magnitude of their Standard NCCs.

- SEW has included an Intergenerational Equity Factor (IGF) which is not in the ESC's model. The quantum of this is subjectively "determined". The effect of application of this IGF is that some 30% of incremental capital infrastructure costs directly associated with growth have been excluded from the Standard NCCs.
- YVW and CWW have included a benefit in the calculation of NCCs to reflect the savings realised through not placing desalination bulk water orders.
    - YVW has incorporated this in the calculation of Recycled Water NCC – with the benefit being applied annually from Year 1;
    - CWW has incorporated this in the calculation of the OGZ (Outer Growth Zone) NCC – with the benefit being applied in Years 17, 24 and 31.

These benefits are founded on the notion that the broader existing customer base somehow benefits from this growth infrastructure as do future customers. The effect is to reduce the calculated Standard NCCs, effectively transferring the recovery of some growth infrastructure costs to the broader existing customer base (collected through the general tariff). These prima facie appear to be inconsistent to some extent with the ESC's model and principles. The Water businesses position for their reasonableness is discussed in the chapters for each water authority. The ESC should consider the merits of the impacts on lowered NCCs, the extra costs on existing customers and the consistency of approach between different water authorities.

6. Apportionment of WP2 (and pre-WP2) Expenditure Carried Forward into NCC Calculations

WP2 expenditure can be apportioned to growth based on at least the following three differing approaches:

- Residual hydraulic capacity ("unused" capacity after meeting servicing levels for existing customers) for water and either hydraulic or pollution load treatment capacity for sewerage (whichever is the primary driver of the next augmentation). No Metropolitan Urban Water Businesses has adopted this approach
- Residual unrecovered costs from the new infrastructure (i.e. total expenditure less costs recovered from NCCs or other). City West Water has adopted this approach

- Remaining asset life – this approach is less preferred if used on its own, especially where an asset will be "idle" for some time and where "asset life" is being consumed but not capacity. Western Water has largely adopted this approach.

Yarra Valley Water and South East Water have adopted a combination of the last two approaches and are reasonable.

Discussion with some utilities explored the inclusion/exclusion of pre-WP2 growth infrastructure from the calculation of Standard NCCs. Acknowledging the ESC's August 2012 NCC Guidance Paper (Appendix C), which sets the beginning of Water Plan 2 as the threshold for past growth infrastructure that can be included in the NCC calculations, several utilities have identified pre-WP2 growth capital infrastructure that could potentially be included in the NCC calculations – indicating that the costs of these infrastructure projects have not been fully recovered through NCC revenue already collected. YVW calculations indicated that including unrecovered Water Plan 1 growth expenditure would almost double the value of the pre-WP3 infrastructure to be recovered.

Being excluded from the Standard NCCs, the unrecovered value of pre-WP2 growth infrastructure will presumably be recovered through the general tariff. However, noting that proposed Standard NCCs (using the new NCC Framework) are generally higher than the uniform standard NCCs from Water Plan 2, one can question whether pre-Water Plan 2 growth infrastructure was, in general, previously able to achieve full cost recovery through developer contributions. It is, in effect, the status quo for some recovery of the pre-WP2 growth infrastructure through the general tariff.

7. Variability in Quantum of NCCs over Time

Using the ESC's NCC model, some water businesses have a zero NCC charge for some services within the defined pricing zones (at least initially for the WP3 period). Yarra Valley Water is an example, with four of its five greenfield pricing zones having a calculated negative NCC for sewer services. The two key reasons for this appear to be due to:

- The level of pre-investment that has resulted in significant "spare" capacity available to accommodate future growth - that is, new customers are receiving the benefit of the "economies of scale" associated with existing infrastructure; and
- The whole of the general tariff revenue is an offset in the NCC model. This substantially lowers NCC charges, to zero in some cases (driven by a net zero NPC outcome from the ESC's NCC model, or in some cases a negative NPC).

If a "zero" NCC charge is adopted now, the corollary is that future customers triggering the next augmentation will bear a higher NCC. While this approach is reasonable it would potentially result in significant variations in NCCs. A better approach would potentially be to "smooth" the NCCs over time. It is noted that YVW has bundled and smoothed the water and sewerage NCCs for its greenfield growth areas to arrive at a positive NCC charge.

8. Differing approaches to Assessment of Incremental Opex

The differing approaches to determining incremental Opex can have an effect on the quantum of NCCs. Yarra Valley Water, Western Water, South East Water and City West Water have all adopted somewhat differing approaches to the determination of incremental OPEX for inclusion in the NCC model. These are summarised in the **Table E 1**. More detail is provided in the specific sections on the individual water businesses.

Table E 1 Basis of Incremental Opex Determinations

Water Business	Incremental Cost / Opex [IC]	
	Approach to Calculation	Comment
Yarra Valley Water [YVW]	YVW has included incremental operating costs in its NCC calculations – with two components: ▪ An 'incremental O&M per customer' [business/administration cost] cost ▪ An 'Other incremental O&M' cost - incorporating the expected incremental OPEX cost for each growth infrastructure project.	The 'incremental O&M per customer' cost includes the additional business and administration costs (meter reading, billing, customer contacts, hardship support, merchant service fees, debt recovery costs, etc.) Projects incremental OPEX costs are allocated to specific services (water, sewer, recycled) and to one of the pricing zones.
Western Water [WW]	WW has: ▪ included incremental operating costs (both fixed and variable) attributable to growth in its NCC modelling across all services. ▪ determined its incremental O&M costs based on the following components: - a fixed O&M cost (excluding labour) per lot for each of the 3 services (water, sewerage and recycled water/Class A) - a fixed labour cost per lot for each of the 3 services (water, sewerage & recycled water/Class A); and - a variable cost, for water only based on the cost of water supply ex the Melbourne grid.	The fixed costs are respectively based on: • averaging the total historical O&M (excluding labour) budget) per total lots serviced; • averaging the total labour budget per total lots serviced
South East Water [SEW]	Operating costs are not included in SEW's calculation of Standard NCCs using its model	In the ESC's model (for comparative purposes) SEW has used *short run marginal operating costs* as a proxy for incremental operating expenditure - based on the 3 year average change in OPEX costs per water customer
City West Water [CWW]	CWW have calculated fixed open costs as a percentage of the capital cost of new infrastructure for growth.	The percentage is only applied to the subset of capex that is in the OGZ. The percentage is based on the historic proportion of O&M costs to the businesses RAB.

9. Other matters

Some other general comments are relevant:

- YVW and SEW have included only pure (100% apportioned) growth projects in their NCC calculations. Projects with other key drivers and an element of growth (e.g. upsizing renewals) have not been included. These incremental infrastructure costs are subsequently recovered from the broader customer base through the general tariff. It has been indicated that the incremental costs are typically small relative to total project costs, which does not justify the administrative effort to calculate and apportion the incremental infrastructure costs.
- YVW and SEW have assumed an asset life of 80 years for all infrastructure for depreciation calculations. As an improvement opportunity, infrastructure could be allocated to a relevant class and assigned an appropriate asset life (e.g. 25 years for mechanical and electrical assets and possibly 100 years for some civil assets).

3. Yarra Valley Water

In summary, Yarra Valley Water (YVW)'s capital expenditure included in its NCC calculations is reasonable. Several opportunities for improvement exist and the inclusion of a recycled water benefit (offsetting desalination bulk water orders) should be considered with regards to a consistency of approach from different water authorities. This review has been performed by SKM using the documents and conversations listed in **Section 3.5**.

3.1. Overview

Whether the capital expenditure included in the calculation relates to growth and the basis of the cost estimate is reasonable

- Growth forecasts (overall and for individual pricing zones) underpinning NCC calculations are based on DPCD and council forecasts. These are reasonable
- The sizing and sequencing of growth shared infrastructure appears reasonable. Information in the sequencing plans is correctly translated into the NCC calculations
- YVW's unit costing of capital infrastructure is reasonable
- YVW has used a 20 year investment period model (plus the 5 years of WP2). YVW feels there is a reasonable level of uncertainty around the growth rates and location of new connections and the specific CAPEX and OPEX expenditure required in the years beyond their forecasted investment period and so, from a fairness perspective, it is difficult to justify the inclusion of these costs and revenues in current NCCs. The nomination of this shorter investment period will need to be considered with regards to the consistency of approach from different water authorities and with regards to the materiality of any difference in the resulting standard NCCs. *For consideration*
- The value of gifted estimates used in the NCC models is over twice the value of the gifted assets estimate published in YVW's Water Plan 3 (Oct 2012) submission (understood to be due to a difference in unit rates used). This could have a material impact in the calculation of Standard NCCs. YVW agrees that a common approach should be used. *Improvement Opportunity*
- YVW has included an economic benefit of $500 per ML in its Recycled Water NCC calculations to reflect the savings realised through not placing desalination bulk water orders. The inclusion of this benefit appears reasonable, but may need to be considered with regards to the consistency of approach from different water authorities. *For consideration*
- YVW has assumed an asset life of 80 years for all infrastructure for depreciation calculations. As an improvement opportunity, infrastructure could be allocated to a relevant class and assigned an appropriate asset life (e.g. 25 years for mechanical and electrical assets and possibly 100 years for some civil assets). *Improvement opportunity*

The relative merits of the proposed infrastructure and related capital expenditure in servicing specific catchments versus a broader area

- The approach taken by YVW to develop its brownfield Standard NCC is considered and the proposed brownfield standard NCC is reasonable in the context of the options explored by YVW.

- A bottom-up approach has been used to identify and allocate growth capital expenditure for each of the five greenfield pricing zones. This is generally reasonable.
- However, growth expenditure that does not fall into one of the five greenfield pricing zones has not been included in the NCC calculations. This may have a material impact on the proposed Standard NCCs. *Improvement opportunity*

Whether the methodology used is reasonable for apportioning capital expenditure that serves multiple purposes (e.g. compliance, renewals etc. as well as growth) to growth and to new customers

- Only projects that are pure (100% apportioned) growth have been included in YVW's NCC calculations. The allocation of sample projects is reasonable.
- Projects with other key drivers and an element of growth (e.g. upsizing renewals) have not been included. Their incremental infrastructure costs are subsequently recovered from the broader customer base through the general tariff. Discussions suggest such incremental costs are typically immaterial.

Any capital expenditure from Water Plan 2 (WP2) that is included (i.e. no double counting)

- Water Plan 2 capital expenditure has been included. As with WP3 and future capital expenditure, only projects with 100% apportionment to growth have been included in the WP2 totals.
- Deductions have been made to account for recovered NCCs, government contributions and asset depreciation. This approach is reasonable.

  Improvement opportunity: Some improvements could be made to allocate these specific deductions to the appropriate pricing zone (instead of a top-down split).

The reasonableness of the incremental operating costs (and their relationship to growth)

- Incremental operating costs have been included in the NCC calculations. YVW's unit costing of operational expenditure and the approach used by YVW is reasonable.

3.2. Setting the Context: The NCCs reviewed in this report

3.2.1. The Proposed Standard NCCs

Yarra Valley Water (YVW) has proposed a set of Standard NCCs to supersede the set of charges nominated within their December 2012 submission[1] to the ESC. The key features of YVW's current proposed set of Standard NCCs are shown in **Table 1**, and can be summarised in the following bullet points:

- Standard NCCs are proposed – with different charges for brownfield (infill) connections and five different greenfield 'pricing zones' (to provide better locational signals)
- A single, 'bundled' NCC is charged for water and sewerage connections. A separate NCC is charged for recycled water connections.
- NCCs within a charging area are for a standard residential lot. Consistent with its December 2012 submission YVW proposes to vary NCCs for lot sizes and meter size as a proxy for the load a connection places on the system.

- **Table 1 – YVW Proposed NCCs for a Standard Residential Lot[13]**

Pricing Zone	Category	Water & Sewerage NCC	Recycled Water NCC	Resulting Bundled NCC
Extension of UGB (Kalkallo, Wallan, etc.)	Greenfield	$5,200	$1,000	**$6,200**
Craigieburn (up to the old UGB boundary)	Greenfield	$1,000	$1,000	**$2,000**
Greenvale	Greenfield	$2,700	$1,000	**$3,700**
Mernda Doreen	Greenfield	$2,200	$1,000	**$3,200**
Epping North	Greenfield	$1,000	N/A	**$1,000**
Infill*	Brownfield	$1,000	N/A	**$1,000**

* Includes all connections not included in the 5 greenfield pricing zones

- **Table 2 – YVW Proposed Conversion of Non-Residential Connections to Equivalent Residential Connections[13]**

General Service Tapping Size	Equivalent Residential Connections
20mm	1.0
25mm	1.6
32mm	2.6
40mm	4.0
50mm	6.3
80mm	16
100mm	25

The rationale for a single, 'bundled' NCC – Summary of the YVW Approach[19]

From a pure economic sense infill development (brownfield) generally connects to existing networks and uses up spare capacity. It may contribute to [the] need to upsize assets when they are renewed but the incremental cost of this upsizing is minor and when input into the ESC's NCC model is likely to be more than offset by the additional incremental revenue received from the new connection and result in a negative NCC which would be set at zero.

Water, sewer and recycled water networks for greenfields development are often interdependent where, for example, the provision of recycled water permits the downsizing of future potable water assets and the deferment or elimination of expensive outlet sewerage works. In most cases recycled water NCCs will model to be high compared to water and sewer NCCs and often sewer NCCs will be negative.

Recognising this YVW's approach is, for each of the 5 greenfield charging areas, to sum the required NCC revenue for each service (not setting required negative NCC for a particular service to zero). This gives a cost-reflective NCC revenue requirements for the interdependent networks for each charging area. The total NCC revenue required is the sum of the revenue required from each greenfields charging area.

YVW is proposing brownfields NCC of $1,000 combined water and sewer (recently revised to $1,217) and the revenue received is offset against total NCC revenue required, reducing the NCC required from the greenfields charging areas.

Comparison to YVW's December 2012 submission

YVW's current proposed set of Standard NCCs are significantly different in structure to it December 2012 submission. The three key differences include:

- Location-specific greenfield charges – the December 2012 submission featured a single greenfield charge and a single brownfield charge.
- The use of a 20 year model (in the current set) instead of a 35 year model (in the December set) [2,3]. Both sets are based on the ESC's NCC model (Excel spreadsheet). YVW have nominated to use a 20 year model as (like SEW) it feels there is a reasonable level of uncertainty around the growth rates and location of new connections and the specific CAPEX and OPEX expenditure required in years 20-30 and so, from a fairness perspective, YVW feels it is difficult to justify the inclusion of these costs and revenues in current NCCs.

  The nomination of a 20 year model may need to be considered with regards to the consistency of approach from different water authorities and with regards to the materiality of any difference between the 20 and 35 (and 30) year models.

3.2.2. The relation of expenditure to pricing zones

The proposed Standard NCCs have been 'smoothed' over the pricing areas

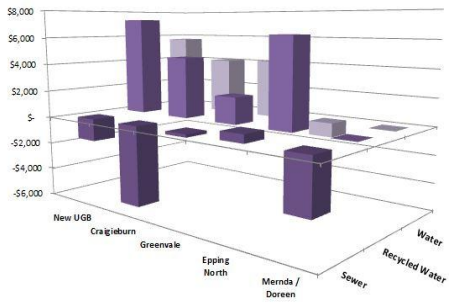
YVW have calculated NCCs for each service in each of the 5 greenfield growth areas – finding significant variations in NCC outcomes (from a negative NCC to over $11,000) across these growth areas – in part due to the level of prior capital investment in some growth areas.

YVW has elected to smooth the proposed Standard NCCs to maintain a level of equity in NCC charges across the different charging areas[8] and to recognise the interdependent nature of the water, sewer and recycled networks[19]. The difference between the charges in the NCC models and the proposed NCCs has been summarised in **Table 3**.

The methodology that has been used by YVW to develop the Standard NCC charges can be summarised in **Figure 1.**

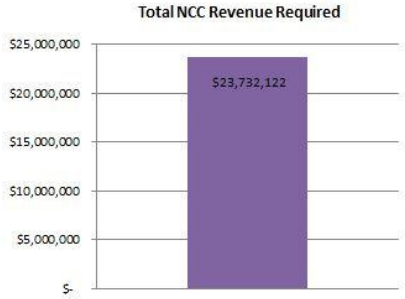
An NCC model is created for each service and 'charging area' (15 models in total)

Water, Sewerage, Recycled Water	UGB Extension, Craigieburn, Greenvale, Mernda Doreen, Epping North	20yr models using ESC template



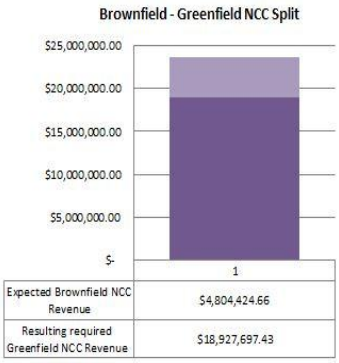
Relevant input values are entered into each model to arrive at location-specific NCCs and the Total NCC Revenue Required (across all growth areas)

Some positive, some negative	Totall NCC Revuenue Required ≈$23.7M



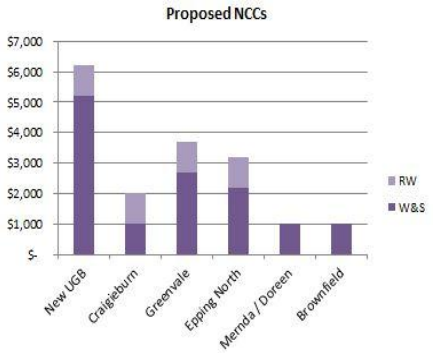
A $1,000 brownfield charge and expected number of connections are nominated. This expected revenue is subtracted from the Total NCC Revenue Required

Brownfield NCCs ≈ $4.8M	Totall NCC Revuenue Required from greenfield connections ≈$18.9M



A combined NCC is proposed for each of the 5 greenfield areas, selected on an equity basis to smooth out the NCC charges across the growth areas

A combined NCC is proposed for each growth area to include water, sewerage and recycled water (where present)	Although ultimately combined, the the following rules were used nominate the service charges for each growth area: RW = $1,000, W+S ≥ $1,000



- **Figure 1 – YVW methodology to arrive at Standard NCCs**

Three rules were used in the smoothing process:

An NCC of $1000 per brownfield/infill connection [this proposal has recently been revised to $1,217.30, equivalent to the existing combined water and sewer NCC for a small lot[19]]. YVW[20] highlight the several possible brownfield NCC charges that could be calculated given several approaches can be used to establish the residual capacity of existing infrastructure (e.g. hydraulic or financial). The approach taken by YVW is considered and the proposed brownfield standard NCC is reasonable in the context of the options explored by YVW.

The bundled water and sewerage NCC for any greenfield growth area must be ≥ $1000 per connection. This is based on the approach that, if recycled water was not provided, as a minimum each household would be required under the energy provisions of the Building Code of Australia to have a rainwater tank to be connected to all sanitary flushing systems. The $1000 value is YVW's conservative estimate of this cost[19] [reflecting the ESC's pricing principle that an NCC be greater than the avoidable cost of that connection].

- An additional $1000 is added to the bundled NCC where a third pipe (recycled water) service is provided whether greenfields or brownfields.

Table 3 – YVW Proposed Standard NCCs and Modelled NCCs for Water Plan 3[13]

Charging Area	Category	From NCC Model	Proposed NCC
Extension of UGB (Kalkallo, Wallan, etc.)	Water	$5,696	$5,200
	Sewerage	-$1,650	
	Recycled	$7,310	$1,000
	Combined NCC	**$11,356**	**$6,200**
Craigieburn (up to the old UGB boundary)	Water	$4,079	$1,000
	Sewerage	-$5,815	
	Recycled	$4,484	$1,000
	Combined NCC	**$2,748**	**$2,000**
Greenvale	Water	$4,194	$2,700
	Sewerage	-$213	
	Recycled	$1,933	$1,000
	Combined NCC	**$5,914**	**$3,700**
Epping North	Water	-$1,010	$2,200
	Sewerage	$576	
	Recycled	$6,341	$1,000
	Combined NCC	**$5,907**	**$3,200**
Mernda Doreen	Water	-$24	$1,000
	Sewerage	-$3,685	
	Recycled	N/A	N/A
	Combined NCC	**-$3,708**	**$1,000**
Infill*	Water	Not modelled	$1,000
	Sewerage		
	Recycled		N/A
	Combined NCC	-	$1,000

* Includes all connections not included in the 5 greenfield areas)

3.3. Capital Infrastructure Costs underpinning NCC calculations

3.3.1. Review of Growth Forecasts underpinning NCC calculations

Summary: Growth forecasts (overall and for individual pricing zones) underpinning NCC calculations are based on DPCD and council forecasts. This is reasonable.

Source of Growth Forecasts

YVW's growth forecasting methodology has been provided[16]. The methodology indicates that growth forecasts are based on DPCD forecasts (Urban Development Program, Victoria in Future Forecasts), forecasts from growth area authorities (precinct plans, growth corridors) and developer forecasts. This is reasonable

Growth Forecasts used in the NCC Models

YVW has provided the spreadsheet[14] which has been used to estimate the total number of lot connections expected each year and the allocation of these new connections to the 5 greenfield pricing zones and infill development. A top-down (percentage distribution) approach has been used to allocate new connection numbers to different growth areas – using a percentage split assessment of the relative growth in each area. The approach used is considered and reasonable given inherent uncertainty around the exact location of developments over a multi-decade investment period. The percentage split assessment incorporates information from the DPCD.

3.3.2. Review of Sequencing Plans underpinning NCC calculations

Summary: The sizing and sequencing of growth shared infrastructure appears reasonable. Information in the sequencing plans is correctly translated into the NCC calculations.

YVW growth strategies form the key basis for establishing the future infrastructure required to service growth in its various growth areas. These include scenario testing to demonstrate that the proposed infrastructure servicing strategy is reasonably robust and optimal (most cost efficient) means to service particular growth areas – taking an IWM approach considering servicing optimisation across different service types (water, sewerage, recycled water).

Sample growth areas indicate that the project costs that have been included in the NCC calculations are reasonable – reflecting the incremental growth infrastructure and sequence timing identified in the sequencing plans (sample review summary for one growth area is provided in **Table 6**). That is, information in the sequencing plans is correctly translated into the NCC calculations.

3.3.3. Unit Costing of Infrastructure

Summary: YVW's unit costing of capital infrastructure is reasonable.

Cost Curves

YVW has a comprehensive document providing CAPEX unit cost rates for a range of asset classes for the Water Plan 3 period[9]. [Note – an SKM employee on secondment to YVW was involved in updating these capital expenditure unit costs].

The unit costs are based on a range of source data (tender costs, project actuals, supplier cost estimates, subcontractor schedules of rates, insured values), and have been developed into cost equations with variables that appear reasonable (diameter for pipes, capacity for treatment facilities, rated power for pumping stations, etc.). Different cost curves have been developed to take into account other significant variables such as construction method (open cut, trenchless), pipe depth and pipe location (road reserve, other). YVW indicates that material, installation, commissioning and reinstatement costs are included within the unit rates.

3.3.4. Capital Costs included in the NCC Model

Summary:

- A bottom-up approach has been used to identify and allocate growth capital expenditure for each of the five greenfield pricing zones. This is generally reasonable.
- However, growth expenditure that does not fall into one of the five greenfield pricing zones has not been included in the NCC calculations. It is unclear if this is infill growth or CAPEX in some other unallocated locations. This may have a material impact on the proposed Standard NCCs.
- CAPEX values in the NCC model are slightly difference to values in YVW's Water Plan 3 submission (overall and for specific services within distinct pricing zones). This would not have a material impact on the proposed Standard NCCs.
- YVW has included an economic benefit of $500 per ML in the Recycled Water NCC calculations to reflect the savings realised through not placing desalination bulk water orders. The inclusion of this benefit appears reasonable, but may need to be considered with regards to the consistency of approach from different water authorities.

Infill growth infrastructure costs have not been included

A bottom-up approach has been used to identify growth capital expenditure that is included in YVW's NCC model[4]. Projects (including STP growth expenditure) are apportioned to the appropriate greenfield pricing zone(s) – where most projects are apportioned to a single pricing zone, but some are apportioned to two or three pricing zones.

However, it is noted that some projects have not been apportioned to any greenfield pricing zone. These projects – tagged as 'other' – are subsequently not included in YVW's NCC calculations. It is unclear if this expenditure relates to expected infill growth capital and there appears no reasonable justification for the

exclusion of this capital expenditure in the NCCs (information to support this decision has not been received). A sample of some of the 'other' projects include

- Plantes Hill Inlet / Outlet Main - Stage 2 (RW)
- Dorset Road Main & PRV (RW)
- Doncaster Hill Integrated Water Project (RW)
- Coburg Integrated Water Project (RW)
- SPS700 Janefield Drive

As shown in **Table 4**, the excluded capital expenditure for Water Plan 3 is approximately 6% of the identified growth capital expenditure. This would presumably have a material impact on the value of the proposed NCCs.

Table 4 – Greenfield and 'other' CAPEX costs separated for use in NCC calculations

Allocated CAPEX [$M]	2013/14	2014/15	2015/16	2016/17	2017/18	Total
Total Greenfield CAPEX	59.2	61.1	58.2	57.5	59.4	**295.3**
'Other' CAPEX*	5.6	3.8	5.3	3.8	1.1	**19.6**
'Other' as % of Overall CAPEX	*8.6%*	*5.9%*	*8.3%*	*6.2%*	*1.8%*	***6.2%***

* Not included in NC calculations

Growth CAPEX Estimate Comparisons

There appears a disconnect between the specific growth CAPEX values in the NCC model calculations and those values provided in YVW's Water Plan 3 submission (and a separate presentation) – overall and for specific services within distinct pricing zones. **Table 5** shows the differences is total CAPEX values from these different sources for the Water Plan 3 period. While there are not material differences in the growth forecasts, these numbers should be consistent.

Table 5 –Growth CAPEX value comparison from different YVW documents

Total Growth CAPEX [$M]	2013/14	2014/15	2015/16	2016/17	2017/18
From NCC model [13]	60.64	64.19	62.69	63.45	67.18
From WP3 Submission (Table 15)[18]	64.77	64.94	63.45	61.3	60.45
YVW Presentation (excluding sewer backlog)[16]	64.77	64.94	63.45	61.3	60.45

Benefit Allowance for Recycled Water Infrastructure

YVW has included an economic benefit of $500 per ML in the Recycled Water NCC calculations to reflect the savings realised through not placing desalination bulk water orders. The $500 per ML benefit is calculated on the minimum desalination order of 50 GL costing Melbourne Water, and ultimately the Melbourne retailers, $25 million and is applied to each charging area on the basis of recycled water demand. This represents the value of savings of the reduced potable water demand[19].

The inclusion of this benefit appears reasonable within the structure of the NCC model - to offset the higher NCC charge that new customers alone would be expected to pay with inclusion of the RW infrastructure, recognising that all customers will realise a benefit (lower variable/volumetric tariff) if desalination bulk water orders are not placed (or are lower than would be required without the alternative RW sources).

The inclusion of this benefit may need to be considered with regards to the consistency of approach from different water authorities.

Government Contributions

YVW indicate there is no relevant forecast government contributions for the incremental capital expenditure used in the NCC calculations[12].

Some government contributions were received during Water Plan 2 and the value of the contributions has been deducted from the value of assets constructed between 2008/09 and 2012/13[19].

Works Brought Forward (or Deferred) Costs

YVW has not included brought forward (or deferred) costs within their NCC Models or in the calculation of the Standard NCCs. All project timings are based on its proposed sequence timings.

3.3.5. Apportionment of Capital Expenditure (Water Plan 3 and Beyond)

Summary:

- Only projects that are '100% growth' have been included in YVW's NCC calculations.
- Augmentation and upsizing renewals projects in brownfield areas have not been included, even if part of their value that could be apportioned to growth.
- Review of sample growth areas suggests the 100% allocation of tested projects to growth does appear reasonable.

YVW have indicated that only 'pure' growth projects in greenfield areas have been included in the NCC calculations. Augmentation and upsizing renewals projects in brownfield areas have not been included, even if part of their value that could be apportioned to growth (effectively resulting in the cost of these incremental infrastructure costs being recovered from existing customers through the general tariff).

Sample growth areas indicate that the apportionment of capital is generally reasonable. That is, the 100% allocation of these projects to growth does appear reasonable. Sample review summary for one growth area is provided in **Table 6**.

■ **Table 6 – Reasonableness of project details in NCC model for a sample growth area**

Project	Included in NCC calcs	Growth Apportionment in NCC Model	Growth Apportionment Reasonable?	Growth Area Allocation Reasonable?	Timing same in Sequencing Plan and NCC?
Wallan [Water]					
PWGW0247	Yes	100%	Yes	Yes	Yes [2013 start]
PWGW0069	Yes	100%	Yes	Yes	Yes [WP2]
PWGW0070	No	N/A		Yes	Yes [2021 start]
PWGW0071	Yes	100%	Yes	Yes	Yes [WP2]
PWGW0210	No	N/A	-	Yes	Yes [WP2]
PWGW0212	Yes	100%	Yes	Yes	Yes [2013 start]
PWGW0250	Yes	100%	Yes	Yes	Yes [2013 start]
PWGW0257	Yes	100%	Yes	Yes	Yes [2022 start]
PWGW0260	No	N/A	-	Yes	Yes [WP2]
PWGW0263	No	N/A	-	Yes	Yes [WP2]
PWGW0264	Yes	100%		Yes	Yes [2013 start]
PWGW0498	Yes	100%	Yes	Yes	Yes [2013 start]
PWGW0499	Yes	100%	Yes	Yes	Yes [2014 start]
PWGW0549	Yes	100%	Yes	Yes	Yes [2018start]
PWGW0550	Yes	100%	Yes	Yes	Yes [2023 start]
PWGW0551	Yes	100%	Yes	Yes	Yes [2018start]
PWGW0561	No	N/A	-	Yes	Yes [WP2]

3.3.6. Water Plan 2 Expenditure in the NCC model

Summary:

- Water Plan 2 capital expenditure has been included. As with WP3 and future capital expenditure, only projects with 100% apportionment to growth have been included in the WP2 totals
- Deductions have been made to account for recovered NCCs, government contributions and asset depreciation. This approach is reasonable, although some improvements could be made to allocate these specific deductions to the appropriate pricing zone (instead of a top-down split).
- YVW indicate that some pre-WP2 growth capital infrastructure could potentially be included in the NCC calculations (indicating the costs of these infrastructure projects have not been fully recovered through NCC revenue already collected). YVW has nominated not to include these in the NCC calculations.

YVW has included capital expenditure from WP2 in the NCC model. The information supplied shows the total 'actual' capital expenditure of the water, sewer and recycled water infrastructure have been used as the basis of the calculations[19].

As with WP3 and beyond growth infrastructure, YVW indicates that only greenfield projects with 100% apportionment to growth have been included in the WP2 totals. Expenditure for brownfield augmentation projects has deliberately been excluded (as discussed in Section 3.2.2). The specific WP2 values used in the NCC models were calculated through the following steps:

1) Determine the value of WP2 growth infrastructure for each service (water, sewer and recycled water)
2) Deduct recovered NCCs and government contributions received during WP2
3) Depreciate the assets based on an 80 year asset life
4) Allocating the infrastructure costs to each pricing zone through a top-down percentage distribution

This process (and the resulting WP2 values used in the NCC model) are highlighted in **Table 7**.

Table 7 –WP2 growth infrastructure values used in the NCC model

Charging Area	Water		Sewer		Recycled	
Total For Service	$104.03M		$129.85M		$41.22M	
NCCs and Govt Contributions Received	$38.77M		$38.31M		$10.96M	
Net WP2 growth infrastructure (nominal)	$65.26M		$91.54M		$30.26M	
Depreciated WP2 growth infrastructure value to be recovered in NCCs	$63.36M		$87.83M		$30.17M	
Allocation to Pricing zones	% allocation	Remaining Value	% allocation	Remaining Value	% allocation	Remaining Value
Extension of UGB (Kalkallo, Wallan, etc.)	10%	$6.34M	20%	$17.57M	50%	$15.08M
Craigieburn (up to the old UGB boundary)	50%	$31.68M	20%	$17.57M	20%	$6.03M
Greenvale	10%	$6.34M	10%	$8.78M	0%	$0
Mernda Doreen	10%	$6.34M	20%	$17.57M	0%	$0
Epping North	10%	$6.34M	20%	$17.57M	20%	$6.03M
'Other' (not included in NCC calculations)	10%	$6.34M	10%	$8.78M	10%	$3.02M
Infill (not included in the allocations)	-	-	-	-	-	-

While the process is reasonable, there are a couple of observations that can be made:

- A top-down approach has been used to allocate the WP2 infrastructure costs to the different pricing zones (rather than a bottom-up approach linking specific projects to their associated pricing zones). YVW agrees that this is an improvement opportunity[19].
- Similarly, government contributions and NCCs received across all pricing zones have been added together and deducted from the total infrastructure costs for each service. Government contributions and NCCs received have not been allocated to their specific pricing zones
- An asset life of 80 years has been assumed for all infrastructure (where a shorter asset life, say 25yrs, is appropriate for M&E infrastructure and a longer asset life, say 100 years, is appropriate for pipes). While a list of projects was provided, there was no breakdown of civil, mechanical and electrical infrastructure in these projects. Increasing the level of granularity in the NCC model to an asset class level is a possible

improvement opportunity. The materiality of this improvement opportunity on the Standard NCCs would need to be tested.

- The included values are in nominal dollars.

Pre-WP2 Capital Expenditure

YVW have indicated that pre-WP2 growth capital infrastructure could potentially be included in the NCC calculations – indicating that the costs of these infrastructure projects have not been fully recovered through NCC revenue already collected. YVW has at this stage followed ESC direction and not included these projects in the NCC calculations. As shown in **Table 8**, including assets constructed in WP1 these would almost double the value of the pre-WP3 infrastructure to be recovered.

Table 8 – The difference between WP2 and WP1&2 depreciated growth infrastructure

Options of pre-WP3 expenditure	Water	Sewer	Recycled
Depreciated WP2 growth infrastructure value to be recovered in NCCs (2008/09-2012/13)	$63.36M	$87.83M	$30.17M
Depreciated WP1 & WP2 growth infrastructure value to be recovered in NCCs (2005/06-2012/13)	$111.81M	$172.03M	$33.67M

3.3.7. Gifted Assets

Summary: The value of gifted estimates used in the NCC models is over twice the value of the gifted assets estimate published in YVW's Water Plan 3 (Oct 2012) submission (understood to be due to a difference in unit rates used). This could have a material impact in the calculation of Standard NCCs. YVW agree that a common approach should be used.

Costing Methodology

The annual value of Gifted Assets has been calculated using the number of expected connections per year (per service and growth area – for each NCC model) multiplied by an assumed unit cost value for each service type:

- $3800 per sewer connection
- $1800 per water connection
- $1800 per recycled water connection

YVW has indicated that these values are estimates provided by a consulting engineer[12].

Gifted assets have not been included in the brownfield NCC calculations as new connections in brownfield developments generally connect to existing assets and do not require the extension of reticulation or shared assets.

Comparison to Gifted Asset Estimate in Water Plan 3 Submission Costing Methodology

It is noted that the value of gifted estimates used in the NCC models is significantly different (over twice the value) from the gifted asset values published in YVW's Water Plan 3 (Oct 2012) submission[18]. These are summarised in **Table 9** and could have a material impact in the NCC calculations. It is understood that this difference resulted from the use of difference unit rates (the YVW WP3 submission used historical unit rates for inclusion in its non-current asset valuation). YVW agrees that a common approach should be used[19]. The costing methodology used in the NCC models does appear reasonable.

Table 9 – YVW WP3 Gifted Asset Estimates from different documentation

Gifted Asset Estimates	2013/14	2014/15	2015/16	2016/17	2017/18
Gifted Assets (from YVW WP3 submission)[18]	$16.06M	$16.06M	$16.06M	$16.06M	$16.06M
Total Gifted Assets (from NCC model)[13]	$35.86M	$37.54M	$39.30M	$39.23M	$39.16M
Water - UGB	$2.41M	$2.78M	$3.18M	$3.46M	$3.71M
Water – Craigieburn	$1.6M	$1.67M	$1.73M	$1.63M	$1.62M
Water – Greenvale	$0.75M	$0.74M	$0.72M	$0.67M	$0.61M
Water – Epping North	$1.6M	$1.67M	$1.73M	$1.63M	$1.62M
Water – Mernda/Doreen	$3.58M	$3.49M	$3.39M	$3.33M	$3.07M
Sewer - UGB	$5.09M	$5.88M	$6.72M	$7.3M	$7.83M
Sewer - Craigieburn	$3.39M	$3.52M	$3.66M	$3.45M	$3.42M
Sewer - Greenvale	$1.59M	$1.55M	$1.51M	$1.4M	$1.3M
Sewer - Epping North	$3.39M	$3.52M	$3.66M	$3.45M	$3.42M
Sewer - Mernda/Doreen	$7.56M	$7.37M	$7.16M	$7.02M	$6.48M
Recycled Water - UGB	$1.87M	$2.22M	$2.6M	$2.87M	$3.14M
Recycled Water - Craigieburn	$1.33M	$1.38M	$1.43M	$1.33M	$1.32M
Recycled Water - Greenvale	$0.38M	$0.37M	$0.36M	$0.33M	$0.31M
Recycled Water - Epping North	$1.33M	$1.38M	$1.43M	$1.33M	$1.32M
Recycled Water - Mernda/Doreen	-	-	-	-	-

3.4. Operating Expenditure Costs underpinning NCC calculations

Summary: Actual incremental operating costs have been included in the NCC calculations. YVW's unit costing of operational expenditure and the approach used by YVW is reasonable.

YVW approach used

YVW indicates that the OPEX values included in the NCC models represent the actual incremental operating costs associated with the specific growth infrastructure identified for WP3 and WP4. SKM has not received documentation that supports this.

Given YVW has indicated that only projects 100% apportioned to growth have been included in the NCC calculations, there has been no opportunity (or need) to test any apportionment of operational expenditure to growth or other drivers.

Unit Cost Rates

YVW has a comprehensive document providing OPEX unit cost rates for a range of asset classes for the Water Plan 3 period[9]. [Note – an SKM employee on secondment to YVW was involved in updating these unit costs].

The values used

YVW has included two OPEX line items for each growth area:

- An '*incremental O&M per customer'* cost of $20 (nominal 2012/13 dollars). This reflects the cost an additional customer imposes on the administration of a business and includes things like meter reading, billing, customer contacts, information to customers (particularly recycled water customers), additional hardship support, merchant service fees, debt recovery costs, increased bad debts, etc[19]. This value is based on the 2011/12 operating expenditure of YVW's Billings and Contact Services Group (the average cost on a per service connection basis) along with a nominal (conservatively low) allowance for other incremental operating costs for YVW's Strategy and Communications Group. This is reasonable.
- An '*Other incremental O&M'* cost[5, 19], which incorporates the expected incremental OPEX cost for each growth infrastructure project. Projects are allocated to specific services (water, sewer, recycled) and to one of the 5 pricing zones (or otherwise counted as infill/other), which allows the total incremental OPEX costs for each year to be inputted into each of the fifteen NCC models. This approach and the review of sample incremental O&M costs is reasonable.

3.5. Reference Information

This review has been performed by SKM using the following documents and conversations:

1) *Yarra Valley Water submission to ESC – December 2012* (sourced from http://www.esc.vic.gov.au; 4-March-2013)
2) YVW email (received 12-March-2013)
3) YVW telephone conversation (12- March -2013)
4) *12-02-26 CAPEX Data For Steve Bumpstead Dec 2012* (excel spreadsheet, received 12-March-2013)
5) *13-02-26 YVW WP3 Growth OPEX timeline_Dec 2012* (excel spreadsheet, received 12-March-2013)
6) *Kalkallo Potable Water Internal* (pdf schematic, received 12-March-2013)
7) *Kalkallo Potable Water Retic with Timing* (pdf schematic, received 12-March-2013)
8) YVW meeting (13- March -2013)
9) *YVW Cost Rates Update – CAPEX – For Water Plan 3 2013/14 – 2018-19* (Version 4.0 Oct 2011, hard copy received 13-March-2013)

10) *YVW Cost Rates Update – OPEX – For Water Plan 3 2013/14 – 2018-19* (Version 1.0 Sept 2011, hard copy received 13-March-2013)
11) Various Infrastructure Plan schematics (hard copies received 13-March-2013)
12) YVW email (received 14-March-2013)
13) *13-02-27 ESC NCC model - YVW submission* (excel spreadsheet, received 14-March-2013)
14) *12-02-26 Lot Forecast* (excel spreadsheet, received 14-March-2013)
15) *Melbourne @ 5 Million – Servicing Growth in Melbourne's North* (Version 1.0 Dec 2010, pdf copy received 30-Jan-2013)
16) *Yarra Valley Water Presents WaterPlan 3 2013/14 – 2017/18 Providing Infrastructure to New Suburbs* (pdf copy of presentation, received 30-Jan-2013)
17) *Yarra Valley Water Servicing Growth WaterPlan 3 (2013/14 – 2017/18)* (Oct 2010, pdf copy received 30-Jan-2013)
18) *Yarra Valley Water - Water Plan 2013/14 to 2017/18* (October 2012, sourced from http://yoursayyvw.com.au; 8-March-2013)
19) YVW email (received 28-March-2013)
20) *13-03-15 Brownfields NCC* (pdf copy received 28-March-2013)

4. Western Water (WW)

4.1. Overview

This review has been undertaken using information obtained from the documents and follow up conversations with Western Water as listed in **Section 4.6.**

In summary, Western Water's (WW's) capital and operating expenditure included in its NCC calculations (i.e. in the ESC's NCC Model) are generally reasonable. A summary of the review of Western Water's NCCs in response to the particular aspects as required by the ESC are provided immediately following with some additional detail in the later sections.

Whether the capital expenditure included in the calculation relates to growth and the basis of the cost estimate is reasonable

- The growth forecasts underpinning Western Water's NCC calculations are based on updated estimates of growth assuming the expanded Urban Growth Boundary. Overall they appear reasonable.
- The sequencing and sizing of growth shared infrastructure appears reasonable.

  This is supported by quite detailed specific sequencing plans for each growth area.
- The unit costing of infrastructure proposed as part of the sequencing plans appears reasonable.

Whether the methodology used is reasonable for apportioning capital expenditure that serves multiple purposes (e.g. compliance, renewals etc as well as growth) to growth and to new customers

- Based on an analysis of WW's overarching growth strategy, growth rates, sequencing plans and sample projects for servicing the growth areas, apportionment of capital expenditure to growth appears reasonable. However the capital expenditure for any given capital project appears to have been wholly allocated to its primary driver – whether growth or otherwise - rather than on the basis of any more detailed analysis of apportionment between multiple drivers for a specific project.

  Potential Improvement opportunity: Preparing cost estimates of those projects without the additional costs related to growth (e.g. upsizing) in all cases would permit a more objective apportionment of project value to growth. Alternatively at least a sample should be tested for materiality to better support the position adopted.
- Western Water has only considered infrastructure for the next two Water Plan periods (2013-2018 and 2018-2023) - and consequently only included the associated capital expenditure – in its NCC calculations. It is understood that WW has primarily adopted this approach because it considers that the prediction of future capex beyond Water Plan 4 is too uncertain and that capital expenditure has less of an impact on current NCCs. This approach has the effect of depressing the standard NCC value estimated below what it might otherwise be.

  This approach is not unreasonable but seems inconsistent with the ESC's requirement to include all growth capex up to a 35 year horizon. Given that NCCs are intended to be reviewed as part of each Water Plan review, it would seem better to adopt all future estimated growth capex and make any necessary adjustments at the next five (5) year and subsequent reviews (as part of the Water Plan reviews). Western Water may have other business reasons, potentially including the encouragement of development in its growth areas, for adopting its stated approach.

The relative merits of the proposed infrastructure and related capital expenditure in servicing specific catchments versus a broader area

- Western Water is proposing to adopt a uniform standard NCC charge across all the various growth areas in its operating area largely based on administrative simplicity, feedback from its customers and the development industry and communications research work undertaken by VicWater. It is noted that this approach is not cost reflective for individual geographic growth areas.

  WW presumably also wishes to smooth the significant variations in NCC outcomes (as it has determined) across its growth areas as a result of the different timing of and varying levels of growth expenditure across pre-WP2, WP2, WP3 and WP4 periods and to avoid significant dislocations in transition from the NCCs adopted in Water Plan 2 to the new regime (as reflected even in its targeted transition program for the uniform standard NCCs adopted under the new regime).

- Western Water has undertaken extensive work on calculating standard NCCs for each of its individual growth areas and for each of the three services (water, sewerage and recycled water/Class A) for each of those areas.

- Western Water is well positioned for adopting non-uniform standard NCCs (or geographic / individual growth area NCCs) in the future or transitioning to them over time if a more cost reflective approach is required.

- Western Water is also understood to have made no distinction between NCCs for any infill development versus greenfield areas.

Any capital expenditure from Water Plan 2 (WP2) that is included (i.e. no double counting)

- Western Water has reasonably included WP2 capital expenditure in the determination of its standard NCC charges.

- In broad terms the residual proportion of the actual/original capital cost of relevant growth related Water Plan 2 infrastructure projects to be recovered from future NCC charges has been determined based on a combination of:

  - The current remaining life of the asset; and
  - The percentage of the asset that is related to growth (where that is the primary driver).

  Note: No specific apportionment of WP2 capital expenditure on the basis of the spare or unused capacity remaining within the asset at end WP2 to service future growth has been adopted for calculating the NCC charges. This should be further explored.

- The specific manner in which such WP2 capex has been apportioned and included is reasonable.

The reasonableness of the incremental operating costs (and their relationship to growth)

- WW has included incremental operating costs (both fixed and variable) attributable to growth in its NCC modelling across all services.

- In particular, Western Water has determined its incremental operations and maintenance costs based on the following components:

  - a fixed O&M cost (excluding labour) per lot for each of the three services (water, sewerage and recycled water/Class A) based on averaging the total historical O&M (excluding labour budget) per total lots serviced;
  - a fixed labour cost per lot for each of the three services (water, sewerage & recycled water/Class A) based on averaging the total labour budget per total lots serviced; and

- a variable cost, for water only based on the cost of water supply from the Melbourne grid.

- WW's approach to determining and providing for incremental opex in its NCC calculations is reasonable, although it is noted that this is one of a number of differing approaches to the determination of incremental opex adopted by the various water businesses.
- Overall, Western Water's nominated incremental operating costs (and the associated calculation methodology) appear reasonable within the context of the current mechanics of the ESC's NCC model.

4.2. Setting the Context: Western Water's NCCs reviewed in this report

Western Water has forecast significant population growth in its region over the next 20 years. The large majority of this population growth is resulting from expansion to the Urban Growth Boundary during the Water Plan 2 period which has significantly increased the area that Western Water will be required to service, with large scale Greenfield developments expected.

There are number of Precinct Structure Plans (PSPs) supporting development in the identified growth areas within Western Water's operating area. However the only currently approved PSPs in its area are for Rockbank North, Diggers Rest and Toolern.

The NCC charge(s) has been determined based on a methodology that is consistent with the pricing principles from the Guidance Paper.

4.3. Capital Infrastructure Costs underpinning NCC calculations

Summary:

- Based on assessment of the detailed documentation provided, Western Water's overarching growth strategy, its sequencing plans and growth forecasts and the infrastructure requirements and the associated capital expenditure to service its growth areas appears reasonable.
- Apportionment of the capital expenditure on major augmentation projects appears to be on the basis of allocation of the whole of the capex to the primary driver (whether growth or otherwise). Most of WW's growth capex appears to be clear cut. However it may be prudent to further test the reasonableness of this approach where multiple drivers do exist to test for materiality.

A review of the reasonableness of Capital Infrastructure Costs underpinning Western Water's NCC calculations requires testing of the associated growth forecasts and sequencing plans, the apportionment of capital costs (to growth and other drivers) and the influence that gifted assets and government funding have on the NCC calculations.

Overarching strategy for each major growth area

Western Water has developed an overarching (or high level) servicing strategy based on the expanded Urban Growth Boundary (UGB) focussed on its two main towns (Sunbury and Melton) and for each of its major growth areas within them[2]. This strategy defines the proposed optimal sequencing of development and forms the basis of the provision of water and sewerage infrastructure and the associated expected timelines for providing this infrastructure. This overarching strategy was undertaken in January 2010 and could be updated to reflect the various individual components of work subsequently undertaken by Western Water so that a

clear integrated picture can be obtained directly linking current growth forecasts with the current growth infrastructure proposed.

In this overarching strategy, Western Water has identified six (6) individual growth areas for the town of Sunbury (including those in Diggers Rest) as shown in **Figure 2** and seven (7) individual growth areas for the town of Melton (including those in Toolern and Rockbank North) as shown in **Figure 3**.

The population forecasts as allocated for the UGB, and the associated number of serviced lots, were reasonably apportioned between the growth areas identified and over time. High level identification of costed options for provision of servicing infrastructure (water, sewerage network and treatment, recycled water) were also identified including an indicative optimal high level option.

Further and more recent work was carried out on population forecasts and forecast serviced lots to 2030, as outlined in Western Water Growth Strategy[3]. This has been reflected in a detailed spread-sheet showing the breakdown of the forecast lots in each growth area[4] and the implications for potable water and recycled water demands and sewage flows (and other measures for establishing the infrastructure for both existing and new developments) under a number of scenarios. The growth and forecast measures form the basis of WW's infrastructure requirements and ultimately its capital program. It is noted that the lot growth rates increase from approximately 3.7% to 5.1% over the Water Plan 3 period which WW considers to be modest compared with Water Plan 2 growth rates of approximately 3% to 4% (based on an assumed linear trend increase) but may be somewhat conservatively high.

Western Water has adopted the approach that only currently Growth Areas Authority approved Precinct Structure Plans (PSP) will be serviced with infrastructure in Water Plan 2013-2018. Currently these approved PSPs are Rockbank North, Diggers Rest and Toolern as indicated in **Figure 4**.

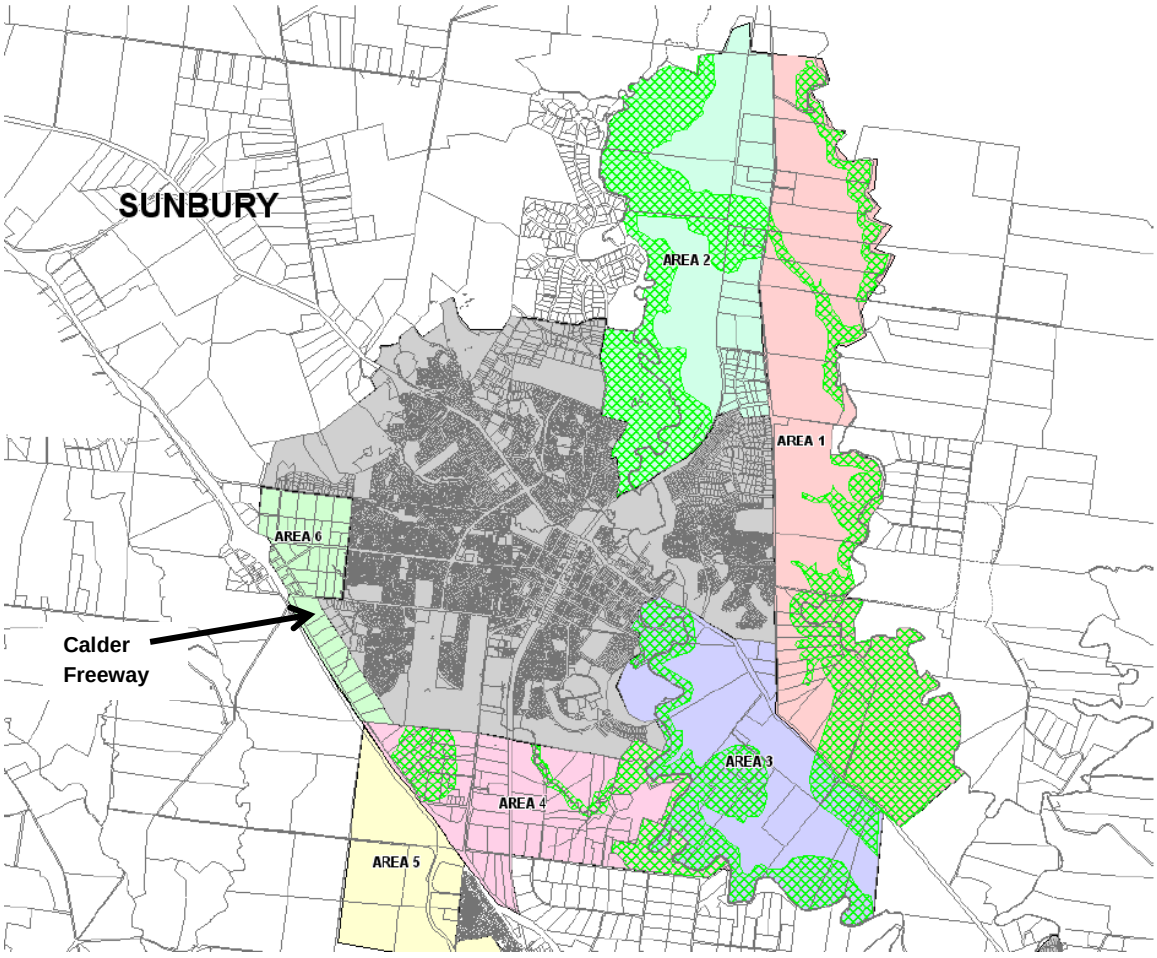
Using the data from WW's Growth Strategy, hydraulic modelling was undertaken to determine the infrastructure needed to service the growth areas, and in particular the infrastructure planned within Water Plan 2013-2018 to service the approved PSP areas.

The modelling undertaken to establish the infrastructure to be provided was based on the DSE's Water Supply Demand Strategy and a "return to dry" planning scenario rather than the "long term average" planning scenario understood to be preferred by the ESC. Within this context Western Water has optimised the operation of its existing facilities (and planned infrastructure) through a number of water supply optimisation tools. This approach has been approved by WW's Board[5]. Extensive water resources optimisation modelling has been undertaken to support this[6].

Western Water has considered its water resources from a holistic viewpoint including local water resources (from local catchments), potable water from Melbourne's water supply grid and recycled water from the Surbiton Park RWP (Recycled Water Plant) and a proposed new Sunbury RWP.

In particular, Class A recycled water from the Surbiton Park RWP is used for potable water substitution supplied to the Eynesbury and Toolern areas. As part of managing its pool of water resources Western Water plans to augment the Class A recycled water system through Water Plan 2013-2018, to provide for further development in the Toolern growth area as well as extending supply to service development at the Rockbank North growth area.

■ **Figure 2 Location of Growth Areas within Sunbury**

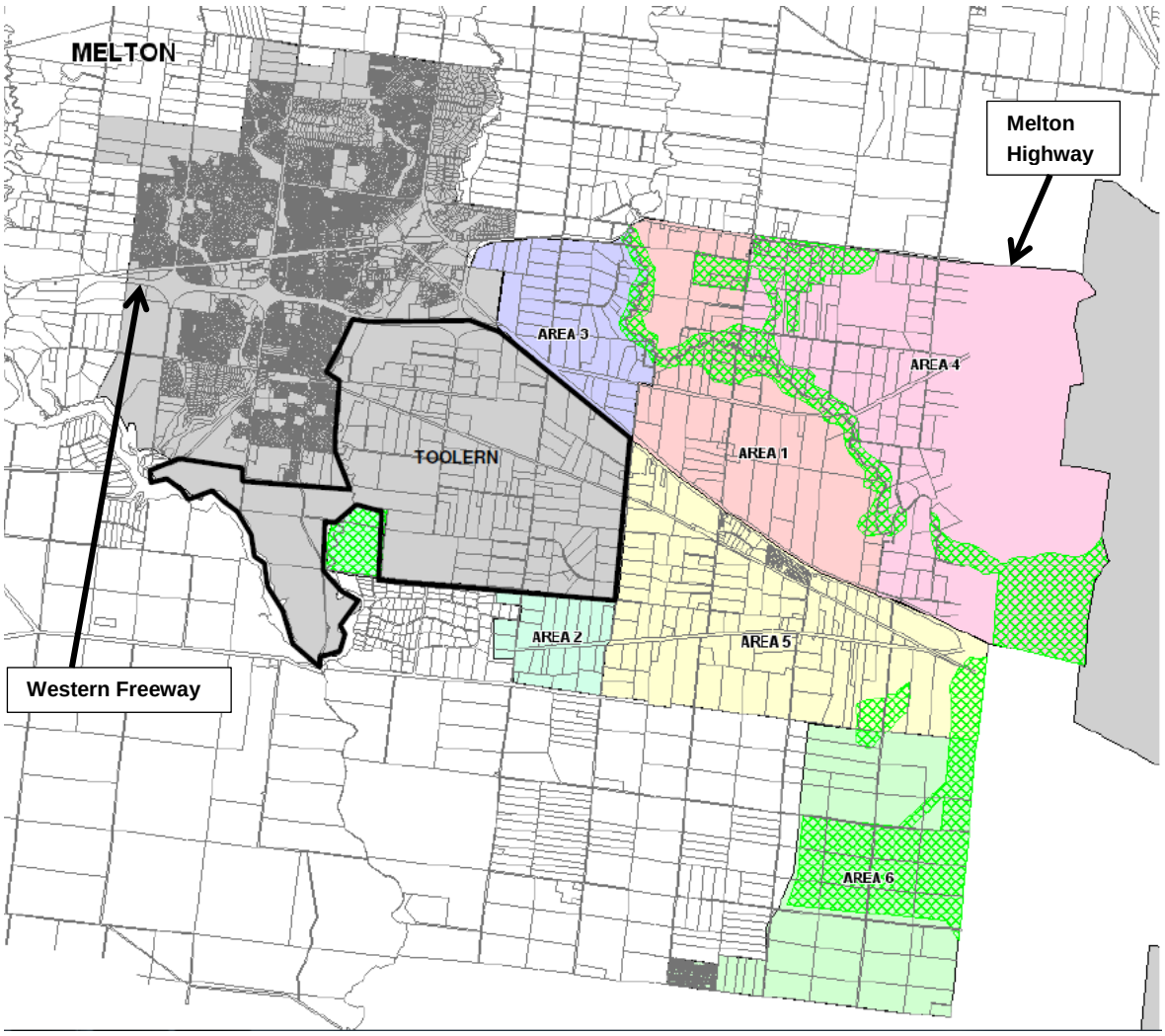


Class A recycled water is also proposed to be supplied (as potable water substitution) to the Diggers Rest growth area in Water Plan 2018-2023 from the Sunbury Recycled Water Plant, with developers to provide the Class A reticulation in 2013-2018 (WP3) and WW providing a potable water cross connection to the proposed Class A reticulation until the Class A plant is constructed in Water Plan 2018-2023.

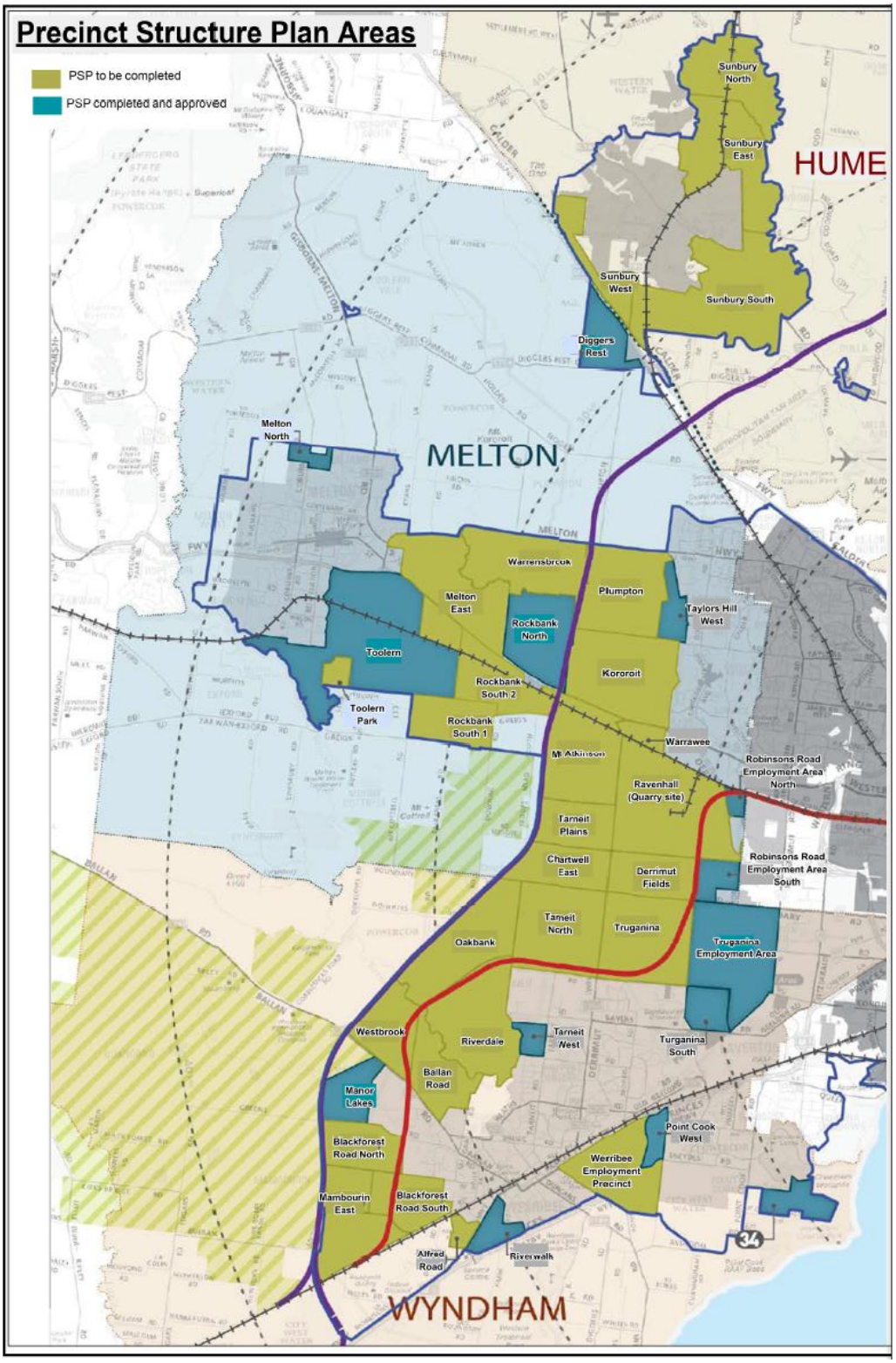
WW has undertaken appropriate financial analysis to demonstrate that:

- While the use of Class A recycled water third pipe reticulated supply is not generally cost efficient based on total community costs compared with conventional water supply (including sourcing water from the Melbourne grid) there are opportunities where it can be cost efficient for particular catchment growth areas including for greenfield development in significant growth areas close to existing Class A infrastructure and is fit for purpose; and
- this recycled water sub-strategy that provides recycled water to Toolern and Rockbank North and defers capital expenditure associated with the Class A infrastructure in Sunbury/Diggers Rest from Water Plan 3 to Water Plan 4 (2018 – 2023) is cost efficient. [NB: The WW Board approved this Recycled Water Strategy in December 2011[7].]

■ **Figure 3 Location of Melton Growth Areas**



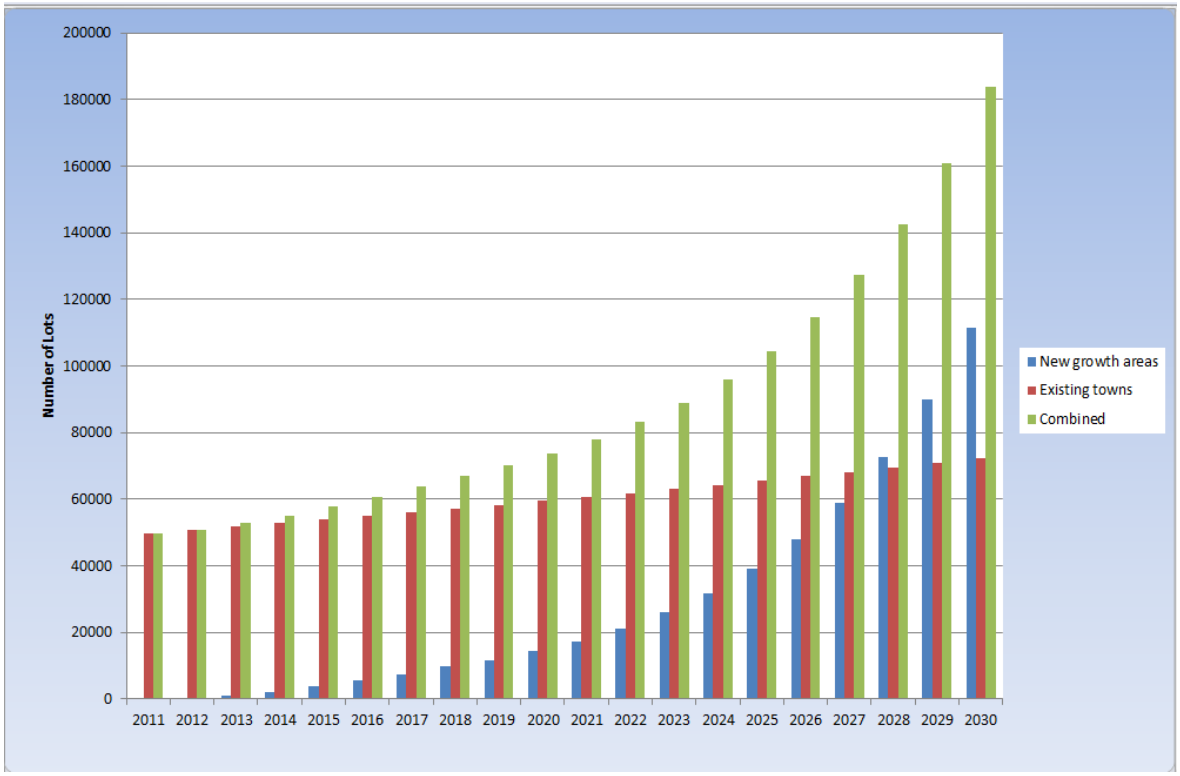
- **Figure 4 Melton Precinct Structure Plan (PSP) Areas – Toolern, Rockbank North, Diggers Rest**



Growth forecasts: Growth forecasts underpinning Western Water's NCC (water) calculations are based on contemporary estimates of growth in its various identified growth areas. A 20 year forecast for new connections/serviced lots has been developed (essentially based on the 2012 Water Supply Demand Strategy (WSDS) and its recent Western Growth Strategy) and underpins WW's NCC calculations. These are summarised in **Figure 5**.

Overall the growth forecasts seem reasonable.

- **Figure 5 Overall Growth Lots Forecast (2030 outlook)**



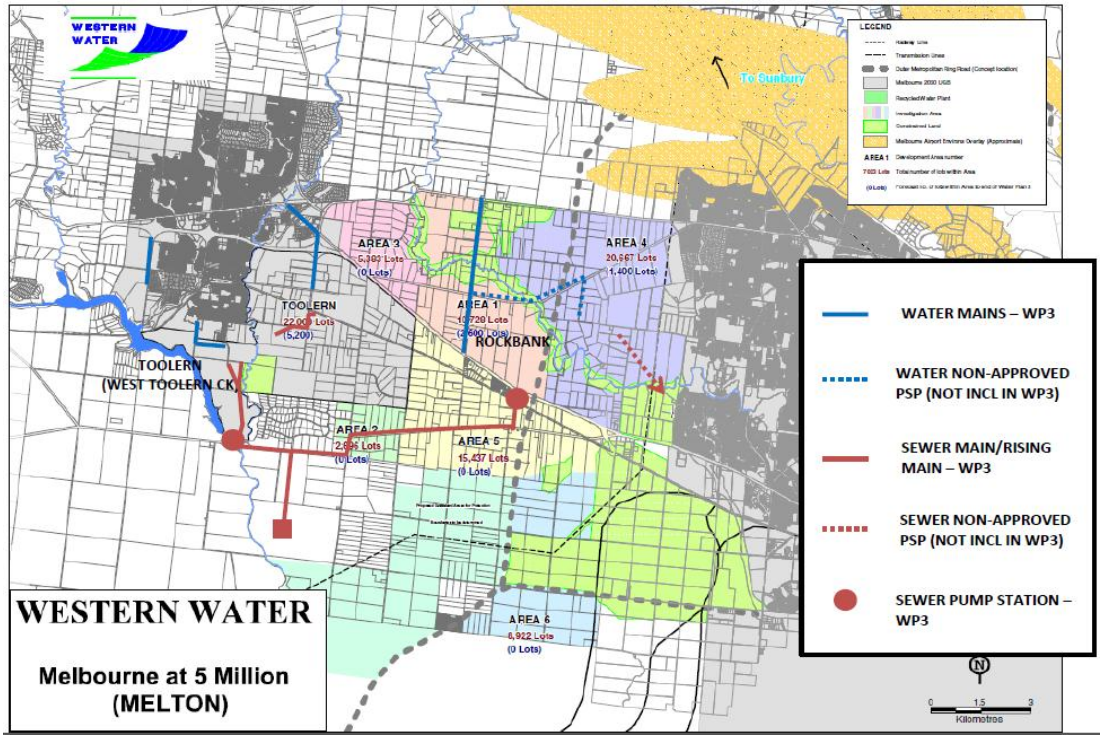
Sequencing Plans: All project timings are based on Western Water's proposed reasonable and efficient 'sequence timing' to service growth. The sequencing and sizing of WW's proposed shared growth infrastructure are based on detailed plans (including scenario testing) and appear reasonable.

An indication of the growth infrastructure proposed for Melton and Sunbury is provided in **Figure 6** and **Figure 7** respectively.

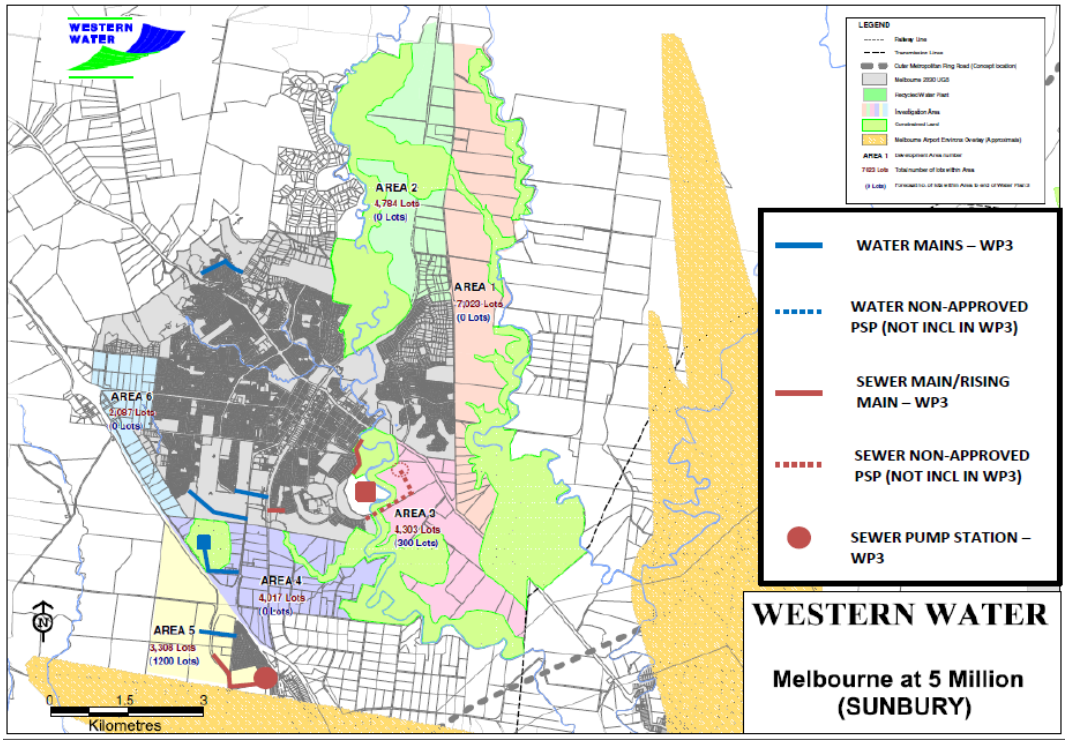
Expenditure cost estimation: The updated unit costing of infrastructure appears reasonable. Some indication of P5/P50/ P95 cost estimates is undertaken but it is uncertain whether this is done for all projects.

An indication of the default unit costs used by Western Water for pipelines (where specific market information is not available) is indicated in **Table 10**. The unit rates adopted by Western Water are reasonable and fall within the normal unit cost bounds (albeit slightly on the high end). Typical 'standard' provisions and contingency allowances adopted are reasonable and fall within normal bounds as indicated in **Table 11**.

- **Figure 6 Melton Growth Infrastructure**



- **Figure 7 Sunbury Growth Infrastructure**



- **Table 10 WW Adopted Unit rates (Pipes)**

Potable Water, Recycled Water & Rising Mains Rates		Gravity Sewer Main	
Pipe Size mm	Unit rate $/m	Pipe Size mm	Unit rate $/m
150	200	225	248
200/225/250	252	300	343
300	400	375	432
375	522	450	647
450	609	525	758
525	800	600	831
600	1000	750	870
750	1100	900	1217
825	1200		
900	1300		
1050	1500		
1350	2000		
1500	3000		

- **Table 11 Standard provisions and contingency cost allowances**

Category / item	Minor Project % Construction cost	Major Project % Construction cost
Stakeholder management	2	5
Design & Project administration	10	15
Contingency	20	35

NB: Provisions for difficult ground conditions and crossings (rail, road, waterways) are selected on a project by project basis

Government contributions: There does not appear to be any government contributions relevant for the incremental capital expenditure used in the NCC calculations.

The Toolern stormwater project for which Western Water is seeking federal funding currently (of approximately $9.3M) is a growth project but (appropriately) it has not been included in the NCC modelling, as it is envisaged that this would result in the deferral of other Western Water growth capex or other benefits should it proceed.

Also, as far as can be established, Western Water has not currently included brought forward costs within its NCC modelling and calculations. Although a further check on the Toolern Main Outfall Sewer project should be undertaken to confirm that it has not been included in the NCC calculations as, while it is a growth related project, Western Water has labeled it an 'out of sequence development'.

Gifted Assets:

Western Water has included the total value of gifted assets calculated based on weighted average costs (informed by historical costs). WW has established the value of gifted assets for inclusion in the NCC model based on the per lot values for the three service categories as shown in **Table 12**. This approach and these values are reasonable.

Table 12 Gifted Assets – basis of valuation

Category	$/Lot
Water	1,900
Sewerage	3,900
Recycled Water (Class A)	1,100

Gifted assets are constructed and funded by developers to service new development. Western Water has included the following annual amounts which are expected to increase substantially over time (a 20 year horizon) in its NCC calculations:

- Water: $4.4M p.a. initially to $14M p.a.
- Sewerage: $9M p.a. initially to approximately $29M p.a.
- Class A recycled water: $1.4M p.a. initially to $5M p.a.

The initial annual value of Gifted Assets adopted is based on the Western Water's historic values/levels of gifted assets and appears reasonable. The later year estimations may require more analysis.

Identification of any material differences in how Greenfield and brownfields developments/growth areas are dealt with in terms of the preceding.

Western Water has consulted extensively with the development industry in relation to the revised approach to New Customer Contributions, including through Vicwater and also its own developer forum. The key features of the feedback from the development industry were that it wanted certainty and consistency on NCCs and that NCC policy should not "influence planning decisions"[12,13].

On this basis Western Water has elected to adopt the position that Brownfield and Greenfield development should be charged the same NCCs and that a single uniform standard NCC should be adopted regardless of the lot size.

It is also relevant that all additional water to service Western Waters growth will come from the Melbourne System and potentially through a common connection. Western Water's water supply system is interconnected which allows flexibility of using both local water and water from the Melbourne system.

4.3.1. Apportionment of Capital Expenditure (Water Plan 3 and Beyond)

Summary:

- Based on analysis of a sample of Western Water growth areas, apportionment of capital expenditure to growth appears reasonable.
- Apportionment of capital expenditure for major augmentation projects – to the extent that there are multiple drivers – appears to have been allocated on the basis of the whole of the capex being allocated on the basis of the primary driver (whether growth or otherwise). However it may be prudent to further test the reasonableness of this approach where multiple drivers do exist to test for materiality.

Infrastructure implementation plans and associated capex

Overall Western Water has provided extensive information on its capital program[8], its financial model[9], cost and timing sensitivity testing[11] and example costings for specific projects[10,11,15,16,17]. It is noted that for NCC modelling purposes:

- Only growth capex for the next two Water Plan periods (10 years 2013 to 2013 = WP3 + WP4) have been included in the NCC calculations. Approximately $179.4 (or 71%) of Western Water's WP3 capital expenditure is designated for growth;
- Only growth capex associated with approved PSPs (Precinct Structure Plans) has been included;
- Growth projects from 2008-2013 Water Plan (WP2) were included (at closing Written Down Value as at 30 June 2013) based on residual asset life;
- The Toolern stormwater project capex has not been included (nor any government contributions);
- Some particular projects with a higher level of design or understanding (above planning level), have more detailed cost estimates, otherwise default unit rates/costs are used (as per **Table 10** and **Table 11**; and
- Western Water uses a water resources optimisation model[6] to robustly test for ensure a balanced sourcing of water (based on a range of scenarios and variables) to inform decisions on which source water should be used. As previously indicated a "return to dry" year scenario has been adopted as WW's benchmark for WP3.

  [NB: Western Water has the ability to provide potable water to customers through the use of local sources or connections with the Melbourne system. Water produced from local water sources are significantly more cost effective than importing water from the Melbourne system and hence is preferable. A blend of Melbourne Water and local supplies is required as local storages do not provide sufficient long term security of supply to Western Water's growing region. For optimal and cost efficient operation a reserve of local water needs to be maintained in order to meet peak day demands.]

Western Water has indicated that while only the 10 year capital program is included in its NCC model, the model extends for a longer period. It is not clear why the future growth capex in the NCC model has been limited to 10 years but it is understood the key reasons are:

- The uncertainty of growth capex beyond the 10 year timeframe;
- The lesser impact of capex beyond 10 years on current NCCs; and
- The ability to adjust the NCCs on a periodic basis.

4.3.2. Water Plan 2 Expenditure in the NCC model

Summary:

- Western Water has reasonably included Water Plan 2 capital expenditure in its NCC calculations both in terms of the method of apportionment of the costs of WP2 Growth related infrastructure projects and the quantum.

Western Water has reasonably included Water Plan 2 capital expenditure in the determination of its standard NCC charges. Some potential improvements could be considered as below.

Most projects allocated to growth with capital expenditure in the 2008-2013 Water Plan 2 (WP2) period have been included in the NCC calculations at the closing Written Down Value of the asset as at 30 June 2013 (in June 2013 $).

In broad terms, the residual proportion of the actual/original capital cost of relevant growth related Water Plan 2 infrastructure projects to be recovered from future NCC charges has been determined based on a combination of:

- The current remaining life of the asset; and
- The percentage of the asset that related to growth (where the primary driver).

The spare capacity currently remaining within an asset constructed in WP2 to cater for future growth does not appear to have been incorporated into the assessment of the appropriate WP2 capex to be carried forward for the NCC calculations. It seems that the notional reduction in asset life/depreciated value alone has been included in the NCC calculations. Consideration should be given to apportioning WP2 capex based on the extent of unused capacity in the asset at the end of WP2 – or a combination of this and remaining asset life - because this seems a better indicator of the availability of the asset to service future growth and the value to be recovered from future new customers (as a number of other water authorities have adopted). By using asset life (or depreciation based on notional asset life) alone the resultant NCC may be slightly underestimated.

Western Water appears to have allocated the whole of the value of an asset to its primary driver (whether growth or other).

In calculating the current remaining life of an asset and assessing its current written down value Western Water has categorized all the new assets with asset life and annual depreciation as shown in **Table 13**.

Table 13 WW's Asset Life Categorisation and Depreciation Regime

Asset Category	Asset Life	Annual Depreciation [%]
1	20	5.0
2	30	3.3
3	50	2.0
4	70	1.4
5	100	1.0

4.3.3. Works Brought Forward (or Deferred) Costs

At present Western Water has not included brought forward costs within the NCC Model. All project timings are based on the proposed "Sequence Timing" of additional infrastructure required to service development in its various growth areas. Western Water's Sequence timing notionally represents the most cost efficient means and optimal timing of providing infrastructure to service development in its various growth areas.

Western Water also undertakes planning and assessment of the potential likely scenarios for development in its growth areas as part of its Master Planning processes. The costs of any bring forward works (additional to those for optimal 'Sequence Timing') are separate and not included in the NCC calculations.

4.4. Uniform vs Non-Uniform Standard NCCs

Western Water has undertaken substantial work to establish variation in standard NCCs for its individual growth areas (i.e. the geographic or growth area specific [non-uniform] standard NCCs):

- for its individual services – water, sewerage and recycled water/Class A; and
- in aggregate for all services
  - for four major growth area categories, namely Western Water overall, Melton Town growth areas, Sunbury growth areas and Other Towns growth areas
  - for individual town growth areas (further disaggregation).

MJA (Marsden Jacob Associates) has assisted Western Water in undertaking extensive modelling of a suite of New Customer Contributions (NCC's) based on the pricing principles established by the Essential Services Commission (ESC).

This modelling work was developed down to a disaggregated level for each service provided by Western Water[9]. This has enabled Western Water to understand the impacts of development in particular growth areas. SKM has sighted the outcomes of this extensive analysis and considers it to be an excellent foundation for establishing cost reflective standard NCCs in future if that is required.

Notwithstanding all the detailed work on establishing cost reflective individual (geographically based) non-uniform standard NCCs for each of its growth areas and each of its services, Western Water has elected to adopt a uniform standard NCC for each of its services regardless of the growth area (and by definition) a single aggregate NCC (where all services are provided) across its whole operating area.

In particular Western water has proposed the following approach to NCC changes (founded on a full cost recovery target):

1. Single NCC for each service – water supply, sewerage and Class a recycled water apply across Western Water's region;
2. A uniform NCC be applied independent of lot size (with a 50% discount continuing as currently for water NCC where lots are provided with Class A recycled water).
3. NCC charges for Water Plan 2013-2018 be;
   - *Water Supply*: $3,100 per lot (50% where Class A provided = $1,550)*

     [*As part of the ongoing support of Class A development with the continuing 50% reduction to Water where Class A Recycled Water "offset" by a slight increase in the overall Water Supply NCC.]

- *Sewerage*: $3,700 per lot
- *Class A recycled water*: $2,400 per lot

4. A transition period commencing at 70% to 100% of the calculated NCC over the 5 year Water Plan period.
5. NCC for multi-unit development be provided with a "credit" for the existing lot and then a standard NCC per unit. For larger unit developments for example retirement villages that a revised NCC be calculated based on either a pro-rata approach and/or "fixture unit".

The adoption of uniform standard NCC(s) is primarily based on:

- feedback from customers as part of 2013-2018 Water Plan consultation, development industry consultation and Western Water modelling of a range of scenarios;
- a desire to "smooth" the variations in NCCs between the different growth areas. The disaggregated or individual growth area NCCs produced variability across the Western Water region in particular in low growth areas where the timeframe for calculation of NCC produced NCC "spikes". The results produced in the new growth (high growth) areas remained fairly constant. By adopting a weighted averaging approach (of these costs) the lower growth area spikes are "absorbed"/smoothed; and
- Western Water's strategy that all new growth in its region will be supported by additional water from the Melbourne grid assisted by the interconnection of Western Waters water supply system. On this interconnectedness basis, NCC's for water across Western Water will therefore result in a "pro rata" calculation which supports a common charge.

  [NB: The majority of lots predicted within the Western Water region are much smaller (around 400m2) than in the past, distorting what was previously the average size lot. Developer feedback suggested an aversion to NCC's driving lot sizes.
- encourage development in the region..
- administrative simplicity - it was considered simpler to communicate, administer and accept as well as providing greater certainty to developers to apply one charge per service across all areas.

Overall SKM notes that:

- The approach proposed by Western Water, like many other water authorities is not cost reflective on a geographic basis and to that extent may be inconsistent with one of the key ESC guiding principles although Western Water considers that it does meet the ESC pricing principles and criteria; and
- If substantial growth capacity has been delivered some time ago and so significantly distorts the determination of a reasonable standard NCC (geographic based) then the issue of cost efficiency and appropriate timing of such growth infrastructure needs to be considered further (as part of this decision-making on uniform vs non-uniform standard NCCs) and whether the broader customer base is unreasonably bearing the burden of this.
- Western Water has also made no distinction between NCCs for any infill development versus greenfield areas.
- Because of the extensive individual growth area NCC modelling that Western Water has undertaken, it is well positioned to move to (or transition to) more cost reflective NCCs and non-uniform standard NCCs for individual growth areas if the regulatory environment requires or facilitates this in future.
- Western Water has already undertaken extensive consultation with its customers and stakeholders and this is continuing[13]. Some key messages from the notes of the meeting are

- *Customers:* Customers were very clear that developers should fund new growth with consideration of an "offset" for future tariff reductions.
- *Developers:* Developers wanted certainty, consistency and sound planning policy settings (not driven per se by NCCs).

4.5. Operating Expenditure Costs underpinning NCC calculations

Summary:

- WW's nominated incremental operating costs (and the associated calculation methodology) for its water NCC appears reasonable within the context of the current mechanics of the ESC's NCC model.

Western Water has included incremental operating costs (both fixed and variable) attributable to growth and new capital expenditure have been included in its NCC modelling across all services. In particular WW has:

- included incremental operating costs (both fixed and variable) attributable to growth in its NCC modelling across all services.
- determined its incremental operations and maintenance costs based on the following components:
  - a fixed O&M cost (excluding labour) per lot for each of the three services (water, sewerage and recycled water/Class A) based on averaging the total historical O&M (excluding labour budget) per total lots serviced;
  - a fixed labour cost per lot for each of the three services (water, sewerage & recycled water/Class A) based on averaging the total labour budget per total lots serviced; and
  - a variable cost, for water only based on the cost of water supply from the Melbourne grid.

  The specific values adopted for this are shown in **Table 14.**

Table 14 WW – Basis of Incremental Opex

Service	Incremental Opex		
	Variable	Fixed O&M $/Lot	Fixed Labour $/Lot
Water	$1742.70/ML	114.02	153.11
Sewer	-	113.65	112.11
Recycled Water	-	96.24	37.48

WW's approach to determining and providing for incremental opex in its NCC calculations is reasonable, although it is noted that this is one of a number of differing approaches to the determination of incremental opex adopted by the various water businesses.

Overall, Western Water's nominated incremental operating costs (and the associated calculation methodology and their relationship to growth) appear reasonable within the context of the current mechanics of the ESC's NCC model.

4.6. Reference Information

This review has been undertaken using the following documents and supporting data and information provided by Western Water:

1) *Western Water NCC Submission to ESC, December 2012*
2) *Servicing Report for Melbourne at 5 Million UGB – Sunbury & Melton (Draft), MWH, Jan 2010*
3) *Forecasting Growth – Western Water Growth Strategy, Final Draft Report, Osborne Management & MJA, December 2011*
4) *Spreadsheet - Growth Strategy updated for 2011/12 actuals (pre ESC audit), Western Water internal document*
5) *Water Plan 2013-2018 - Board Report (Commercial-in-Confidence), October 2012*
6) *WW's Water Resources Optimisation Model (WP3 & WP4) - Optimised "Return to Dry Scenario*
7) *Class A Strategy Board Report (Commercial-in-Confidence), DECEMBER 2011*
8) *WP3 Reporting Sheet $251M (Capital Projects Summary), October 12*
9) *Western Water NCC modelling (based on ESC guidance) – Detailed inputs and outputs, 2012*
10) *Example Cost Template - Rockbank Rising Main - Stage 1*
11) *Western Water Capital Plan_Rev A1*
12) *VICWATER (VWIA) NCC Engagement Program, Final Report, October 2012*
13) *Feedback from Western Water Developer NCC Forum, Western Water Notes, February, 2013*
14) *Western Water Draft NCC Negotiation Framework, Guide to New NCCs, January 2013*
15) *Melton Class A RW Business Case WP3*
16) *Melton Recycled Water Straty_S0365_Cost Estimate*
17) *Memo_Class A Melton to PWC 20130111*
18) Supporting conversation with Rob Franklin (WW), March 2013.

5. South East Water

In summary, South East Water (SEW)'s capital expenditure included in its NCC calculations is generally reasonable, with several opportunities for improvement. It is noted that SEW has nominated to use its own model – which only includes incremental capital expenditure in the NCC calculations – instead of the ESC's NCC model – which includes incremental operational expenditure and various benefits.

This review has been performed by SKM using the documents and conversations listed in **Section 5.5**.

5.1. Overview

Compliance with ESC model

SEW has nominated to use its own model – which only includes incremental capital expenditure in the NCC calculations – instead of the ESC's NCC model – which includes incremental operational expenditure and various benefits. There are material differences between SEW's model and that put forward by the ESC.

To that extent SEW's approach is not compliant with the ESC's requirements.

Whether the capital expenditure included in the calculation relates to growth and the basis of the cost estimate is reasonable

- Growth forecasts underpinning NCC calculations are reasonably based on Victoria in the Future and Urban Development Plan forecasts.
- An error in a formula used in SEW's NCC model was identified, which will change the number of estimated connections for WP3 and WP4 (and hence the proposed Standard NCCs). This error has been discussed with SEW and should/will be corrected. *Improvement Opportunity*
- SEW has elected not to use the ESC's NCC model to calculate its proposed Standard NCCs. SEW's own model includes only growth capital expenditure for a 15 year investment period (Water Plans 2-4). Incremental operational costs and some other inputs have not been included in the calculation of the proposed NCCs. SEW considers that there is a reasonable level of uncertainty around the growth rates and location of new connections and the specific CAPEX and OPEX expenditure required in the years beyond their forecasted investment period and so, from a fairness perspective, it is difficult to justify the inclusion of these costs and revenues in current NCCs. The nomination of this shorter investment period and the exclusion of some inputs will need to be considered with regards to the consistency of approach from different water authorities and with regards to the materiality of any difference in the resulting standard NCCs. *For consideration*
- SEW has included an Intergenerational Equity Factor (IGF) which is not in the ESC's model. The quantum of this is subjectively "determined". The effect of application of this IGF is that some 30% of incremental capital infrastructure costs directly associated with growth have been excluded from the Standard NCCs and included for recovery in the general tariff. The reasonableness of this should be considered further by the ESC in terms of consistency with the ESC's principles (especially cost reflectivity) and also in terms of consistency of approach as between different water authorities. *For consideration*
- SEW has nominated to not included significant sewage treatment plant growth infrastructure and some recycled water expenditure in the NCC calculations on the basis of equity and consistency of approach

(with other major shared infrastructure). As incremental growth infrastructure (identified by SEW as growth related expenditure), it would appear reasonable to include these costs in the calculation of the Standard NCCs. The materiality of the inclusion of these costs in the Standard NCCs has not been tested. It is appreciated that the inclusion of these costs may have a material impact on the magnitude of the Standard NCCs and affordability may need to be considered/tested. *For consideration*

- SEW has assumed an asset life of 80 years for all infrastructure for depreciation calculations. As an improvement opportunity, infrastructure could be allocated to a relevant class and assigned an appropriate asset life (e.g. 25 years for mechanical and electrical assets and possibly 100 years for some civil assets). *Improvement opportunity*

Whether the methodology used is reasonable for apportioning capital expenditure that serves multiple purposes (e.g. compliance, renewals etc. as well as growth) to growth and to its new customers

- SEW has indicated that only projects that can be 100% apportioned to growth have been included in the NCC calculations. Based on analysis of sample growth areas, apportionment of capital expenditure to growth appears reasonable.
- Projects with other key drivers and an element of growth (e.g. upsizing renewals) have not been included. Their incremental infrastructure costs are subsequently recovered from the broader customer base through the general tariff. Discussions suggest such incremental costs are typically immaterial.

The relative merits of the proposed infrastructure and related capital expenditure in servicing specific catchments versus a broader area

- SEW's proposed Standard NCCs relates directly to the incremental growth infrastructure (and hence growth forecasts) within each pricing zone. That is, there is a bottom-up approach linking specific projects to their associated pricing zones; and there is no 'smoothing' in the proposed NCCs. This approach is reasonable and consistent with the ESC's key principle of 'cost reflectivity'.

Any capital expenditure from Water Plan 2 (WP2) that is included (i.e. no double counting)

- The WP2 values included in the NCC calculations are reasonable. Location specific (bottom up for each pricing zone) project values have been included with at 28% reduction applied (to take into account recovered NCCs and asset depreciation)
- An improvement opportunity is possible – to calculate and apply the value reduction (collected NCCs and depreciation) specific for each pricing zone and service. *Improvement Opportunity*
- The nominated exclusion of some non-residential recycled water capital expenditure would need to be explored further. Arguments exist for both their inclusion and exclusion from the NCCs. *For consideration*

The reasonableness of the incremental operating costs (and their relationship to growth)

- SEW has elected to not include operating costs in its calculation of Standard NCCs. The exclusion of OPEX costs (along with other inputs) will need to be considered with regards to the consistency of approach from different water authorities. *For consideration*

5.2. Setting the Context: The NCCs reviewed in this report

5.2.1. The Proposed Standard NCCs

SEW's proposed set of Standard NCCs are summarised within its December submission to the ESC. The current proposed set of Standard NCCs is shown in **Table 15** and can be summarised in the following bullet points. Note that these values may need to be adjusted following some recommendations from this review.

- Location-specific, per lot per service Standard NCCs are proposed for three 'pricing zones' ('infill' and two geographically distinct greenfield areas)
  - Casey growth area,
  - Cardinia growth area
  - Infill areas covering the remainder of South East Water's service area
- Pricing zones have a separate Standard NCC for each service – water, sewer and recycled water (where available)
- There is a single Standard NCC for each service within a pricing zone – they do not vary for different lot sizes or customer types (residential / non-residential)

Table 15 – SEW proposed Standard NCCs

Pricing Zone	Water	Sewer	Recycled	Total
Cardinia (Officer – Pakenham)	$1,324	$2,632	$1,991	**$5,947**
Casey (Cranbourne)	$821	$1,785	$2,023	**$4,630**
Infill*	$401	$727	N/A	**$1,129**

* Includes all connections in all other areas (excludes backlog sewer lots)

Cost reflectivity - the proposed Standard NCCs are location and infrastructure specific

SEW's proposed Standard NCCs relate directly to the incremental growth infrastructure (and hence growth forecasts) within each pricing zone. That is, there is a bottom-up approach linking specific projects to their associated pricing zones ; and there is no 'smoothing' in the proposed NCCs (i.e. have not adopted a uniform standard NCC across its whole operating area). This is reasonable.

The three pricing zones were identified on the basis of:

- Geographically distinct growth areas
- Level of integrated network investment to service growth
- Adjustment for developments seeking alternative levels of service
- Administrative simplicity

Changes to the proposed Standard NCC values since SEW's December 2012 submission

The value of the proposed Standard NCCs have changed since SEW's December 2012 submission to the ESC. It is understood that the changes relate to:

- Updates in capital expenditure estimates used in the NCC model
- Updating the estimate of NCC revenue collected for Water Plan 2 growth infrastructure (increased from 25% to 28%).

5.3. Capital Infrastructure Costs underpinning NCC calculations

5.3.1. Capital Costs included in the NCC Model

Summary:

- SEW has elected not to use the ESC's NCC model to calculate its proposed Standard NCCs. SEW's own model includes only growth capital expenditure for a 15 year investment period (Water Plans 2-4). Incremental operational costs and some other inputs have not been included in the calculation of the proposed NCCs.
- SEW has included an Intergenerational Equity Factor (IGF) which is not in the ESC's model. The quantum of this is subjectively "determined". The effect of application of this IGF is that some 30% of incremental capital infrastructure costs directly associated with growth have been excluded from the Standard NCCs and included for recovery in the general tariff. The reasonableness of this should be considered further by the ESC in terms of consistency with the ESC's principles (especially cost reflectivity) and also in terms of consistency of approach as between different water authorities.
- SEW have nominated to not included significant sewage treatment plant growth infrastructure and some recycled water expenditure in the NCC calculations on the basis of equity and consistency of approach (with other major shared infrastructure). As incremental growth infrastructure (identified by SEW as growth related expenditure), it would appear reasonable to include these costs in the calculation of the Standard NCCs. The materiality of the inclusion of these costs in the Standard NCCs has not been tested.

SEW have elected to not use the ESC model

As discussed in their December 2012 submission, SEW have elected to not use the ESC's NCC model. They have developed their own model for calculating Standard NCC charges (based on the Economic Regulation Authority of Western Australia's NCC model). SEW have used a 15 year model to calculate their proposed Standard NCCs, which includes:

- 10 year forward (WP3 and WP4)
- 5 year behind (WP2)

Similar to Yarra Valley Water, SEW has nominated to use a shorter period than the ESC's proposed 30 year model, as they feel there is a reasonable level of uncertainty around the specific capital expenditure required in future years 10-30 and so, from a fairness perspective, it is difficult to justify the inclusion of these costs in current NCCs. SEW also considers that, in nominal dollars, capital expenditure in future years does not

materially impact the proposed Standard NCCs. SKM has not reviewed documentation that supports these positions.

The SEW model is based on the following equation:

$$NCC = \frac{\text{NPV}(\text{Sum (15 [past 5 years and forward 10 years] year Distribution Capex)}) \text{ x IGF}}{\text{Lot Growth (past 5 years actuals and 10 year forecasts)}}$$

As can be seen from the equation, the SEW model is concerned with incremental capital expenditure. In comparison to the ESC model, the SEW model does not include in the calculation of NCCs:

- Incremental operational expenditure
- Gifted assets
- The cost of temporary assets
- Depreciation from Capital Expenditure
- Incremental Bulk Water Purchases
- Incremental Revenue (general tariff revenue of new customers)
- Government contributions and other benefits (noting that there are no government contributions applicable to the infrastructure included in the NCC model)
- Brought forward costs
- Inflation (factored earlier into project costs to arrive at nominal 2012/13 costs).

An Intergenerational Equity Factor

SEW has adopted an "Intergenerational Equity Factor (IGF)" to modify the growth capex to be included in the NCC calculations. SEW's stated purpose in doing this is "to take into account the long lived nature of the infrastructure assets", suggesting that – on some notion of fairness – present ('short run') new customers should not incur the full cost of growth infrastructure that will serve customers for many decades into the future. SEW has nominated – without material substantiation - an IGF of 70% -proposing that it is equitable to recover 70% of incremental capital infrastructure costs through NCCs. SEW considers that this does not conflict with the NCC Pricing Principles.

The effect of application of this IGF is that some 30% of incremental capital infrastructure costs directly associated with growth which would have normally been included as part of growth capex in the Standard NCC calculations have now been excluded from the Standard NCCs (and effectively included for recovery in the general tariff, i.e. borne by the existing general customer base). The reasonableness of this should be considered further by the ESC in terms of consistency with the ESC's principles (especially cost reflectivity) and also in terms of consistency of approach as between different water authorities.

Information has not been received to support the selection of an IGF of 70% - whether it is based on a subjective assessment or based on an appropriate calculation methodology.

Exclusion of sewage treatment plant growth infrastructure and some recycled water expenditure

It is noted that SEW has nominated not to include significant sewage treatment plant growth infrastructure and some recycled water expenditure from Water Plans 3 and 4 in the calculations of the NCCs[11]. This includes approximately:

- $220M in sewage treatment plant growth capital expenditure ($149M in WP3 and $70M in WP4); and
- $1.1M in recycled water growth capital expenditure (over WP3 and WP4).

It is understood that this decision was made from a social equity perspective and to provide a consistent approach with other major shared infrastructure (notably Melbourne Water headworks, which are not included in the NCC calculations). As incremental growth infrastructure (identified by SEW as growth related expenditure), it would appear reasonable to include these costs in the calculation of the Standard NCCs. The materiality of the inclusion of these costs in the Standard NCCs has not been tested.

SEW's provided version of the ESC model

SEW has provided SKM with versions of the ESC 30 year NCC model for each service and pricing zone (nine models in total plus one 'overall' model). These models have used the same cost inputs used in the SEW model. The resulting NCCs that are calculated from the ESC model are shown in **Table 16**.

Table 16 – SEW Standard NCCs using the ESC 30 year model

Pricing Zone	Water	Sewer	Recycled	Total
Cardinia (Officer – Pakenham)	-$240	$4,663	$1,676	**$6,099**
Casey (Cranbourne)	-$653	$1,464	$975	**$1,786**
Infill	-$1,382	-$794	N/A	**-$2,176**

As seen in **Table 16**, the ESC 30 year model results in negative charges for half of the Standard NCC set (all water NCCs and the infill-sewer NCC). Noting the observations made in the Key Issues chapter of this report (particularly that negative NCCs can occur where there is residual capacity in existing infrastructure from prior capital investment), another factor within SEW's model has contributed to lower/negative NCCs. While SEW have only included a 10 year capital expenditure forecast (WP3 and WP4) in the model, SEW have included ongoing lot connections (and the collection of general tariffs) for the full 30 year period.

Noting SEW's comment on the (lack of) materiality of capital expenditure in years 10-30, should SEW nominate to use the ESC model in the future, capital expenditure for years 10-30 should be included.

Assumed asset life in the ESC Model

It is noted that - in the ESC model – SEW have assumed an asset life of 80 years for all capital infrastructure, where a shorter asset life (say 25yrs) is appropriate for mechanical and electrical infrastructure (and a longer asset life may be appropriate for civil infrastructure).

Should SEW nominate to use the ESC model in the future, it would be appropriate for capital expenditure to be divided to a level of granularity where expenditure is correctly allocated to particular asset classes (e.g. civil, mechanical, electrical), with associated asset life estimates, so that depreciation estimates are reasonable. It is noted that SEW do have this level of granularity in their capital estimate data at present.

5.3.2. Review of Growth Forecasts underpinning NCC calculations

Summary:

- Growth forecasts underpinning NCC calculations are reasonably based on Victoria in the Future and Urban Development Plan forecasts.
- An error in a formula used in SEW's NCC model was identified, which will change the number of estimated connections for WP3 and WP4 (and hence the proposed Standard NCCs). This error has been discussed with SEW and should/will be corrected.
- There appears to be a dis-connect between the specific growth values in different documents provided by SEW. While there are not material differences in the growth forecasts, these numbers should be consistent.

Growth Forecasting Methodology

SEW's methodology for developing growth forecasts (number and timing) has been provided and appears reasonable. Growth forecasting estimates used in the NCC calculations are understood to include:

- Water and sewer forecasts for the greenfield growth areas: Victoria in the Future (ViF) 2012 OPD forecasts for Casey and Cardinia LGAs
- Recycled water growth forecasts - South East Water's Water Plan Submission recycled water customer numbers
- Infill - All other OPD forecasts from Vif12 for South East Water's service area
- Timing is primarily based on the Urban Development Plan (UDP)

Growth Forecast Estimates – Formula Error

The growth forecasts used in SEW's calculation of their current proposed Standard NCCs showed a constant number of new connections (11,201) every year for the full 10 year forecast. Through discussion with SEW to clarify the basis of this constant value, it was identified that there was an error in one formula in the SEW model - specifically the formula that referenced the growth data spreadsheet. An absolute cell reference was used instead of a relational cell reference (by adding the '$' symbol in the formula) resulting in all years referencing the 2009/10 growth of 11,201 connections.

Correcting this formula should give the adjusted growth forecast estimate shown in **Table 17**, and should result in an adjustment in SEW's proposed Standard NCCs.

Table 17 – Growth forecasts (for Water Plan 3) in SEW's NCC Model

Number of new connections	2013/14	2014/15	2015/16	2016/17	2017/18
Original in NCC calculations [residential only]	11,201	11,201	11,201	11,201	11,201
Revised in NCC calculations [residential only]	9,729	9,630	9,631	9,933	9,962

Growth Forecast Estimate Comparisons

There appears to be a dis-connect between the specific growth values in different documents provided by SEW. While there are not material differences in the growth forecasts, these numbers should be consistent.

Given SEW have performed growth estimates for water and sewer connections, it would be an improvement opportunity to use these service specific growth estimates rather than an aggregated estimate currently used in the NCC calculations. [The recycled water growth estimates were developed separately and appear reasonable]

- **Table 18 – SEW Residential growth forecasts comparisons from different SEW documents**

Pricing Zone	2013/14	2014/15	2015/16	2016/17	2017/18
Revised NCC calculations For water and sewer *All Areas NCC Model, Row 22*	9,729	9,630	9,631	9,933	9,962
From Growth Spreadsheet For water and sewer *Summary VIF 12, Row 124*	9,761	9,729	9,630	9,933	9,962
Water Plan 3 submission Increase in water customers *Table 6.4*	9,729	22,477*	22,479*	9,002	9,948
Water Plan 3 submission Increase in sewer customers *Table 6.4*	9,729	23,536*	23,521*	10,849	10,832

* Much of these larger numbers relate to SEW's proposed tariff structure changes (shifting from billing service charges on the basis of land titles to the number of dwellings). As they are existing customers, they will not pay an NCC.

- **Table 19 – SEW Non-Residential growth forecasts comparisons from different SEW documents**

Pricing Zone	2013/14	2014/15	2015/16	2016/17	2017/18
Revised NCC calculations* For water and sewer	887	878	878	906	909
From Growth Spreadsheet For water and sewer *Summary VIF 12, Row 216*	895	886	886	914	917
Water Plan 3 submission Increase in water customers *Table 6.4*	897	890	886	900	915
Water Plan 3 submission Increase in sewer customers *Table 6.4*	897	891	886	899	916

* These are calculated through an assumption that the number of non-residential customer connections equals 9.12% of the number of residential customer connections

5.3.3. Review of Sequencing Plans underpinning NCC calculations

SEW master plans and servicing plans form the key basis for establishing the future infrastructure required to service forecasted growth. These plans include scenario testing to demonstrate that the proposed infrastructure servicing strategy is reasonably robust and optimal (most cost efficient) means to service particular growth areas. These appear reasonable.

5.3.4. Unit Costing of Infrastructure

Standard unit costing of infrastructure has not been provided to support the development of project cost estimates. The Koo Wee Rup and Lang Lang Sewerage Master Plan Stage 2 Report has been provided, which includes detailed unit costing as part of the infrastructure options assessment process. [Note – this report was prepared by SKM for SEW].

5.3.5. Apportionment of Capital Expenditure (Water Plan 3 and Beyond)

Summary: SEW have indicated that only projects that can be 100% apportioned to growth have been included in the NCC calculations. Based on analysis of sample growth areas, apportionment of capital expenditure to growth appears reasonable.

SEW has indicated that only projects that can be 100% apportioned to growth have been included in the NCC calculations. Projects with other key drivers (reliability, compliance, etc.) have not had any of their costs included in the NCC calculations, even if part of their value that could be apportioned to growth (e.g. upsizing during renewals). These incremental infrastructure costs are to be recovered through the general tariff. SEW has indicated that the portion of project values that could be apportioned to growth are minor and may only contribute to around 1-2% of total growth capital expenditure.

5.3.6. Water Plan 2 Expenditure in the NCC model

Summary:

- The WP2 values included in the NCC calculations appear reasonable. Location specific (bottom up for each pricing zone) project values have been included with at 28% reduction applied (to take into account recovered NCCs and asset depreciation)
- An improvement opportunity is possible – to calculate and apply the value reduction (collected NCCs and depreciation) specific for each pricing zone and service
- The nominated exclusion of some non-residential recycled water capital expenditure would need to be explored further. Arguments exist for both their inclusion and exclusion from the NCCs.

SEW has included capital expenditure from WP2 in the NCC model. The information supplied indicates that, as with WP3 and WP4 capital expenditure:

- The expenditure in each NCC model relates directly its service and pricing zone (no smoothing); and

- Only 'pure' growth projects have been included in the NCC calculations. Projects with other key drivers have not been included.

The actual values used in the NCC models include an estimate of remaining asset life (through asset depreciation) and residual unrecovered costs from the new infrastructure (i.e. total expenditure less costs recovered from NCCs). SEW has assumed that 28% of sunk CAPEX spend from 2009/10 - 2012/13 has been recovered either through existing NCCs or regulatory depreciation. Information provides indicates that of the 28% value, 26% relates to recovered NCCs and 2% relates to depreciation). This appears reasonable.

It is noted that this 28% value is applied to all services and pricing zones. Asset depreciation and collected NCCs have not been calculated/allocated for specific projects/services/pricing zones. This is a potential improvement opportunity.

Exclusion of non-residential recycled water expenditure

SEW indicates that capital costs for WP2 non-residential recycled water growth projects have not been included in the NCC calculations. These projects amount to approximately $42.5M and include projects in the: Mornington Schemes; Boneo Recycled Water; SEW Industrial #4 (Bluescope); Logis Dandenong Scheme and other projects.

Given the proposed Standard NCCs are for both residential and non-residential customers, it would appear reasonable for this growth expenditure to be included in the calculation of the Standard NCCs (unless non-standard charging arrangements were/are negotiated with the key non-residential customers – e.g. Bluescope). It is appreciated that recycled water schemes in infill locations provide benefits for the broader customer base through potable water substitution and deferred capex – lending argument to the (perhaps partial) exclusion of these costs from the Standard NCCs (and included in the general tariff). This point would need to be explored further.

Pre-WP2 Capital Expenditure

SEW has not included Pre-WP2 growth capital expenditure in the NCC calculations. SEW has indicated that pre-WP2 growth capital infrastructure could potentially be included in the NCC calculations, but note that they are following the ESC's direction of only looking back to WP2 expenditure.

5.4. Operating Expenditure Costs underpinning NCC calculations

Summary:

- It is noted that operating costs are not included in SEW's calculation of Standard NCCs
- In the event that SEW use the ESC NCC model, a more reasonable proxy for incremental operating expenditure should be used (compared to short run marginal operating costs). It is appreciated that SEW are not currently using the ESC model (and hence not undertaken a detailed analysis of incremental operating costs).

No OPEX values included in the proposed Standard NCCs

It is noted that operating costs are not included in SEW's calculation of Standard NCCs.

In the ESC model

It is noted that in SEW's provided version of the ESC 30 year NCC model, SEW have used *short run marginal operating costs* as a proxy for incremental operating expenditure. The short run marginal operating cost is based on the 3 year average change in OPEX costs per water customer (from the National Performance Reporting). This treats changes in OPEX as solely related to variable operational costs (power, chemicals, etc.). Fixed costs and other factors that can contribute to OPEX changes (e.g. efficiency gains/losses) are effectively excluded.

Should SEW nominate to use the ESC model in the future, this would not be considered a reasonable proxy for incremental operating expenditure unless evidence can demonstrate a lack of materiality of incremental operating expenditure in the calculation of NCCs. This would need to be tested as it is noted that there is almost $220M in forecasted Sewage Treatment Plant growth capital expenditure over the next ten years ($149M in WP3 and $70M in WP4), which may result in material increases in operating expenditure.

5.5. Reference Information

This review has been performed by SKM using the following documents and conversations:

1) *New Customer Contributions – South East Water supplementary submission to the Essential Services Commission* (Dec 2012) (sourced from http://www.esc.vic.gov.au; 4-March-2013)
2) *South East Water 2013-18 Water Plan* (sourced from http://www.esc.vic.gov.au; 4-March-2013)
3) *Alternative Water Capacity Plan (P3.0) Water Plan Period July 2013 to June 2018* (Ver 2; August 2012) (pdf, sourced from ESC; 31-Jan-2013)
4) *Koo Wee Rup and Lang Lang Sewerage Master Plan Stage 2 Report* (Rev 0; Oct 2012) (pdf, sourced from ESC; 31-Jan-2013)
5) SEW telephone conversation (12- March -2013)
6) SEW email (received 12-March-2013)
7) *SEW ERA NCC Model Nov 2012 - updated data – 20121207* (excel spreadsheet, received 12-March-2013)
8) *SEW ESC NIC NCC Model Feb 2013 - Casey and Cardinia LGA Growth Areas* (excel spreadsheet, received 12-March-2013)
9) *WP3 10 year Capital Plan_Ver 11Basis_080312* (excel spreadsheet, received 12-March-2013)
10) SEW email (received 13-March-2013)
11) *Scenario_A3_040912_BL_Revised v1* (excel spreadsheet, received 13-March-2013)
12) SEW telephone conversation (19- March -2013)
13) SEW email (received 19-March-2013)
14) *SEW -2013 Demand Forecasting Document V6 - 18 Oct 2012*
15) *Potable Water Supply System Capacity Management Plan (P1.1) Incorporating Water Plan 2013-2018* (Ver 2; July 2012) (pdf, received 19-March-2013)
16) *Sewage Collection System Capacity Management Plan (P2.1) Including Water Plan Period July 2013 to June 2018* (Ver 2; July 2012) (pdf, received 19-March-2013)
17) SEW telephone conversation (26- March -2013)
18) SEW email (received 26-March-2013)
19) *New Region Sheet May 2012 Vif12* (excel spreadsheet, received 26-March-2013)
20) SEW telephone conversation (27- March -2013)

6. City West Water

6.1. Overview

City West Water's capital expenditure allocated to growth and transferred into the NCC appears to be reasonable, albeit it has restricted the inclusion of growth capex to those areas that are essentially 'greenfield' development in the Outer Growth Zone (OGZ). This means that SKM's assessment has been performed on a restricted subset of the capital plan (although it is noted that there is limited capex in existing areas). This simplified approach is somewhat different to the other metropolitan water businesses reviewed but to an extent reflects particular circumstances in the west and north of Melbourne where there tends to be spare capacity in networks because of the downturn in industrial water usage compared to historic levels. This review has been performed by SKM using the documents and communications listed in **Section 6.5**.

Whether the capital expenditure included in the calculation relates to growth and the basis of the cost estimate is reasonable

- CWW has based its standardised NCC charge on the cost of shared distribution assets in the Outer Growth Zone (OGZ) of the business. Very little capex for growth is planned by CWW outside of these areas, and the strategy in that instance is to negotiate NCC on a case by case basis when additional capex is required.
- The direct cost of head-works capex by others, i.e. Melbourne Water is not included in the build-up.
- Growth forecasts underpinning growth capex are based on historical data, state level strategic growth plans, and council forecasts and developer consultations. The growth trend projected for the future does appear to be broadly consistent with that observed in recent years, and that predicted in the State governments Victoria in Future (ViF) 2011 projections. *Improvement opportunity*: It would be beneficial to establish more clearly the linkage between (and basis of) the growth forecasts adopted compared with growth projections available from the statutory planning authorities, and records of adjustments made
- The sizing and sequencing of growth infrastructure appears to be generally reasonable, and there is evidence of strategic planning in collaboration with Melbourne Water on a regional basis, and optioneering by CWWs consultants on a growth area specific basis to determine the most efficient solution. *Improvement opportunity:* Modifications to the presentation of the sequencing plans would make the justification of sequence timing much clearer, especially for those projects beyond WP3. In particular a clearer understanding of the triggers for capex, accompanied with plans illustrating the staging of infrastructure tying in with the phasing of development, as produced by some other businesses, would be very informative.
- The unit costing of infrastructure appears to of the right order but there is some apparent variability between the application of standard rates for a given pipeline size that needs further clarification. There is significant variance reported on a number of the 'top ten' WP2 projects (deviation of out-turn cost from forecast cost) which might impact on estimates prepared using existing cost curves.
  Improvement opportunity: It would be desirable to demonstrate the process for capturing any improvements in estimating processes or adjustments to rates used from previous regulatory periods (or projects generally), especially where significant deviations have been experienced - noting that standard cost rates from WP2 projects were used in some instances.

- Pending clarification of the rates discrepancies the overall capital program against the extent of shared assets proposed to be provided in WP3 and WP4 appears to be reasonable at the level of detail made available to SKM.
- Initial comparison of the WP3 and WP4 capital plan indicated a significant discrepancy between the water and alternative water service line values in the NCC. Subsequently CWW provided an updated capital program spreadsheet with an adjusted subset of the capital program that was apparently used in the calculation of the NCC. There appears to be general alignment between the sewage service and water service capex indicated in the NCC models and that indicated in the subset capital plan.
- However there still appears to be a material difference of 3.6% between the growth capex in the capital plan and the NCC model for the alternative water service lines.
  Improvement opportunity: It would be beneficial to have transparent alignment between the capital plan growth program and the capex used to calculate the NCC where possible. If not already undertaken, some way of isolating OGZ growth projects in the capital plan to feed into the NCC would be beneficial.
- At present CWW have not included brought forward costs within the NCC Model. All project timings are based on their proposed sequence timing. CWW indicate that no government contributions are relevant for the incremental capital expenditure used in the NCC calculations.
- The annual value of Gifted Assets appears reasonable to the limited extent that SKM was able to review (i.e. the figure does not seem disproportionate the growth capex). The value of gifted assets is based on projected lot numbers and a historical average value.
  Improvement opportunity: Estimates of future gifted assets associated with the specific new infrastructure proposed should be visible for review.

Whether the methodology used is reasonable for apportioning capital expenditure that serves multiple purposes (e.g. compliance, renewals etc. as well as growth) to growth and to new customers

- CWW has restricted the projects included in the growth NCC calculation to those in the three broad growth areas / supply zones that make up the outer growth zone (OGZ): Werribee West, Greek Hill and Holden. This greatly simplifies issues about apportionment. There is a single standardised NCC for the whole OGZ.
- CWW does not have a standardised NCC for its inner / 'brownfield' development areas (of which there are several areas identified). This has been justified on the circumstances within the 'inner' growth areas that mean that there is significant spare capacity available. This appears to be a reasonable assessment. However it does leave uncertainty for developers in inner growth zones who will have to negotiate site specific NCCs in the event that capex is required to service a particular development. CWW's proposed negotiating framework would apply the ESCs guiding principles to these negotiated charges i.e. offset incremental cost with incremental revenues.

Any capital expenditure from Water Plan 2 (WP2) that is included (i.e. no double counting)

- Significant capex from WP2 has been carried forward for capex from WP2 on the ongoing West Werribee Dual Supply Project, and approximately half of the WP2 growth capex in the sewer and water service areas. CWW has offset NCCs already received against this capex so that cost recovery is limited to the capacity as yet unutilised. This seems reasonable on the basis that the majority of growth expenditure is, as SKM understands it, for new residential customers.

The reasonableness of the incremental operating costs (and their relationship to growth)

- CWW has calculated fixed opex costs as a proportion of growth capex. In addition the cost of bulk water / wastewater services provided by Melbourne Water, and the additional incremental cost for treatment of alternative water supplies have been included. As the percentage is only applied to the subset of capex that is in the OGZ it is most likely that this does apply primarily to growth. The percentage is based on the historic proportion of O&M costs to the businesses RAB. The approach appears to be reasonable.

6.2. Setting the Context: The NCCs reviewed in this report

City West Water is currently reviewing their approach to NCCs in the light of progress to date in negotiations between the ESC and City West Water. For the purposes of this review we have considered the NCCs proposed by City West Water (CWW) in their supplementary WP3 submission in December 2012 relating to NCCs.

Whilst the scope of this review does not include an assessment of the proposed NCCs, or NCC model used to estimate them, there is a need to have an understanding of the relationship between the capital and operational costs associated with growth and how these have been applied to the NCC model in order to test the reasonableness of costs used to develop the NCC charges proposed.

CWW has proposed an ultimate standardised NCC of $6,500 will apply in the Outer Growth Zone that CWW have identified as being the predominant areas where significant capex is required to service growth. The Outer Growth Zone (OGZ) consists of the following growth areas that will see the majority of growth capex in WP3 into WP4:

- Werribee West Zone
- Greek Hill Supply Zone
- Holden Supply Zone

These are largely assumed to be 'greenfield' type developments. CWW has proposed an escalator system for the application of charges, increasing year on year until the calculated NCC is achieved, so as not to impact development with a significant increase in charges (compared to existing NCCs) from the first implementation of the new charges.

Inner growth areas include Greenvale, Preston, Gaffney Street, East Keilor, North Essendon and the Melbourne CBD. Whilst the growth predicted from these areas is significant (~5,000 new dwelling p.a., similar to the rate of growth expected in the OGZ) CWW's initial view was that spare capacity in the network might mean little infrastructure investment is needed to service growth here. This is due to the displacement of high water use industry and changes in the water usage profiles of remaining customers. As a result CWW has proposed a zero standardised NCC to apply in 'brownfield' areas / inner growth areas. It is noted however that recent forecasts for the Inner Melbourne Growth Area could now change this.

As a result of the above the majority of CWW's growth related capex is in the OGZ. Only the capex in the OGZ is included in the OGZ NCC model. Growth related capex in the inner growth zone (and there is some e.g. spencer street branch sewer augmentation $2.25M in 2014-15) is not sufficient to generate positive NCCs and has not been included in the NCC.

CWW has proposed that, where capital expenditure is required but has not been included in servicing plans and / or the capital plan, the associated infrastructure needs be classed as 'non-standard' and developer charges be negotiated on case by case basis to suit. They envisage these charges will be calculated using the ESC model.

6.3. Capital Infrastructure Costs underpinning NCC calculations

Summary: The capital costs for projects included in the NCC model appear to be generally reasonable, but further clarity around how the standard cost curves have been derived and applied (and the use of rates apparently outside the cost curve dataset) and the process for refining and updating the cost data in the light of most recent projects is needed. In particular, in the context of some significant positive and negative cost variations in WP2 delivered projects, there is a need to improve cost forecasting.

In common with the other water businesses CWW undertakes a process of planning for the capital infrastructure investment necessary to service growth. In the first instance it is necessary to achieve an understanding of customer growth projections for development areas, then to developing sequencing plans for the most efficient staged provision of infrastructure to meet the location of new customers and the rate of growth expected. Only then can project capital costs and the expenditure program be estimated. In association with this activity and apportionment of costs between capital programs may be necessary. The impact of developer procured gifted assets and government funding also have to be incorporated into the NCC calculation.

SKM has reviewed the capex plan from CWW which was set in 2012. Changes to address matters that require correction or adjustment is done at another point in time and needs follow up and checking as appropriate. SKM has summarised in **Table 20** the aggregate capital costs per service per annum for WP3 and WP4 from the capital program and from the NCC model (the NCC model values are nominal and have we have adjusted these down to be comparable to the capital program costs that are in $@Jan2012 pbd). SKM considered that two projects – Raleigh Rd from the water program, and Spencer Street Branch from the sewer program – which are indicated in the Asset Development Plan as being 'inner' growth area projects, should be deleted. CWW has confirmed that this is correct with respect to the Spencer St Branch, confirmation is awaited with respect to the Raleigh Road main.

Table 20 CCW capex reconciliation (WP3 Capex Plan, NCC model)

Year	Water Service		Sewer Service		Alternative Water Service	
	Capex plan	NCC	Capex plan	NCC	Capex plan	NCC
2013/14	34,734,616	29,793,981	12,605,259	12,514,687	4,152,434	28,503,967
2014/15	15,179,101	4,528,275	8,075,823*	7,908,775	8,716,585	1,462,364
2015/16	18,487,734*	9,771,438	15,224,975	15,171,151	16,771,371	9,748,932
2016/17	35,395,208*	30,292,958	8,132,081	7,963,756	42,803,265	30,508,605
2017/18	25,541,449	22,019,032	8,160,975	7,996,239	43,349,278	36,612,697
2018/19	12,137,023	8,335,337	13,899,899	13,851,378	34,082,382	48,134,494
2019/20	12,291,840	7,431,098	15,139,999	15,000,671	50,984,129	92,759,740
2020/21	14,730,188	9,186,578	7,880,999	7,661,143	56,568,420	58,066,270
2021/22	9,851,593	6,016,323	8,423,024	8,223,755	4,097,255	4,856,142
2022/23	17,732,914	13,995,326	27,326,100	27,293,178	11,678,637	12,516,217
TOTALS	196,081,666	141,370,346	124,869,134	123,584,733	273,203,756	323,169,428

* All costs at Jan 2012 pbd.NCC deflated by factor in model

Only the sewer program appears to be broadly in alignment between both the capex plan and the (deflated) values in the NCC model. The water program (-$54.71M) and the alternative water program (+$49.97M) are significant discrepancies.

Following further discussion with CWW they provided a revised spreadsheet with the subset of the capex included in the NCC model. This clarified the growth projects outside of the OGZ excluded from the NCC and indicated that the business had decided not to include some capitalised costs in the NCC model (primarily some elements of the labour budget). Further an element of the West Werribee Dual Reticulation Project had been to the compliance budget previously. This resulted in revised figures as follows:

Table 21 CCW adjusted capex (WP3 Capex Plan, NCC model)

Year	Water Service		Sewer Service		Alternative Water Service	
	Capex plan	NCC	Capex plan	NCC	Capex plan	NCC
2013/14	29,330,558	29,793,981	12,320,030	12,514,687	28,060,609	28,503,967
2014/15	4,457,842	4,528,275	7,785,760	7,908,775	1,439,618	1,462,364
2015/16	9,615,753	9,771,438	14,929,433	15,171,151	10,093,604	9,748,932
2016/17	29,787,828	30,292,958	7,830,961	7,963,756	30,499,878	30,508,605
2017/18	21,627,837	22,019,032	7,854,176	7,996,239	43,962,227	36,612,697
2018/19	8,175,358	8,335,337	13,585,530	13,851,378	54,710,656	48,134,494
2019/20	7,340,442	7,431,098	14,817,668	15,000,671	91,628,110	92,759,740
2020/21	9,054,053	9,186,578	7,550,610	7,661,143	57,228,500	58,066,270
2021/22	5,914,355	6,016,323	9,084,375	8,223,755	4,773,837	4,856,142
2022/23	13,834,214	13,995,326	26,978,985	27,293,178	12,372,133	12,516,217
TOTALS	139,138,239	141,370,346	122,737,529	123,584,733	334,769,173	323,169,428

* All costs at Jan 2012 pbd.NCC deflated by factor in model

This gives much better reconciliation for all services, although there is still a 3.6% material difference (NCC capex lower than capital plan capex) for alternative water. This requires further investigation, and may require scenario testing to establish what the impact is on proposed NCCs.

6.3.1. Review of Growth Forecasts underpinning NCC calculations

Summary: CWW growth projections appear to be reasonable in the context of most recent historical growth figures, but there are a number of different contemporary growth estimates available. There needs to be clarity and supporting justification on how CWW determines which of these is the most robust or realistic/ least risk growth estimate as appropriate.

CWW consider the growth projections by the state (DSE and the Growth Area Authority) and local councils and developers when forecasting the growth that they need to plan to service. CWW has stated that, historically, its own growth forecasts have varied significantly from those of DSE and GAA. Going forward

CWW intends to use the Victoria In Future (2011) growth projections as the basis of projecting the growth in their area.

6.3.2. Review of Sequencing Plans underpinning NCC calculations

Summary: The sizing and sequencing of infrastructure to service growth appears to be reasonable. Some optioneering and scenario testing is apparent for some but not all areas. A consistent presentation and level of detail would assist in understanding the cost estimates: sewer service sequencing plans (ADP) include much less detail than the equivalent for water. [NB: CWW has indicated that these are available but have not been sighted.]

CWW has provided an Asset Development Plan (ADP) which aligns the infrastructure requirements for each service in each growth area to the needs to meet the projected growth. This if for both the OGZ and 'inner' areas, albeit there is relatively little capex identified in the inner areas. The ADP sets the existing infrastructure context, projections for growth and identifies in broad terms the infrastructure needed in the short / medium term WP3/WP4 and beyond.

For each development are identified there is a forecast of lots per year developed projected to 2018 that appears to be broadly consistent with the growth modelling figures used by CWW (the sum of the growth in the inner and outer areas is 5,250 and 4,900 respectively for 2013/14 for example).

Each development area included in the ADP considers:

- a broad view of the existing CWW assets and associated constraints in the catchment areas where the development occurs
- the expected staging of development and associated number of lots released in particular time frames (within WP3) and some sense of what the longer term development potential is in broad terms within the expanded urban growth boundary
- how this impacts the capacity of existing assets and an indication of the assets needed to service each stage of development
- Individual projects are identified with information on capacities / lengths etc. for some assets, particularly water and alternative water, with less detail for sewerage assets (although this is understood to be undertaken) with an associated capital cost estimate and year required into service up to at least WP5.

However:

- the ADP does not identify developer funded assets that will need to be provided, although it does estimate the value of developer reimbursed assets envisaged through WP3 based we understand on historic rates of developer asset provision
- the ADP does not identify any temporary assets that will need to be developer funded if some areas are brought forward out of the expected sequence.

There is broad alignment between the capital costs in the ADP and the capital costs included in the capex program.

6.3.3. Unit Costs of Infrastructure

Summary: CWW unit costs for pipes, pumps and tanks are broadly based on historic values from the preceding water plans increased by CPI. Estimates for treatment assets tend to be developed by consultants for CWW. There is a need to clarify the application of cost curves, and how the most up to date information on market trends is incorporated.

City West Water's unit costing is based on a mixture of cost curves informed by the historic costs of capital works (for water and sewer pipes and pumping) and consultant cost estimates for treatment plant assets.

Cost Curves

CWW have prepared cost curves for pipeline and pumping projects based on the costs incurred for projects in the previous two regulatory periods (CPI adjusted to give a real rate for future projects). This is split between three broad categories based on generalisations of typical construction conditions: 'Rural', 'Urban' and 'City'. The actual cost curves include additional contingency of 25% over the historic rates, plus a 10% allowance for design.

The cost curves are shared with consultants preparing the project scheme costs.

It is difficult without knowing the individual circumstances of each individual project to assess the reasonableness of each estimate. However there is some apparent variation between rates used that is significant and requires some clarification from CWW as to the basis of the estimate. The example below illustrates this:

- **Table 22 CWW Unit Rate comparison (Water Pipes including contingency)**

600mm diameter pipelines			
CWW recommended pipeline construction rates for 600mm diameter	Rural: ~$1,520 per m	Urban: ~$1,980 per m	City: ~$3,790 per m

- **Table 23 Capex – Specific project assessment**

Project	Length (m)	Year	Capex ($M)	Approximate unit cost ($/m)
600mm Western Outlet main Keilor Melton Road - [rural]	1900	2023	2.89	1520
600mm Sinclairs Road (Taylors to Western Highway) – [rural]	3200	2027	4.86	2019
600mm Transport Corridor to Black Forest Road *Note: This line item is now understood to be included in the cost of the West Werribee Potable Supply Project.*	2500	2015	7.6	3040
600mm Ison Road Nth thro Manor Lakes – [Urban]	1500	2017	3.1	2067
600mm main Tarneit Road – [rural]	2000	2019	3.04	1520

It would be expected that projects in the OGZ would fall in the 'rural' or at most 'urban' category given they are considered to be to all intents and purposes 'greenfield' construction conditions.

Table 24 Forecast vs. actual top 10 WP2 projects

Project	Estimate	Actual	Deviation ($ value and %)
	$M 2012-13 real terms		
West Werribee Dual Water Supply, low level reservoir and 750 inlet/outlet main	100	117.3	17.3 +17%
Altona recycled water project	64.6	40.0	-24.7 -38.1%
Water main renewals – social risk - reticulation	34.4	39.2	4.8 +14%
Water main renewals – social risk - distribution	29.8	28.8	-1.0, -3.5%
Derrimut interceptor sewer	22.7	23.2	0.5 +2.2%
Renew water mains – KPI attainment – reticulation	18.1	37.3	19.1 +106%
1150mm main – Sayers Road to Dohertys Road	13.7	7.9	-5.8 -73.4%
New meter program	9.3	13.6	4.3 +46.2%

CWW has stated that there were increases in water and sewerage renewal costs as a result of higher than allowed for cost escalation and reinstatement costs for main replacements. The learning from recent projects should be built into future cost estimates and adjustments to cost curves made as necessary. It is not clear that this continuous improvement process is in place to ensure cost forecasting data uses the best available information at the time the estimate is prepared.

Consultant Estimates

For treatment plan assets CWW have stated they rely on consultant estimates on a project by project basis. This appears to be a reasonable approach given the relatively small number of treatment assets constructed by CWW recently and the likely greater number of treatment plant assets that consultants can collate cost estimates for.

An example has been provided for the Urban Growth Boundary, which includes a number of discrete alternative water treatment assets, and in this instance the consultant (SKM) has used a variety of cost curves to develop estimated treatment plant costs based on the particular type of treatment plant being considered.

It would be expected that as CWW gains more internal experience of treatment assets, particularly treatment for alternative water, that the opportunity is taken to create CWW specific cost curves or at least calibrate data used to ensure it is a prudent assessment of the costs of delivering such projects in the CWW area.

Contingencies

A 25% contingency has been included in the pipe cost curves used as the basis for planning estimates of sewer and water main projects.

6.3.4. Apportionment of Capital Expenditure

CWW has restricted their NCC calculation to the Outer Growth Zone areas. These areas, with little or no pre-existing infrastructure- are effectively 'greenfield'. As a result there is little scope for apportionment. Notwithstanding this CWW project planners identify individual projects as being growth, renewals or compliance driven, and only growth driven projects were used in the calculation of the NCC.

There is some different treatment for the West Werribee Dual Supply Project, included in the compliance program as part of the State's 20% recycled water target, but included in the NCC for growth.

6.3.5. WP2 capex carried forward into WP3 NCC

WP2 growth capex that has not yet been utilised and hence not yet had any NCC recovery, has been carried forward into the WP3 calculation. CWW has calculated the carried forward value by estimating the proportion of capex in the OGZ and then netting off depreciation of the assets and NCC contributions already received in WP2. This appears to be a reasonable approach.

Table 25 CWW WP2 Capex carried forward

Service	Total WP2 Growth capex ($M)	'Greenfield' factor - % capex in OGZ ($M)	Adjusted capex (A) ($M)	WP2 depreciation (B) ($M)	WP2 NCC income (C) ($M)	Historic net capex into WP3 NCC model (A-B-C) ($M)
Water	76.14	0.9	68.53	1.73	36.08	30.72
Sewer	84.46	0.75	63.34	2.76	32.68	27.9
Alternative	154.37	0.79	121.95	3.95	0.23	117.77

6.3.6. Works Brought Forward Costs

CWW has indicated that there are no bringing forward / deferral costs applicable to the growth program in the NCC model.

6.3.7. Gifted Assets

Initial WP3 figures included gifted assets projections based on projection of historic rates of developer gifted assets of the order of ~$22M per annum. The NCC model has been updated to include projections of gifted assets, based on a forward looking assessment of the expected assets. This is based on a cost per connection per service line, which includes a significant increase in the value of alternative water assets expected to be installed with developments, resulting in ~$30M per annum of gifted assets in total. This revised approach appears to be reasonable.

6.3.8. Government Contributions

CWW has indicated that there are no government contributions applicable to the growth program in the NCC model.

6.4. Operating Expenditure Costs underpinning NCC calculations

Summary: CWW has calculated incremental open costs as a proportion of growth capex. Fixed costs per customer have been included based on historic values (modified for alternative water). The variable cost of bulk water / wastewater services provided by Melbourne Water, and the additional incremental cost for treatment of alternative water supplies have also been included.

CWW has based the incremental operating costs of assets required for providing services to new customers on a combination of:

- A percentage (3%) applied to the associated capex estimates based on CWW experience of typical historic O&M costs in relation to capex. [*Note: SKM understands that CWW is updating this currently to be 3% for plant and equipment and 1% for pipelines.]*
- An estimate of the additional fixed cost per customer of alternative water provision
- The projected cost of bulk water / wastewater services provided by Melbourne Water
- Incremental cost of $1,200/ML for alternative water.

The 3% figure was derived from the CWW's overall annual O&M costs for the 2011/12 accounting period, as a proportion of the Regulatory Asset Base ($1,338,791,000 RAB / $38,132,000 O&M = 2.85%).

Incremental fixed costs per customer were based on historic values, with the exception of alternative water that was discounted heavily from historic costs based on the expectation that the incremental cost will reduce rapidly as more customers are serviced with alternative water.

This appears to be reasonable, notwithstanding that it is another different methodology applied than that used by the other businesses reviewed.

6.5. Reference Information

This review has been performed by SKM using the following documents and conversations:

1) *Water Plan 3 October 2012* retrieved from http://waterplan.citywestwater.com.au/wp-content/uploads/2012/11/city_west_water_plan.pdf on 14-Mar-2013

2) *Capital Costs WP3 and WP4* (excel spreadsheet received by email 19-Mar-2013)

3) *121218 CWW NCC Model* (excel spreadsheet received by email 19-Mar-2013)

4) *Example of how Asset Staging and Development is linked to growth forecasting* (received by email 19-Mar-2013)

5) *Growth Forecasting Methodology (ADP Extract Oct 2012)* (received by email 19-Mar-2013)

6) *Memo – Revised Residential Alternative Water Demands – Final Oct 2012* (received by email 19-Mar-2013)

7) *Part B Asset Development Plan_26 OCT update*(received by email 19-Mar-2013)

8) *Servicing Strategy (extract)* (received by email 19-Mar-2013)

9) *Water Plan 3 – December 2012 Water Plan Submission* (received by email 19-Mar-2013)

10) *Richard Smith email 22 March 2013* including document *Response to SKM.docx*

11) *Richard Smith email 25 March 2013*

12) *Revised Capital Costs WP3 and WP4* (excel spreadsheet received by email 25-Mar-2013)

13) *Second Reg Net Capex* (excel spreadsheet received by email 26-Mar-2013)