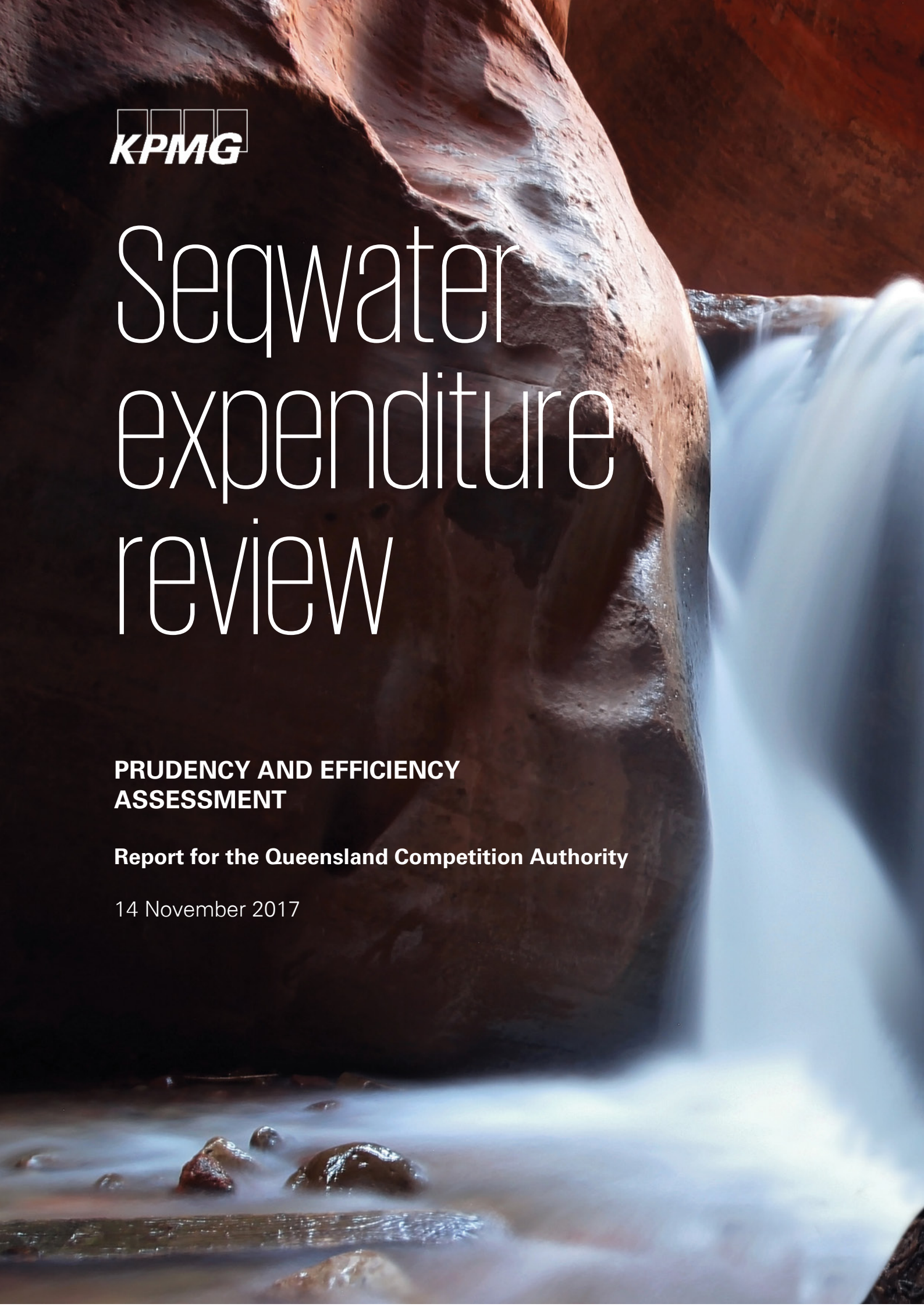


KPMG

Seqwater expenditure review

PRUDENCY AND EFFICIENCY ASSESSMENT

Report for the Queensland Competition Authority

14 November 2017

Important Notice

If you are a party other than the Queensland Competition Authority, KPMG:

- owes you no duty (whether in contract or in tort or under statute or otherwise) with respect to or in connection with the attached report or any part thereof; and
- will have no liability to you for any loss or damage suffered or costs incurred by you or any other person arising out of or in connection with the provision to you of the attached report or any part thereof, however the loss or damage is caused, including, but not limited to, as a result of negligence.

If you are a party other than the Queensland Competition Authority and you choose to rely upon the attached report or any part thereof, you do so entirely at your own risk.

Limitations

The responsibility for determining the adequacy or otherwise of our terms of reference is that of the Queensland Competition Authority.

The services provided under our engagement ('Services') have not been undertaken in accordance with any auditing, review or assurance standards. Any reference to 'audit' and 'review', throughout this report, is not intended to convey that the Services have been conducted in accordance with any auditing, review or assurance standards. Further, as our scope of work does not constitute an audit or review in accordance with any auditing, review or assurance standards, our work will not necessarily disclose all matters that may be of interest to the Queensland Competition Authority or reveal errors and irregularities, if any, in the underlying information.

In preparing this report, we have had access to information provided by Seqwater, as well as publicly available information. We have relied upon the truth, accuracy and completeness of any information provided or made available to us in connection with the Services without independently verifying it. The publicly available information used in this report is current as of August 2017. We do not take any responsibility for updating this information if it becomes out of date.

This report provides a preliminary summary of KPMG's findings during the course of the work undertaken for the Queensland Competition Authority under the terms of the engagement contract. The findings in this report are subject to change as our analysis progresses during the course of this engagement

Any findings or recommendations contained within this report are based upon and preliminary assessment and our reasonable professional judgement based on the information that is available from the sources indicated. Should the project elements, external factors and assumptions change then the findings and recommendations contained in this report may no longer be appropriate. Accordingly, we do not confirm, underwrite or guarantee that the outcomes referred to in this report will be achieved.

We do not make any statement as to whether any forecasts or projections will be achieved, or whether the assumptions and data underlying any such prospective financial information are accurate, complete or reasonable. We will not warrant or guarantee the achievement of any such forecasts or projections. There will usually be differences between forecast or projected and actual results, because events and circumstances frequently do not occur as expected or predicted, and those differences may be material.

Executive Summary

Seqwater as it is known today was officially formed on 1 January 2013, in accordance with the South East Queensland Water (Restructuring) Act 2007 as amended by the South East Queensland Water (Restructuring) and Other Legislation Amendment Regulation (No.1) 2012. This resulted in the merger of Seqwater and Linkwater, as well as transfer of responsibility for certain functions of the then Water Grid Manager to Seqwater. This followed the earlier merger of Seqwater and Watersecure in July 2011.

As a result, Seqwater now owns and operates 26 dams, 37 water treatment plants (WTPs), 51 weirs and 2 bores and aquifers that supply up to 90% of SEQ's drinking water. It also owns and operates a 600-kilometre network of pipelines, as well as the Western Corridor Recycled Water Scheme (WCRWS) and Gold Coast Desalination Plant (GCDP).

Seqwater's bulk water prices are set by the Queensland Government and subject to review by the Queensland Competition Authority (QCA or Authority) at the government's request. In May 2017, the Authority was tasked with conducting an investigation into Seqwater's proposed bulk water prices for the period 1 July 2018 to 30 June 2021.[1] This represents the second investigation by the Authority following the establishment of Seqwater on 1 January 2013.[2]

To support its investigation, the Authority has engaged KPMG to independently assess the prudency and efficiency of Seqwater's forecast operating and capital expenditure (opex and capex respectively) associated with its bulk water supply activities. Specifically, in accordance with our terms of reference and at the request of the Authority, KPMG evaluated:

- Seqwater's forecast opex and capex over the period 1 July 2018 to 30 June 2028 (consistent with the current 10-year price path);
- Seqwater's actual capex (to the extent available) over the period 1 July 2014 to 30 June 2018, where this exceeds capex recommended by the QCA in the previous price investigation;[3] and
- costs arising from any review events over the period 1 July 2015 to 30 June 2018.

An assessment of the historical and forecast opex and capex represents a critical component in any investigation of (regulated) bulk water prices.

In respect of opex and capex, prudency is assessed in respect of how a decision to invest is made, whereas efficiency is assessed as to whether the forecasted expenditure is reasonable given time and resource constraints. We have adopted the following definitions of prudency and efficiency of expenditure in accordance with those set out in the Authority's Terms of Reference (ToR)*:*

- prudent, if it can be justified by reference to an identified need or cost driver; and
- efficient, if it is the least cost to deliver on an appropriately defined scope and standard of works and minimises Seqwater's long-run costs of providing bulk water supply services.

Where KPMG has assessed expenditure as not prudent or inefficient, we have identified appropriate adjustments to the proposed expenditure profile provided by Seqwater to better align with that of a prudent or efficient service provider.

[1] Queensland Government. Treasurer and Minister for Trade and Investment. Referral Notice for the Review of South East Queensland Bulk Water Prices. 25 May 2017.
[2] The first pricing investigation was completed for the period 1 January 2015 to 30 June 2018.
[3] KPMG note actual capex over this period was less than that allowed by the QCA and therefore this second evaluation was not required.

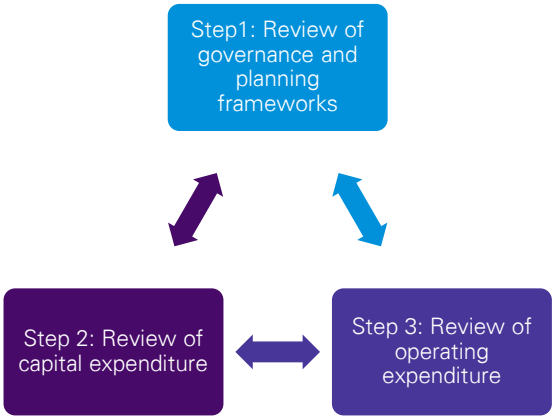
A detailed review of Seqwater's demand forecast was considered out of scope for the purposes of KPMG's assessment provided the forecasts within the regulatory submission are within the range published by Seqwater as part of their Water Security Program (WSP). As part of this review, KPMG has confirmed the demand forecasts included in the regulatory submission are consistent with those presented under the WSP. Specifically, Seqwater has provided for a hybrid demand scenario encompassing a combined low and medium growth scenario in its submission to the Authority.

This report details our approach and findings from our assessment. Our assessment draws upon information provided by Seqwater to KPMG over the period 11 August 2017 to 22 September 2017, as well as meetings held with Seqwater staff during 21, 22 and 24 August 2017.

Our approach

To support the Authority with its investigation, KPMG has approached this task by focusing on three separate, though interrelated, steps as shown in Figure 1 below. As step 1 KPMG reviewed Seqwater's governance arrangements and planning frameworks for consistency with good industry practices, providing for appropriate controls (e.g. approval) and the mitigation of potential risks. This provided the context of KPMG to reviewing the prudency and efficiency of Seqwater's historical and forecast capital expenditure (Step 2) and operating expenditure (Step 3).

Figure 1. KPMG assessment approach



In completing each step, KPMG has:

1 **Reviewed governance and planning frameworks**: Completed a desktop review of Seqwater's supporting policies and procedures detailing its overarching governance and planning frameworks. KPMG then sought to test the application of Seqwater's supporting governance and planning frameworks in the development of its capex and opex proposals to the Authority.

2 **Reviewed capital expenditure:** Completed its review of Seqwater's historical and forecast capex in four stages, first at a portfolio level, second at a project level, third to consider opportunities for capital and operating expenditure trade-offs, and finally the fourth to identify systemic issues, based on the project reviews.

   At a project level, KPMG has completed detailed reviews of twelve major projects ranging in size from $9m to $150m. These projects are driven by growth, compliance, renewals and service improvements or a combination of these factors.

3 **Reviewed operating expenditure**: Evaluated the prudency and efficiency of Seqwater's forecast operating expenditure in accordance with a base, trend and step approach. This approach establishes an efficient base year, rolls forward the efficient base operating expenditure to take

account of scale growth, input price growth and efficiency improvements plus any adjustments for material step changes to costs.

This approach differs from previous reviews of Seqwater's forecast opex which have typically adopted a bottom up assessment focusing on a sample of cost categories.

Importantly, in completing our review of Seqwater's capex and opex forecast we have been mindful of the difference in assessment period (1 July 2018 to 30 June 2028, 10 years) as required in the referral notice to the Authority relative to the overall objective of the Authority's investigation of recommending bulk water prices for Seqwater for the period of 1 July 2018 to 30 June 2021, 3 years. This has ramifications for how the prudency and efficiency of Seqwater's capex and opex are assessed.

For example Seqwater's capital expenditure may be categorised into three types of expenditure profiles:

1 Expenditure commencing and capitalised in the period 1 July 2018 to 30 June 2021 (consistent with the 3-year pricing period);

2 Expenditure commencing in the period 1 July 2018 to 30 June 2021 and capitalised between 1 July 2021 to 30 June 2028; and

3 Expenditure commencing in the period after 1 July 2021 and capitalised in the period up to 30 June 2028.

It is important to note that only once a project expenditure has been capitalised does it form part the regulated asset base and therefore have an impact on prices. It is therefore reasonable to expect Seqwater have robust documentation to establish the prudency and efficiency of expenditure for projects under profile 1 above – i.e. capitalised before 30 June 2021.

In contrast, it would be unreasonable to expect the same level of documentation for those projects commencing outside of the three year period ending 30 June 2021 (i.e. profile 3 above) given an inherent level of uncertainty exists with planning the network beyond a period of three years. We have therefore not proposed adjustments for those projects in this profile category.[4]

KPMG notes that for projects which incur expenditure in the first three years but are not capitalised within this same period (i.e. profile 2 above) there are potential further opportunities to assess their prudency and efficiency in subsequent pricing reviews. This is of particular importance for those projects due to commence in year three of the forecast period and may therefore be at an early stage in the capital planning process. For these projects, we recognise alternative assessment approaches exist that may be suitable subject to the expectations of the reviewer (and Authority), for example in relation to the level of documentation deemed appropriate in justifying both prudency and efficiency. We note these alternative approaches may include:

1 Placing greater focus and scrutiny only on those projects impacting prices in the short term, specifically those projects which commence and are capitalised in the next three years – i.e. before 30 June 2021. Projects which commence within (or outside of) and are capitalised beyond the initial three years are not assessed.

2 Applying a notional discount (e.g. 25%) to those capital projects where efficiency cannot be suitably assessed, such as those projects at an early stage in the capital planning process or commencing in the later years of the forecast period as recognition of the increasing uncertainty of individual projects;

[4] Excluding those twelve major projects sampled.

3 Placing a consistent level of scrutiny for all projects commencing within the first three years of the forecast regardless of when they are capitalised.

We note the third approach identified above provides for a more robust assessment and is consistent with our agreed scope of work with the Authority. Further, this approach is consistent with our assessment of sampled major projects as described below and has been adopted throughout our report.

Our recommendations

Governance, planning and asset management frameworks

Corporate governance of capital and operational delivery are core business functions. Seqwater is considered as primarily an asset management organisation which means its objectives will include coordinating activities to realise customer value from its asset base.

To properly assess the corporate governance and procurement processes of this type of organisation, we have utilised the International Standard, ISO55001 which requires a management system approach to asset management. Where business functions are not sufficiently covered by the Seqwater management system, associated and referenced documents have been used such as the Asset Management Landscape that covers the globally agreed 39 subjects of asset management and the risk management standard, ISO31000.

Similarly, we have reviewed the application of Seqwater's investment decision making process, and risk management and procurement governance arrangements supporting Seqwater's operations.

While our review of Seqwater's governance, planning and asset management frameworks has not directly impacted our assessment of the proposed capex and opex, we have utilised these frameworks by linking our recommended adjustments to the frameworks – specifically the investment governance framework.

Governance framework

Overall we found the corporate governance and procurement framework of Seqwater, as supported by various policies and processes such as the Enterprise Risk Management Framework, Investment Decision Making or gateway process, to provide for an effective approach to the management of key asset and investment risks and compliance obligations. These policies and processes are considered in large to be fit for purpose and are aligned with key standards such as AS/NSZ ISO 31000:2009: Risk management – principles and guidelines.

Discussions with Seqwater have indicated that in certain areas the business is still implementing key processes across all business functions. KPMG recognise Seqwater are still in the process of operationalising the gateway process across all business functions. As a result, there are still sub-processes that are undertaken that appear to map between the gates. The procurement process currently monitors all spend down to $5,000. Whilst this provides a detailed amount of governance, the time it takes to monitor appears to be detracting time away from larger projects with significantly more spend. Possible automation of low value spend could be investigated to continue to enable audit verification whist releasing time for limited resources to spend on larger capital works.

Capital planning framework

The International Standard for asset management enables clear assessment guidelines and allows for targeted improvements on specific areas of the management system. ISO55002, Guidance to the Asset Management System, states that Seqwater must "demonstrate responsibility for delivering performance against one or more asset management objectives, and the effective control and

governance of asset management related function(s) and activities it is carrying out, in order to generate the value from the assets defined in the scope of its asset management system".

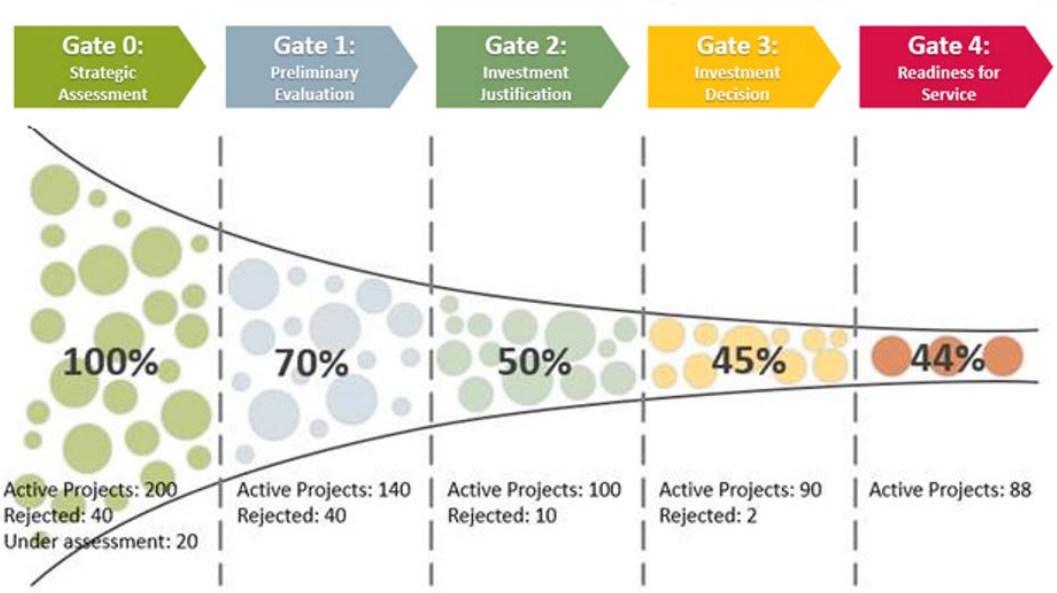
KPMG's tests included:

- determining whether Seqwater has a consistent Asset Management Policy and Asset Management Strategy that provide a stable framework to allow joined up Asset Management Decision-Making.
- validating that the Asset Management Policy provided the overarching principles to enable the Strategic Asset Management Plan (SAMP), to be produced and implemented. The SAMP would then typically contain the value criteria to be used to optimise Asset Management Decision-Making.
- The process of Capital Investment Decision-Making was tested to understand asset degradation and trading-off capital costs, maintenance costs, risks and their probabilities in order to optimise a capital investment decision, both in terms of timing and asset intervention options.
- Delivery of individual projects were tested to validate they were managed through a lifecycle divided into different phases, separated by governance decision gateways where financial sanction for the next phase is approved.

Overall, KPMG consider the capital planning framework to be commendable and consistent with Seqwater's legislative requirements and industry practice. We note, in addition to the Water Security Program, Seqwater are building on its planning processes through development or further enhancement of an Integrated Master Plan, Asset Portfolio Master Plans and Asset Class Plans. These plans are supported by Seqwater's strategy assessment management framework (systems, policies and procedures).

A key aspect of the capital planning framework is the capital investment decision making process. This process is based on a gateway review system whereby a project is required to pass through strategic gateways prior to approval as shown in Figure 2. This process forms the basis for all capital planning and delivery across Seqwater and is a similar process to that adopted by the Queensland Government and which is aligned with the internationally-recognised OGC Gateway$_{TM}$ Process.

Figure 2. Capital project refinement through gateway



As projects progress through gates, they are refined and the scope of works and associated cost before more clearer. This results in a reduction in contingency required in the budget. This continues to the point that a project is commissioned and a target cost is agreed. For the purposes of KPMG's

assessment we note Seqwater would seek to establish the prudency of a proposed capital project through Gate 1 and the efficiency of the project through Gate 2.

We have relied on Seqwater's gateway process as part of our assessment of the forecast capital program. Specifically, this process has helped identify sample projects, and establish an understanding or expectation on what stage a project may be at and subsequently what level of documentation may suitably expected in order to assess a projects prudency and efficiency.

In addition in relation to the capital planning framework, KPMG made the following observations:

- Seqwater continues to face key asset risks. For example, Seqwater may have limited history regarding the operation of an asset and, under specific circumstances, limited knowledge of the actual assets "in the ground". This is not a reflection of Seqwater itself, but rather the asset management practices (processes/systems) of its predecessors, and therefore the historical knowledge which it has been required to inherit
- The key criteria that have been agreed between Seqwater and its customers (distributor-retailers), (economic, resilience, environment and people and place) should be used as criteria for selecting and prioritising work in the asset portfolio master plan (APMP), subject to any regulatory obligations;
- Improvements to strategic asset management practices in a business, leadership and organisational sense have been shown to result in a material improvement in customer value and the bottom line.
- The asset class plans could be developed in a more agile manner with layers of detail to gain a broad understanding of each asset class and build on this understanding using analytics and other technology. This will enable earlier realisation of insights for better decision making and tangible benefits.
- Seqwater could increase the priority of testing and implementing a renewals support tool to increase robust analysis and increase productivity of staff from data manipulation to data interpretation.

Capital expenditure

Seqwater has proposed a total capital expenditure of $1,282 million (real Dec 2016) for the 10 year period ending 30 June 2028. Over the three year period 1 July 2018 to 30 June 2028, Seqwater is forecasting to spend $624.1 million, a 100 per cent increase on the actual capitalised expenditure of $311.7 million that is expected to be delivered in the current regulatory period and 41 per cent higher than the QCA allowance for the current regulatory period.

The deferral of significant project expenditure from one pricing period to another raises an issue for the Authority, being that Seqwater's bulk water prices for the 2015-18 period were set based on the delivery of certain capital projects (where these projects were forecast to be commissioned). We note this deferred capex has been included in Seqwater's proposed capital program and therefore assessed as part of our broader review of capital projects.

Seqwater's submission to the Authority is based on the 2017 APMP which was finalised in September 2016 and is updated annually. As a result of this, we have identified and/or been made aware of capex projects where the cost estimates have significantly changed from the 2017 APMP.

Through project sampling KPMG has tested Seqwater's implementation of its capital planning and asset management framework. In certain cases significant changes to cost estimates or significant uncertainty over the costs have inhibited our ability to assess, with any level of certainty, the efficiency of specific projects. These changes most commonly occur in projects which are still at early stages of the capital planning process, usually Gateway 0, 1 or 2.

Table 1 highlights Seqwater's total capex program by investment gateway. Those projects that remain at an early stage within the capital planning process (i.e. Gateway 0, 1 or 2) account for on average 79% of all projects across the 10 year period and 69% over the first three years.[5]

Where we have been unable to assess the efficiency of a sampled project we have sought to make an adjustment to the remaining program of works. Similarly, where we have identified common variations across project categories or gateways, such as those at an early stage in the capital planning process we have sought to make an adjustment to the remaining program of works.

Table 1. Seqwater total capital program by investment gateway - including renewals and sampled projects (real Dec 2016 $ million)

FY	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
0 - Strategic Assessment	$53.1	$74.9	$69.4	$50.1	$82.5	$76.8	$78.5	$48.7	$51.0	$36.9
1 - Preliminary Evaluation	$28.6	$56.7	$82.1	$68.3	$9.3	$27.4	$29.8	$5.8	$9.8	$5.1
2 - Investment Justification	$23.1	$34.4	$10.0	$3.3	$0.5	$0.2	$0.2	$0.2	$0.2	$0.2
3 - Investment Decision	$44.3	$56.3	$43.6	$7.2	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
4 - Readiness for Service	$17.2	$5.9	$2.7	$2.3	$2.3	$2.3	$2.3	$2.3	$2.3	$2.3
Unclassified	$7.2	$7.3	$7.2	$7.2	$5.9	$4.7	$5.8	$7.9	$8.8	$9.9
Total Capex	**$173.5**	**$235.5**	**$215.1**	**$138.5**	**$100.6**	**$111.4**	**$116.5**	**$64.8**	**$72.1**	**$54.4**
Total Capex (less renewals and sample)	**$118.5**	**$97.9**	**$75.8**	**$64.8**	**$12.6**	**$17.7**	**$19.5**	**$23.6**	**$26.2**	**$17.8**

KPMG provides the following observations:

- With regards to actual capex over the period 1 July 2014 to 30 June 2018:
  - Seqwater underspent its allowance by 31 per cent, or $131 million, predominantly due to the deferral of major projects (refer section 7.4); and
  - As the expenditure was less than the allowance set, therefore avoiding the need for an ex-post review.
- With regards to the 12 sample capital projects reviewed:
  - We support the inclusion of $207 million in these projects across the 10 year period as both prudent and efficient, including $148.1 million in 2018-21 and $58.9 million in 2021-28;
  - We recommend adjustments of -$281.4 million across the 10 year period for those projects that have not progressed to Gateway 3, including;
    - -$92.2 million in expenditure from the program for the 2018-21 period; and
    - -$189.2 million in expenditure from the program for the 2021-28 period.

    Table 2 below summarise KPMG's recommended adjustments and expenditure profiles for each major project sampled respectively.
- With regards to the total capital program (excluding renewals and sampled projects):

[5] Includes sampled capex projects and renewals.

- We recommend the removal of expenditure during the ten year price path period related to projects which commence prior to 30 June 2021 that have not progressed to Gateway 3 of the capital planning process, and are neither part of our sample projects, nor renewal programs. This equates to $366.7 million comprising $235.3 million in the first three years and $131.4 million in the remaining seven years;

Table 3 summarises our proposed adjustments to the total capital program (excluding sampled projects and renewals) focusing on those projects that remain at an early stage within the capital planning process (i.e. Gateway 0, 1 or 2) only. These projects are due to commence prior to 30 June 2021.

Table 2. KPMG recommended adjustments to sample projects (real Dec 2016 $ million)

Period	2018-21	2021-28
Adjustments to major project expenditure		
Beaudesert WSZ Upgrade	($41.5)	($38.3)
Mt Crosby Filters Upgrade	-	-
Mt Crosby Sedimentation	($33.3)	-
North Pine WTP Filters	-	($37.5)
ICT ERP Upgrade	($6.6)	($8.7)
Holts Hill pH Upgrade	($9.1)	-
Somerset Dam Upgrade	($1.6)	($104.7)
Lake MacDonald Dam Upgrade	-	-
Leslie Harrison Dam Upgrade	-	-
Fleet and Mobile Plant Renewals	-	-
Mudgeeraba WTP Renewals	-	-
Mt Crosby WPS Renewals	-	-
Total Project Adjustments	**($92.2)**	**($189.2)**

Table 3. KPMG recommended adjustments to total capital program – excluding renewals and sampled projects (real Dec 2016 $ million)

$ million	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Capex prior to Gateway 3 commencing 2018-2021*	$74.5	$90.1	$70.7	$60.6	$10.6	$16.3	$16.1	$9.6	$9.2	$9.1
Recommended Adjustment to Capex prior to Gateway 3*	($74.5)	($90.1)	($70.7)	($60.6)	($10.6)	($16.3)	($16.1)	($9.6)	($9.2)	($9.1)

** Excluding renewals and sampled projects*

We note that it is likely many of these projects will be required in the future and do not dispute the general prudency of these projects. As a result, and in particular for those projects with significant expenditure in the first three years, it is possible for Seqwater to proceed with a project regardless of an allowance granted by the Authority. If this were to occur we note the Authority may be required to complete an ex-post review of such expenditure as part of future pricing review.

Further, subject to the Authority's discretion in responding to its referral notice, its own considerations of the prudency and efficiency of Seqwater's capital program and the potential impacts on prices, it may choose to adopt one of the alternative approaches previously discussed. For example:

- Placing greater focus and scrutiny on only those projects impacting prices in the short term, specifically those projects which commence and are capitalised in the next three years. This approach would amount to an adjustment of $146.7m over the three years with no adjusts in the remaining years of the forecast as shown in Table 4; or

- Applying discounts for expenditure not at gateway 3 or above thereby reflecting the inherent uncertainty that exists with regards to the cost estimates for these projects. For example a 25% discount would result in a total adjustment of $103.0m over the full 10 year as shown in Table 4.

Table 4. Alternative assessments of total capital program – excluding renewals and sampled projects (real Dec 2016 $ million)

FY	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Capex Commencing & Capitalised in 3 years	($61.1)	($65.6)	($19.9)							
Notional Discount (25%)	($18.6)	($22.5)	($17.7)	($15.6)	($3.4)	($5.7)	($6.5)	($5.5)	($4.9)	($2.6)

Table 5 and Table 6 summarise KPMG's recommended aggregate adjustments and recommended capital expenditure profile for Seqwater across the entire 10 year period.

Table 5. KPMG recommended adjustments to incurred expenditure (real Dec 2016 $ million)

Period	2018-21	2021-28
Seqwater proposed capex	$624.1	$658.3
Adjustments to sample projects	($92.2)	($189.2)
Recommended Adjustment to Capex prior to Gateway 3*	($235.3)	($131.4)
KPMG Recommended Adjustments	**($327.5)**	**($320.6)**
KPMG Recommended Capex Allowance	**$296.6**	**$337.7**

** Excluding renewals and sampled projects*

Table 6. Recommended capex allowance (real Dec 2016 $ million)

FY	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Sample projects	$22.6	$76.2	$49.3	$13.0	$7.8	$10.7	$13.3	$7.4	$3.1	$3.5
Balance of capital program*	$70.0	$36.7	$41.8	$26.3	$33.9	$26.2	$32.1	$33.0	$42.8	$39.0
Total capital program	**$92.6**	**$112.9**	**$91.1**	**$39.3**	**$41.8**	**$36.9**	**$45.4**	**$40.4**	**$46.0**	**$42.6**

** Including renewals*

Operating expenditure

Seqwater has developed its operating and maintenance expenditure forecasts for the regulatory period 1 July 2018 to 30 June 2028 based on the adoption of a base, trend and step approach. In addition, Seqwater has made a clear distinction between forecasts of fixed and variable operating expenditure.

Our analytical approach top reviewing Seqwater's opex forecasts include four main components:

1 **A review of the preceding pricing determination** – KPMG commenced its assessment by first reviewing the Authority's past bulk water price investigations with particular reference to the last operating expenditure review undertaken by CH2M Hill in 2015.

2 **A review of the robustness of the base year (2018-19) for both fixed and variable opex** – KPMG sought to verify that the baseline operating expenditure reflects efficient controllable costs and has appropriate adjustments for non-recurring expenditure and efficiency savings. In doing so, KPMG has assessed the proposed base year against historical opex, reviewing the proposed inclusions and exclusions and assessing the underlying expenditure for potential non recurrent expenditure.

3 **A review of the robustness of the proposed trends** – KPMG's review has sought to provide an independent assessment of the basis for the operating expenditure roll-forward calculations and how key assumptions have been used to determine future operating expenditure requirements.

4 **A review of the proposed step changes –** finally, KPMG considered the proposed expenditure associated with major new initiatives or variations that change the operating expenditure trend.

Our assessment of each component under this approach is provided below.

Base

Seqwater's base year (2018-19) is based on two years of bottom up budget forecasts (2017-18 and 2018-19). The budget forecasts utilised a zero based budgeting process that required all budgeted expenditure to be justified and supported by evidence such as contractual arrangements, efficiency programs, baseline operating scenarios and trends in actual expenditure for the preceding two years.

In practice we have found that the adoption of a base year developed over two budgeted years of forecasts makes it difficult to verify that the appropriate base year adjustments have occurred. The budget process is an internal process not one that has been developed with transparency to third parties as a primary objective. Identifying non-recurring and recurring costs has therefore been problematic and could only be achieved in an indirect manner. While Seqwater has not proposed any inclusions for the base year, it has proposed the exclusion of costs associated with operating the Western Corridor Recycled Water Scheme in 2018-19 for local industrial use, which is currently under consideration and subject to a business case. These costs are equal to approxiamtely $4.5m.

Our review identified:

- 86 expenditure streams constituting $23 million that potentially related to other exclusions. Through consultation with Seqwater on each of these expenditure streams we were able to identify that the majority of these expenditures were related to valid exclusions and that a small number of the expenditures related to changes in budgeting.
- 33 expenditure streams constituting $41 million that potentially related to inclusions. Through consultation with Seqwater on each of these expenditure streams we were able to identify that the majority of these expenditures were related to valid inclusions or changes in budgeting accounting.

A small number of expenditures KPMG considered were not justified for inclusion have been identified. These expenditures relate to training and profession development and "other allowances" and total $0.57m.

Our assessment of Seqwater's proposed steps has also led us to identify a number of steps that should be treated as inclusions in the base year. These are discussed in the steps section.

Trends

In terms of growth, Seqwater have proposed to extrapolate the base year via a bottom up approach that considered demand at the individual asset level. KPMG has compared the results against those of alternative approaches and found it provided for broadly similar outcomes. On this basis, KPMG recommends QCA accept the growth assumptions underlying Seqwater's forecasts.

Seqwater have developed separate input cost escalation factors for seven different opex cost categories. KPMG assessed each of these escalators and has provided recommendations to the Authority for each. Our recommendations include:

- **Employee expenses and contract labour:** Based on regulatory precedent and the appropriate use of WPI based indexes KPMG recommends that Seqwater's cost escalator for employee expenses and contractors be accepted.

- **Other materials and services**: Based on the appropriate maintenance of the real values of costs over the period KPMG recommends that Seqwater's cost escalator for other materials and services be accepted.
- **Insurance:** Unlike the other escalation factors, this factor is not discussed in the accompanying PWC *Cost Escalation Factors Final Report* or in *Seqwater Submission Part A and Part B.* This escalator is presented solely in the regulatory financial pricing model.

  Given the lack of explanatory documentation provided by Seqwater and our concerns regarding consumers ability to manage the associated risks KPMG cannot recommend the Authority accept this escalator. Instead KPMG recommends the Authority apply the Other material and services escalator to Seqwater's insurance costs for pricing purposes.
- **Contractors:** We note that the Authority accepted Seqwater's proposed contractor escalator in the previous 2015-16 to 2017-18 price investigation. Seqwater's previous index resulted in higher estimations. KPMG believes the proposed approach for this regulatory period represents an improvement on that previously adopted by Seqwater. The proposed escalator is relatively simpler, logically valid and is cost reflective. We also note that the proposed escalator appears to generate lower rates than the previous approach. KPMG therefore recommends QCA accept Seqwater's proposed escalation factor for this cost category.
- **Chemicals:** Seqwater's has proposed escalation factors based on CPI. In doing this Seqwater has proposed to maintain the value of these expenditures in real terms at constant level over the course of the regulatory period. KPMG recommends that Seqwater's cost escalator for chemicals be accepted on the basis that it is consistent with reasonable expectations given recent market activity in chemicals.
- **Electricity:** KPMG acknowledges that it is extremely difficult to estimate credible long term trends in electricity prices given current uncertainty and investment environment. Overall, the AEMO escalation factor is reasonable as an independent metric in the absence of doing separate market modelling. The AEMO retail price forecasts are well respected within the broader utility sector and have been utilised in regulatory decisions across a number of jurisdictions.

  While KPMG accepts AEMO as a reliable basis for an escalation factor it has amended Seqwater's proposed rates to reflect the latest available AEMO forecasts and to make the first three years of the regulatory period consistent with these forecasts.

Steps

Step changes should relate to output changes that are not captured by the escalation factors discussed above. They should not relate to discretionary changes in inputs. Step changes should not relate to changes in volume. Steps are typically:

- new or changed government obligations that come into effect over the course of the regulatory period or, alternatively, came into being prior to the regulatory period but are not expected to come into effect until the regulatory period and are not reflected in the base year;
- new or changed customer service demands where there is a clear willingness to pay; and
- changes in opex associated with the commissioning of new capacity.

Seqwater has proposed 14 separate steps across a broad range of activities. The Steps range in magnitude of cost from approximately $50,000 per annum to $1million per annum. KPMG's assessment of each step is provided in the table below. We note a number of the steps are considered immaterial, while others should be considered as inclusions/exclusions from the base year.

Table 7. KPMG's assessment of the proposed steps $ million

Step	NPV (@ 6%)	% Total Opex	KPMG Recommendation
Assessment of major contracts prior to expiry	$0.9	0.043%	• Recommend step not be included on the basis of inappropriate driver, immateriality and concerns regarding efficiency. • Do not recommend the step be treated as an inclusion in the base year as it only relates to two years of the total regulatory period
Water quality reporting	$1.5	0.074%	• Recommend step not be included on the basis of inappropriate driver and immateriality.
Gold Coast Desal and WCRWS contracts	$2.4	0.118%	• Recommend step not be included on the basis of inappropriate driver and immateriality. • Recommend proposed step be treated as an inclusion to the base year on the basis that it is related to a typical operating activity and is ongoing in nature.
ICT projects	-$0.2	-0.010%	• Recommend step not be included on the basis of inappropriate driver and immateriality.
Provision of additional drafting services	$0.4	0.019%	• Recommend step not be included on the basis of inappropriate driver and immateriality. • Recommend proposed step be treated as an inclusion to the base year on the basis that it is related to a typical operating activity and is ongoing in nature.
QCA reviews	-$2.2	-0.108%	• Recommend step not be included on the basis of inappropriate driver and immateriality. • Recommend proposed step be treated as an inclusion to the base year on the basis that it is related to a typical operating activity and is ongoing in nature.
Future water security program updates	$0.4	0.022%	• Recommend step not be included on the basis of immateriality. • Recommend proposed step be treated as an inclusion to the base year.
Integrated master plan update	$0.2	0.011%	• Recommend step not be included on the basis of inappropriate driver and immateriality. • Recommend proposed step be treated as an inclusion the base year on the basis that it is related to a typical operating activity and is ongoing in nature.
Communication and education for recycled water	$8.1	0.405%	• Recommend step be included at an amended rate. Given the step relates to the implementation of a three year program we suggest the expenditure be capped at three years. If Seqwater elects to continue the program into the next regulatory period it can propose for an extension of the program. • The driver for the step is not a new obligation or new capital program. The driver appears operational in nature. • In the absense of drought and high level restrictions we believe it would not be prudent to include 10 years of onoing recycled water eductation programing..
EBA advice	$0.3	0.015%	• Recommend step not be included on the basis of inappropriate driver and immateriality. • Recommend proposed step be treated as an inclusion the base year on the basis that it is related to a typical operating activity and is ongoing in nature.
Additional training spend leadership	$0.4	0.018%	• Recommend step not be included on the basis of inappropriate driver and immateriality.
Budget Assumptions	$7.5	0.374%	• Recommend step not be included on the basis of inappropriate driver, insufficient information and an inability to establish efficiency.
Wyaralong WTP	$5.6	0.280%	• Recommend step be excluded on the basis that the associated capex was excluded.
Ewan Maddock	$4.2	0.210%	• Recommend step be included on the basis of it being associated with capex aimed at increasing capacity and securiing higher levels of security of supply.

Productivity assumptions

In the 2015 Review the Authority chose not to recommend an ongoing efficiency target on the basis of cost savings already identified by Seqwater in its proposal. Seqwater have proposed to a cumulative ongoing efficiency target of 0.2% per annum of controllable costs.

We note that most interstate water utilities propose ongoing efficiency rates higher than Seqwater and the most regulators impose a higher efficiency target or productivity hurdle on controllable opex. In most cases these efficiency rates and targets range from 1 to 2% per annum.

There is a strong case for setting a more challenging efficiency target over the course of the regulatory period given regulatory precedent and industry standards. We acknowledge that we have not undertaken a Total Factor Productivity study or any frontier based statistical analysis (such analysis is outside the scope of this review). For this reason we have taken a conservative approach and included an efficiency target of 1% per annum, which is at the lower end of targets currently being adopted by businesses in other jurisdictions.

KPMG also reviewed the base of controllable costs identified by Seqwater to which the productivity factor is applied and made the following recommendations:

- That the efficiency factor be extended to include both variable chemical costs and variable electricity costs.
- That the controllable fixed opex cost base be extended to include a number of proposed non-controllable costs that we believe should be treated as controllable. We have included contract based costs in the controllable base on the basis that the 10 year length of the regulatory period provides Seqwater with opportunity to influence or exert control over contracts as they are negotiated or renegotiated. Similarly we believe the EBA represents a controllable cost as Seqwater has multiple opportunities within the 10 year period to negotiate for more efficient outcomes.

KPMG's recommended opex profile

Based on our assessment of Seqwater's forecast opex, the following table and figure summarise our recommendations to the Authority of a prudent and efficient expenditure profile for the business moving forward.

Table 8: KPMG recommended opex $million

$ million	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Base year (fixed) plus escalation	$207.4	$212.9	$218.8	$225.6	$232.5	$239.5	$246.7	$254.3	$262.2	$270.4
Step changes	$1.1	$1.1	$1.9	$0.8	$0.8	$0.8	$0.8	$0.8	$0.8	$0.8
Efficiency	$0.0	($2.2)	($4.5)	($6.9)	($9.5)	($12.3)	($15.1)	($18.2)	($21.5)	($24.9)
Total fixed opex costs	$208.5	$211.8	$216.2	$219.4	$223.8	$228.0	$232.3	$236.9	$241.5	$246.2
Total variable opex costs	$37.5	$38.4	$39.9	$41.4	$45.0	$47.9	$51.2	$54.7	$58.2	$61.6
Total opex costs	$246.0	$250.2	$256.0	$260.8	$268.8	$275.9	$283.6	$291.6	$299.6	$307.8
Offset costs	($3.6)	($3.7)	($3.8)	($3.9)	($4.0)	($4.1)	($4.2)	($4.4)	($4.5)	($4.7)
KPMG recommended opex (excl. revenue offsets)	$242.5	$246.6	$252.3	$256.9	$264.8	$271.8	$279.3	$287.2	$295.1	$303.2

Figure 3. Difference between Seqwater proposed net opex and KPMG recommended net Opex

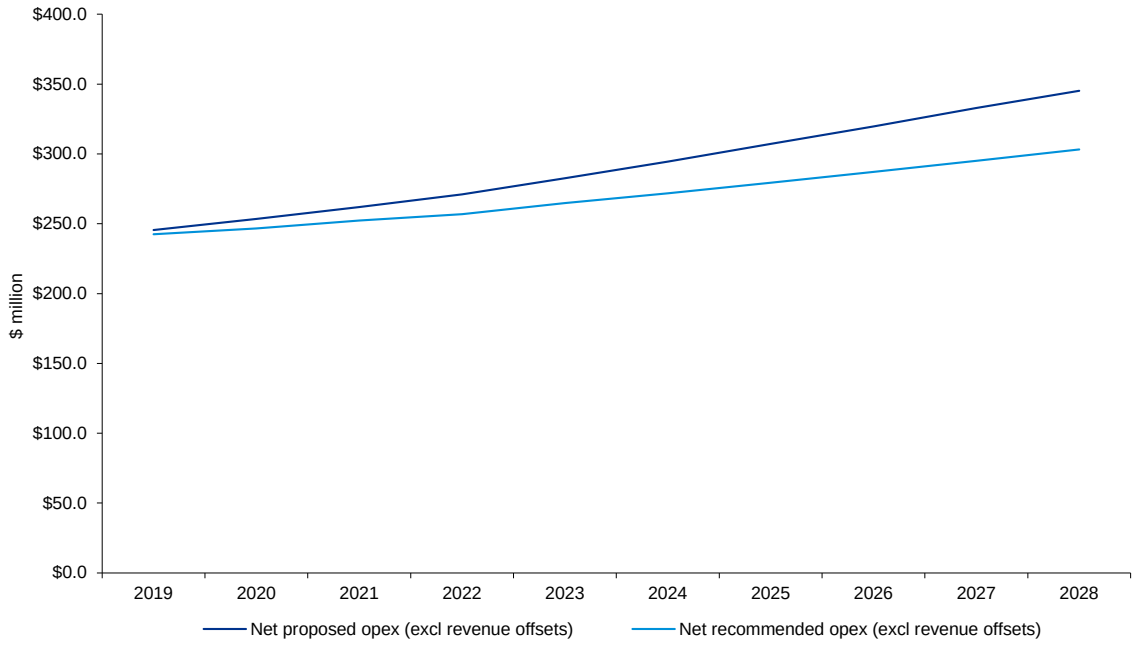


Table 9: Difference between proposed expenditure and KPMG recommendations

$ million	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Annual difference	$3.1	$6.8	$9.8	$14.1	$17.8	$22.8	$27.8	$32.6	$37.8	$42.1
NPV of difference	**$142.5**									

Note: NPV calculations based on a 6% discount rate

Review events

In handing down its 2015 final recommendation, the Authority recognised *"end-of-period reviews are suitable for managing demand and cost risks which do not adversely affect an entity's financial viability or its customers in a material manner during the regulatory period."*[6] The Authority defined three types of review events to be considered as part of a future price review including:

- Emergency events;
- Law or government policy events; and
- Feedwater quality events.

As part of the referral notice from the Queensland government, the Authority is required to review and assess the prudency and efficiency of additional costs incurred by Seqwater as a result of each of these events, as well as costs incurred for drought response over the period 1 July 2015 to 30 July 2018.

Consistent with KPMG's approach to reviewing Seqwater's proposed step changes, KPMG has applied a similar criteria aligned with regulatory best practice and our experience of the manner in which review events are typically treated within existing regulatory frameworks.

Specifically, the expenditure (capex or opex) associated with a review event needs to be:

1. reflective of an external event outside of the control of Seqwater which is not reasonably foreseeable or which cannot be responded to under normal operation;
2. both prudent and efficient; and

[6] Queensland Competition Authority. Final Report. SEQ Bulk Water Price Path 2015-18. March 2015

3. material relative to the total capital or operating expenditure proposed over the regulatory period.

The expenditure associated with a review event is not intended to form part of the forecast base revenue requirement moving forward. Instead, as an end of period adjustment, the recovery of these costs occur over a defined period.

KPMG understand Seqwater are still in the process of finalising their assessments of individual review events. Seqwater has therefore not been in a position to provide supporting information in relation to those additional costs incurred by Seqwater. KPMG could therefore not complete our assessment of the prudency and efficiency of the proposed costs of review events.

Table 10. Seqwater proposed review event end of period adjustments

Review event	End of period adjustment
Emergency event	Seqwater has not finalized its assessment of the additional costs resulting from ex-tropical cyclone Debbie which hit the east coast of Australia in March 2017.
Law or government policy event	No specific adjustment proposed
Feedwater quality event	No specific adjustment proposed
Drought response – Change in gird operation	Seqwater has not finalized its assessment of the additional costs incurred by the business resulting from drought conditions. Seqwater has provided an indicative estimate for the additional costs associated with changes to the operation of the grid in response to the prevailing drought. These costs are estimated to be approximately $400,000 and relate primarily to additional energy costs associated with the re-direction of flows along the Northern Pipeline Interconnector (NPI).
Drought response – Carting	Seqwater has not finalized its assessment of the additional costs incurred by the business resulting from drought conditions. Seqwater has indicated it has incurred additional costs associated with carting of water at the Dayboro Water Treatment Plant (WTP) to stand-alone supply schemes. The costs associated with carting of water are estimated to be $100,000.

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1 Introduction

As the bulk water supplier for South East Queensland (SEQ), Seqwater is responsible for the safe, secure and reliable supply of bulk water to eleven council areas in a region spanning from the New South Wales boarder to the base of the Toowoomba ranges and north to Gympie.[7] Seqwater's bulk water prices are set by the Queensland Government and subject to review by the Queensland Competition Authority (QCA or Authority) at the request of the government.

In May 2017, the Authority was directed by the Treasurer and Minister for Trade and Investment to conduct an investigation into the bulk water prices of Seqwater for the period 1 July 2018 to 30 June 2021.[8] In support of its investigation, the Authority has engaged KPMG to provide expert advice and guidance on the prudence and efficiency of Seqwater's forecast operating and capital expenditure (opex and capex) associated with bulk water supply activities. Specifically, KPMG is to assess the forecast expenditure over the period 1 July 2018 to 30 June 2028. This period corresponds to the 10-year price path set by the Queensland government and discussed in further detail below.

This report details our approach and findings from our assessment. Our assessment draws upon information provided by Seqwater to KPMG over the period 11 August 2017 to 22 September 2017, as well as meetings held with Seqwater staff during August 21, 22 and 24. A full list of the meetings held is provided in Appendix A.

1.1 Seqwater

For the south east Queensland water sector, the period 2007 to 2013 represented one of continuous institutional reform and disruption. Prompted in part by the prevailing outcomes associated with the Millennium Drought (2001 to 2009), this period would result in the amalgamation and formation (and in certain instances reversion) of new water service providers, at both the distributor-retailer and bulk water supplier level.

Prior to 2008, bulk water supply functions sat within individual local councils. In July of 2008, these functions were moved into three new formed state-owned statutory authorities, Seqwater, Linkwater and Watersecure. At the same time a Water Grid Manager was established tasked with strategic operation of the SEQ water grid.

Seqwater as it is known today was officially formed on 1 January 2013, in accordance with the South East Queensland Water (Restructuring) Act 2007 as amended by the South East Queensland Water (Restructuring) and Other Legislation Amendment Regulation (No.1) 2012. This resulted in the merger of Seqwater and Linkwater, as well as transfer of responsibility for certain functions of the then Water Grid Manager to Seqwater. This followed the earlier merger of Seqwater and Watersecure in July 2011.

As a result, Seqwater now owns and operates 26 dams, 37 water treatment plants (WTPs), 51 weirs and 2 bores and aquifers that supply up to 90% of SEQ's drinking water. It also owns and operates a 600-kilometre network of pipelines, as well as the Western Corridor Recycled Water Scheme (WCRWS) and Gold Coast Desalination Plant (GCDP).

[7] These eleven (11) council areas across SEQ include: Gold Coast City, Scenic Rim, Logan City, Redland City, Ipswich City, Lockyer Valley, Brisbane City, Moreton bay, Somerset, Sunshine Coast and Noosa Shire

[8] Queensland Government. Treasurer and Minister for Trade and Investment. Referral Notice for the Review of South East Queensland Bulk Water Prices. 25 May 2017.

Figure 4. Seqwater major assets

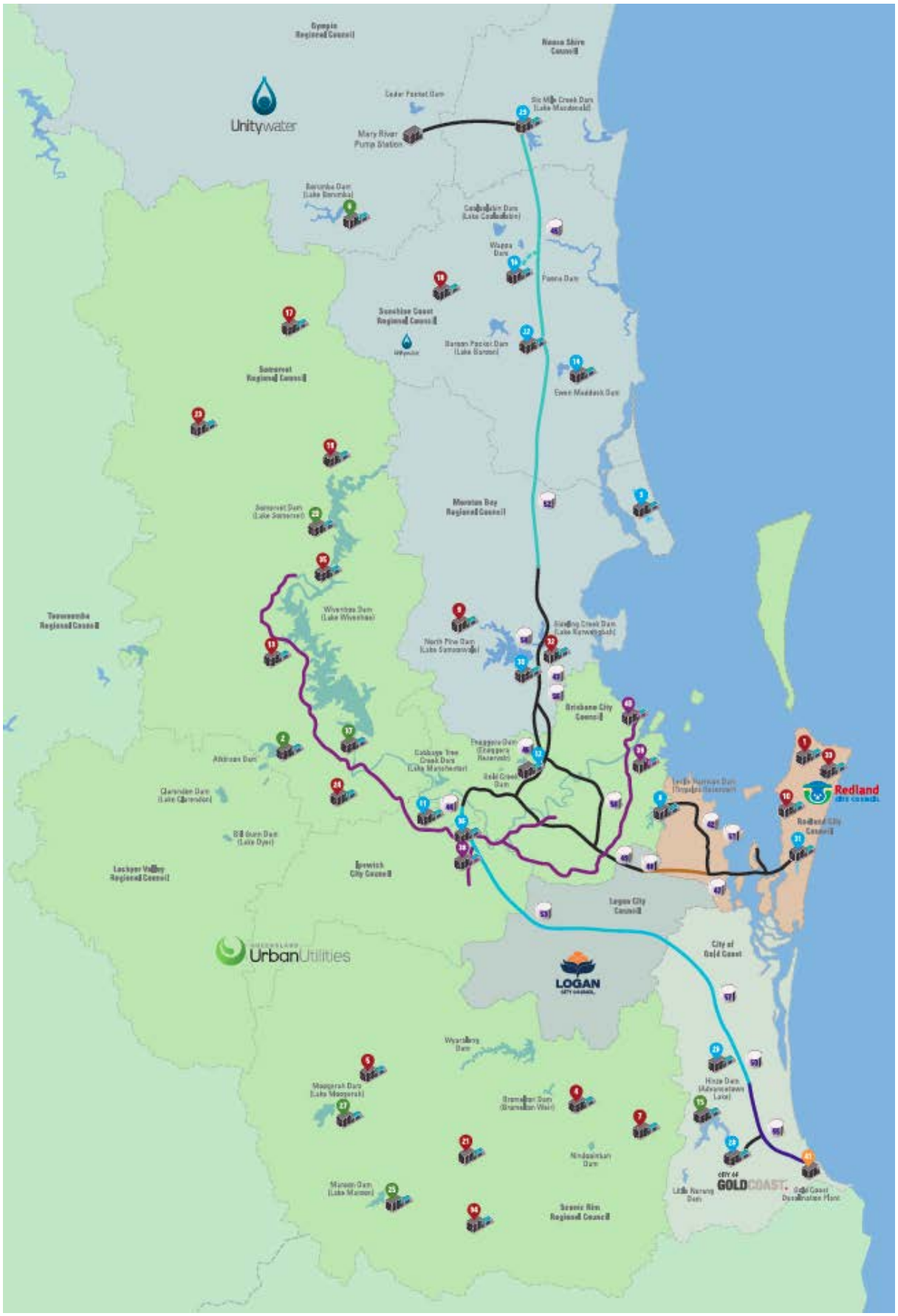
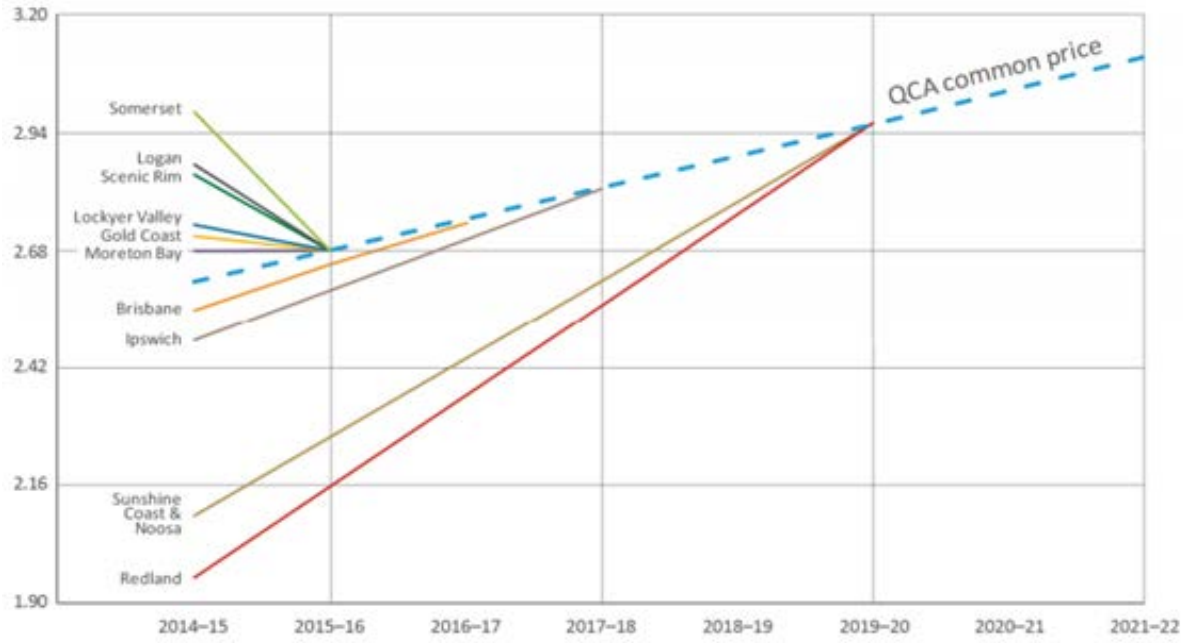


Figure 4 highlights Seqwater's major assets. In addition to the provision of bulk water supply Seqwater also provide essential flood mitigation and irrigation services to rural customers in seven water supply schemes, in addition to managing multiple recreational facilities.[9]

1.2 Bulk water prices in SEQ

Until 2008, bulk water supply in SEQ was the responsibility of local council, with each council area responsible for setting its own prices. When the Queensland Government took over responsibility for bulk water supply in 2008, it established a 10-year 'price path' of annual price increases to achieve a common bulk water price across all eleven SEQ councils. Due to variances in starting prices, each of the eleven councils has a different price path prior to reaching an indicative common price in financial year 2019/20 subject to determination by the government as shown in Figure 5.

Figure 5. Queensland Government – Bulk Water Price Path (Note prices from 2018-19 are indicative only)



Source: QCA

The structure of the price path results in Seqwater under recovering its costs in the early years despite gradually increases from the outset. As a result, the price path set by the government is to provide Seqwater with the opportunity to recover not only its prudent and efficient costs of operation but also the interest on and repayments of price path debt incurred in servicing this under-recovery.

While a price path has been established, the Queensland Government periodically investigates the pricing practices of Seqwater. The Authority conducted its first review of Seqwater's bulk water prices for the period 2015-18.[10]

In providing a referral notice to the Authority requesting a review of Seqwater's bulk water prices for the period 1 July 2018 to 30 June 2021, the Treasurer and Minister for Trade and Investment recognised the price path had been, and will continue to be, an effective and important policy instrument for

[9] The cost associated with irrigation services are excluded from KPMG's assessment of the prudency and efficiency of Seqwater's forecast capital and operating expenditure

[10] Queensland competition Authority. Seqwater Bulk Water Prices 2015-18. < http://www.qca.org.au/Water/Urban-bulk-water/SEQ-bulk-water/Archive/Seqwater-Bulk-Water-Prices-2015-18>.

transitioning to a cost reflective common price, and ultimately, repaying the investment in the water grid over a sustainable period of time.[11]

In accordance with the referral notice the Authority is required to recommend prices that would provide Seqwater with sufficient revenue to recover prudent and efficient costs incurred in providing bulk water services, as well as repay 'Price Path Debt' by 2027-28.

This investigation represents a key juncture with the convergence of all eleven council areas under a common price to have occurred by the end of the review period. KPMG note in recommending a price path structure:

- the prices for Redland, Sunshine Coast and Noosa councils are to be transitioned to the common price in 2019-20 unless this would result in a transitional price that is above the common price 2018-19, in which case prices should be set to the common price from 1 July 2018;
- the price for Noosa council is to be the same as the price for Sunshine Coast council for consistency following the de-amalgamation; and
- the common price for other council areas is to be reset from 1 July 2018, and prices are to remain constant in real terms once the common price has been reached until 2027-28.

Finally, the Authority has also been tasked with presenting an alternative price option which would result in smoothed price increases for all council areas (including Redland, Sunshine Coast and Noosa) over the 3 year regulatory period.

1.3 Our objectives and scope

Seqwater's forecast operating and capital expenditure, which contribute to the total costs recovered via bulk water prices, represents a key component in the Authority's price investigation.

The objective of KPMG's assessment is to assist the Authority determine if Seqwater's forecasts for capital and operating expenditure are consistent with those that would be incurred by a prudent service provider acting efficiently to achieve the lowest cost of delivering on service outcomes over the regulatory period, taking into account a long-term planning horizon for the business.

In accordance with the terms of reference the scope for KPMG's assessment includes:

- Seqwater's forecast opex and capex over the period 1 July 2018 to 30 June 2028);
- Seqwater's actual capex (to the extent available) over the period 1 July 2014 to 30 June 2018, where this exceeds capex recommended by the QCA in the 2015 review; and
- costs arising from any review events over the period 1 July 2015 to 30 June 2018.

Importantly, in completing our review of Seqwater's capex and opex forecast we have been mindful of the contrast in assessment period (1 July 2018 to 30 June 2028) as required in the referral notice to the Authority relative to the overall objective of the Authority's investigation of recommending bulk water prices for Seqwater for the period of 1 July 2018 to 30 June 2021.

For capital expenditure, this contrast may be thought of in terms of three expenditure profiles:

- Expenditure commencing and capitalised in the period 1 July 2018 to 30 June 2021 (consistent with the pricing period);

[11] Queensland Government. Treasurer and Minister for Trade and Investment. Referral Notice for the Review of South East Queensland Bulk Water Prices. 25 May 2017.

- Expenditure commencing in the period 1 July 2018 to 30 June 2021 and capitalised between 1 July 2021 to 30 June 2028; and
- Expenditure commencing in the period after 1 July 2021 and capitalised in the period up to 30 June 2028.

Only once a projects expenditure has been capitalised does it form part the regulated asset base and therefore have an impact on prices. For all stakeholders it is therefore those projects which are capitalised before 30 June 2021 that are likely to hold greatest weight given their immediate impact on prices. For projects capitalised outside of this period, further opportunities exist in which to assess its prudency and efficiency – for example as part of the next pricing review.

Given this variation in expenditure profiles, it is reasonable to expect Seqwater have sufficiently robust documentation to establish the prudency and efficiency of expenditure for projects under profile 1 above – i.e. capitalised before 30 June 2021. In contrast, it would be unreasonable to expect the same level of documentation for those projects commencing outside of the three year period ending 30 June 2021 (i.e. profile 3 above) given an inherent level of uncertainty exists with planning the network beyond a period of three years.

The contrast between assessment period and three year pricing period becomes more pronounced when reviewing those projects which incur expenditure in the first three years but are not capitalised within this same period (i.e. profile 2 above). As these projects have less of a bearing on immediate prices, and with further opportunities to assess their prudency and efficiency in subsequent pricing reviews, we acknowledge alternative regulatory treatments exists for these projects.

For example, where efficiency cannot be suitably assessed one approach may be to provide for a discount on expenditure (e.g. 25%) in later years of the forecast period as recognition of the increasing uncertainty of individual projects. A more stringent approach would be to provide for the same level of scrutiny in assessment of projects across all years, regardless of timing and therefore impact on prices. Projects commencing in year 1 or year 10 would be required to have the same level of documentation justifying both prudency and efficiency.

Due to these alternative approaches we have sought to link our assessment wherever possible back to Seqwater's own investment governance processes (discussed further below) and the Authority's own TOR requiring the assessment of prudency and efficiency of capex and opex be completed over the full 10-year period.

Where KPMG has assessed expenditure as not prudent or inefficient, we have sought to identify appropriate adjustments to the proposed expenditure profile provided by Seqwater to better align with that of a prudent or efficient service provider.

Additionally, KPMG were required to review Seqwater's forecast demand in so far as its consistency with the demand forecasts outlined in Seqwater's Water Security Program (Version 2).

We note in relation to the second bullet point, Seqwater's actual capex for the current regulatory period has been below that which was previously recommended by the Authority. As a result, KPMG has not completed a detail review of the prudency an efficiency of Seqwater's historical capex.

1.4 Our approach

To support the Authority with its investigation, KPMG has approached this task through the following steps identified below. Where relevant, KPMG has drawn on regulatory precedent (set by the Authority and other jurisdictional regulators across Australia) in relation to key aspects of Seqwater's forecast.

The steps completed by KPMG include:

1 **Review of governance and planning frameworks**: KPMG completed a desktop review of Seqwater's supporting policies and procedures detailing its overarching governance and planning frameworks. KPMG then sought to test the application of Seqwater's supporting governance and planning frameworks in development of its capex and opex proposals to the Authority.

   The strategic direction underpinning the development of opex and capex forecast are best captured in the governance and planning frameworks adopted by the business. These frameworks should provide detail on how an organisation aims to achieve its strategic objectives and manage its key risks.

2 **Review of capital expenditure:** KPMG completed its review of Seqwater's historical and forecast capex in four stages, the first at a portfolio level, second at a project level, the third to consider opportunities for capital and operating expenditure trade-offs, and finally the fourth to identify systemic issues, based on the project reviews.

   At a project level, KPMG has completed detailed reviews of twelve major projects ranging in size from $9m to $150m. These projects are categorised as driven by growth, compliance, renewals and service improvements or a combination of these factors.

3 **Review of operating expenditure**: KPMG evaluated the prudency and efficiency of Seqwater's forecast operating expenditure in accordance with a base, trend and step approach. This approach establishes an efficient base year, rolls forward the efficient base operating expenditure to take account of scale growth, input price growth and efficiency improvements plus any adjustments for material step changes to costs.

   In applying this methodology, KPMG has reviewed Seqwater's total operating expenditure explicitly considering major service and cost categories.

In performing each of the steps above, KPMG has:

- Completed a desktop assessment of capex and opex supporting documentation as provided by Seqwater. This documentation has included, but not been limited to, asset management plans, corporate strategic and operational plans, risk management and compliance policies, long term planning reports, individual capex project business cases, asset portfolio master plan (APMP), regulatory pricing model, asset lifecycle approach and independent third party reports (e.g. PWC's cost escalation factors).
- Held face to face meetings with key staff responsible for the formation of Seqwater's forecast capex and opex. These meetings were held over the period August 21, 22 and 24 and included staff from the following business areas (not exhaustive): finance, long term planning, strategic asset management, ICT, procurement, community engagement, and regulation.
- Sought clarifications either in the form of secondary information request or via further discussions with key areas of the business. An example of these discussions include meeting with key staff of the finance department to discuss the budgeting process and forecast opex in greater detail.

Further details of KPMG's approach to completing each are provided in Section 3.

Importantly, in completing our review of Seqwater's capex and opex forecast we have been mindful of the difference in assessment period (1 July 2018 to 30 June 2028, 10 years) as required in the referral notice to the Authority relative to the overall objective of the Authority's investigation of recommending bulk water prices for Seqwater for the period of 1 July 2018 to 30 June 2021, 3 years. This has ramifications for how the prudency and efficiency of Seqwater's capex and opex are assessed.

For example Seqwater's capital expenditure may be categorised into three types of expenditure profiles:

1 Expenditure commencing and capitalised in the period 1 July 2018 to 30 June 2021 (consistent with the 3-year pricing period);

2 Expenditure commencing in the period 1 July 2018 to 30 June 2021 and capitalised between 1 July 2021 to 30 June 2028; and

3 Expenditure commencing in the period after 1 July 2021 and capitalised in the period up to 30 June 2028.

It is important to note that only once a projects expenditure has been capitalised does it form part the regulated asset base and therefore have an impact on prices. It is therefore reasonable to expect Seqwater have sufficiently robust documentation to establish the prudency and efficiency of expenditure for projects under profile 1 above – i.e. capitalised before 30 June 2021.

In contrast, it would be unreasonable to expect the same level of documentation for those projects commencing outside of the three year period ending 30 June 2021 (i.e. profile 3 above) given an inherent level of uncertainty exists with planning the network beyond a period of three years. We have therefore not proposed adjustments for those projects of this profile category, excluding those twelve major projects sampled.

KPMG notes that for projects which incur expenditure in the first three years but are not capitalised within this same period (i.e. profile 2 above) there are potential further opportunities to assess their prudency and efficiency in subsequent pricing reviews. This is of particular importance for those projects due to commence in year three of the forecast period and may therefore be at an early stage in the capital planning process. For these projects, we recognise alternative assessment approaches exist that may be suitable subject to the expectations of the reviewer (and Authority), for example in relation to the level of documentation deemed appropriate in justifying both prudency and efficiency. We note these alternative approaches may include:

1 Placing greater focus and scrutiny only on those projects impacting prices in the short term, specifically those projects which commence and are capitalised in the next three years – i.e. before 30 June 2021. Projects which commence within (or outside of) and are capitalised beyond the initial three years are not assessed.

2 Applying a notional discount (e.g. 25%) to those capital projects where efficiency cannot be suitably assessed, such as those projects at an early stage in the capital planning process or commencing in the later years of the forecast period as recognition of the increasing uncertainty of individual projects;

3 Placing a consistent level of scrutiny for all projects commencing within the first three years of the forecast only regardless of when they are capitalised.

We note the third approach identified above provides for a more robust assessment and is consistent with our agreed scope of work with the Authority. Further, this approach is consistent with our assessment of sampled major projects as described in Section 7.

1.4.1 Defining prudency and efficiency

We have adopted the following definitions of prudency and efficiency of expenditure in accordance with those set out by the Authority in the terms of reference.

Operating expenditure is considered:

- prudent if it can be justified by reference to an identified need or cost driver - e.g. to meet legal or regulatory obligations or contracts with external agencies; and
- efficient if it minimises Seqwater's long-run costs of providing bulk water supply services.

While capital expenditure is considered:

- prudent if it can be justified by reference to an identified need or cost driver - e.g. to meet legal or regulatory obligations, new growth, renewal of existing infrastructure or an increase in the reliability or quality of supply explicitly endorsed or desired by customers, external agencies or participating councils; and
- efficient if it is the least cost to deliver on an appropriately defined scope and standard of works. Efficient capex would typically encompass the scope (i.e. whether the general characteristics of the project provide the best means of achieving the desired outcomes), standard (e.g. whether the works conform to technical, design and construction requirements in legislation, industry and other standards, codes and manuals) and cost of the works.

1.5 Structure of the report

The remainder of this report is structured as follows:

- Section 2: Regulatory requirements
- Section 3: Review methodology and assumptions
- Section 4: Corporate governance and procurement
- Section 5: Capital planning and asset management framework
- Section 6: Demand
- Section 7: Forecast capital expenditure
- Section 8: Forecast operating expenditure
- Section 9: Review events
- Appendix A: Seqwater meetings

2 Regulatory requirements

How Seqwater both plan and operate its portfolio of assets ensuring for the security, reliability and quality of bulk water supply to customers throughout SEQ is governed by a range of legislative and regulatory instruments. These instruments include, but are not limited to:

- South East Queensland Water (Restructuring) Act 2007 (Qld);
- Water Act 2000;
- Water Supply (Safety and Reliability) Act 2008 (WSSR Act);
- Financial Accountability Act 2009;
- Environmental Protection Act (1994);
- Aboriginal Cultural Heritage Act 2003;
- Work Health and Safety Act 2011;
- Financial and Performance Management Standard 2009;
- Bulk Water Supply Code; and
- Australian Drinking Water Guidelines.

Critical to Seqwater's capital and operating expenditure activities is its ability to meet its obligations in terms of water quality in accordance with the WSSR Act, Australian Drinking Water Guidelines and supply agreements with its customers. Similarly, how Seqwater meets its Level of Service (LOS) and obligations in accordance with the Water Regulation 2016 (under the Water Act 2000) and dam safety obligations in accordance with the Water Supply (Safety and Reliability) Act 2008, Water Legislation (Dam Safety) Amendment Act 2017 and Dam Safety Management Guidelines (ANCOLD Guideline 2003) will dictate the capital program options assessed by the business as well as operating expenditure and maintenance performed by the business.

For example the LOS obligations are broken into three key areas and provide a measure for the performance of the bulk supply network. Each of these three areas are summarized in Table 11 below. Seqwater is required to develop and publish its Water Security Program under the Water Act 2000 every 5-years. The WSP sets out the basis for meeting the LOS obligations over a 30-year horizon and provides for, among other matters Seqwater's:

- proposed operation of its designated bulk water supply assets;
- future infrastructure needs, including building new infrastructure or augmenting existing infrastructure;
- management of infrastructure relevant to the designated water security entity's operations; and
- management of demand for water; and
- response to drought conditions.

The WSP therefore provides the basis upon which Seqwater's proposed capital and operating expenditure forecasts included within the regulatory submission are developed.

Table 11. LOS Obligations

Projected regional average urban demand for SEQ region	Bulk water drought supply	Minimum operating levels and essential minimum supply volume
1) The bulk water supply system is to be able to supply enough water to meet the projected regional average urban demand. 2) The bulk water supply authority must: a) work out the projected regional average urban demand in collaboration with the SEQ service providers, and publicly publish the projection in the way stated in the SEQ water security program; and b) assess annually whether the projected regional average urban demand or latest projected regional average urban demand is still current, and publicly publish the outcome of the assessment in the way stated in the SEQ water security program.	1) The bulk water supply system is to be able to supply enough water so that medium level water restrictions on residential water use: a) will not happen more than once every 10 years on average; and b) will not restrict the average water use for the SEQ region to less than 140L for each person for each day. 2) The bulk water supply system is to be able to supply enough water so that medium level water restrictions on non-residential water use that is incidental to the purpose of a business will not happen more than once every 10 years on average 3) Medium level water restrictions on residential and non-residential water use are expected to last no longer than one year on average.	1) Each of the following dams will not reach its minimum operating level more than once in every 10,000 years on average: a) Baroon Pocket Dam; b) Hinze Dam; c) Wivenhoe Dam. 2) The bulk water supply system: a) will be able to supply the essential minimum supply volume; and b) will not be reduced to being able to supply only the essential minimum supply volume more than once in every 10,000 years on average.

3 Review methodology and assumptions

In this section, KPMG provide further detail in relation to the methodology applied in completing each of the three steps to our assessment as well as the key assumptions made when reviewing material provided by Seqwater.

3.1 Governance and planning frameworks

The strategic direction underpinning the development of opex and capex forecast are captured in the governance and planning frameworks adopted by the business. These frameworks should provide detail on how an organisation aims to achieve its strategic objectives and manage its key risks.

The planning framework will define the process, principles and accountabilities for developing capital and operating plans, and it will provide transparent and robust principles to ensure alignment between strategic objectives and investment priorities, incorporating stakeholder and regulatory requirements.

To assess Seqwater's governance and planning frameworks, KPMG firstly completed a desktop review of Seqwater's supporting policies and procedures detailing its overarching governance and planning frameworks. In completing a desktop review we pursued evidence of:

- consistency with relevant standards and guidelines, including, AS/NZS ISO 31000:2009 Risk Management, AS/ISO 19600:2015 Compliance Management Systems, ISO 55001:2014 Asset Management;
- delegated financial authority and capital approval processes;
- mandatory documentation requirements such as phase record documents;
- planning and design processes;
- procurement policy and relevant commercial principles;
- cost estimation processes (component estimation, cost element estimation, benchmarking);
- delivery strategies;
- project/program management;
- change control processes and policies; and
- performance monitoring and benefits realisation.

Following completion of this desktop review KPMG then sought to test the application of Seqwater's supporting governance and planning frameworks in development of its forecast expenditure proposals to the Authority. To do so we have sampled the supporting information provided by Seqwater in relation to individual capital projects to be completed over the upcoming regulatory period and looked for evidence associated with the investment governance / capital planning and delivery framework (described further in Section 4.3 and Section 5.5). Example documentation includes needs and options assessments, business cases and investment justification or independent (third party) reports.

3.2 Capital Expenditure

In order to effectively assess Seqwater's proposed capital expenditure over the period 1 July 2018 to 30 June 2028, KPMG has completed its review in four stages, the first at a portfolio level, second at a

project level, the third to consider opportunities for capital and operating expenditure trade-offs, and finally the fourth to identify systemic issues in their approach to capital expenditure forecasting, based on the project reviews, as explained below:

1 **High level review and prioritisation:** At a portfolio level, KPMG has reviewed the robustness of planning policies and strategies and assessed portfolio-wide issues identifying priority areas across the major capital expenditure categories.

   This work builds on our assessment of Seqwater's governance, capital planning and assessment management frameworks.

2 **Detailed project reviews:** KPMG has critically evaluated twelve major capital projects ranging in size from $9m to $150m.

3 **Capital / operating expenditure trade-offs:** KPMG considered the opportunities, which may exist for substitution (trade-off) of capital for operating expenditure or vice versa thereby ensuring for efficient service delivery and least efficient cost outcomes for customers.

4 **Identification of systemic issues:** Adopting a risk-based approach, KPMG has tested for systemic issues built into Seqwater's such as significant contingency allowances across multiple projects and the use of any inappropriate price indexes.

3.3 Operating Expenditure

For our assessment, KPMG has adopted a base, trend and step approach. The base-step-trend approach is well established for assessing operating expenditure forecasts in determinations across a range of utility sectors (including the energy sector in Australia) and has been adopted by other jurisdictional regulators including for example the Essential Services Commission of Victoria and Australian Energy Regulator.

This approach establishes an efficient base year, rolls forward the efficient base operating expenditure to take account of scale growth (in this case growth in the volume of water delivered), input price growth and efficiency improvements and includes adjustments for step changes to costs.

Our analytical approach adopted in assessing Seqwater's proposed opex provided for five main components:

1 **A review of the Authority's past determination:** KPMG first reviewed the QCA's past determination with particular reference to the last operating expenditure review undertaken by CH2M Hill. The purpose of this review was to identify any issues or actions recommended by CH2M Hill, which Seqwater have subsequently sought to address over the course of the current regulatory period.

2 **Assessment of Seqwater's forecasting method:** KPMG assessed the appropriateness of the forecasting approach adopted by Seqwater relative to that applied in other jurisdictions and industries (e.g. Victoria and electricity).

3 **Assessment of base year opex**: KPMG sought to verify that the baseline operating expenditure reflects efficient controllable costs and has appropriate adjustments for non-recurring expenditure and efficiency savings, in doing so KPMG has assessed the proposed base year against historical opex, reviewing the proposed inclusions and exclusions and assessing the underlying expenditure for potential non recurrent expenditure.

4 **Assessment of proposed trends in opex:** KPMG has assessed the basis for the operating expenditure roll-forward calculations and how assumptions have been used to determine future operating expenditure requirements. This element of the review considered the:

- operating expenditure input price inflation forecasts;
- forecast growth in consumption;
- assumed efficiency improvements; and
- internal consistency of proposed operating expenditure with the capital program.

5 **Assessment of proposed step changes in opex:** Finally, KPMG considered the proposed expenditure associated with major new initiatives or variations that change the operating expenditure trend.

3.4 Meetings with Seqwater

KPMG's completed interviews with Seqwater staff held over three days – August 21, 22 and 24. During this time, KPMG met with key areas of Seqwater business responsible for development of the capital and operating expenditure forecasts.

In addition to these meetings, KPMG has had numerous teleconference discussions with members of Seqwater's regulatory and pricing team. These discussions sought to further clarify information provided by Seqwater and identify potential information gaps.

A full list of the meetings held has been provided in Appendix A.

4 Corporate governance and procurement

Corporate governance of capital and operational delivery and expenditure is a core business function and should therefore be assessed in terms of Seqwater's business model and operating model. Seqwater is seen as an asset management organisation which means its objectives include coordinating activities to realise customer value from its asset base. To properly assess the corporate governance and procurement processes of this type of organisation, we have utilised the International Standard, ISO55001 which requires a management system approach to asset management. Where business functions are not sufficiently covered by the Seqwater management system, associated and referenced documents have been used such as the Asset Management Landscape that covers the globally agreed 39 subjects of asset management and the risk management standard, ISO31000.

These standards state that the responsibilities and authorities of key functions should be defined. These definitions should include both internal and outsourced roles and responsibilities. The interfaces between organisational functions should be clearly established. This becomes more important in an outsourced environment.

Risk Management must occur within a disciplined management framework and governance process. Often organisations will develop risk registers or logs and develop processes to support the opening, updating and closure of business risks. The management of risks should include both a system of review and escalation of the risk, with assessment taking place at the appropriate level within an organisation. The testing process requires Seqwater to have in place a Risk Management System that enables the identification of risks, the assessment of risk exposure, the classification of business risk appetite and controls to reduce or manage risks in a suitable manner.

Procurement governance is largely focussed on the procurement of goods and services. Goods can be considered physical assets and services may consist of outsourced activities to deliver Seqwater functions. Outsourcing is a method for an organisation to have certain asset management activities performed by a service provider. These outsourced activities (which can influence the achievement of the asset management objectives), should be defined, maintained, controlled and documented as a part of the asset management system. Tests include:

- the extent of outsourcing that requires aligning processes of the services provider(s);
- outsourcing risks and impacts on assets, asset management and asset management system;
- what potential risks cannot be transferred, even if the related asset management activities are transferred;
- performance reporting on transparency and performance of outsourced activities; and
- the exertion of leadership to formalise the outsourcing relationship.

In this section, KPMG has provided an overview of the corporate and procurement governance processes adopted by Seqwater including: risk management; compliance; investment governance; delegation of authority; and procurement.

4.1 Risk management framework

Risk Management is an essential component that enables an organisation to benefit from optimized Asset Management decision making. It is part of the process that enables a disciplined approach for an organisation to maximise value and deliver its Organisational Strategic Plan.

Seqwater has an Enterprise Risk Management Framework aligned with the risk management process defined in AS/NSZ ISO 31000:2009: Risk management – principles and guidelines. The Framework provides an overview of the risk management principles that define the key activities for effective risk management within Seqwater and is documented in PRO-00801 Corporate – Risk Management Procedure.

This Framework provides guidance on Seqwater's enterprise risk management system and has been designed to outline the minimum requirements for risk management within Seqwater. The Seqwater Strategic Asset Management Plan (SAMP) and particularly the asset management objectives have been developed with consideration of the Seqwater Enterprise Risks as described in the Enterprise Risk Register.

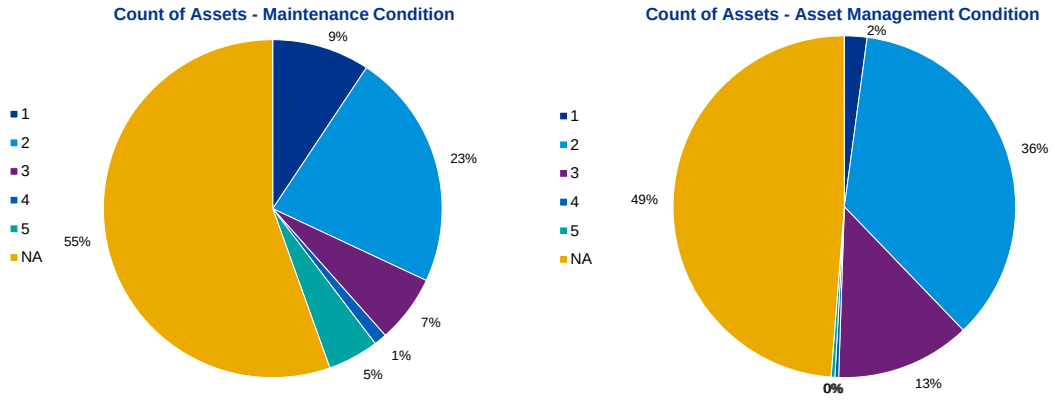
For investment decision making, Seqwater has considered many enterprise risk, activity risk and asset risk factors in developing their expenditure forecasts. The Framework provides for ratings/scores of both the likelihood and consequence of a specific risk. For the most part, the likelihood and consequence scores have definitions with quantified examples to help prioritise investments, however the application of the scores are subjective based on the user. The consequence score can be confidently validated using network models and analysis however the likelihood score is more time based and dynamic.

KPMG's assessment has identified one main issue with this Framework and Seqwater's approach. To improve confidence in the likelihood score, Seqwater should consider using data driven metrics from condition and performance assessments to predict the likelihood of failure at multiple points in time. This will help forecast when more detailed surveys should be undertaken before any project is committed. The analysis should be supported by an improvement loop to capture where condition degradation curves, used to forecast likelihood, should be updated with more robust results.

Improving the likelihood score should lead to better forecast needs identification and result in a lower number of projects being deferred having already passed a preliminary evaluation as outlined in Section 4.3.

For example, KPMG was provided with sample data for the 283 assets that together constitute the Kooralbyn WTP, approximately half of the assets do not have a condition score which is a critical input to calculating likelihood. Within this sample, there appears to be two different condition scores captured, 'maintenance condition' and 'asset management condition'. These scores are not consistently captured with many assets only having one or the other score. For those assets that have both scores, some are not consistent with each other. Figure 6 compares the two different score profiles (1 is good, 5 is poor).

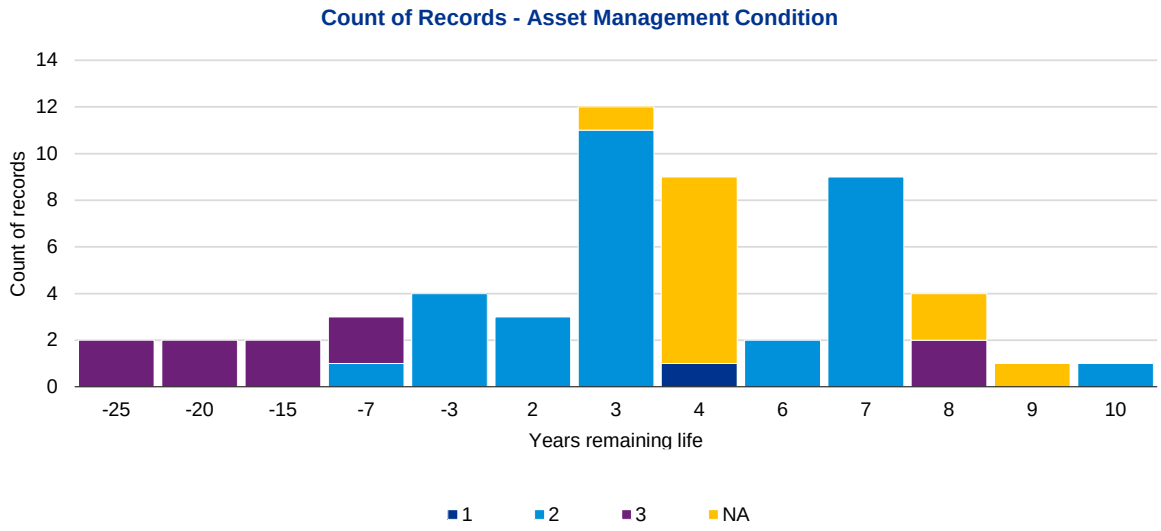
Figure 6. Comparision of condition score breakdown



The sample data also provided figures calculated from install dates and economic lives to provide a 'remaining life'. Figure 7 below also shows that for the 54 assets at Kooralbyn WTP that are within 10 years or less remaining life, none of the assets have a condition score worse than 3 out of 5. This

indicates that the assets do not require replacing and may be an indicator that either there is an issue with condition analysis or the economic lives need further analysis.

Figure 7. Lack of correlation between condition scores and remaining life



4.2 Compliance policy

The Compliance Policy confirms Seqwater's commitment to compliance with: all relevant legislation; government policies and directives; licences; approvals; permits; contract terms and conditions; and certification standards. It also states that Seqwater will employ the Australian / New Zealand Standard Compliance Framework AS/NZS 3806:2006 to monitor compliance.

Internal compliance controls used by Seqwater include policies, procedures, systems and processes, which are internally / externally audited and continually improved. Staff compliance is managed through a documented Code of Conduct, which raises staff awareness of compliance issues and improves staff compliance accountability. The details of the Corporate Compliance Framework are documented in the Corporate Manual MAN-00255 Compliance.

The Corporate Compliance Framework covers compliance registers, a compliance software solution, an assurance checking and corrective action procedure, a notification procedure, a legislative change procedure and a, compliance reporting regime.

Below is a list of potential policies that should be covered by the compliance framework:

- Drinking Water Quality Policy;
- Occupational Health and Safety Policy;
- Environment Policy;
- Land Management Policy;
- Security Policy;
- Information Security Policy;
- SCADA Security Policy;
- Security Fencing Policy;
- Tapping into Water Mains Policy;

- Privacy Policy;
- Purchasing Policy;
- Intellectual Property Policy;
- Copyright Policy;
- Fleet Policy

The vast number of compliance requirements that Seqwater needs to track and monitor drives a culture of focusing on individual KPI's which makes it challenging to see the big picture. Seqwater utilises a software solution in order to track these at an individual requirement level however it was not evident that it is used to improve decision making outcomes.

4.3 Investment governance

Seqwater's investment decision-making is based on the gateway review process as shown in Figure 8. This process forms the basis for all capital planning and delivery across Seqwater. KPMG note this is a similar process to that adopted by the Queensland Government and which is aligned with the internationally-recognised OGC Gateway$_{TM}$ Process. Further details regarding the implementation of the gateway review process are provided in Section 5.5.

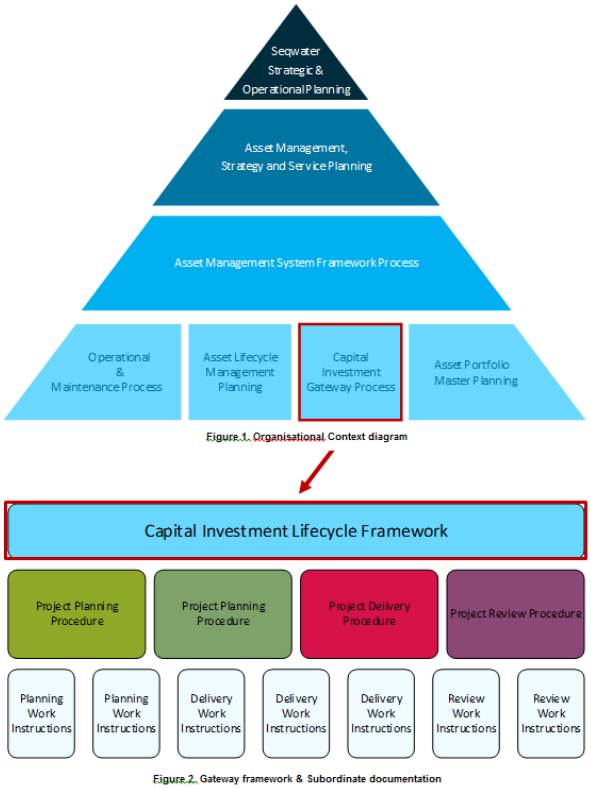
Figure 8. Seqwater investment gateway process

	Gate 0	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Seqwater	**Strategic Assessment**	**Preliminary Evaluation**	**Investment Justification**	**Investment Decision**	**Readiness for Service**	**Benefits Realisation**
Intent	Strategic alignment and Portfolio Planning	Project initiation and Planning	Business Case approval	Contract Award	Project Delivery and handover	Project Performance review

Source: Seqwater

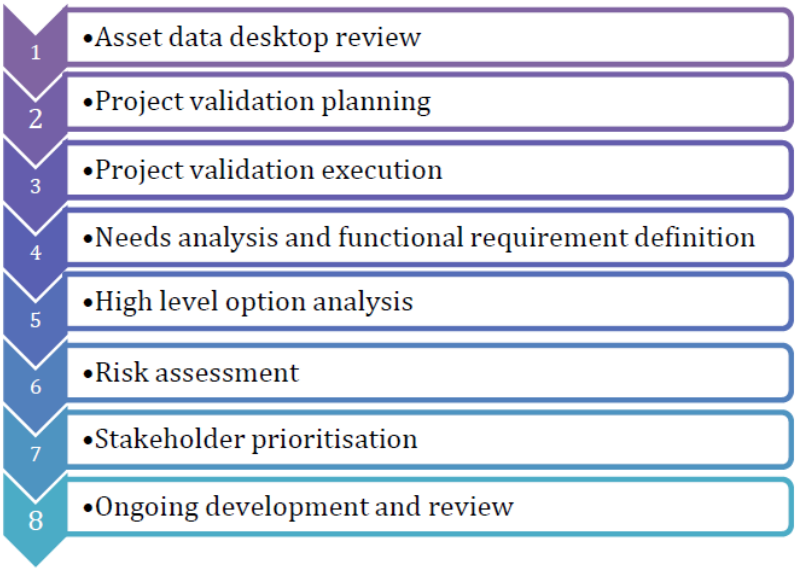
Discussions with Seqwater have indicated that the business is progressing with formalising this process across all business functions. This work includes revising existing processes and templates and rolling out necessary training to staff. Further, procedural documentation has been drafted and submitted for internal review across the business and multiple work instructions remain in various stages of development (see Figure 9).

Figure 9. Capital Investment Lifecycle Framework



Source: Seqwater

Figure 10. The asset renewals, refurbishment and replacement investment program development steps



Source: Seqwater

KPMG recognise Seqwater are still in the process of operationalising the gateway process across all business functions. As a result, there are still sub-processes that are undertaken that appear to map between the gates. These sub-process can create the possibility that formal review at major milestones can be missed. Figure 10 provides an example of such sub-processes from the Asset Capability team. While these sub-processes would typically cover Gates 0 and 1 under the new framework, there is no clear requirement within the process to gain approval before moving onto Gate 1.

While communication of processes have taken place and there was evidence of awareness of the gated process, KPMG note it is possible that the 'investment program development steps' outlined above bypass Gate 1. This is further evidenced by the data provided in the 2017 Asset Portfolio Master Plan (APMP) which is a database of all projects identified for potential capital investment. Table 12 provides a breakdown of all 1,289 projects within the APMP where each project is allocated a status by stage gate. As can be seen, there is a significant lack of documentation captured for Gateway 1 indicating a packaging of documentation to pass multiple gateways at once. For example, of the 117 projects that are currently at Project Status 3, Investment Decision, only 17 have documented evidence required to pass Gateway 1.

If projects are passing gates either without appropriate documentation, review or the completion of necessary approvals are based on incomplete data then Seqwater should consider including additional procedures.

Table 12. Current Status of Projects Breakdown by Stage Gate

Project Status	Gateway 0 Documentation	Gateway 1 Documentation	Gateway 2 Documentation	Gateway 3 Documentation
0 - Strategic Assessment	661	8	21	3
1 - Preliminary Evaluation	162	40	22	1
2 - Investment Justification	26	10	25	
3 - Investment Decision	***112***	***17***	***117***	
4 - Readiness for Service	29	1	24	5
(blank)	5			
Total	**995**	**76**	**209**	**9**

4.4 Delegation of authority

At each stage gated project management phase, there are identified Approving Officers with the delegations and authorisations arrangements described in the Delegations and Authorisations Manual (MAN-00076), with additional consideration of risk implications. For investment decisions that exceed General Manager financial delegations or are assessed as high risk, matters must be considered and endorsed by the Investment Review Group (IRG) before consideration by the CEO. For investment decisions that exceed the CEO's financial delegation, projects are passed to the Investment and Procurement Committee (IPC) – a sub-committee of the Board. The IPC consider proposals and provide endorsement before business cases can be presented to the Board.

Other key governance bodies and processes include:

- Key input parameters approved by Audit and Risk Committee and the Board;
- Group plans developed and signed off by area General Manager;
- Monthly progress tracking / reporting completed – budget vs actual; and
- Investment Review Group that oversees the gated process.

In addition to the Delegations and Authorisations Manual, Seqwater has a Management of Change (MOC) procedure (X-PRO-STD-00X) in place to capture and control the impacts of changes to the configuration of the network and the operating model to manage customer services.

For changes that require a MOC, the delegation procedure is used to assign authorisation responsibilities (e.g. higher duties) to a suitably qualified substitute. For changes that do not require a MOC, it is possible to gain approval to deviate from the delegation procedure to allocate authorities to another individual.

4.5 Procurement

Seqwater has developed a procurement business framework. Fundamentally the responsibility of the Procurement function is to ensure the delivery of best value contract models and manage the framework that delivers:

- value for money;
- open and effective competition;
- sustainability;
- probity and ethical behaviour;
- risk management; and
- responsible spend management.

Seqwater's Procurement and Commercial Services structure are made up of: category management (capex), category management (opex) and business excellence. There are documented procedures that provide a guide to procurement sourcing options based on the project risk rating and capital cost (including contingency). These polices are:

- Queensland Government Procurement Policy 2013 (note new Policy commences 1 September 2017 with 6 months to transition)
- Seqwater Procurement Policy 2014 (Document No. POL-0045)
- Seqwater Procurement Procedure 2016 (Document No. PRO-01514)

In addition to this, the IPC considers proposals and provide endorsement before business cases can be presented to the Board. The IPC are bound by the charter, Investment and Procurement Committee Charter, POL-00046.

Further, Seqwater Program Controls, who have the largest proportion of outsourced staff, have a procedure in place requiring all spend over $5,000 to be tracked and signed off at appropriate levels. In accordance with this procedure:

- Category Management – Capex. Charged with managing Capital Projects greater than $500k. Overseeing Standing Offer Arrangement for Projects between $100,000 and $500,000 (Minor Works) and Planning and Design for Consultancy arrangements up to $2million.
- Category Management – Opex. Charged with managing addressable spend on Energy, Chemicals, Sludge, Facilities, Materials, Maintenance and Professional Services. Utilising various Whole of Government and Seqwater arrangements and contractual arrangements.
- Business Excellence – focused on governance, systems, training, quality assurance, supply chain and logistics, commercial administration, document management, analytics and reporting.

Reporting on these tender outcomes is imperative to demonstrate value for money. Reporting includes financial analysis on contractor viability, ASIC checking, compliance reporting (internal audit, Q-leave), analytics on category spend and sourcing review activities.

Seqwater's procurement procedures appear robust and a strong panel of local resources have been established. However, driving through and tracking all spend down to $5,000 increments takes a lot of effort which can allow for other 'big picture' work to be overlooked. Seqwater may wish to consider automating approval levels for certain purchasing with remote areas like treatment plants.

Seqwater should also closely monitor the value they get from their outsourced staff in Program Controls which equates to approximately 15 Fixed Term staff and 30 Project Based outsourced staff. Whilst it is advantageous to be able to flex the size of the team to suit the workload, there should be a clear Competency Framework that outlines which capabilities are best to outsource and therefore what KPI's and shared information should be monitored.

4.6 Summary findings

Overall we found the corporate governance and procurement framework of Seqwater, as supported by various policies and processes such as the Enterprise Risk Management Framework, Investment Decision Making or gateway process, to provide for effective approach to management of key asset and investment risks and compliance obligations. These policies and process have are considered in large to be fit for purpose and have been aligned with key standards such as AS/NSZ ISO 31000:2009: Risk management – principles and guidelines.

Discussions with Seqwater have indicated that in certain areas the business is progressing with formalising key process across all business functions in particular in relation to recently implemented gateway investment process (described further below). This is one example of a notable area where processes have not become effective or embedded however there appears to be progress made and improvements are programed.

It appears Seqwater should improve the way the likelihood component of the risk equation as part of the Enterprise Risk Management Framework and approach is formed. This either requires an improved process or increased data quality. Based on the data analysed, there were material gaps (50% incomplete) in condition information that is used to form the likelihood of failure. Furthermore, there are instances where the same asset is graded as good and poor condition using different database fields.

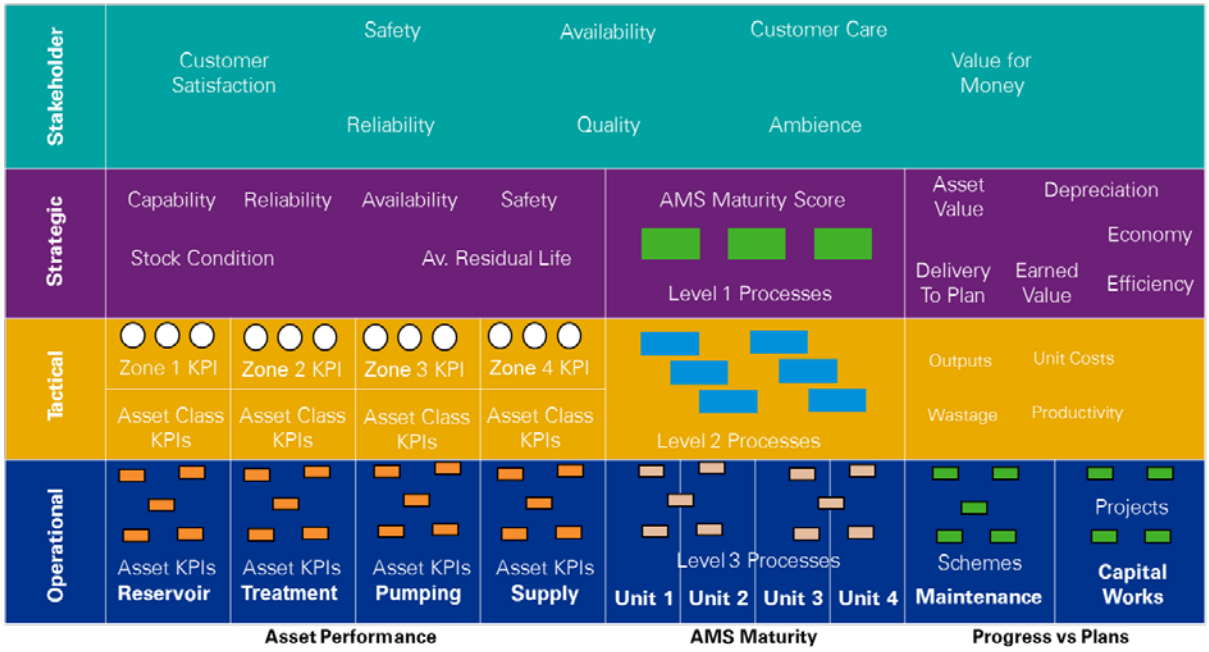
For Seqwater to manage the compliance framework, Seqwater should consider a compliance driver tree hierarchy that links team and individual KPI's so that management can monitor the impact of performance on overarching compliance issues. An example of this is provided in the figure below and could be annotated with the appropriate compliance requirements.

The investment governance process should be improved to capture gateway approval supporting documentation at each stage gate, not just nominated gateways. This may be due to an alignment issue between the new OGC Gateway™ Process and the traditional asset renewals, refurbishment and replacement investment program development steps.

We recognise Seqwater are still in the process of operationalising the gateway process across all business functions. As a result, there are still sub-processes that are undertaken that appear to map between the gates. These sub-process can create the possibly that formal review at major milestones can be missed. It is possible that the 'investment program development steps' outlined above bypass Gate 1. Evidence from the 2017 APMP showed that of all 1,289 projects there is a significant lack of documentation captured for Gateway 1 indicating a packaging of documentation to pass multiple gateways at once.

The procurement process currently monitors all spend down to $5,000. Whilst this provides a detailed amount of governance, the time it takes to monitor appears to be detracting time away from larger projects with significantly more spend. Possible automation of low value spend could be investigated to continue to enable audit verification whist releasing time for limited resources to spend on larger capital works.

Figure 11. Example - Hierarchy of Performance Measures



5 Capital planning and asset management framework

As with Section 4, the International Standard for asset management enables clear assessment guidelines and allows for targeted improvements on specific areas of the management system. ISO55002, Guidance to the Asset Management System, states that Seqwater must "demonstrate responsibility for delivering performance against one or more asset management objectives, and the effective control and governance of asset management related function(s) and activities it is carrying out, in order to generate the value from the assets defined in the scope of its asset management system".

KPMG's tests include determining whether Seqwater has a consistent Asset Management Policy and Asset Management Strategy that provide a stable framework to allow joined up Asset Management Decision-Making. Furthermore, our test involved validating that the Asset Management Policy provided the overarching principles to enable the Strategic Asset Management Plan (SAMP), to be produced and implemented. The SAMP would then typically contain the value criteria to be used to optimise Asset Management Decision-Making.

The process of Capital Investment Decision-Making was tested to understand asset degradation and trading-off capital costs, maintenance costs, risks and their probabilities in order to optimise a capital investment decision, both in terms of timing and asset intervention options.

To further test the trade-off between maintenance and capital investment and likewise, individual Operations & Maintenance Decisions, Lifecycle Cost & Value Optimisation processes were tested to assess if the right decisions are being made to maximize the return on asset value. Lifecycle Cost & Value Optimisation requires the calculation of costs, risks and revenues over the life of the assets or asset systems and can be split into the four areas of the asset lifecycle itself being plan, acquire, operate & maintain and dispose.

Delivery of individual projects were tested to validate they were managed through a lifecycle divided into different phases, separated by governance decision gateways where financial sanction for the next phase is approved. This delivery cycle was tested to check that projects were appropriately triaged and prioritised based on value to the customer.

This chapter provides an overview of Seqwater's approach to planning and asset management across its network and portfolio of bulk water supply assets. This includes content relating to long term planning, strategic asset management, asset management plans, the renewals program and capital planning and delivery.

5.1 Long term planning

For Seqwater, structural reform of the Queensland water sector has resulted in significant disruption in relation to how the business establishes its long term capital and assessment management plans for its portfolio of assets. For example, following its formation in January 2013, Seqwater assumed responsibility for the long term water security planning for all of SEQ.

Similarly, Seqwater has had to inherit many of the asset management practices, legacy systems and processes associated with its predecessor companies. Prior to 2007, 18 different asset management practices were in place reflecting previous asset ownership/service delivery models in the sector.

The following sections provide a summary of the programs/plans adopted throughout Seqwater and their role within the organisation.

Water Security Program

Under the Water Act 2000 and the Bulk Water Supply Code, Seqwater is required to develop a Water Security Program (WSP) to meet level of service objectives for water security in SEQ for the next 30 years. The WSP is to detail how Seqwater plans to, among other factors:

- Operate and manage its assets;
- Address future infrastructure needs across its bulk supply network (including off-grid communities);
- Manage demand for water; and
- Respond to drought conditions.

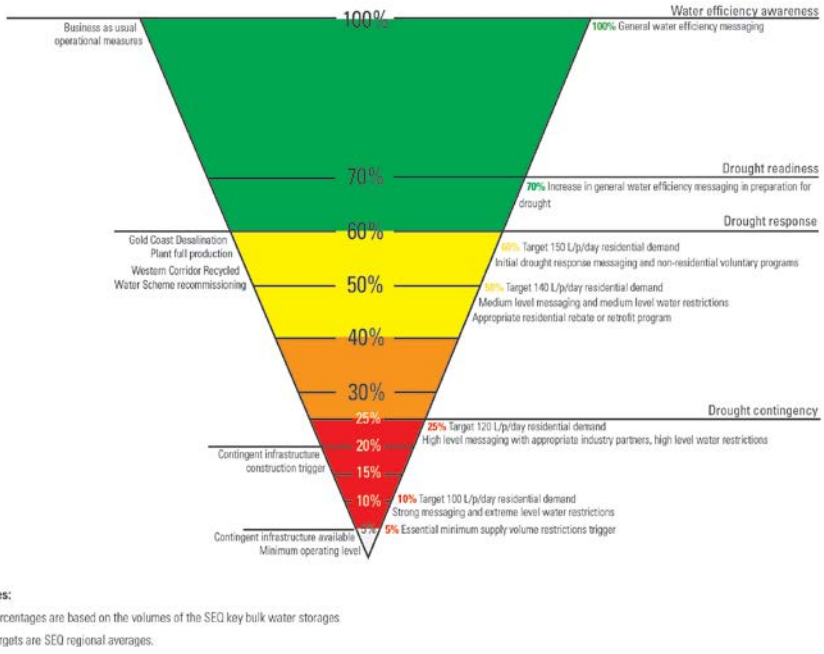
Water security Level of Service (LOS) objectives are Seqwater's targets for long term water supply security for a community. The LOS objectives include statements about:

- How much water the water supply system will typically be able to supply;
- How often and for how long water restrictions might occur; and
- The possibility of needing an emergency water supply due to a prolonged drought.

The LOS approach helps ensure that the available water for treatment and distribution is enough to supply the community's (both grid and non-grid connected customers) water needs into the future. LOS objectives provide a basis for water supply security planning, helping to balance the need for water with the cost of supplying it.

Seqwater is required to review and publish its WSP every five years, or if there is a significant change in any matter affecting, or likely to affect, the achievement of the desired level of service objectives for water security.

Figure 12. Seqwater drought response initiatives



Source: Seqwater

The current WSP (now in its second version), "Water for Life", was release by Seqwater in March 2017 and provides an outlook for the period 2016 to 2046. In development of the WSP, Seqwater undertook

stakeholder consultation through various workshops with customers (such as distributor-retailers) and consumers.

A key component of the WSP is Seqwater's demand outlook over the 30-year period. Seqwater adopt a medium demand outlook of 185L/p/d residential and 100L/p/d non-residential, as the basis for its capital planning activities. This outlook is reported in the WSP, along with additional scenario analysis capturing specifically low and high demand growth forecasts, as well as specific climate change scenarios. These additional scenarios are used in testing of proposed capital plans. Section 4 provides further details of Seqwater's demand forecasting methodology.

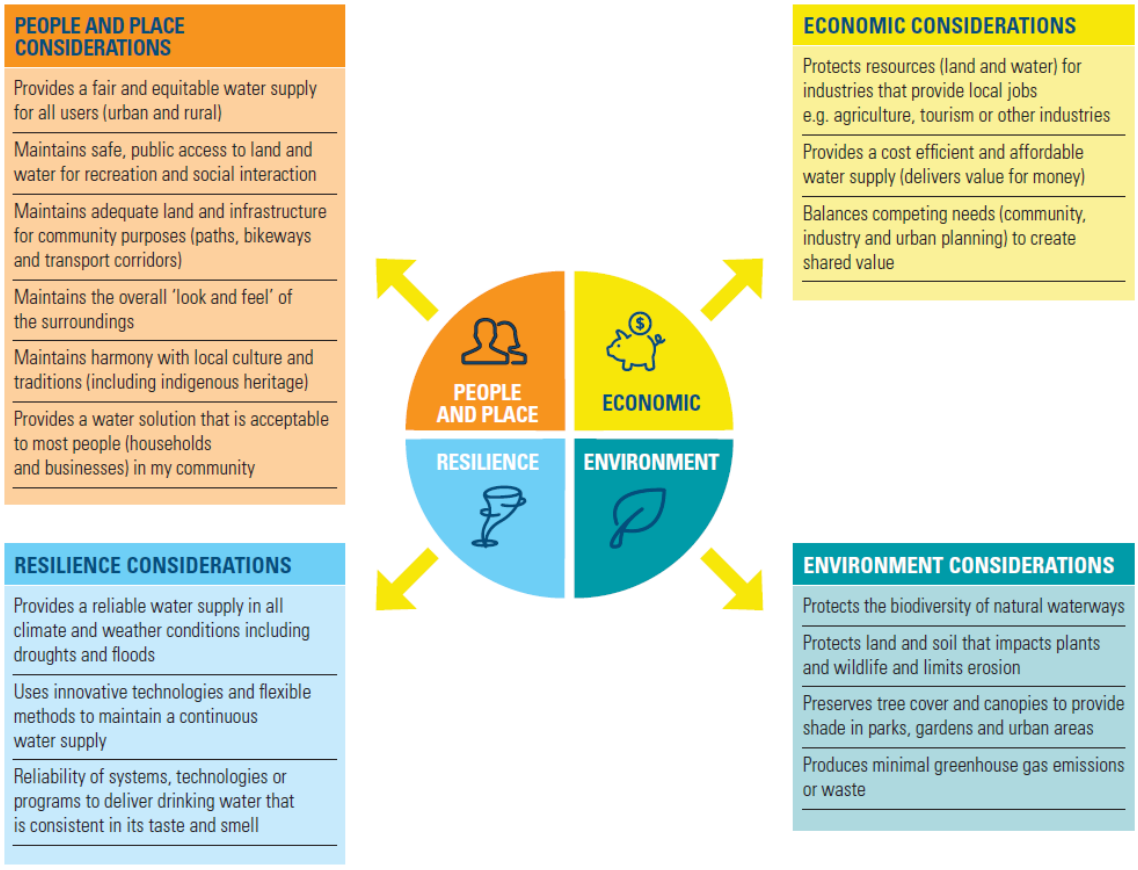
Finally, the WSP sets out Seqwater's response to changes in climatic conditions and in particular key drought triggers tracked by the business and its proposed response initiatives (as shown in Figure 12).

Seqwater utilise the WSP (now in its second version) as the basis for its long term planning activities. The outcomes, or plans, developed in the WSP feed into the development of Seqwater's Integrated Master Plan, as well as its annual APMP. These additional plans are described in further detail below.

Integrated Master Plan

Seqwater's Integrated Master Plan sets out a strategy for how all bulk water supply assets need to be able to work together to achieve water supply LOS objectives. It is an umbrella document that builds upon the WSP, and pulls together strategy for all water supply assets to provide a common direction. It also sets out what operational functions the assets need to be capable of doing and what actions Seqwater needs to take to make those assets capable of performing the desired functions.

Figure 13. Considerations for planning: economic, resilience, environment and people and place



Source: Seqwater

Planning criteria, as set out in the WSP, are a set of assessment parameters, which enable a balance between the requirement for a safe, secure, reliable, quality water supply and the desire for this service to be provided at minimal cost. These parameters are shown in Figure 13.

The planning criteria have been agreed through two rounds of community engagement and are not intended to preclude the consideration of innovative options or to diminish the goal of least-cost planning in promoting efficiency. Actual infrastructure delivery is still to be underpinned by appropriate planning investigations and developing effective investment triggers so all decisions meet the underlying service objectives in a demonstrably prudent and efficient manner.

KPMG understand the Integrated Master Plan is to be updated in conjunction with updates to the WSP, i.e. every five years moving forward.

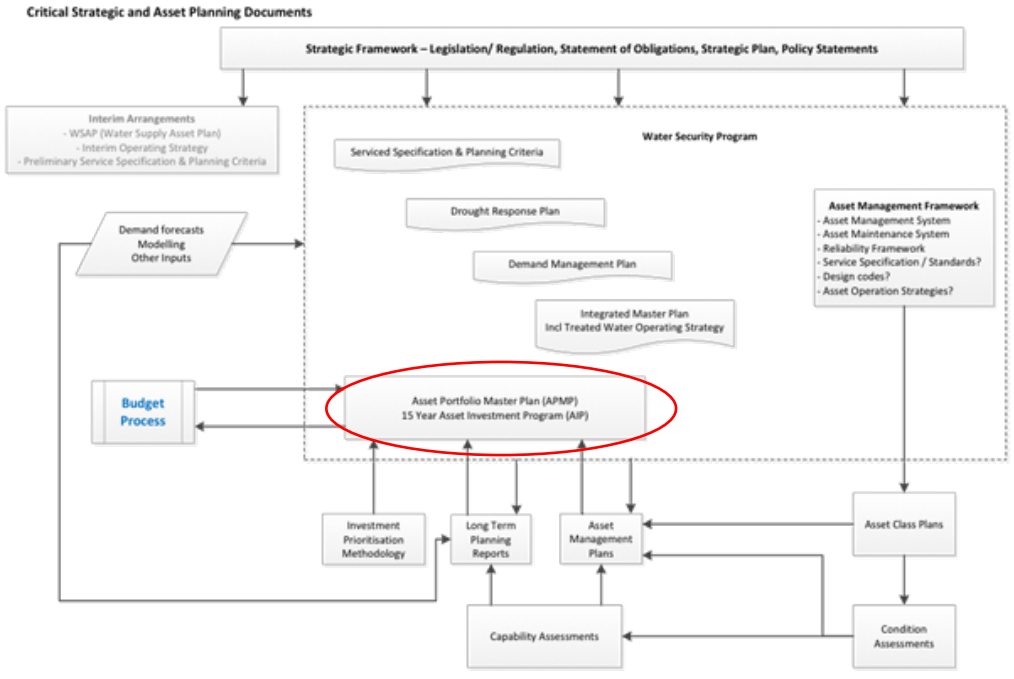
Asset Portfolio Master Plan

In addition to the Integrated Master Plan, Seqwater has taken steps to implement planning as a business as usual (BAU) process throughout the organisation. It does so through the development of the Asset Portfolio Master Plan (APMP). This has resulted in the business switching its focus from short term to longer term objectives and as such changed the way the business prioritises and schedules its capital program for any given year.

The APMP provides a single source of truth for Seqwater's capital investment plans over a forecast period of 20 years and forms the basis for all annual capital budgets. Seqwater endeavour to update the APMP annually. Subsequently, as a BAU process, the regulatory submission to the Authority represents an extension of this process with the 2017 APMP forming the basis for Seqwater's submission to the Authority.

The APMP captures capital projects (only) across all investment gateways (discussed in Section 4.3 and 5.5) and strategies including for example WSP, asset class plans, projects in delivery and fleet and ICT strategies.

Figure 14. Asset planning manual



Source: Seqwater

Each project is scored on a multi-criteria basis to assess its strategic value. It was noted these criteria were limited and did not necessarily address the full range of 'value' that customers and stakeholders have been engaged on. Importantly, while the APMP is updated annually its key inputs (expenditure) are not. For example, having completed an options assessment and identified a preferred capital program, it is possible for the capital program to be captured in the APMP at the time of finalizing the assessment. Were the capital program to be delayed for a couple of years, the expenditure reported

against the program may not have changed unless further analysis was completed throughout the preceding year warranting an update to the APMP. Therefore, caution must be taken when reviewing forecast expenditure in the APMP as these amounts may be recorded at different points in time (e.g. 2013, as oppose to 2017). Figure 14 highlights where in Seqwater's asset planning manual, the APMP fits.

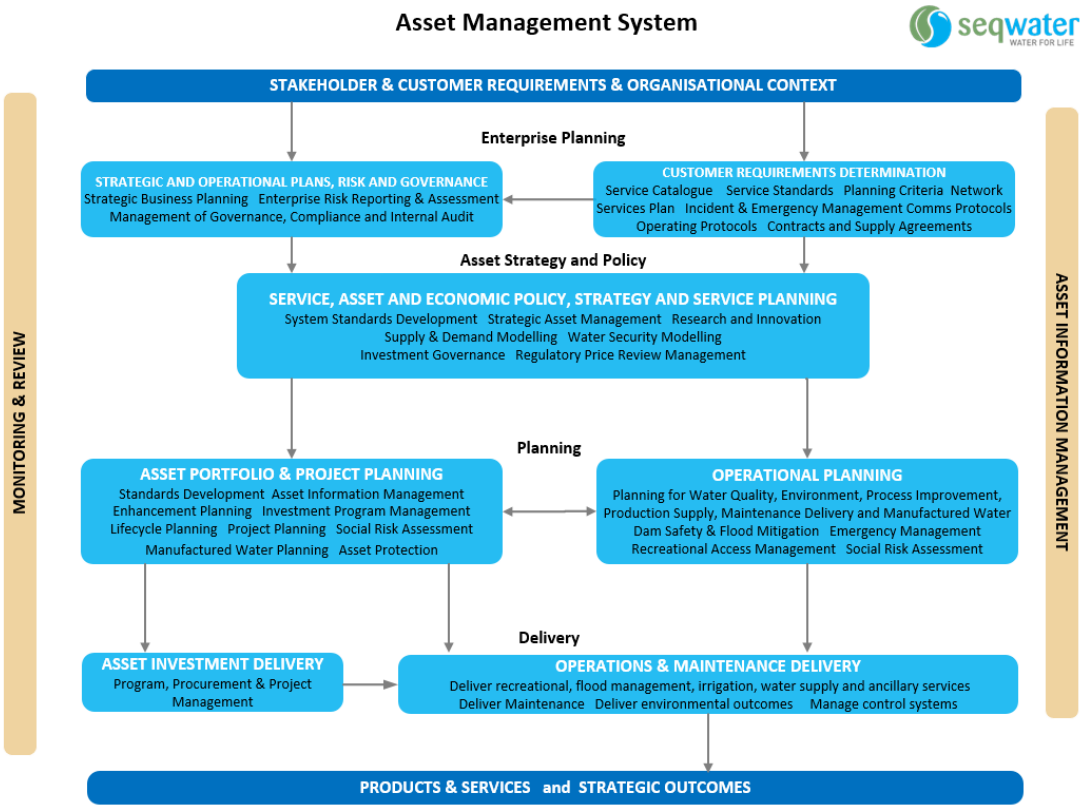
5.2 Strategic asset management

This section briefly describes Seqwater's approach to asset management and the policies, processes and systems in place detailing the generation requirements of the business, as well as links to broader corporate objectives/plans.

Asset Management System

Seqwater's approach to asset management is governed by their Asset Management System (AMS). This provides a structured management system methodology to align business activities and demonstrate line of sight between customer and stakeholder needs and how those needs are translated into objectives, planned for and delivered through operations.

Figure 15. Seqwater Asset Management System Level 1 Diagram



Source: Seqwater

The AMS has been presented in a manner that allows for ease of alignment and review against the ISO55000 standard, which describes the asset management system requirements in terms of - organisational context, leadership, planning, support, operation, performance evaluation and improvement.

Asset Management Policy

The purpose of the Asset Management Policy is to outline principles and mandated requirements, derived from and consistent with the Seqwater Strategic Plan, providing a basis for the development

and implementation of the Asset Management System and the setting of the asset management objectives.

The Asset Management Policy defines the overall mandated requirements and guiding principles that must be adhered to in undertaking all asset management activities involved in the lifecycle management of physical assets. It provides consistency and transparency in decision making and action. It should:

- align with the Seqwater strategic plan and other policies;
- state the principles that must be adhered to by all concerned;
- state how the policy will be implemented, roles and responsibilities;
- be communicated to all employees, service providers and stakeholders; and
- be endorsed by the top management within Seqwater.

The coverage of the policy and strategy detailed in Seqwater's Strategic Asset Management Plan (SAMP, discussed in further detail below) does not indicate that the Asset Management Policy has been endorsed by senior leadership or that it has been widely communicated.

It does mention Asset Management Policies which are lower level technical documents describing how different asset classes behave and the individual strategies that should be applied across their whole of life.

Asset Management Objectives

Seqwater have referred to the 'line of sight' between organisational objectives and product delivery. A critical requirement to satisfying 'line of sight' to customer objectives is the Statement of Alignment. Seqwater have addressed this through translating its business objectives into asset management objectives. For each objective listed below, Seqwater have mapped the process flow from overarching legislation (i.e. the Water Act 2000) through its Statement of Obligations, Enterprise Risk, Seqwater Policy, Strategic Objectives, and Asset Management Objectives. Seqwater's asset management objectives state:

- Assets will be managed to meet regulatory requirements and satisfy the corporate risk appetite.
- Assets will be managed using an agreed and articulated asset management system that drives quality asset decision making across all of our business.
- Asset management processes and performance targets are linked to and support delivery of services to the agreed standards.
- Assets will be capable of meeting future service requirements and challenges.
- Asset investment will be optimised across the value chain, from catchment to tap.
- Assets will achieve service standards at minimum economic, environmental and social cost across the asset lifecycle.
- Assets will be planned for, managed and operated to achieve general environmental duty, our duty of care to the public and our cultural heritage responsibilities, and continuous improvement in our performance of each.
- Assets will be managed to achieve consistent workplace health and safety standards.

Currently, Seqwater does not have an automated system to track the achievement of these objectives. Instead, Seqwater is monitoring its performance against each objective annually using a maturity scale and scoring against defined criteria of:

- Completeness of documentation;

- Approval status;
- Communication throughout the business;
- Implementation progress; and
- Monitoring, review and update status.

Strategic Asset Management Plan

The development of Seqwater's Strategic Asset Management Plan (SAMP) has been guided by alignment to ISO55001. The Seqwater Board have made the decision to not seek certification to the ISO55001 standard however will continue to seek alignment and are in the process of developing an integrated management system to enable further alignment with quality, safety, environment and water quality standards and customer requirements.

The SAMP should fulfil a number of purposes:

- To document the role of the assets, asset management and the asset management system in supporting achievement of the organisational objectives and to provide clarity and direction for everyone in the organisation from top management to delivery teams.
- To translate organisational objectives into strategic asset management objectives and reconcile with other strategic objectives which can have an impact on the assets and asset management.
- To guide the approach for developing the asset management plans and the asset management system and applying the asset management policy to ensure alignment.
- To establish the decision criteria that enable describe the derivation of value for the organisation and its stakeholders and the coordinated approach for performance evaluation.
- To present a consolidated plan at the asset portfolio-level for achieving the strategic asset management objectives and linking these to organisation's financial plans.
- To present the plan for creating or improving the asset management system to ensure the required capabilities and resources are available to achieve the asset management objectives.

KPMG notes that while the SAMP references the Asset Management System Improvement Program (AMSIP) as the process to drive improvements, it does not offer a roadmap of what improvements will be undertaken, when and why. This is where a SAMP should excel and be offered as a business strategy for how asset management will deliver customer value. The improvement, resource and capabilities and management reporting sections appear to be incomplete with section titles added as a placeholder for future development.

5.3 Asset management plans

The asset management plans (AMP) should contain a rationale for asset management activities, operational and maintenance plans, capital investment (overhaul, renewal, replacement, enhancement and disposal) plans, financial and resource plans. The purpose of the AMPs is to enable the capital management plan and disposal plan to be generated as a list of assets that are to be planned for construction, renewal, refurbishment or decommissioning.

When developing an asset management plan, Seqwater would be required to consider:

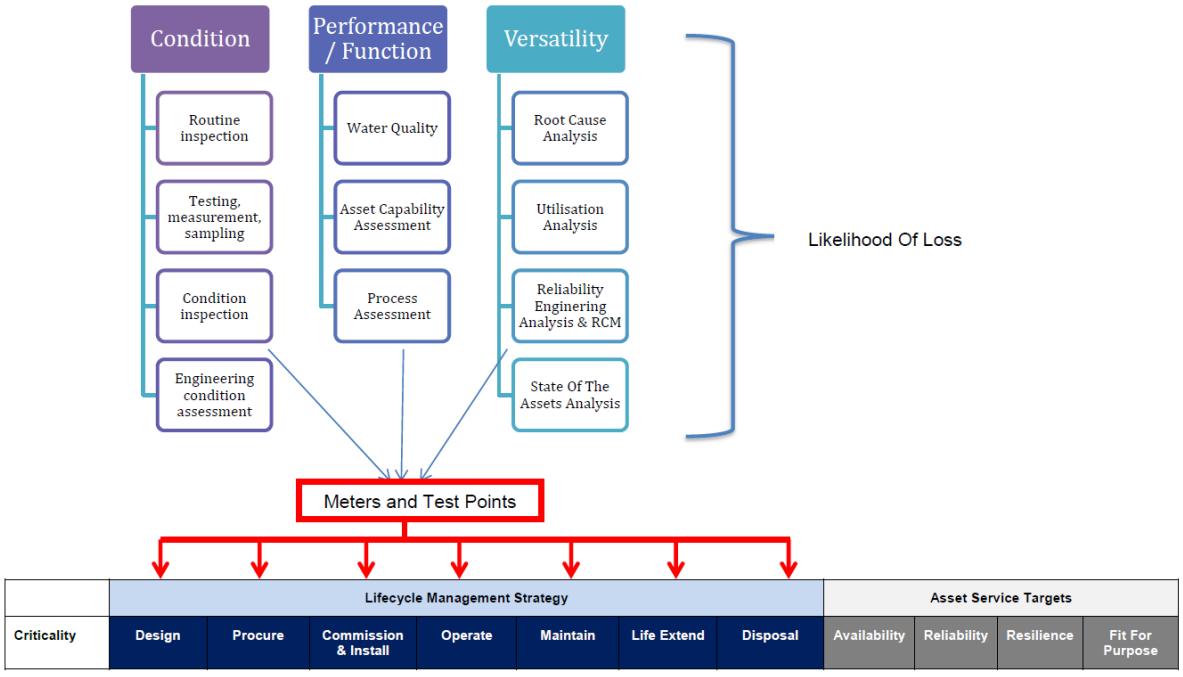
- The scope of the asset management plan;
- The performance of the assets and the intended outcomes expected from implementation i.e. are the assets capable of delivering the forecast demand for products or services;

- The whole life cost structure to enable trade-off between capital and operational expenditures, including non-asset solutions;
- Who should be responsible for developing and implementing the asset management plan and their continual improvement and communicating it to stakeholders;
- The asset intervention options, their processes and methods, which will typically also involve operational planning activities and implementation; and
- The environments in which the assets are operating or are intended to operate and the activities that are being performed either on individual assets, on various components, where interdependencies exist or combinations of activities occur on the same asset, or on multiple assets.

Asset Lifecycle Management Plan

Seqwater have developed an Asset Lifecycle Management Plan (ALMP) as a generic overarching approach for each asset class plan. Its purpose is to provide a decision guideline to manage operational built infrastructure assets to deliver upon agreed levels of service and optimise utilisation of resources and investment. It details the processes that govern investment and management decisions for operational built infrastructure assets based on a rigorous, documented, risk and opportunity-based approach. The approach outlined is in the diagram below and illustrates how various components of likelihood of loss are to be used at each point in the asset lifecycle.

Figure 16. Generic Asset Lifecycle Management Plan



Source: Seqwater

Asset Class Plans

Currently the ALMP provides a light touch on each section, describing the content that should be in the individual Asset Class Plans (ACP). These ACP's are under development and therefore the process above is not yet fully operationalised.

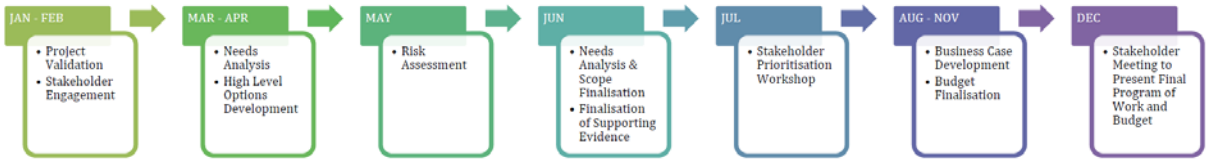
Seqwater also has an improvement plan captured as a recommendations table for an Asset Lifecycle Approach (ALA). This table outlines the forecasted capability improvement projects that are required to gain further insight into the optimum timing for different lifecycle intervention types.

The ACP's are listed in the table to be developed between 2018 and 2020. Currently the ALA does not have individual leads for each initiative, only teams. Also the timing of completion i.e. 2018-2020 is too broad and will be near impossible to monitor progress.

5.4 Renewals program

Seqwater's renewals program is the key output from the asset portfolio and the application of the ACP. This program provides mostly like-for-like renewals and provides the function of maintaining the network and agreed levels of service. Renewals are assessed to determine if the old asset has the capacity to meet current demand, however has degraded to the point that replacement is the most economically viable option. If an upgrade is required, the project may progress as an individual enhancement project outside of the renewals program. The annual process for updating the program is outlined below in Figure 17. The renewals program represents a significant portion of the annual capital works program to be completed by Seqwater.

Figure 17. Timeframe elements for the minor works program

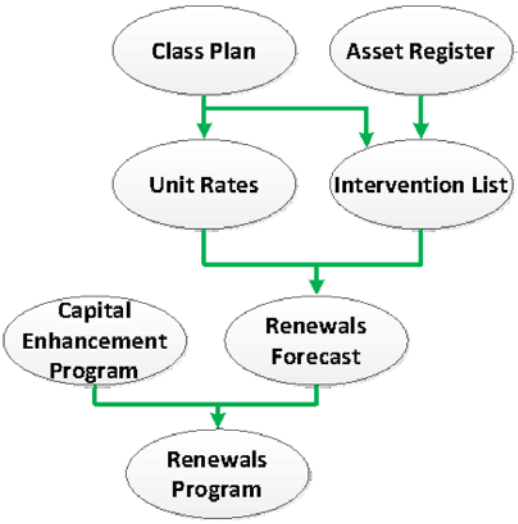


Source: Seqwater

There are two types of asset renewals, bulk water infrastructure assets and capital renewal interventions. Bulk water infrastructure assets include recreation assets only and not irrigation, fleet, plant, ICT, land, GCDP or WCRWS and AWTP. Capital renewals interventions include life extensions and investments that may be capitalised only and not operations and maintenance, enhancements or consumable equipment.

Key to the formation of Seqwater's renewals program is having access to accurate data in relation to the operation of the asset, its technical envelop (including useful life), unit rate costs, and broader ACPs. Seqwater seek to compile this data from a range of sources as shown in Figure 18. In compiling this data, Seqwater is better able to establish a long term renewals forecast for individual assets or types of assets. KPMG note this process is manually completed in a Microsoft Excel spreadsheet.

Figure 18. Modelling Logic Approach



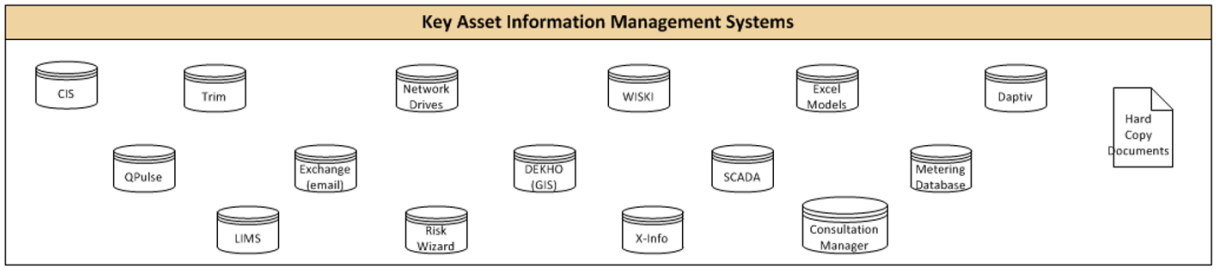
Source: Seqwater

The profile of the forecast established by Seqwater is initially based on economic lives from the valuation and fixed asset register and then modified to consider different intervention types and to smooth peaks of work that fall on the same year. This renewals forecast is merged and further optimised with proposed capital enhancements to form the renewals program. The plan is updated annually in consultation with distributor-retailers.

There is a recognition within Seqwater that there is room for improvement from the manual spreadsheet based process described above to a more automated off-the-shelf tool which would also allow for additional multi-criteria assessment.

The addition of a tool enabling such assessment was to be completed this year, however has been delayed a year within the budget process. Figure 19 highlights the suite of tools that are currently used by Seqwater in the preparation of its renewals program.

Figure 19. Seqwater's Asset Information Management Systems



Source: Seqwater

5.5 Capital planning and delivery

As discussed in Section 4.3, Seqwater's investment decision-making is based on the gateway review process. The detailed process is illustrated below in Figure 20 and highlights the inputs, processes and requirements for approval when operationalised as part of the capital planning and delivery process.

As projects progress through gates, they are refined and the scope of works and associated cost before more clearer as shown in the following figure. This results in a reduction in contingency required in the budget. This continues to the point that a project is commissioned and a target cost is agreed. For the purposes of KPMG's assessment we note Seqwater would seek to establish the prudency of a proposed capital project through Gate 1 and the efficiency of the project through Gate 2.

Importantly, the process is iterative when required. For example, it is common to step back through a gate when consideration of a project moves from a single asset to an entire facility or portfolio of assets or if there is variance in approved expenditure.

Figure 20. Capital planning and project delivery gateways

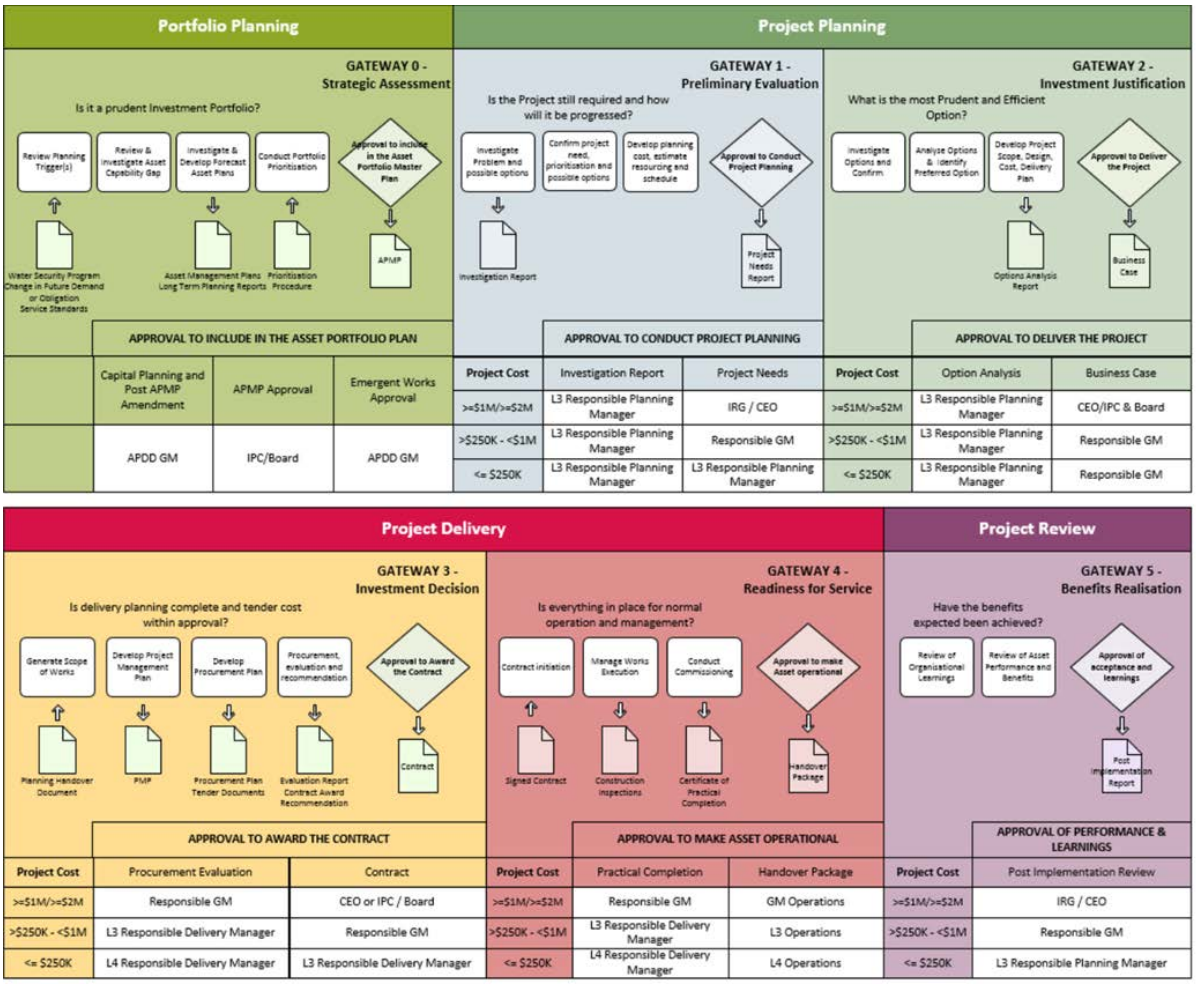
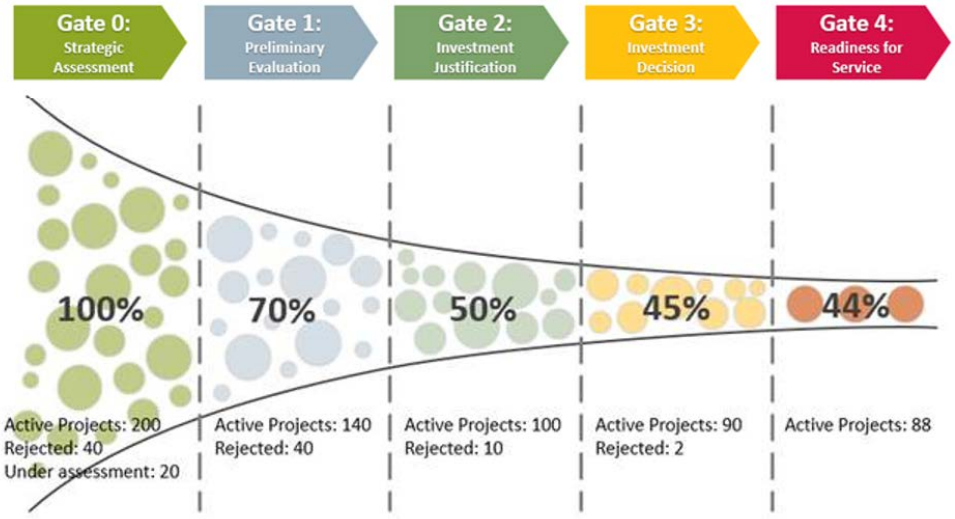


Figure 21. Capital project refinement through gateway



Portfolio planning – Gateway 0

The first step provides for identification of the possible future risks and opportunities across the businesses portfolio of assets and a first means to best managing them. Capital projects identified at

this stage are incorporated into the APMP annually. For a project to be included it must first be approved either by the General Manger of the APDD or IPC/Board.

Through consolidation of projects into the APMP, Seqwater is able to draw upon a single planning document which in turn provides details of the total capital investment program for the forthcoming 20-year period. This document forms the basis for all budgeting and reporting across the business.

Project planning – Gateway 1 and 2

Under the project planning phase, Seqwater first completes a preliminary evaluation of a project. The intention of this step is to review a specific risk or opportunity as captured under the portfolio planning phase (Gateway 0) and confirm prudency and the need to manage it. For each project, this requires Seqwater to complete a needs assessment report, providing for an understanding of a project plan and resource requirements.

Subject to the initial estimates of the capital project costs, Seqwater have established various levels of approval required in order to conduct the project planning phase ranging from L3 responsible planning managers (<=$250k) up to IRG/CEO (>=$1m/>=$2m).

At this stage a decision is made by the business to progress, recycle or cancel the proposed project.

Having established a need for the project to progress, Seqwater sets about completing an options analysis and developing a business case for each individual project. The business case is required to provide sufficient justification of the proposed investment prior to moving to the project delivery phase. As part of the business case development Seqwater seek to review, analyse and recommend the most efficient option to managing the risk or opportunity identified by the business.

Importantly, the business case provides the basis for the scope of work and plan to progress through the project delivery phase. Further it establishes the process for approval of funding in relation to the proposed project.

Having developed a business case a decision is made by the business to progress, recycle or cancel the proposed project. Delegation of approval of a business case and therefore ability to deliver a project is dependent on the project costs and is typically the responsibility of the General Manager or CEO/IPC or Board for major projects (above $1m).

Project delivery – Gateway 3 and 4

Having received approval of the business case, Seqwater moves into the project delivery phase. The intent of this phase is to:

a) prepare for the request, receipt and management of competitive market offers from service providers for delivery of the project identified and scoped in the project planning phase; and

b) review offers and recommend the best value for money approach.

A key component of this phase is the development of a project handover document. This provides the project delivery team with a comprehensive understanding of the scope and requirements of the project as well as an estimate of the forecast expenditure associated with delivery.

Seqwater's project delivery team consists of approximately 60 staff, the majority of whom are outsourced by the business. The project delivery phase is supported by a range of internal service providers including legal, contract management and commercial.

Following receipt of commercial offers from suppliers, Seqwater is required to make an investment decision to progress, recycle or cancel the project. Where a decision to progress the project is made, Seqwater enter in a contract for the delivery of an asset or service with their preferred supplier.

Through discussions with Seqwater, KPMG understand Seqwater target a primary 6-month delivery window corresponding to the winter/dry season for the majority of projects delivered. For the later part of 2017 and first half of 2018, this window is likely to be further impacted by the Commonwealth Games

on the Gold Coast. As a result certain projects have been accelerated or deferred in order to best manage resources throughout this time.

The last step in the project delivery phase is the need for Seqwater to test the asset or services "Readiness for Service". During this step, Seqwater confirm the asset or service is ready for normal operation and management. Where an asset or service is deemed ready, Seqwater take responsibility for the asset or service at which time the asset/service is included into the ongoing asset management or service plan in place. Importantly, a handover package is provided from the project delivery team to the asset operations team.

Consistent with prior steps, delegated authority to make an asset or service operational is dependent on the project's cost. Typically this authority falls to a general manager or L3 or L4 operations.

Finally, Seqwater use this step to identify key project delivery learnings and improvement opportunities for the project planning and delivery process.

Benefits realisation – Gateway 5

The final step in the capital planning and delivery process requires the business to complete a post implementation report. This report seeks to measure the risk reduction or opportunity realised from the delivered asset or service relative to the expectations established through the project planning phase.

The post implementation report aims to ensure the benefits identified in the initial business case are realised. This process is currently under development and is used opportunistically on projects. Currently this is viewed as a post implementation review however it should be tied into the front end of the business requirements management which will help identify benefits and track them as they are realised. There is potential to use business case success criteria and performance measures. Seqwater is currently updating business case templates to capture information on expected benefits

Seqwater will sample five projects through the benefits review process in the next 12 months. These projects range in size from $800k to $6m. The outputs of this will inform the next stage of development of this phase.

The end to end process for securing funding for a project, delivering it and realising the value from it is a fundamental component of improving control in capital delivery. The process Seqwater has rolled out, has received support to raise the awareness of, and communicate, the process, as evidenced from staff that were able to confidently talk to the process.

Currently the processes that support the gateways are not added to corporate system workflows. Therefore it is difficult to track the progress of a project in certain instances (e.g. where someone is on leave and is yet to approve a step). By applying the stage gates as part of corporate system, additional KPI reporting can be achieved and identify areas that need streamlining or additional support/training.

5.6 Summary findings

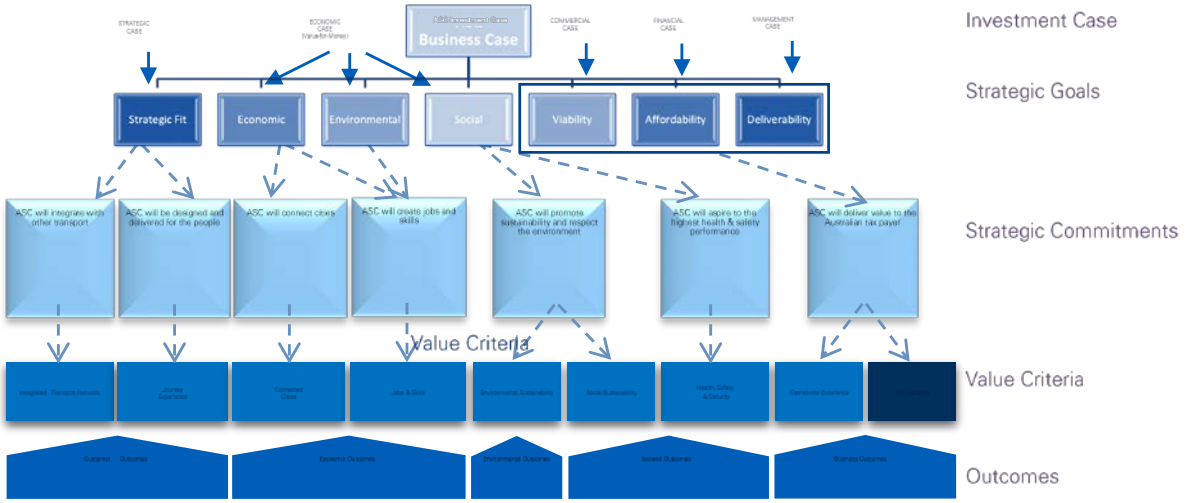
Overall, KPMG consider the capital planning framework to be commendable and consistent with Seqwater's legislative requirements and good industry practice. We note, in addition to the Water Security Program, Seqwater are building on its planning the processes through development or further enhancement of an Integrated Master Plan, Asset Portfolio Master Plans and Asset Class Plans. These plans are supported by Seqwater's strategy assessment management framework (systems, policies and procedures).

Seqwater has successfully sought to strip out a lot of the duplication in the number of processes and systems associated with the investment in and operation of its assets, however the business continues to face key asset risks. For example, Seqwater may have limited history regarding the operation of an asset and, under specific circumstances, limited knowledge of the actual assets "in the ground". This is not a reflection of Seqwater itself, but rather the asset management practices (processes/systems)

of its predecessor firms, and therefore the historical knowledge which it has been required to inherit. Due to the changing shape of Seqwater over time, and the existence of key risks such as those discussed above, it is understandable that some of the business processes and data are not very mature which may therefore make it difficult to present a strong history of condition data for decision making as discussed in Section 4.

The key criteria that have been agreed with the customers, (economic, resilience, environment and people and place) should be used as criteria for selecting and prioritising work in the APMP, subject to any regulatory obligations. These can be broken into the detailed areas covered by individual asset class plans, however, until these are developed, Seqwater should at a minimum align the strategic criteria in the APMP spreadsheet to the four strategic pillars agreed with customers. An example of a cascading framework from overarching goals through to assessment 'value criteria' and customer outcomes is illustrated below.

Figure 22. Alignment of Investment Value Criteria



Further, as a core discipline within an asset intensive organisation such as Seqwater, asset management has become a cornerstone of good business management. Improvements to strategic asset management practices in a business, leadership and organisational sense have been shown to result in a material improvement in customer value and the bottom line. There are several areas where Seqwater could improve including:

- The AMS should include people and resources as an enabler to better asset management. In this context, the competency framework can be applied and accountabilities can be linked to the capabilities of a team and competencies of individuals.
- The asset management policy should be formalised, endorsed by leadership and widely communicated as a Tier 1 policy alongside health and safety, risk and human resources etc.
- The asset management objectives should be collated into a structured performance and KPI hierarchy so that delivering the tangible metrics can roll up to a demonstrable delivery of higher level (and sometimes intangible) KPI's.
- The SAMP should evolve to focus on direction setting for asset management within Seqwater and highlight the roadmap of future improvements, who is accountable and when they should be achieved. Again, improving the communication of this would help raise the profile and gain further buy-in of aspirations from across Seqwater.

Moreover, in order to propose the right work at the right time, a clear view of lifecycle activities is required for each asset type. In addition, when packaging works, Seqwater must know how far it can bring forward or defer works before it becomes uneconomical.

The asset class plans are designed to enable this thinking however with a long timeline before completion, they will still be low maturity before the next regulatory submission. These plans should be developed in a more agile manner with layers of detail to gain a broad understanding of each asset class and build on this understanding using analytics and other technology. This will enable earlier realisation of insights for better decision making and tangible benefits. Also, by the time of the next regulatory submission, the process will be more mature and robust when making dynamic changes of scenarios with customers and stakeholders.

Finally, the impact of renewals forecasting on the regulatory submission due to models and systems that are spreadsheet based can be significant. While spreadsheets are generally capable of providing an answer and even validation checks, there are several potential risks associated with its use including, but not limited to, the ability for the spreadsheet to be incorrectly configured / updated, general human error with its use, as well as an inability to appropriately notify the user of an issue or change in an asset. Seqwater should increase the priority of testing and implementing a renewals support tool to increase robust analysis and increase productivity of staff from data manipulation to data interpretation.

6 Demand

A detailed review of Seqwater's demand forecast was considered out of scope for the purposes of KPMG's assessment provided the forecasts are within the range published by Seqwater as part of their Water Security Program (WSP).

KPMG has subsequently reviewed the demand forecasts reported by Seqwater within the WSP and compared these to those reported within Seqwater's regulatory submission (including regulatory model) to the Authority.

6.1 Water Security Program

Demand represents one of three independent levers utilised by Seqwater to optimise system performance, and in turn drive water security across the network.[12] Figure 23 sets out Seqwater's demand forecasting methodology as detailed in the WSP. For the purposes of the WSP, demand has been forecast for the period 2016 to 2046.

Figure 23. Independent levers of system performance

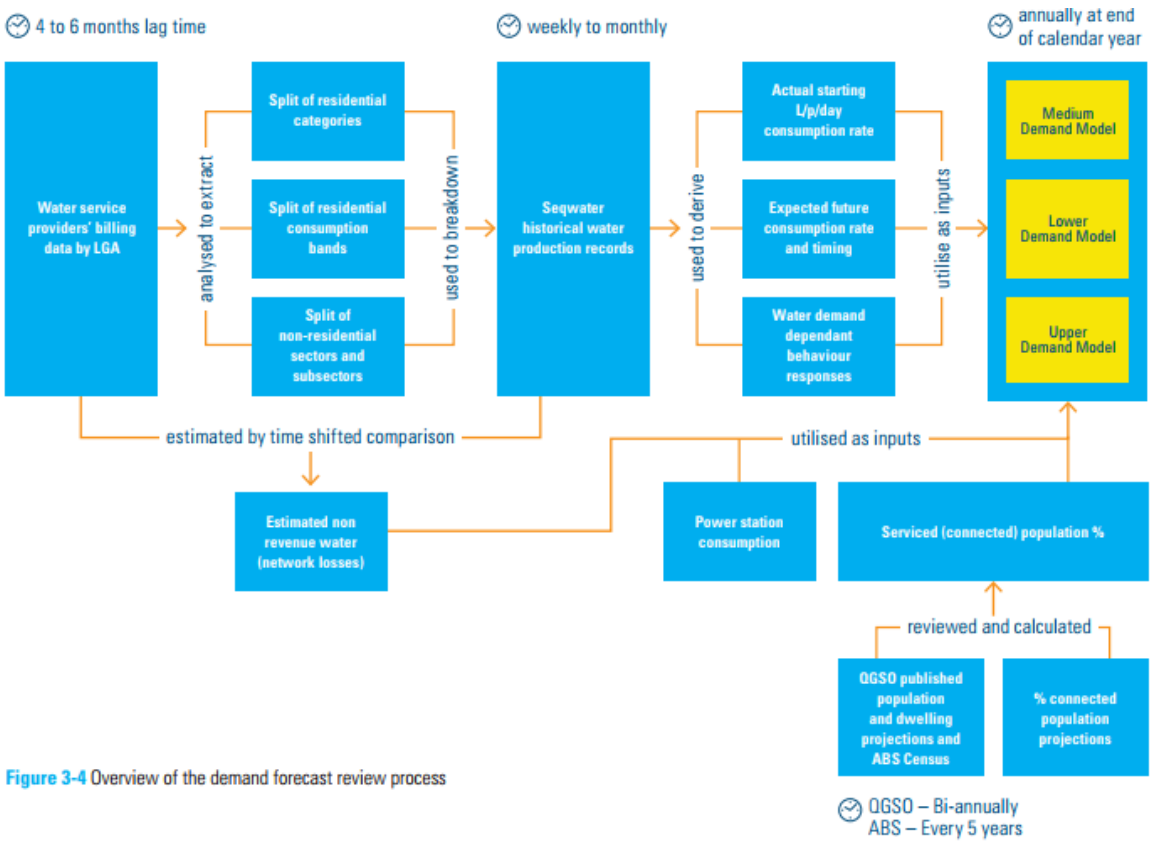


Figure 3-4 Overview of the demand forecast review process

Source: Seqwater WSP

Seqwater 's demand forecasting methodology seeks to provide for three urban water demand forecasts – low, medium and high – across ten local government areas which combine per-capita consumption with projected population growth.[13] These forecast are completed for both residential and non-

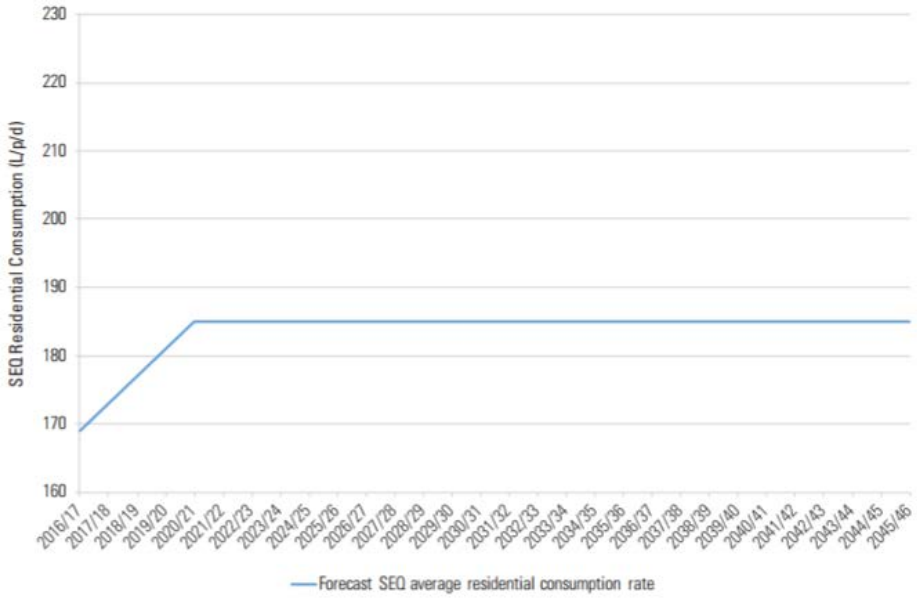
[12] The remaining levers include System operation and Supply.
[13] Seqwater. Water for life. South East Queensland Water Security Program. 2016-2046. Version 2. March 2017

residential sectors. The medium demand forecast is utilized by the business for all planning purposes, while the low and high demand forecast are used for scenario analysis. In developing each forecast, Seqwater note demand may be influenced by a variety of factors including[14]:

- population size, location and demographic;
- changes in housing density and type;
- changes to how people use and value water;
- climatic conditions;
- energy consumption – amount of energy and the type of energy;
- economic growth;
- liveability outcomes;
- changes in regulation to water efficiency device requirements;
- new water efficient technology which may reduce demand;
- technological advances in how we monitor water use and manage use of appliances; and
- new devices that may use more water.

The WSP medium scenario forecasts average per capita usage to increase over the medium term from 169 L/p/day to 185 L/p/day for the residential sector, stabilising in year 2019-20 as shown in Figure 24.[15] Similarly, consumption by the non-residential sector is forecast to stabilise at approximately 100 L/p/day in 2019-20. These forecasts account for predicated usage patterns post Millennium Drought of users across the system.[16]

Figure 24. Per capital forecast consumption



Drawing upon those assumptions shown in Figure 25 including the forecast per capital usage and population growth Figure 26 highlights Seqwater's low, medium and high demand forecasts reported under the WSP. Under the medium projection, bulk water demand is forecast to increase from 299,242

[14] Ibid.
[15] Ibid.
[16] Ibid.

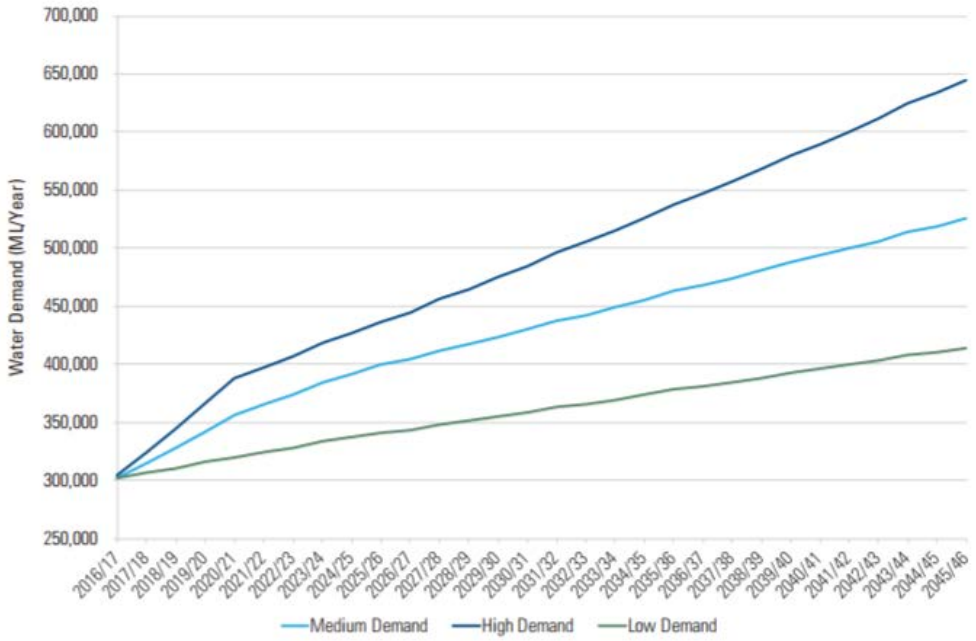
ML in 2017 to 410,436 ML by 2028 (the end of the 10-year price path). This forecast forms the basis for Seqwater's planning activities and how it meets its LOS objectives.

Figure 25. Forecast demand assumptions, uses and output

Scenarios	1. Low demand	2. Medium demand	3. High demand
FACTORS			
Population	QGSO low growth forecast[1]	QGSO medium growth forecast[2]	QGSO high growth forecast[3]
Consumption residential	**Observed current use** +/- adjustment for climatic conditions - impact of structurally efficient new accounts + failure of water-efficient structural devices +/- impact of price increases and demand management initiatives	**Most likely use** +/- adjustment for climatic conditions + impact of likely change in water use behaviour[4] - impact of structurally efficient new accounts + failure of water-efficient structural devices +/- impact of price increases and demand management initiatives	**Most likely use** + impact of possible higher change in water demand for liveability outcomes
Consumption non-residential **Contract demand**	**Observed current use** + Forecast for customers under contract (having regard for current and future conditions)	**Most likely use** + Impact of likely change in water use behavior + Forecast for customers under contract (having regard for current and future conditions)	**Most likely use** + Impact of possible higher change in water non-residential customer growth[5] + Forecast for customers under contract (having regard for current and future conditions)
Network loss	Total bulk and distributor-retailer network loss	Total bulk and distributor-retailer network loss	Total bulk and distributor-retailer network loss
Used for	• Water supply balance assessments • Determining when infrastructure is needed to meet minimum demand • Drought response planning (before restriction trigger point) • Considered for pricing purposes	• Water supply balance assessments • Determining when infrastructure is needed to meet minimum demand • Drought response planning (before restriction trigger point) • Considered for pricing purposes	• Water supply balance assessments • Determining when infrastructure could be needed to meet upper demand • Long-term security • Ensuring long-term planning preparedness
Outputs Consumption (L/person/day)	**Residential/Non-residential** 169/89	**Residential/Non–residential** 185/100[6,7]	**Residential/Non-residential** 200[8]/100

Source: Seqwater WSP

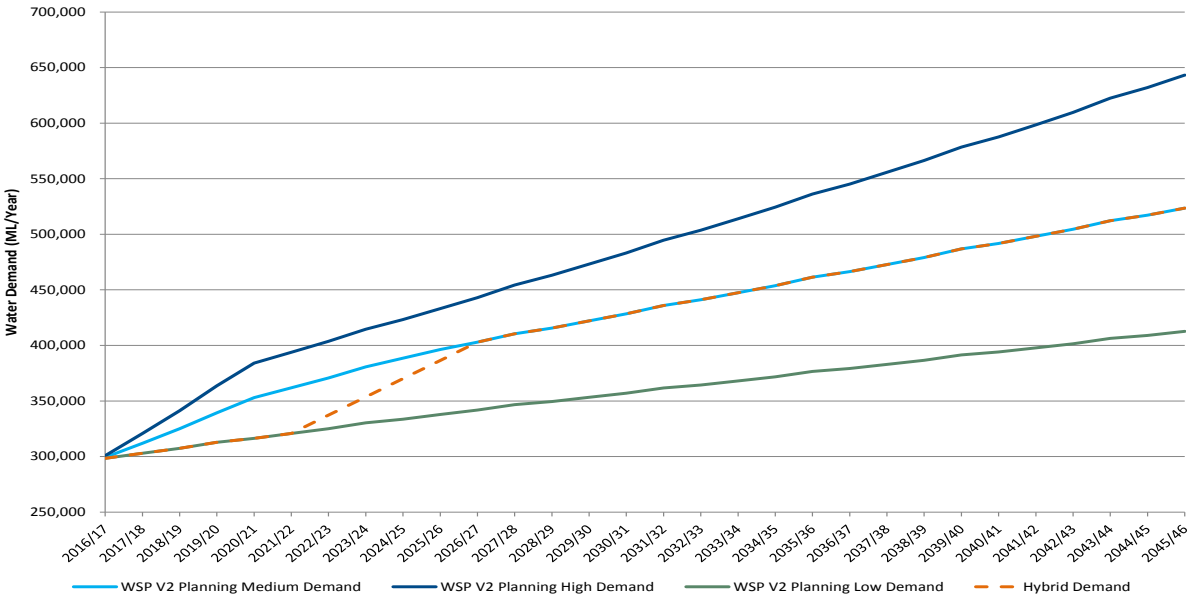
Figure 26. Low, medium and high demand forecasts



6.2 Seqwater Regulatory Submission

KPMG has reviewed Seqwater's regulatory submission and regulatory pricing model, as well supplementary information provided by the business in response to an information request from the Authority.

Figure 27. Seqwater demand forecast – regulatory submission



Seqwater has proposed a hybrid demand forecast providing for aspects of both the low and medium demand forecasts reported within the WSP as shown in Figure 27. Specifically:

- Between the years 2017-18 and 2021-22, demand is to grow in line with the low demand forecast;
- Between the years 2022-23 and 2026-27, demand is to grow in a linear fashion from the low demand forecast to the medium demand forecast; and
- From 2027-28 onwards, demand is forecast to grow in line with the medium scenario.

Under the hybrid scenario, demand is forecast to increase from 302,913 ML to 410,436 ML over the period 2017-18 to 2027-28.

While the medium demand scenario under the WSP provides for a level of bulk water demand from power stations, the low demand scenario does not. Seqwater has chosen not to include bulk water demand from power stations in its hybrid forecast due to variability associated with the volume of bulk water supply required. Seqwater in recent years has not been required to provide any bulk water to power stations.

Having reviewed the above material, KPMG has therefore confirmed the demand forecast included within its regulatory submission to the Authority is consistent with the range published by Seqwater as part of their WSP.

7 Forecast capital expenditure

An assessment of the prudency and efficiency of historical and forecast capital expenditure represents a critical component in any investigation of (regulated) bulk water prices. For the Authority, its assessment of Seqwater's historical and forecast capital expenditure will have ramifications for the total return earned by the business for the forthcoming regulatory period (and years following). We note the Authority consider capital expenditure to be:

- prudent, if the capital expenditure can be justified by reference to an identified need or cost driver, which might include a legislative obligation, a need to meet new customer growth, the need to maintain or renew existing infrastructure, or to improve the quality or reliability of services provided (if these improvements are explicitly desired and endorsed by customers or shareholders). Prudency is supported by:
    - documenting key drivers for expenditure (e.g. legislative, regulatory, or customer/ shareholder/ stakeholder directions or obligations);
    - demonstrating that there is a problem that needs to be addressed and how it will be addressed;
    - demonstrating the appropriateness of the proposed timing for project commencement and completion; and
    - the provision of appropriate supporting documentation.
- efficient, if:
    - the *scope of works* (as relevant to the specific asset or facility) reflects the most appropriate means of resolving the need identified, having due consideration for the possible options, ensuring that regional or non-standard solutions are assessed, and ensuring that the option of a non-capital solution has been robustly assessed (that is, operational solutions or demand management);
    - The *standard of works* proposed comply with the relevant legislative, regulatory and industry obligations, standards and codes for design and construction; the works are compatible with existing infrastructure; and the works take account of modern engineering options and technology, and;
    - The *cost* of the proposed solution represents the least overall cost to deliver the works consistent with the market conditions (labour, materials and construction).

An assessment of prudency relates to how a decision to invest is made, whereas an assessment of efficiency refers to whether the forecasted expenditure is reasonable given time and resource constraints and, in some cases, whether the forecast expenditure represents the least cost option for providing the associated service.

We have used the above framework to guide our assessment of each project documented in Section 7.6.

Further, we have also sought to assess, at a program wide level, whether there are any systemic issues with regards to how Seqwater has completed its capital forecasting. These systemic issues are determined by assessing whether Seqwater has appropriately implemented its capital planning and asset management framework for the selection of projects reviewed, and whether there are any consistent shortfalls in meeting the expectations for prudency and efficiency. Where there is a shortfall, we have sought to make an adjustment to the remaining program of works. This assessment is completed in Section 7.7.

7.1.1 Summary Findings

Seqwater has proposed a total capital expenditure of $1,282 million (real Dec 2016) for the 10 year period ending 30 June 2028. Over the three year period 1 July 2018 to 30 June 2028, Seqwater is forecasting to spend $624.1 million, a 100 per cent increase on the actual capitalised expenditure of $311.7 million that is expected to be delivered in the current regulatory period and 41 per cent higher than the QCA allowance for the current regulatory period.

The deferral of significant project expenditure from one pricing period to another raises an issue for the Authority, being that Seqwater's bulk water prices for the 2015-18 period were set based on the delivery of certain capital projects (where these projects were forecast to be commissioned). It is reasonable to expect some projects to be deferred as circumstances change, or for that funding to be re-directed to other projects that were not funded, or for Seqwater to find better ways to deliver the project, hence making savings. Excluding these circumstances, where a project is deferred, it is potentially due to either Seqwater over-estimating capital requirements, or having insufficient internal capacity to deliver. We note this deferred capex has been included in Seqwater's proposed capital program and therefore assessed as part of our broader review of capital projects.

Further, we have identified and/or been made aware of a number of capex projects where the cost estimates have significantly changed from what has been referenced in Seqwater's submission to the Authority or what had previously been proposed by Seqwater under the last price investigation. These changes primarily reflect Seqwater's decision to use the 2017 APMP as the basis for its forecast capital expenditure. Through discussions with Seqwater staff, we understand the APMP represents the primary source of information for all capex projects across the business. The 2017 APMP was finalised in September 2016 and is updated annually.

Table 13. Seqwater total capital program by investment gateway - including renewals and sampled projects (real Dec 2016 $ million)

FY	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
0 - Strategic Assessment	$53.1	$74.9	$69.4	$50.1	$82.5	$76.8	$78.5	$48.7	$51.0	$36.9
1 - Preliminary Evaluation	$28.6	$56.7	$82.1	$68.3	$9.3	$27.4	$29.8	$5.8	$9.8	$5.1
2 - Investment Justification	$23.1	$34.4	$10.0	$3.3	$0.5	$0.2	$0.2	$0.2	$0.2	$0.2
3 - Investment Decision	$44.3	$56.3	$43.6	$7.2	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
4 - Readiness for Service	$17.2	$5.9	$2.7	$2.3	$2.3	$2.3	$2.3	$2.3	$2.3	$2.3
Unclassified	$7.2	$7.3	$7.2	$7.2	$5.9	$4.7	$5.8	$7.9	$8.8	$9.9
Total Capex	**$173.5**	**$235.5**	**$215.1**	**$138.5**	**$100.6**	**$111.4**	**$116.5**	**$64.8**	**$72.1**	**$54.4**
Total Capex (less renewals and sample)	**$118.5**	**$97.9**	**$75.8**	**$64.8**	**$12.6**	**$17.7**	**$19.5**	**$23.6**	**$26.2**	**$17.8**

Through project sampling KPMG has tested the implementation of Seqwater's capital planning and asset management framework. In certain cases significant changes to cost estimates or significant uncertainty over the costs have inhibited our ability to assess, with any level of certainty, the efficiency of specific projects. These changes most commonly occur in projects which are still at early stages of the capital planning process, usually Gateway 0, 1 or 2 and may be representative of a broader issue associated with our ability to assess the prudency and efficiency of projects at a program wide level.

Table 13 highlights Seqwater's total capex program by investment gateway. Those projects that remain at an early stage within the capital planning process (i.e. Gateway 0, 1 or 2) account for on average 79% of all projects across the 10 year period and 69% over the first three years.[17]

Where we have been unable to assess the efficiency of a sampled project we have sought to make an adjustment to the remaining program of works. Similarly, where we have identified common variations across project categories or gateways, such as those at an early stage in the capital planning process we have sought to make an adjustment to the remaining program of works.

KPMG provides the following observations:

- With regards to actual capex over the period 1 July 2014 to 30 June 2018:
  - Seqwater underspent its allowance by 31 per cent, or $131 million, predominantly due to the deferral of major projects (refer section 7.4); and
  - As the expenditure was less than the allowance set, therefore avoiding the need for an ex-post review.
- With regards to the 12 sample capital projects reviewed:
  - We support the inclusion of $207 million in these projects across the 10 year period as both prudent and efficient, including $148.1 million in 2018-21 and $58.9 million in 2021-28;
  - We recommend adjustments of -$281.4 million across the 10 year period for those projects that have not progressed to Gateway 3, including;
    - -$92.2 million in expenditure from the program for the 2018-21 period; and
    - -$189.2 million in expenditure from the program for the 2021-28 period.

  Table 14 below summarise KPMG's recommended aggregate adjustments for each major project sampled respectively. Table 15 and Table 16 summarise the annual adjustments and recommended expenditure profiles for each major project.

Table 14. KPMG recommended adjustments to sample projects (real Dec 2016 $ million)

Period	2018-21	2021-28
Adjustments to major project expenditure		
Beaudesert WSZ Upgrade	($41.5)	($38.3)
Mt Crosby Filters Upgrade	-	-
Mt Crosby Sedimentation	($33.3)	-
North Pine WTP Filters	-	($37.5)
ICT ERP Upgrade	($6.6)	($8.7)
Holts Hill pH Upgrade	($9.1)	-
Somerset Dam Upgrade	($1.6)	($104.7)
Lake MacDonald Dam Upgrade	-	-
Leslie Harrison Dam Upgrade	-	-
Fleet and Mobile Plant Renewals	-	-
Mudgeeraba WTP Renewals	-	-
Mt Crosby WPS Renewals	-	-
Total Project Adjustments	**($92.2)**	**($189.2)**

[17] Includes sampled capex projects and renewals.

Table 15. KPMG recommended adjustments to incurred expenditure – sample projects (real Dec 2016 $ million)

FY	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Beaudesert WSZ Upgrade	($1.0)	($10.1)	($30.4)	($33.4)	$0.0	$0.0	$0.0	$0.0	($4.9)	$0.0	($79.8)
Mt Crosby Filters Upgrade	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Mt Crosby Sedimentation	($1.4)	($16.0)	($16.0)	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	($33.3)
North Pine WTP Filters	$0.0	$0.0	$0.0	$0.0	($3.9)	($16.8)	($16.7)	$0.0	$0.0	$0.0	($37.5)
ICT ERP Upgrade	($2.5)	($2.5)	($1.6)	($0.9)	($0.9)	($0.9)	($2.5)	($1.6)	($0.9)	($0.9)	($15.3)
Holts Hill pH Upgrade	($1.4)	($3.9)	($3.8)	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	($9.1)
Somerset Dam Upgrade	$0.0	$0.0	($1.6)	($2.6)	($40.5)	($33.9)	($25.8)	($0.6)	($0.7)	($0.5)	($106.3)
Lake MacDonald Dam Upgrade	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Leslie Harrison Dam Upgrade	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Fleet and Mobile Plant Renewals	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Mudgeeraba WTP Renewals	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Mt Crosby WPS Renewals	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Total - Sample Projects	**($6.4)**	**($32.5)**	**($53.3)**	**($37.0)**	**($45.4)**	**($51.7)**	**($45.1)**	**($2.2)**	**($6.5)**	**($1.4)**	**($281.4)**

Table 16. KPMG recommended incurred expenditure profiles – sample projects (real Dec 2016 $ million)

FY	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Beaudesert WSZ Upgrade	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Mt Crosby Filters Upgrade	$12.5	$11.7	$7.2	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$31.4
Mt Crosby Sedimentation	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
North Pine WTP Filters	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
ICT ERP Upgrade	$1.0	$1.0	$1.0	$1.0	$1.0	$1.0	$1.0	$1.0	$1.0	$1.0	$10.0
Holts Hill pH Upgrade	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Somerset Dam Upgrade	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Lake MacDonald Dam Upgrade	$2.4	$40.0	$35.0	$6.8	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$84.2
Leslie Harrison Dam Upgrade	$5.0	$17.5	$2.2	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$24.7
Fleet and Mobile Plant Renewals	$1.7	$1.7	$1.7	$1.7	$1.7	$1.7	$1.7	$1.7	$1.7	$1.7	$17.0
Mudgeeraba WTP Renewals	$0.0	$0.2	$0.7	$0.5	$0.4	$0.0	$10.5	$3.9	$0.4	$0.8	$17.4
Mt Crosby WPS Renewals	$0.0	$4.1	$1.5	$3.0	$4.7	$8.0	$0.1	$0.8	$0.0	$0.0	$22.3
Total - Sample Projects	**$22.6**	**$76.2**	**$49.3**	**$13.0**	**$7.8**	**$10.7**	**$13.3**	**$7.4**	**$3.1**	**$3.5**	**$207.0**

- With regards to the total capital program (excluding renewals and sampled projects):
    - We recommend the removal of expenditure during the ten year price path period related to projects which commence prior to 30 June 2021 that have not progressed to Gateway 3 of the capital planning process, and are neither part of our sample projects, nor renewal programs. This equates to $366.7 million comprising $235.3 million in the first three years and $131.4 million in the remaining seven years;

  Table 17 summarises our proposed adjustments to the total capital program (excluding sampled projects and renewals) focusing on those projects that remain at an early stage within the capital planning process (i.e. Gateway 0, 1 or 2) only. These projects are due to commence prior to 30 June 2021.

Table 17. KPMG recommended adjustments to total capital program – excluding renewals and sampled projects (real Dec 2016 $ million)

$ million	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Capex prior to Gateway 3 commencing 2018-2021*	$74.5	$90.1	$70.7	$60.6	$10.6	$16.3	$16.1	$9.6	$9.2	$9.1
Recommended Adjustment to Capex prior to Gateway 3*	($74.5)	($90.1)	($70.7)	($60.6)	($10.6)	($16.3)	($16.1)	($9.6)	($9.2)	($9.1)

** Excluding renewals and sampled projects*

We note that it is likely many of these projects will be required in the future and do not dispute the general prudency of these projects. As a result, and in particular for those projects with significant expenditure in the first three years, it is possible for Seqwater to proceed with a project regardless of an allowance granted by the Authority. If this were to occur we note the Authority may be required to complete an ex-post review of such expenditure as part of future pricing review.

Further, subject to the Authority's discretion in responding to its referral notice, its own considerations of the prudency and efficiency of Seqwater's capital program and the potential impacts on prices, it may choose to adopt one of the alternative approaches previously discussed in its assessment. For example:

- Placing greater focus and scrutiny on only those projects impacting prices in the short term, specifically those projects which commence and are capitalised in the next three years. This approach would amount to an adjustment of $146.7m over the three years with no adjusts in the remaining years of the forecast as shown in Table 18; or
- Applying discounts for expenditure not at gateway 3 or above thereby reflecting the inherent uncertainty that exists with regards to the cost estimates for these projects. For example a 25% discount would result in a total adjustment of $103.0m over the full 10 year as shown in Table 18.

Table 18. Alternative assessments of total capital program – excluding renewals and sampled projects (real Dec 2016 $ million)

FY	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Capex Commencing & Capitalised in 3 years	($61.1)	($65.6)	($19.9)							
Notional Discount (25%)	($18.6)	($22.5)	($17.7)	($15.6)	($3.4)	($5.7)	($6.5)	($5.5)	($4.9)	($2.6)

Table 19 and Table 20 summarise KPMG's recommended aggregate adjustments and recommended expenditure profile across the entire 10 year period.

Table 19. KPMG recommended adjustments to incurred expenditure (real Dec 2016 $ million)

Period	2018-21	2021-28
Seqwater proposed capex	$624.1	$658.3
Adjustments to sample projects	($92.2)	($189.2)
Recommended Adjustment to Capex prior to Gateway 3*	($235.3)	($131.4)
KPMG Recommended Adjustments	**($327.5)**	**($320.6)**
KPMG Recommended Capex Allowance	**$296.6**	**$337.7**

** Excluding renewals and sampled projects*

Table 20. Recommended capex allowance (real Dec 2016 $ million)

FY	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Sample projects	$22.6	$76.2	$49.3	$13.0	$7.8	$10.7	$13.3	$7.4	$3.1	$3.5
Balance of capital program*	$70.0	$36.7	$41.8	$26.3	$33.9	$26.2	$32.1	$33.0	$42.8	$39.0
Total capital program	**$92.6**	**$112.9**	**$91.1**	**$39.3**	**$41.8**	**$36.9**	**$45.4**	**$40.4**	**$46.0**	**$42.6**

** Including renewals*

7.2 Price path vs Forecast capex horizon

In accordance with the referral notice from the Treasurer and Minister for Trade and Investment, the Authority has been tasked with:

- recommending bulk water prices for Seqwater for the period from 1 July 2018 to 30 June 2021; and
- assessing the prudency and efficiency of Seqwater's proposed capital (and operating) expenditure for the period from 1 July 2018 to 30 June 2028. This period is part of a longer term price path which initially commenced in 2008 and was set, at the time, for a fixed period of 20 years.

This distinction in periods is important for the purposes of KPMG's review and in particular our assessment of individual major projects. A number of the projects proposed by Seqwater have significant capital expenditure in the period (1 July 2018 to 30 June 2021), while other projects have no, or very little, expenditure in this period, but have significant expenditure in the remaining years to 2028. In addition, some of the projects (particularly those with forecast expenditure in the later years of the ten year period) are at a very early stage in the investment governance process and have not yet developed robust business cases outlining detailed options assessments or cost estimates. Assessing the prudency and efficiency of these projects is difficult at these early stages of project development with the limited supporting information available.

Between now and when the Authority is likely to receive the next Terms of Reference for a price review, and therefore when Seqwater is required to submit its next regulatory submission to the Authority, we would expect that these individual projects at an early stage in the Gateway process, would have progressed further through the investment governance process. For example, moving from Gateway 0 to Gateway 1 or 2 during this time is likely to result in a completed options assessment or developed business case for individual projects, making the assessment of the projects significantly more robust.

When assessing the prudency and efficiency of individual projects, we have applied the following review process to those projects with significant forecast expenditure in the next regulatory period:

- If a project is not demonstrated to be prudent, then it should not be included in the next regulatory period or the ten year forecast of capex to 2028.
- where a project is at an early stage in the investment governance process (that is, within Gates 0-2) and, while considered to be prudent, there is insufficient supporting information to clearly demonstrate the efficiency of the project, we cannot support the efficiency of the project and have removed the proposed project costs from the capital program.
- Where a project is determined to be both prudent and efficient (i.e. the supporting documentation demonstrates the scope, standard and cost of works), it is appropriate that this expenditure be considered in determining pricing for the ten year period.

7.3 Changes to cost estimates

Throughout the course of KPMG's assessment we have identified and/or been made aware of a number of capex projects where the cost estimates have significantly changed from what has been referenced in Seqwater's submission to the Authority or what had previously been proposed by Seqwater under the last price investigation. These changes have been identified through:

- KPMG's interviews with key Seqwater staff;
- Comparison with the 2017 APMP and Seqwater regulatory submission and regulatory model provided to the Authority;
- The provision of supporting documents; and
- Follow up queries and responses received.

These changes primarily reflect Seqwater's decision to use the 2017 APMP as the basis for its forecast capital expenditure. Through discussions with Seqwater staff, we understand the APMP represents the primary source of information for all capex projects across the business. The 2017 APMP was finalised in September 2016 and is updated annually.

Since this time, Seqwater has continued with its planning and assessment of individual projects in accordance with its asset management and investment governance frameworks. For example, projects previously recorded in the submission as being at Gateway 0 were stated by Seqwater as having progressed to Gateway 1 or 2. This therefore has implications for the preferred options to be considered as part of the assessment, and importantly, the total expenditure to be reported against those projects. In certain instances, capital expenditure has more than doubled relative to what has been recorded in the APMP and therefore included in the submission. While we have been consistent in our reporting of proposed capex (as per the 2017 APMP and regulatory submission), where such changes have occurred, KPMG has highlighted this in its discussion.

Significant changes to cost estimates or significant uncertainty over the costs inhibit our ability to assess, with any level of certainty, the efficiency of proposed projects. These changes most commonly occur in projects which are still at early stages of the capital planning process, usually Gateway 0, 1 or 2. We have identified and assessed specific issues in relation to this matter in section 7.7.

7.4 Outcomes following the 2015-18 Seqwater Bulk Water Price Investigation

As actual expenditure incurred during the 2015-18 regulatory period is estimated to be lower than that allowed, an ex-post review of actual capital expenditure is not required.

Seqwater expect to capitalise $311.7 million of projects over the current regulatory period, $131 million less than that which was approved by the Queensland government (as shown in Figure 28). The majority of underspend is the result of the deferral of capital expenditure into the forthcoming regulatory period. The total underspend represents approximately 42 per cent of the delivered expenditure and 30 per cent of the original QCA allowance for the current regulatory period.

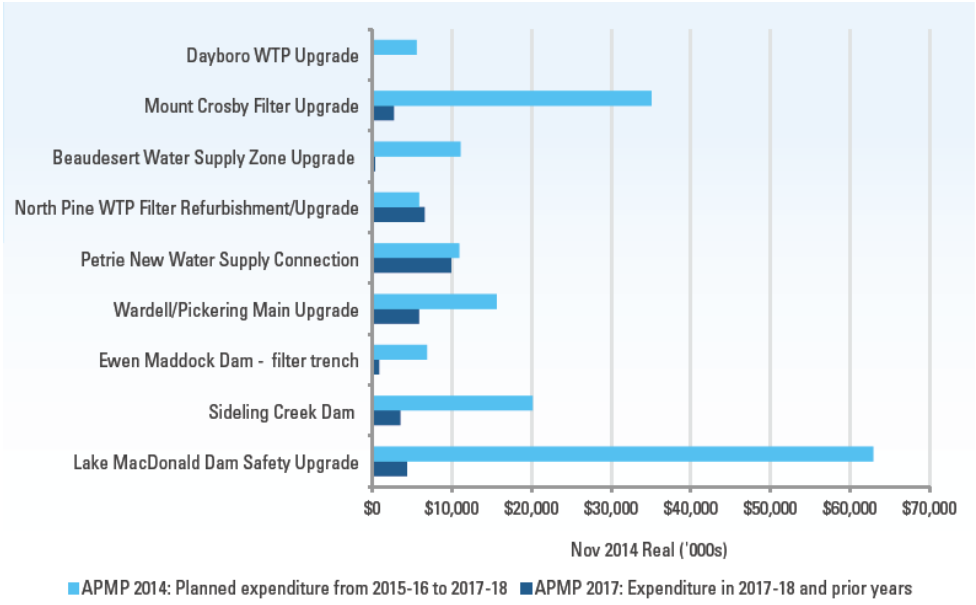
Figure 28. QCA Recommended Capex Allowance vs Seqwater Actual Capex 2015-16 to 2017-18

	2015-16	2016-17	2017-18	Total
QCA allowance	122.7	124.3	195.9	**442.8**
Seqwater capitalised expenditure	88.4	93.9	129.4	**311.7**
Variance between QCA allowance and Seqwater capitalised expenditure	-34.2	-30.4	-66.5	**-131.1**

Source: Seqwater

KPMG note that this represents a significant level of expenditure deferral. Moreover, half of this deferred expenditure, $66.5 million, occurs in 2017/18. KPMG note the significantly higher allowance in 2017/18, which is likely to have contributed to the large underspend, and the increasing delivery of actual expenditure achieved by Seqwater. The level of underspend could suggest that Seqwater has overestimated the works required to be completed in the period or that Seqwater does not have the capacity to deliver a program of this size.

Figure 29. Forecast underspend in capital expenditure for nine highest value projects of 2015/16 to 2017/18 Regulatory Period



Source: Seqwater

Figure 29 demonstrates Seqwater's reported underspend for its nine highest valued projects. The biggest contributors to the total deferred capital expenditure, as reported in Seqwater's Submission, are:

- Lake MacDonald Dam Safety Upgrade (approximately $60 million deferred), Ewan Maddock Dam filter trench (approximately $6.5 million deferred), Sideling Creek Dam ($16 million deferred), and the Atkinson Dam filter trench (as reported to the QCA) deferred.

  Overall the dam safety program of work contributed around $88 million to the net deferral amount. Seqwater has indicated that the reasons for the deferral were the completion of revised risk assessments on each dam reducing uncertainties and adjusted scope of works to reflect the lower risks along with revised project commencement dates.

  The actual expenditure incurred in the current regulatory period for the three projects is broadly reflective of the detailed design allowances originally proposed in Seqwater's 2015 regulatory submission. While the level of expenditure deferred broadly reflects the project delivery estimates for the three projects.

  This implies that detailed design work was done for the projects but delivery was not progressed.

- Mt Crosby East bank WTP Filter Upgrade ($32.5 million deferred).

  This project is assessed as one of the major projects (refer section 7.6). No specific reason for deferral of this expenditure was supplied by Seqwater.

- Various renewals projects ($11 million deferred).

  Seqwater has deferred expenditure across a number of projects due to better asset condition and asset life data leading to fewer renewals required, consolidation of separately forecast project expenditure into existing programs, and more detailed performance testing of assets. Together this has led to lower preventative maintenance requirements.

- Beaudesert Water Supply Zone Upgrade ($10.7 million deferred).

  Seqwater has deferred this expenditure having completed a re-scoping exercise for the project in response to updated demand projections (lower than expected), more detailed technical evaluations and consideration of a regional perspective (at the level of the Water Grid) which opened up new potential options. KPMG has reviewed this project in detail in section 7.6).

- Savings made in project delivery ($10.6 million saved).

  Seqwater has made savings through delivery of projects at lower than allowed prices (mostly due to construction market conditions lowering delivery costs) and through developing partnerships with customers (distribution / retailers) to deliver projects and therefore sharing costs.

- New projects identified ($11.6 million added)

  Three new, previously unforeseen projects were identified and included in the current regulatory period as a result of new compliance requirements and improved information gathering (including physical asset condition data) leading to new asset requirements.

Overall, the impacts of the underspend on capital expenditure in the current regulatory period, that will be realised within the next regulatory period are predominantly related to the delivery of the deferred projects on top of the originally proposed expenditure for the next regulatory period.

The deferral of significant project expenditure from one pricing period to another raises an issue for the Authority, being that Seqwater's bulk water prices for the 2015-18 period were set based on the delivery

of some of the aforementioned capital projects (where these projects were forecast to be commissioned).

It is reasonable to expect some projects to be deferred as circumstances change, or for that funding to be re-directed to other projects that were not funded, or for Seqwater to find better ways to deliver the project, hence making savings. Excluding these circumstances, where a project is deferred, it is due to either Seqwater over-estimating capital requirements, or it does not have the internal capacity to deliver.

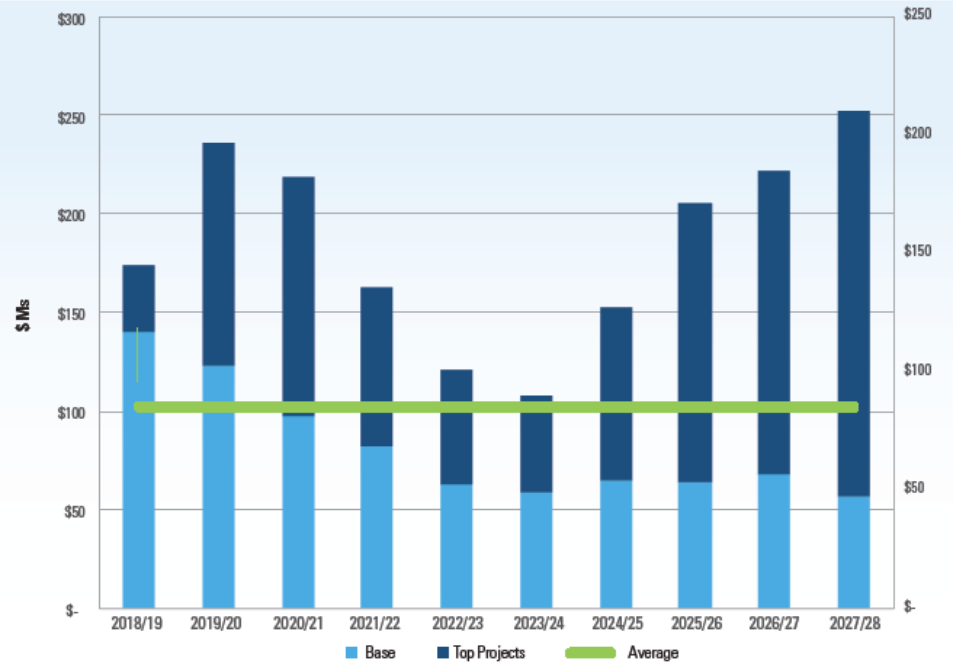
7.5 Forecast capital expenditure 2018 - 2028

Seqwater is proposing a total capital expenditure of $1,282 million (real Dec 2016) for the 10 year period ending 30 June 2028. Over the next regulatory period (2018-21) Seqwater is forecasting to spend $624.1 million, a 100 per cent increase on the actual capitalised expenditure of $311.7 million that is expected to be delivered in the current regulatory period and 41 per cent higher than the QCA allowance for the current regulatory period.

Seqwater's total capital expenditure over the 10 year price path is presented in Figure 30 below. The figure also shows the proportion of expenditure Seqwater considers base (normal level of ongoing expenditure plus smaller projects) and major projects (larger well defined projects) along with what Seqwater is reporting as average expenditure over the price path.

Figure 30, as reported by Seqwater in their Submission, highlights that there is quite a significant reduction in the "base" level of capital expenditure across the years of the forecast horizon to 2022/23 from which point it seems to stabilise to the end of the period. There is also a spike of expenditure in the last two years of the next regulatory period and the last two years of the 10 year price path period.

Figure 30. Seqwater's 10-year Forecast Capital Expenditure ($m nominal)



Source: Seqwater

7.5.1 Drivers of expenditure

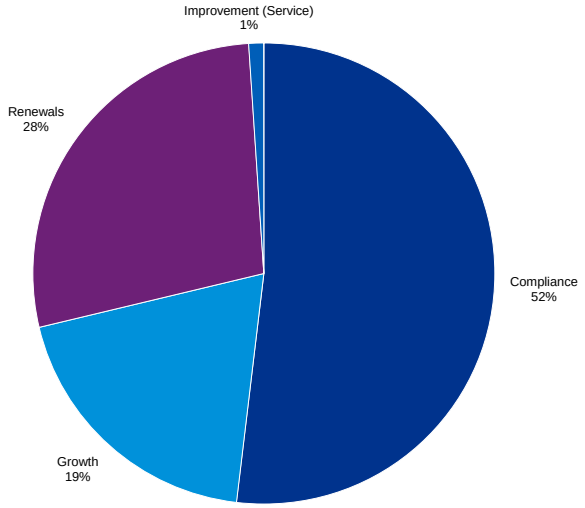
Seqwater has four key drivers under which its expenditure is classified:

- Compliance with regulatory and service obligations - Capital expenditure related to compliance is usually associated with the replacement and/or enhancement of an asset to prevent non-compliance with one of the contractual or legislative requirements on Seqwater. This could include:
  - conditions within Bulk Water Agreements;
  - legislative obligations related to water supply or quality, licences approved, or dam safety related requirements; or
  - specific technical regulation requirements or occupational health and safety requirements.

  Expenditure under the compliance driver must be supported by a clearly defined obligation on Seqwater that is not already being met.
- Meeting additional customer demand or growth - Capital expenditure related to growth is intended to provide an increase in the capacity or capability of an asset, or to construct new assets, in response to increased demand, growth or variations required by a customer. Capital expenditure which provides increased security of supply is also included under the growth driver.
- Maintaining the service capacity of assets - Capital expenditure related to renewals is usually associated with the replacement and/or enhancement of an asset that currently meets service performance standards and legislative requirements, but where there is an unacceptable risk of non-compliance with these standards or requirements at some time in the short to medium term future. Renewals expenditure is intended to maintain the performance of the asset at the existing levels of service over the life cycle of the asset.
- Service improvement - Capital expenditure related to service improvements is associated with upgrading service outcomes to improve the efficiency of assets, their reliability, or to increase the anticipated life of an asset to prevent future non-compliance with service performance or a capacity shortfall. The proposed expenditure must achieve an increase in the reliability of the quality of supply that is explicitly endorsed or desired by customers, external agencies or shareholders since the expenditure relates to improving services rather than meeting obligations.

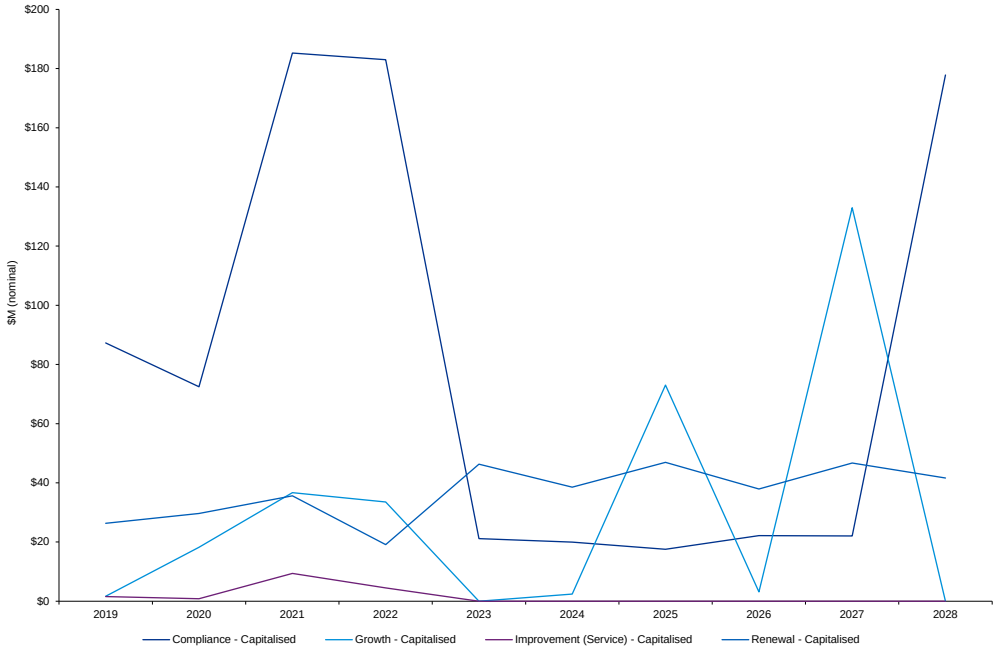
Total capital expenditure for the next regulatory period broken down by investment driver, is presented in Figure 31 below and discussed in the following sections. The profile of expenditure across the 10 year price path by each driver is presented in Figure 32.

Figure 31. Forecast Capital Expenditure 2018-19 to 2027-28 by Driver ($'000 nominal (capitalised))



Source: Seqwater

Figure 32. Forecast Capitalised Expenditure 2018-19 to 2027-28 by Driver



Source: Adapted from Seqwater

Compliance

The compliance driver accounts for around 52 per cent of total capital expenditure over the 10 year forecast period. By comparison, in the 2015-18 price investigation the compliance driver accounted for about 56 per cent of a larger capital program. As in the current regulatory period, the majority of expenditure in compliance is related to dam safety with works in the next regulatory period representing over $257 million.

Two large projects Mt Crosby East Bank WPS ($320 million) and the Wivenhoe Dam Upgrade ($299 million) are due to commence towards the end of the forecast horizon, however Seqwater is not expecting them to be capitalised until beyond 2028. As such, the expenditure for these projects is not included in the capitalised costs total for the 10 year forecast period and we have not reviewed them.

The proposed expenditure on compliance over the 10 year price path is shown in Figure 33 below.

Renewals

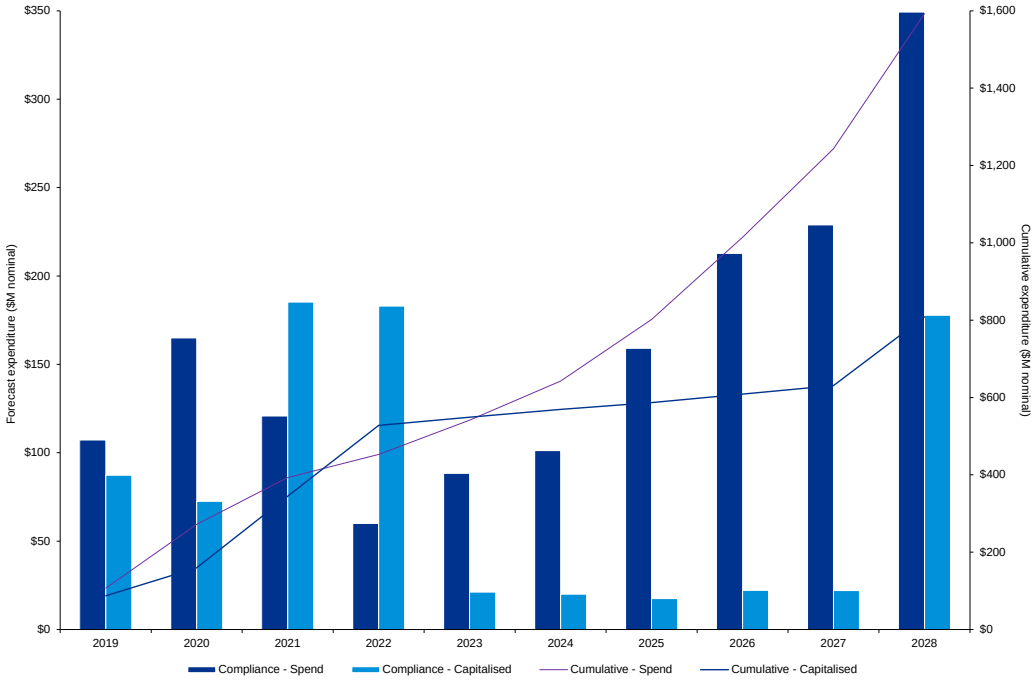
Renewals expenditure is forecast to be around $43 million per year representing about 28 per cent of total capital expenditure across the 10 year forecast period. By comparison, the proportion of renewals expenditure in the 2015-18 price investigation was 35 per cent.

Seqwater has stated that long term renewals of treatment assets, ICT, and Mobile Plant and Fleet are three of the largest renewals projects over the remainder of the forecast period to 2027/28. No major pipeline renewals are expected during this time. ICT renewals is the largest single item of renewals expenditure with a total forecast expenditure of around $28 million. This relates to the proposed ERP program to be rolled out over the upcoming 10 year period.

Seqwater conducted a sensitivity analysis on the level of renewals expenditure included in its submission to the Authority and concluded that forecasts are conservative and likely to underestimate actual required expenditure by up to 30 per cent. Seqwater expect to recover this likely shortfall through improved modelling and investigation of actual renewals projects to try and defer works and through optimised investment whereby alternatives to renewals are assessed and implemented. Seqwater

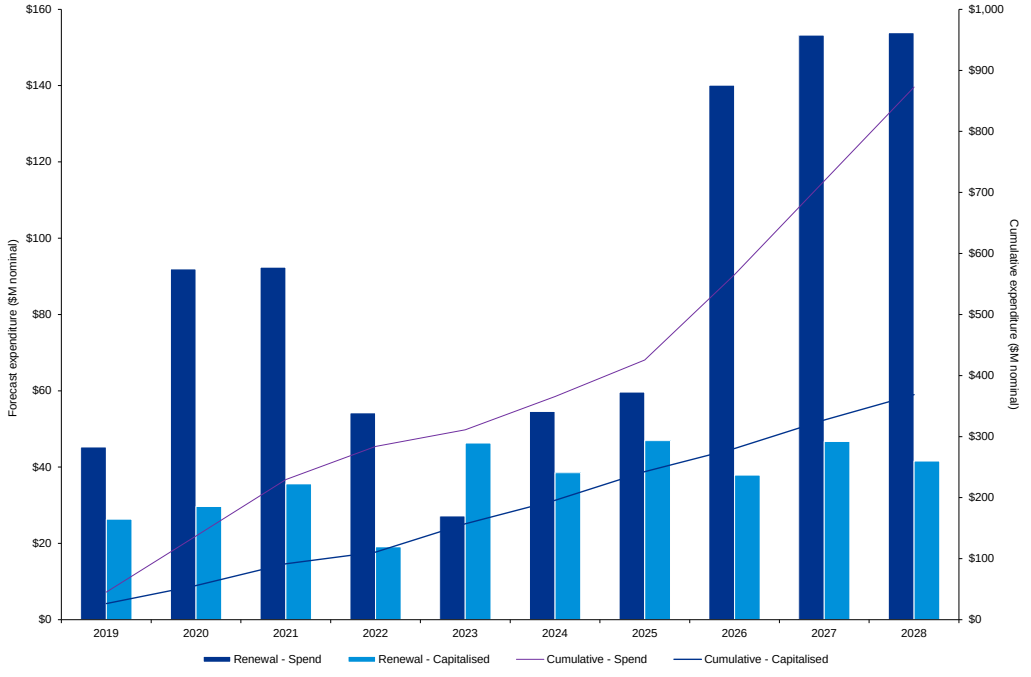
have stated that there is no bow wave of investment or increased risk associated with the underestimate of required renewals expenditure.

Figure 33. Forecast Capital Expenditure Profile for Compliance 2018-19 to 2027-28



Source: Seqwater

Figure 34. Forecast Capital Expenditure profile for Renewals 2018-19 to 2027-28



Source: Seqwater

Growth

Seqwater's growth expenditure represents 19 per cent of the total capital expenditure over the 10 year forecast period or around $300 million. There are a limited number of growth projects forecast for the

next regulatory period with only 18 projects in total included under this driver. These projects primarily relate to towns not yet connected to the Water Grid, including Beaudesert, which is the largest single project at a forecast capitalised expenditure of over $109 million. The proportion of expenditure under the growth driver is slightly larger than what was set in the current regulatory period.

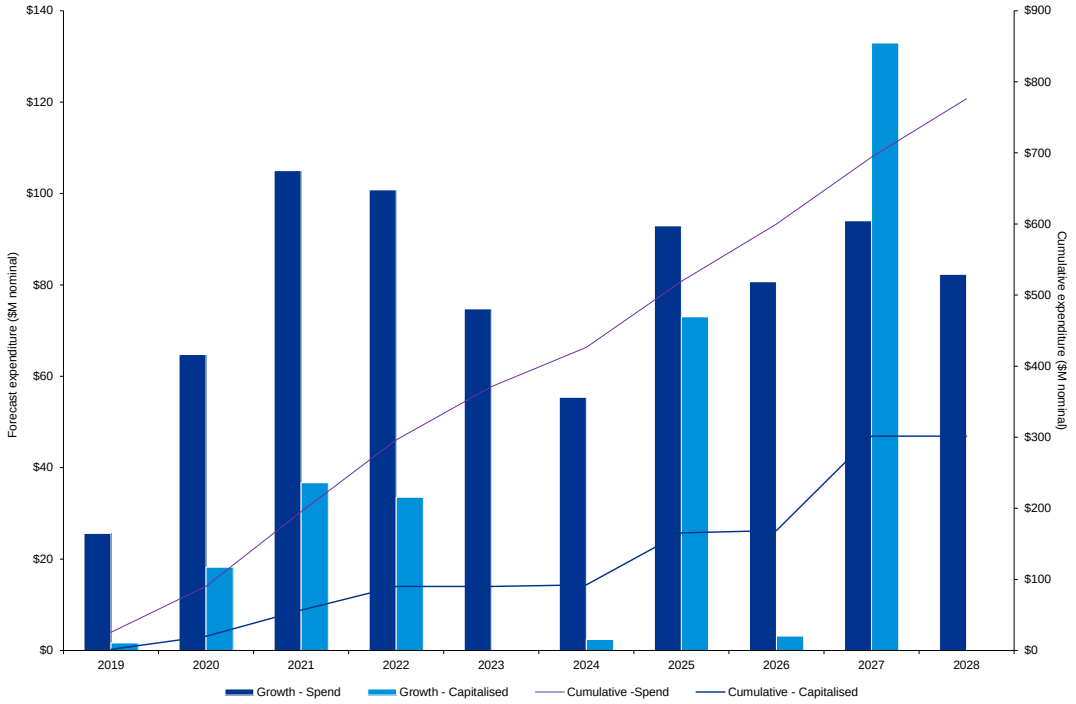
The breakdown of growth expenditure over the 10 year price path is outlined in Figure 35 below.

The figure shows significant growth related expenditure in the next regulatory period compared to what was originally recommended in the 2015-18 price investigation. Seqwater forecast an average annual expenditure on growth of between $15 to 20 million for the period 2015-16 to 2017-18. Proposed expenditure for the next investigation period is approximately $25 million in 2018-19, $65 million in 2019-20 and $105 million in 2020-21.

Seqwater outlined in its regulatory submission to the Authority that their standard capital planning processes use the medium demand forecast to determine the timing of growth projects. KPMG understands that Seqwater, through use of a hybrid demand assumption has enabled some growth related projects to be deferred by up to two years. Seqwater engaged a consultant to review the use of a hybrid demand growth assumption which resulted in lower demand forecasts in some years. The consultant identified five projects with a value of approximately $100m that could potentially be deferred by up to three years. Three projects were subsequently confirmed as candidates for deferral of project implementation:

- North Pine WTP Filtration Upgrade – deferred for two years from 2022-23 to 2024-25
- Mt Crosby Westbank WTP Sedimentation Upgrade – deferred for two years from 2022-23 to 2024-25
- Narangba Pump Station – deferred one year from 2023-24 to 2024-25

Figure 35. Forecast Capital Expenditure for Growth 2018-19 to 2027-28



Source: Seqwater

Service Improvements

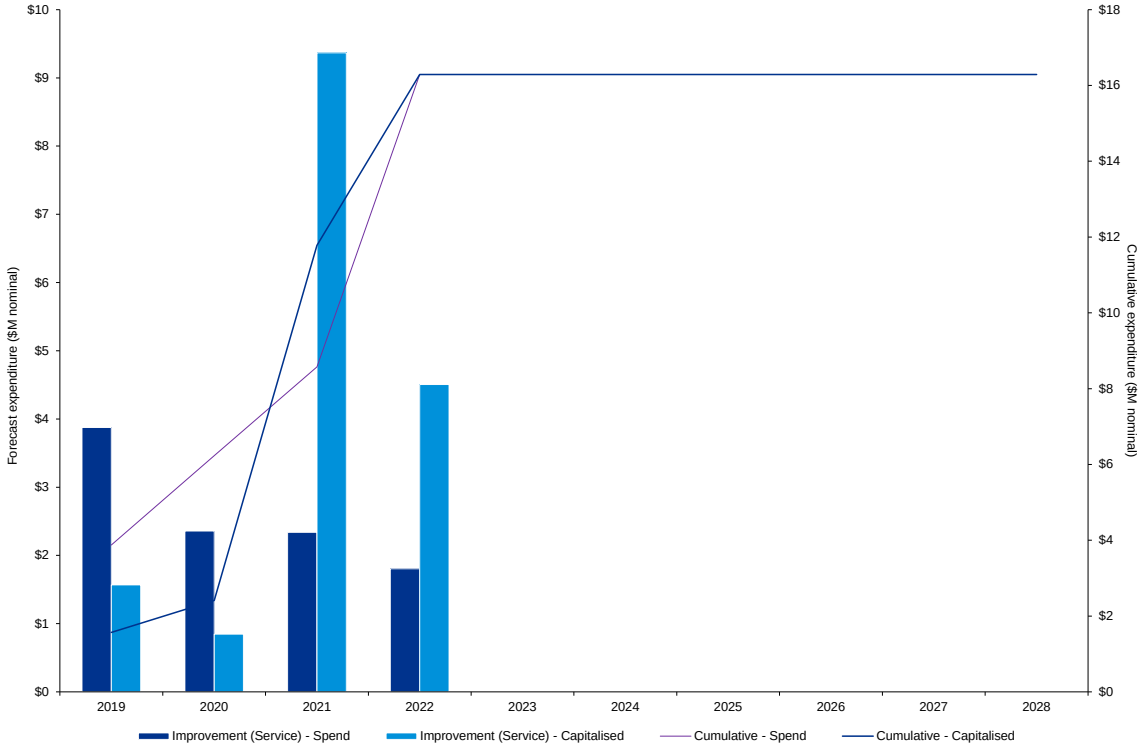
Expenditure related to service improvements represents a very small proportion of Seqwater's total capital expenditure with the proportion in the 10 year forecast period representing around 1 per cent of the total program or around $16 million total. At this stage projects have only been identified in the APMP out to 2021-22 with other potential projects not yet at the level of documentation or concept development sufficient to be considered for inclusion in the APMP.

The largest projects under this driver are the Holts Hill Reservoir pH Correction Upgrade, which is one of the major projects reviewed by KPMG (refer to Section 7.6) and the Mt Cotton Reservoir to Alexandra Hill Reservoir pipeline duplication project, which improves the reliability of supply for customers.

Projects under this driver are undertaken for a variety of strategic outcomes including service reliability, improving water quality and public safety, particularly around assets and facilities providing recreational opportunities at Seqwater water supply lakes. The public safety projects are undertaken to balance recreational access for customers with public safety and the health of the catchments and source water quality.

Seqwater's forecast expenditure on service improvements is presented in Figure 36 below.

Figure 36. Forecast Capital Expenditure Profile for Service Improvements



Source: Seqwater

7.5.2 Assessment of forecast capital expenditure

Comparison with Current Regulatory Period

Proposed expenditure over the next regulatory period, at $624.1 million, is significantly higher (a 100 per cent increase) than the actual capitalised expenditure of $311.7 million that is estimated to be delivered in the current regulatory period. This includes approximately $100 million in deferred

expenditure from the current regulatory period. The proposed expenditure for the next regulatory period is also 41 per cent higher than the QCA allowance for the current regulatory period.

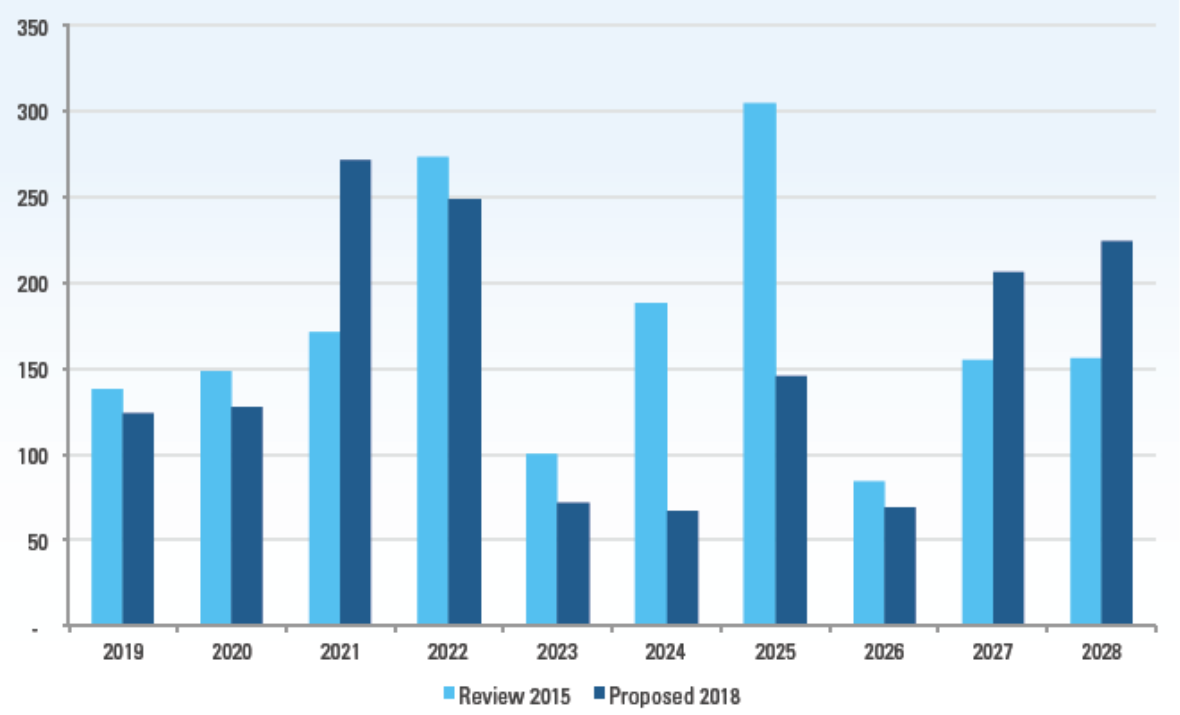
The total capitalised expenditure in the current period compared to the next period is presented in Figure 37 below. Specifically, Figure 37 shows significant shifts in the timing of capitalised expenditure between 2015-18 review and what is now proposed. The quantum of expenditure to be capitalised in 2020-21 (the final year of the next regulatory period) is dominated by compliance related expenditure capitalisation which represents around $185 million of the total $272 million (68 per cent).

The relative proportions of expenditure allocated to the four drivers of expenditure have shifted slightly in the next regulatory period from the current regulatory period:

- the proportion of compliance expenditure has decreased from 56 per cent of total expenditure in the current regulatory period to 52 per cent of forecast expenditure in the next regulatory period;
- the proportion of renewals expenditure has decreased from an estimated 30-33 per cent in the current period to 28 per cent in the next period;
- the proportion of growth related expenditure has increased from an estimated 10-13 per cent in the current regulatory period to around 19 per cent in the next regulatory period; and
- the proportion of service improvements related expenditure has remained relatively stable at around 1 per cent.

Overall, there has been a decrease in the proportions of expenditure on compliance and renewals and an increase in the proportion of expenditure on growth between the current regulatory period and the next regulatory period.

Figure 37. Total Capitalised Expenditure 2018-19 to 2027-28, 2018 Forecasts Vs 2015 Forecasts (nominal)



Source: Seqwater

Assessment of Deliverability

Seqwater has proposed a capital expenditure budget of approximately $1,282 million for the 10-year forecast period from 2018-19 to 2027-28 compared to the Authority's recommended allowance set in the 2015-18 price investigation of $1,723 million, an approximately 25 per cent reduction.

However, Seqwater's actual performance across the current regulatory period resulted in a 30 per cent underspend relative to the recommended allowance. Comparing the requested expenditure for the next regulatory period of $624.1 million against the expenditure Seqwater is forecast to deliver in the current regulatory period, being $311.7 million, the requested expenditure for the next regulatory period represents a significant increase of 100 per cent on actual delivery.

There are also significant deferrals from the current regulatory period of $131.1 million. This deferral places significant pressure on Seqwater in the next regulatory period to catch up and deliver this expenditure.

An analysis of the average annual expenditure requested over the next regulatory period identifies that there is a significantly higher average annual expenditure of $208 million (real Dec 2016, as incurred) in first three years than the average of the remaining seven years ($94 million) of the 10 year forecast period. This could imply that expenditure has been "front loaded" into the next regulatory period or that there is a higher degree of confidence in the next regulatory period, whereas expenditure outside this period has been spread more widely. In either case, the higher level of average annual spend is significantly more than the actual annual expenditure delivered or forecast to be delivered by Seqwater in the current regulatory period. The average annual expenditure in the current period was only $68.9 million.

We have also disaggregated capex for the next regulatory period by where the projects currently sit within Seqwater's gateway process refer Figure 38 and Figure 45.

Figure 38. Total Capital Expenditure 2018-19 to 2027-28 by Gateway Status

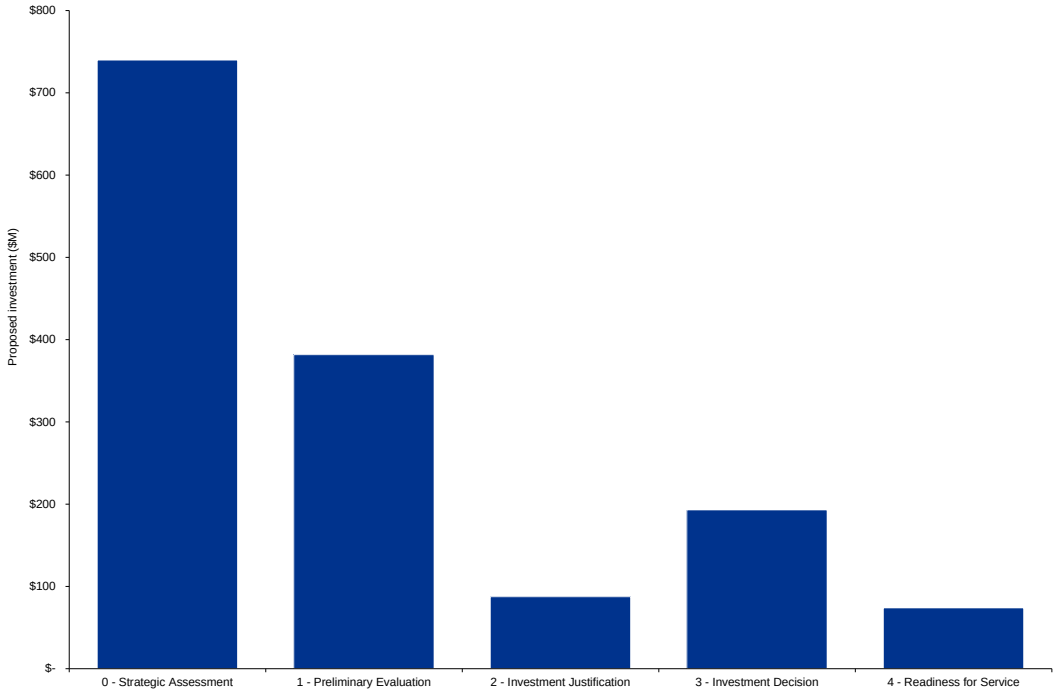
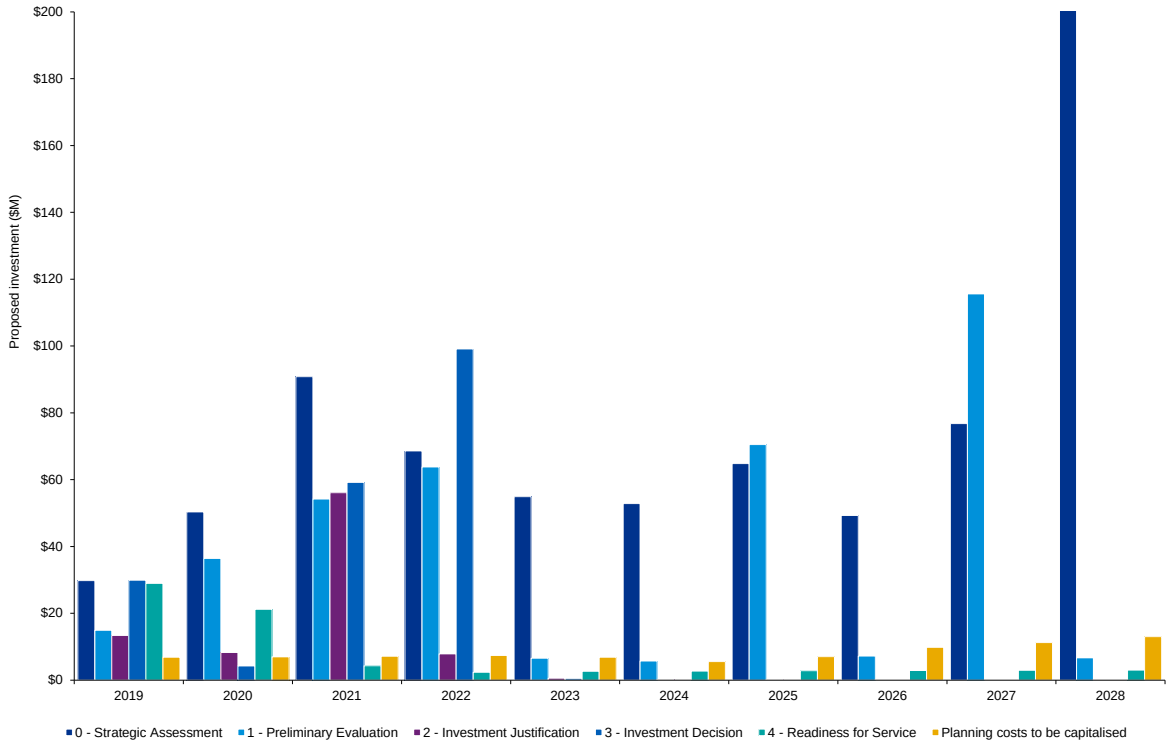


Figure 39. Capital Expenditure over 2018-19 to 2027-28 by Year and Gateway Status (nominal, capitalised)



Approximately 47 per cent of total forecast expenditure remains in Gateway 0. While around 30 per cent of forecast expenditure is sitting in Gateways 1 and 2 and approximately 17 per cent within Gateways 3 and 4 (the remainder relates to planning costs to be capitalised for each year). The table above provides a breakdown of the expenditure profile across the 10 year price path by each gateway.

The figure above shows that in the first three years, approximately 68% ($354m) of the total expenditure over those three years is within Gateways 0, 1 and 2. It is also noted that the expenditure in Gateway 0 is the largest category across six of the ten years of the price path. More importantly in the consideration of delivery of expenditure, only 28 per cent of expenditure in the first three years is at Gateways 3 or 4, that is, getting ready for, or under construction. This implies that significant works is required in the next years to progress projects through the gateway review process. This creates a substantial level of uncertainty on the accuracy of the proposed forecasts and the deliverability of the expenditure, hence leading to a higher level of risk for customers who would be the beneficiaries of these projects.

Overall, KPMG has concerns over the deliverability of Seqwater's capital program for the next regulatory period. This reflects a combination of the following factors:

- Forecast expenditure in the next regulatory period being 68 per cent higher than delivered in current regulatory period;
- 30 per cent of the allowed expenditure in the current regulatory period being deferred to the next regulatory period; and
- A higher proportion of expenditure in the next regulatory period sitting within Gateway 0 to 2 relative to expenditure sitting within Gateways 3 and 4 (getting ready for or under construction).

7.6 Sample projects reviewed

KPMG's broad approach, as outlined in Section 3, 4 and 5 has provided for an initial strategic review of the robustness of the governance and planning frameworks relative to good/best practice and the prioritisation of forecast capital expenditure across key drivers.

Following the strategic review, KPMG has sampled a range of capital projects in order to test the application of Seqwater's frameworks across the business. Applying the definitions and criteria outlined in the beginning of this chapter, we can test each project against the identified requirements.

The choice of the representative sample of projects can be made on the basis of different criteria including:

- value (the largest projects in the capital program);
- risk (projects representing the highest risk to the business); or
- a randomised sample (for example, our approach as outlined below).

The choice of approach has been guided by the need to ensure that the final sample is representative of the overall capital program. KPMG's preferred approach is to select major projects which reflect:

- Capital value (size of the project) – KPMG's selected projects ranging from $9 million to over $150 million. While we expect the most effort to go into the largest projects, it is prudent that we check a number of the smaller projects to ensure the same systems and processes are applied.
- Drivers (Compliance, Growth, Renewals, Service Improvements). Each driver has a different set of factors that contribute to establishing prudency and efficiency. Further, the proportion of projects and associated expenditure associated with each driver in the sample should reflect a similar proportion by driver for the entire capital program.
- Asset classes. KPMG has sought to avoid picking too many projects of the same class, e.g. dams, reservoirs, or WTP.
- Site locations - not picking projects which are based at the same site. For example, there are eight projects located at or around the Mt Crosby site. Once you have selected one project within a site, it is often interrelated to others and some basic information on the other projects at the site can also be assessed, thus widening the scope of the 12 sample projects under review.

KPMG has also selected projects which have proposed completion dates ranging across the 10-year forecast period to 2028.

To complete our assessment, we have (for each project), provided:

- An overview of the scope of the project;
- Key assumptions and status of support project justification;
- A summary of the options analysis completed;
- The proposed annual capex over the ten year period; and
- Our assessment of the project against the guiding questions, including recommended variations to the proposed expenditure.

7.6.1 Project 1: All Pipes - PAA Beaudesert WSZ Upgrade

Overview

The Beaudesert Water Supply Zone (WSZ) is located with the Scenic Rim Council area, south of Brisbane. Beaudesert operates as a regional hub serving the surrounding communities of Rathdowney, Kooralbyn, Canungra, Tamborine Mountain and Jimboomba. The township is supplied by bulk water via the Beaudesert WTP (Helen Street WTP), an independent system, not connected to the grid, Mount Crosby WTP or Southern Regional Water Pipeline (SRWP). The current WTP has a hydraulic capacity of 4 ML/day.

Long term planning and needs analysis have identified a requirement to augment the bulk water supply capacity to the Beaudesert and Logan areas to support projected growth in demand in these areas. As of August 2016 it had been forecast that the Beaudesert WTP would have insufficient capacity to meet future demand in the area within a period of two to five years (that is, between 2018 to 2021). Further, the current raw water source for this area is considered unreliable and variable in quality so access to alternative water sources is an important outcome of the augmentation.

This project was first identified in early 2011 with preliminary needs analysis and business cases completed in August 2012. The project was included in the 2015 Submission based on further work completed in early 2014. Subsequent to its inclusion in the 2015 Submission, Seqwater undertook an additional assessment in order to develop updated demand projections; to develop more detailed technical evaluations; and to give greater consideration to the grid-wide impacts of the project. As a result, the preferred strategic option and delivery phasing for the project has changed significantly from that which was presented in the 2015 Submission. The change in scope means that Beaudesert will no longer be separate to the Water Grid which connects most of the towns in South East Queensland.

In late 2016, stakeholder engagement processes identified specific issues that led to the preferred option (option 2) no longer being considered feasible, and further planning was undertaken to revise options. Options considered at this stage involved bringing forward the Wyaralong WTP.

The project (Option 2) as included in the APMP was comprised of two stages broadly following. Stage 1 involved construction of pipelines connecting Beaudesert to the Water Grid. Stage 1 was due to be completed by 2019/20 but had been delayed to 2021/22. Stage 2 involved the construction of a booster pumping station to ensure supplies are maintained. Stage 2 was to be completed by 2026-27.

Key Assumptions and Status

Information source	• RFI 51 Beaudesert capitalisation.xlsx • RFI 42 D15 157236 Beaudesert WSZ Needs Analysis - confidential.pdf • RFI 42 D15 159782 Beaudesert WSZ Long Term Water Supply Options Analysis - confidential.pdf • RFI 42 Beaudesert WSZ Investigation December 2016 infrastructure pipeline - proposal information request requirements.DOCX • RF1 42 D17 59203 Beaudesert WSZ Investigation - Key Documents Register.xlsx
Investment Driver	• Contractual compliance – contractual requirements for the supply of bulk water at specified locations to Beaudesert. • Growth – Growth in demand within Beaudesert, Bromelton Industrial Area (Queensland Urban Utilities) and the Yarrabilba growth area (Logan City Council). This is the key driver. Capacity required 2018-2021. • Service improvements – Improvements to water quality supplied and reliability.

Intended Outcome	The project would address the long term water supply security and capacity issues within the Beaudesert area by providing for reliable water supply for the next 30 years. In the short term the project will address demand growth with the QUU and LCC areas, whilst maintaining a suitable water quality to each service provider.
Current Project Status	Gateway 2 - Business case development with preliminary design work being undertaken on a new preferred option
Procurement and project delivery Process	N/A – This is to be developed as part of the Business Case for the project.

Options analysis

A needs analysis was completed for this project in August/September 2015 which recommended more detailed options analysis and planning/design work immediately to progress the project. The proposed timeframe for completion of these assessments included preliminary design by September 2016, a business case by October 2016 and service connection by September 2018.

A long term planning report detailing the water supply options analysis performed by the business was completed over the period from December 2014 to November 2015. This report details four options (plus sub-options) with most options having previously been considered as part of Seqwater's initial investigations.

Stakeholder consultation and more detailed options analysis of the preferred pipeline option around September 2016, identified significant issues with the pipeline route, particularly around its location in a rail line corridor and a major highway corridor. Proposed or likely future upgrades identified by external stakeholders to the rail line and the highway resulted in significant uncertainty associated with the timing of works and the potentially significant increases in cost and easement restrictions.

Seqwater has subsequently revisited the original options analysis and is giving greater consideration to the inclusion of Wyaralong WTP. The final list of options considered as part of the re-investigation process include:

- Option 1 – New 16 ML/day Beaudesert WTP (Business As Usual) staged for growth:
  - Offtake from Chambers Flat and associated pipeline;
  - South Maclean PS upgrade; and
  - Additional QUU pipework around Gleneagle Reservoir.
- Option 2 - Beaudesert Pipeline:
  - DN450 pipeline from Woodhill Reservoir (LCC) to Birnam Range Reservoir (QUU). Two route alignment sub-options were investigated:
  - Sub option 2a – Central pipeline from SRWP to follow route as identified by LCC in their Logan South Water Supply Servicing Strategy, January 2014 with offtake connection located at Chambers Flat PS.
  - Sub-option 2b – Eastern pipeline from SRWP to follow route as proposed by the developer for the Yarrabilba area (as advised in December 2014) with offtake connection to SRWP located several kilometres east of Chambers Flat PS.
- Option 3 – Replace Beaudesert WTP with a new 16 ML/d Wyaralong WTP, and Wyaralong WTP staged to match growth to supply whole of Beaudesert WSZ only initially, plus pipeline connection between Woodhill reservoirs to Birnam Range Reservoirs to feed Beaudesert WSZ.
  - Sub option 3a – Wyaralong WTP located at previously identified Cedar Grove Weir plot of land, and the feed pipeline to Beaudesert to be DN450 as sized in previous studies.

- Sub option 3b – Wyaralong WTP located near the Wyaralong Dam spillway, closer to the Beaudesert area, and the feed pipeline to Beaudesert to be DN450 as sized in previous studies.
- Sub option 3c – Wyaralong WTP located at previously identified Cedar Grove Weir plot of land, and the feed pipeline to Beaudesert WSZ to be built for ultimate demands and additional bulk water supply to the water grid (i.e. DN1085).

- Option 4 – Replace Beaudesert WTP with a new 32ML/d Wyaralong WTP:
  - Staged to match growth plus pipeline from Woodhill Reservoir to Birnam Range Reservoir to feed south Beaudesert WSZ. The treatment plant would be able to supply both Beaudesert WSZ and South Logan WSZ, thus reducing the amount of additional distribution pipeline upgrades required in Logan area.
- Option 5 – Hybrid Option:
  - This is a hybrid of options 1 and 2 wherein the Beaudesert WTP is retained at its current 4 ML/day capacity and the pipes required for option 2 are also installed, thus, providing Beaudesert with dual bulk water supply sources, giving flexibility in drought conditions.

At the time the preferred option involved the replacement of Beaudesert WTP with Wyaralong WTP and the construction of a pipeline from Woodhill Reservoir to Birnam Range Reservoir (Option 3 above). The option to utilise the Wyaralong WTP required significant expenditure to be brought forward given that, in November 2015, the requirement to construct the Wyaralong WTP would not have otherwise been triggered until 2040. Subsequent to the November 2015 long term planning report being completed, a submission was made to Building Queensland in August 2016 which was based on the same options and cost estimates from the November 2015 report.

Seqwater presented a further variation of the options considered during interviews with KPMG. The new option proposed by Seqwater includes storage at the Beaudesert WTP, pipeline connections from the Beaudesert WTP to Beaudesert Water Supply Zone and WTP to northern grid connection point within Logan City Council infrastructure, new Wyaralong WTP, and the Travis Road / Yarrabilba supply connection pipeline (Logan City Council to complete this independent section of pipeline).

No specific documentation was provided by Seqwater to support this most recent option apart from Seqwater's presentation during its interviews with KPMG staff. A preliminary design for this preferred option will be included within the business case which Seqwater stated is currently being prepared. In addition, no details of the reassessment of options which led to the current preferred option being selected have been provided. Given that the current preferred option was consistently excluded from further analysis due to its significantly higher costs, it is not clear how this option was selected.

Proposed Capital Expenditure

The original cost estimate for this project, as included in the current regulatory period, was $18 million, however only $0.3 million of this estimate has been spent by Seqwater. It is understood that this option represented an upgrade at the Beaudesert WTP only to supply the local area.

Part way through the early development of this original option, a new strategic option was identified for a proposed capital cost of $109.2 million, covering a much larger scope of work, as shown in Table 21. This cost estimate was included in the 2017 APMP. This new strategic option was identified through the Water Security Program process and involved the connection of the Beaudesert region into the water grid. The connection would be facilitated by trunk pipelines, with additional storage at the Beaudesert WTP site, and the construction of a small pumping station in 2026-27 to ensure that demand increases due to growth were able to be met in the future.

Table 21. Forecast Capital Expenditure – Beaudesert WSZ Upgrade Project ($ million, Real Dec 2016)

FY	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Seqwater Forecast	$1.0	$10.0	$30.4	$33.4	$0	$0	$0	$0	$4.9	$0	$79.8
Capitalised*	$0	$0	$0	$0	$0	$0	$0	$0	$109.2	$0	$109.2

** includes actual expenditure and interest during construction*

This cost estimate comprises approximately $79.8 million of capital delivery expenditure and approximately $29.4 million of expected capitalisation related costs (to 2028). The primary component of the capitalisation costs reported by Seqwater is Interest During Construction (IDC), given the long time frames between the completion of stage 1 in 2021-22 (approximately $75m) and the commencement and proposed commissioning of stage 2 (approximately $5m) in 2026-27. It is possible that the current preferred option will not require this pump station, and as such the expenditure profile, and commissioning date may change significantly.

Seqwater has advised during interviews with KPMG that since the time of preparing the 2017 APMP the cost estimates for this project have significantly changed. The proposed new total capital costs are estimated to be $136 million, a 25 per cent increase relative to the estimated reported in the 2017 APMP, with some of this expenditure to be incurred beyond 2028 and therefore outside the remaining 10 year forecast period.

The revised capital expenditure estimates for the project are as follows:

- New 20 ML/d Wyaralong WTP and Transfer PS ($53 million);
- 25.5km of DN450/DN500 pipeline from new Wyaralong WTP to Helen Street Storage (at old Beaudesert WTP) ($80 million) and to northern grid connection point within Logan City Council infrastructure network; and
- Storages at Helen Street (old Beaudesert WTP) totalling 5.1ML ($3 million).

Details of the annual expenditure estimates for this option have not been provided by Seqwater and the option appears significantly different to options considered in the previous assessment

The cost estimates for this project are changing regularly and it is not possible to evaluate the efficiency of the estimates at this stage. Further work is still being undertaken on the current $136 million estimate (for which no details have been provided) as part of the project's transition through the business case development process. No profile for the updated costs has yet been provided so the timing of the works is unclear as is the need and timing for Stage 2 of the works – the booster pump station, and therefore the likely commissioning date of the project.

Once the business case is completed, we would expect a more robust estimate to emerge.

Assessment

Prudency

Seqwater identified the key driver for this project as growth, with the existing Beaudesert WTP unable to meet projected demands during the period 2018-2021 according to modelling conducted for the Water Security Program. In particular, the Mean Day Maximum Month (MDMM) demand from the surrounding areas would exceed the capacity of the Beaudesert WTP by mid-2018. In 2016, the MDMM of 3 ML/day was just below the rated capacity of the WTP (3.5 ML/day over 24 hrs) and close to the maximum hydraulic capacity of the WTP (4 ML/day if raw water conditions permit treatment at this rate). The Water Security Program recommended a supply augmentation be completed by 2019 with a connection to the grid the preferred option.

The project has been delayed with the change in preferred option, but no details have been provided as to whether the projected demands can be met by the updated works or whether the timeframe for meeting the project demand has been adjusted with any updated growth forecasts.

Seqwater has demonstrated the prudency of the project identifying a clear need to respond to the future demand growth driver through the Water Security Program.

Efficiency

Scope of Works

The scope of works for the current updated preferred option cannot be assessed as no information has been provided apart from some revised estimates and basic asset descriptions.

A business case is being prepared which includes a preliminary design for the current preferred option, however this has not yet been completed or made available. Previous preferred options appeared to have better defined scopes of work and while the current preferred option is somewhat similar to some of the previously identified options, this has not been confirmed and the final scope of works has not been adequately defined at this stage.

Standard of Works

This project did not progress beyond a concept or preliminary design for the two previous options, while the current preferred option is also still at preliminary design stage and business case approval.

This project is very large and is therefore expected to be delivered in accordance with Building Queensland requirements. Along with internal requirements, systems and processes for major projects, it is expected that this project will follow the required standard of works.

Seqwater has not provided documentation to demonstrate that the standard of works proposed is appropriate.

Cost of Works

The cost estimates for this project have changed significantly, from $18 million for the original scope of work, to the latest estimate of $136 million, which is based on a completely different scope of works.

The process for developing cost estimates for previous options was described in the November 2015 Long Term Water Supply Options Analysis report. This report stated that costs were developed using a standard Seqwater Net Present Cost template incorporating a whole of life approach to the assets costed. Costs were developed from a range of sources including previous preliminary design reports (completed in 2012 but using 2011 estimates escalated to 2014 dollars), preliminary consultant's advice, and cost estimates and approaches used to develop costs for the Water Security Program. Various levels of accuracy for cost estimates ranged from 30-50 per cent with contingencies of between 21-30 per cent applied.

While these are fairly standard processes with generally appropriate contingencies and levels of accuracy, these are all related to previously considered options. No information has been made available yet, for the current preferred option. We can assume that the appropriate processes will be followed, however this cannot be confirmed until documentation has been provided.

The expenditure profile included in the APMP is not reflective of the current preferred option. The commissioning / capitalisation date is based on the previous preferred option, which required a component of works to be completed in 2026/27. No details of an updated cost profile have been provided.

Overall, Seqwater has not justified the cost estimate for this project.

Summary findings

Based on the preceding analysis:

- Seqwater has demonstrated the need to address existing capacity constraints, as documented in the various options investigations and needs analysis reports which support the outcomes of the Water Security Program, however the business case and preliminary design for the current preferred will not be completed in time to meet the original project completion of mid-2018;
- Seqwater has not justified the proposed project timing, as the current expenditure profile included in the APMP is based on previous options which are no longer viable;
- Seqwater does not have appropriate supporting justification to support the recent change of preferred option and still has significant work to be completed with the project now in the preliminary design phase, including assessment of options;
- Seqwater has not justified the final capital cost estimate for the works required, as demonstrated by recent material increases in the proposed capex with none of the previous cost estimates considered justified either;
- Seqwater has not supported the proposed scope of works, as it has not provided an updated program of works reflecting the new preferred option.

The most efficient means of achieving the objectives of the project have therefore not been demonstrated and as such, the project, as it currently stands, is considered inefficient. We therefore propose to remove the majority of expenditure from the capital program. This is detailed in Table 22.

Table 22. Recommended Re-profiling of Capital Expenditure for Beaudesert WSZ Upgrade Project ($ million Real Dec 2016)

FY	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Seqwater Forecast	$1.0	$10.0	$30.4	$33.4	$0	$0	$0	$0	$4.9	$0	$79.8
KPMG Proposed	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
KPMG Proposed Adjustment	($1.0)	($10.0)	($30.4)	($33.4)	$0	$0	$0	$0	($4.9)	$0	($79.8)

7.6.2 Project 2: Mt Crosby Eastbank WTP - PID01566 - TEB: Filtration Upgrade and Improvement

Overview

The two Mt Crosby WTPs currently provide water for the greater part of Brisbane, supplying approximately 40 per cent of the water produced by Seqwater for South East Queensland. The WTPs will become increasingly important over the next five to ten years as other WTPs are required to more routinely operate at allocation or capacity limits. As a result, the two WTPs at Mt Crosby will be required to supply water beyond Brisbane, especially in peak demand periods and when other assets are unavailable due to drought, emergencies or scheduled works.

The long term planning report for the Mt Crosby WTPs acts as a single source of reference on the current status of the WTPs and future asset investment needs to ensure that Seqwater is able to meet customer requirements of a safe and reliable water supply. This report covers a period of up to 15 years. The outcomes of the long term planning reports are used as inputs in the development of the capital enhancement investment forecast and asset investment plans.

The need for future improvements and upgrades of the Mt Crosby WTPs identified within the long term planning reports include:

- Addressing current deficiencies and constraints;
- Opportunities for plant optimisation and/or cost reduction;
- Meeting future demand growth; and
- Improving reliability of supply.

Due to their history, the current filter design is inconsistent with contemporary standard practice, which limits the ability to maximise public health protection and also restricts operating capability and resilience. Additional issues identified by Seqwater include:

- Filters have reduced operability and water quality limitations compared to modern open gravity filter designs to the extent that, unlike other Seqwater treatment plants, polymer chemical addition is required to meet filtered water quality at all times;
- The lack of air scour infrastructure for effective backwashing leading to sludge accumulation in the sand media and flow on effect of less effective filtration (increased risk) and requiring more frequent backwashing (less efficient and potentially limiting capacity); and
- Due to inefficient washing process of using surface wash and water only backwashing, the sludge handling system is overloaded under poor raw water quality conditions.

The proposed Filtration Upgrade and Improvement project to be completed at the Mt Crosby Eastbank WTP is one of a much larger program of capital projects scheduled at the Mt Crosby WTP facilities over the 10 years forecast horizon. Seqwater have noted the importance of undertaking the filtration upgrade within the next five years, as it will become increasingly more difficult to take filters offline as demand increases. Options to accelerate the works are to be considered as part of the detailed design and procurement.

As part of their 2018 Submission, Seqwater has stated that "*the project allows us to jointly deliver several asset maintenance and renewals projects as one "program" with one design and construction contract. This will provide an overall cost reduction and reduced interruption in the water supply capacity. The cost of these asset maintenance and renewals projects has been separately forecasted in our capital investment proposal.*" The consolidation of several projects into this project should provide good benefits in regards to the timing of overall works and the cost allowed for the works.

A business case for the proposed filtration upgrade and improvement project was initially finalised in October 2014 and approved by the Seqwater Board in November 2014. Since this time, Seqwater has appointed an independent expert panel to oversee this project from the preparation of the long term planning reports to the business case decision to invest. The expert panel endorsed the choice of filtration approaches to resolve the capacity constraint and to ensure that water quality issues are adequately resolved.

Seqwater are also applying the learnings gained from development of the North Pine WTP filter refurbishment project to assist in delivering the project with minimal procurement and delivery risk.

Key Assumptions and Status

Information source	• RFI 43 - D14 62997 Mt Crosby East bank TEB and West bank TWB Long Term Planning Report (LTPR)(2).pdf • RFI 34 - D14 98154 Mt Crosby East Bank TEB and West Bank TWB LTPR Long Term Planning Report 2014 - Executive Summary to D14 62997.pdf • RFI 34 - D14 88166 TEB Mt Crosby Eastbank Filter refurbishment Business Case (Major Project).pdf • RFI 34 - D14 62997 Mt Crosby East bank TEB and West bank TWB Long Term Planning Report (LTPR)(2).pdf

	• RFI 55 D14 113184 QE99091_Preliminary Design Report_DP2_Rev0 MtCrosby Project SKM.pdf]
Investment Driver	• Compliance – requirement to meet specific legislative / regulatory obligations including Water Supply (Safety & Reliability) Act 2008 and the Australian Drinking Water Guidelines. • Renewals – current infrastructure ranges between 30 and 65 years old and is reaching the end of their typical service life. • Growth – It is likely that an additional 50-100 ML/day will also be required by 2027 in order to meet future growth in demand.
Intended Outcome	• Deliver a reliable production of 500 ML/day at Eastbank (at <20 NTU) with a reduction in process risk from medium to low requiring a capacity or process augmentation for the filtration system
Current Project Status	Gateway 3 – The project is currently in the investment decision phase
Procurement and project delivery Process	Procurement method to be further developed by procurement, legal and project delivery teams. It is proposed in the business case three separate contracts be obtained for: detailed design; underdrain supply; and construction, media supply installation and commissioning. Project delivery to first develop detailed design and construction specifications to provide for new and raised launders, air scour delivery manifold. For the filter refurbishment project, it is noted a highly experienced project manager, designer and contractor need to be selected to secure the project and reduce the procurement and delivery risk. The recommended delivery approach is to refurbish four filters at one time; essentially due to the current control arrangement of having four filters per control unit. Refurbishing four filters at once will also enable project efficiencies to be gained by delivering the filters at a faster pace, enabling the project to be completed sooner and more cost effectively than would otherwise be the case. This approach was originally forecast to provide completion of the filter refurbishment towards the end of 2018 (based on Board approval in November 2014). The project has been deferred through the 2015 Regulatory Period and is now expected to be completed in 2020.

Options analysis

The 2014 business case details five options considered as part of Seqwater's assessment of filtration upgrades. These options included:

- Do nothing;
- Option 1 – Filter refurbishment: with underdrain sub-options including:
  - Sub-option 2A – Filter refurbishment to current design
  - Sub-option 2B – Filter refurbishment with piped, encased, laterals and nozzles with PVC air scour grid
  - Sub-option 2C – Filter refurbishment with piped, encased, laterals and nozzles with steel air scour grid
  - Sub-option 2D – Filter refurbishment with manufactured underdrains
- Option 2 – Provide additional filtration capacity (4 or 8 new gravity filters):
  - The existing filters currently operate at hydraulic rates in excess of acceptable standards. Additional filter capacity would reduce the hydraulic rates to be in line with design standards. However, this would not address the existing filter renewal requirement. Involves a

conventional treatment based upgrade as well as an additional filter area to increase the capacity and in the later years, a UV disinfection system to improve the level of protozoa treatment.

- Option 3 – Install UV disinfection system
  - Involves a conventional treatment based upgrade as well as an additional filter area to increase the capacity and in the later years, a UV disinfection system to improve the level of protozoa treatment.
- Option 4– Install new membrane filters in series or in parallel to the existing filters.
  - Installing a membrane facility after the existing infrastructure in order to improve treatment reliability, protozoa treatment and achieve the required production. The membranes provide an augmentation to the existing filtration process without having to upgrade the existing filtration system. The facility would be built at Holts Hill to treat flows from both sites.
  - This option was not pursued due to the large investment required ($80m to reach 500ML/day)

Under the business case, Sub-option 2C was ranked highest providing for filtration refurbishment with steel air scour grid and manufactured underdrain. Seqwater's proposed program of filtration upgrades and improvements is to be completed over the period to 2021.

Seqwater notes its preferred option will improve the level of process reliability and resilience and ease of maintenance in the future. Further this sub-option is considered the lowest cost option. Specifically, a steel grid is considered to require less maintenance due to the increased level of durability. While a manufactured underdrain is seen to provide for easier installation and maintenance in the future.

Further, is it expected that the washing efficiency will be far greater and there will be less risk of wash distribution errors associated with this option. In addition to reducing the volume of washwater being processed in the sludge handling facility, improved washing efficiency is expected to improve the throughput capacity of the filter, the media lifecycle and have a positive impact on water quality.

A significant risk identified during options assessment process was the existence of only one supplier with a proven track record of refurbishment of the underdrain system used at the Eastbank WTP. This reflects the underdrain used at the facility not being common around the world. Seqwater have clearly identified this and are identifying options to implement during procurement to ensure that the recommended solution is the optimal cost.

Proposed capital expenditure

Table 23 provides a year on year breakdown of costs as reported by Seqwater in the 2017 APMP and their submission to the Authority associated with the proposed filtration upgrades and improvements to be competed at the Mt Crosby Eastbank WTP.

Table 23. Forecast capital expenditure – Mt Crosby Eastbank WTP Filtration Upgrade and Improvement ($ million, Real Dec 2016)

FY	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Seqwater Forecast	$12.5	$11.7	$7.2	$0	$0	$0	$0	$0	$0	$0	$31.4
Capitalised*	$0	$0	$35.7	$0	$0	$0	$0	$0	$0	$0	$35.7

** includes actual expenditure and interest during construction*

This project was previously included in the current regulatory period with an estimated cost of around $35m, however Seqwater has indicated in their regulatory submission that they will spend only $2.6m during this period.

During KPMG's interviews with Seqwater, Seqwater confirmed the total estimated cost of the project to be $34 million, including actual expenditure of $2.6 million to date. However, these estimates of the

preferred option are similar to those presented in the 2014 business case, that is, $33.8 million ± 30 per cent (NPV $37.4 million ± 30 per cent). KPMG note that costs in the business case are based on the P80 construction cost for each option assessed with a 30 year NPV assessment used as the basis for cost assessment. Maintenance costs have been estimated at 1 per cent of the capital costs which is relatively consistent with good practice for estimates at this stage. The contingency allowance used at this stage was 30 per cent which is also consistent with projects where a preliminary design has been undertaken.

Each of the cost items have been assessed as to their level of accuracy, with the levels varying between 70 per cent and 140 per cent of the calculated estimate. This allows a range of costs to be developed and incorporated into a risk based cost model to determine present value costs based on low, likely and high value scenarios. This process facilitates the development of risk based P80 cost estimates.

Assessment

Prudency

The key drivers for this project are compliance, renewals and growth and they are well established in the supporting documentation for this project, in particular the long term planning report.

The works are required to ensure that the treatment process continues to achieve compliance with treated water quality guidelines, while the existing treatment / filtration assets are coming up to 30-70 years old and some assets are therefore reaching the end of their service life. In addition, demand growth in the area as assessed within the Water Security Program, indicates that the two Mt Crosby WTPs will require additional capacity to supply the demands.

The Eastbank WTP requires an additional 50-100 ML/day by 2027 to achieve the required capacity. The main capacity restriction at present is the filtration system which cannot filter the required flow rate of water whilst also maintaining an acceptable level of risk of not meeting water quality standards. The current maximum throughput of the plant is 420 ML/day with the likely short term capacity required being 505 ML/day by 2019.

The current filters (x20) are required to meet a 4 log reduction in protozoa, with each individual filter required to meet the specific criteria. All the filters were built around the same time and therefore have components at the same age nearing end of service life.

Seqwater has demonstrated the prudency of the project, to ensure compliance with treated water quality guidelines and appropriate capacity to meet future demand.

Efficiency

Scope of Works

The scope of works for this project is well defined in the supporting documentation, including the 2014 Major Project Business Case. The scope of the preferred option involves rebuilding the existing filters in situ by raising the filter walls to allow for a deeper filter bed and to provide an air scour based washing process.

The scope of works outlined is reasonable and covers the required areas with civil/structural issues and design, under-drain design, pipework considerations including air scour system, valves, media options (dual media gravel and sand), mechanical components including air blowers, and automation and control components including SCADA, controls, and switchboards.

Standard of Works

The project is currently in the investment decision phase Gateway 3 with more detailed design works being undertaken to support the business case. No design documents have yet been developed / provided to allow us to assess the standards to which the work is undertaken.

It is noted that Seqwater have sought to outsource the detailed design of the works and as such, we expect that the full range of Seqwater standards, policies and procedures for design work will be referenced in the contract for this work.

As detailed design documents have not been provided, Seqwater has not justified the standard of works.

Cost of Works

The costs associated with this project were developed predominantly in the 2014 Business Case with the three key options assessed being:

- Option 2.2 Filter refurbishment with piped, encased, laterals and nozzles with PVC air scour grid
- Option 2.3 Filter refurbishment with piped, encased, laterals and nozzles with steel air scour grid
- Option 2.4 Filter refurbishment with manufactured underdrains

Options costs for each of these three key filter refurbishment options were developed using Seqwater's standard NPV template. NPVs were calculated over a 30 year life cycle with operations and maintenance costs and standard asset lives. Operations and maintenance costs are incremental annual costs arising from the power requirements of the air scour system and backwash pumping system. Annual maintenance costs have been determined to be around 1 per cent of the total capital improvements value which is relatively standard. Other businesses around Australia have used figures around 1.13 to 1.15 per cent of total capital expenditure. Replacement costs for assets with asset lives less than the 30 NPV period were also included in the cost analysis.

Seqwater has followed an appropriate process to develop the costs estimates demonstrating their efficiency.

Summary findings

Based on the preceding analysis, Seqwater:

- Has demonstrated the need to address existing compliance obligations and the project's timing to avoid the potential impact of future demand scenarios;
- Has provided robust supporting project justification;
- Has sought to 'consolidate' several related projects into a single program of works, with a common contract, improving the overall construction timeframe, reduce the length of interruption at the plant and improve the overall cost;
- Has included appropriate allowances for contingency and risks; and
- Has demonstrated that it has chosen the least cost servicing solution;

Table 24. Recommended Capital Expenditure for Mt Crosby Eastbank WTP Filtration Upgrade and Improvement ($ million, Real Dec 2016)

FY	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Seqwater Forecast	$12.5	$11.7	$7.2	$0	$0	$0	$0	$0	$0	$0	$31.4
KPMG Proposed	$12.5	$11.7	$7.2	$0	$0	$0	$0	$0	$0	$0	$31.4
KPMG Proposed Adjustment	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

Seqwater has justified the basis of its cost estimates, through robust options NPV analysis, applying appropriate consideration of contingencies, This project is well established and while some additional procurement and project delivery details need to be determined, the cost estimates are established to

a degree to provide some certainty. KPMG's review of the costs identifies that they are most likely to be efficient and therefore we do not propose any adjustments to the expenditure profile to this project as shown in Table 24.

7.6.3 Project 3: Mt Crosby Eastbank WTP - TEB: Eastbank WTP Sedimentation Upgrade (Resilience)

Overview

As noted in section 7.6.2, the long term planning report for the two Mt Crosby WTPs acts as a single source of reference on the current status of the WTPs and future asset investment needs to ensure that Seqwater is able to meet customer requirements of a safe and reliable water supply.

The Mt Crosby WTPs supply the majority of bulk water throughout SEQ and growth in demand in the greater Brisbane region represents a key driver of capital expenditure for these assets over the forecast planning horizon. Given the anticipated growth in demand, Seqwater has forecast a need for additional output from the Mt Crosby plants in the near future. Consequently, it is forecast that the two Mt Crosby WTPs will be required to reliably produce 750 ML/day from 2020 to 2027 and therefore it is likely that an additional 100 ML/day will be required, on top of existing capacity, by 2027.

The long term planning report sets out known deficiencies at the Mt Crosby Eastbank WTP in relation to sedimentation basins which may prevent these assets from achieving the operational capacity requirements moving forward. These deficiencies include:

- Flocculation basin 1 is in poor condition, is a poor performance design and the water enters the sedimentation basin in such a way that half of the basin is not utilised (that is the flow is short-circuiting through the basin). The raw water flow meter is the pitot tube variety which reduces the reliability of that basin. These issues suggest that the basin has capacity limited to half its rated design (impact of the short-circuiting).

  Further, flocculation Basin 1 is nearing the end of its useful life (having been constructed in the early 1900s using mass concrete), with significant aggregate exposure and a number of cracks, where external leakage of water is evident. The internal timber baffles are significantly degraded and the inlet penstocks are corroded. The design of the duct that connects to the sedimentation basin results in the flow short-circuiting down one side. These issues essentially reduce the capacity of the sedimentation basin 1 by approximately 50 per cent.
- Sedimentation Basins 2, 3 and 4 have general (but not yet severe) aggregate exposure, some degradation of joints, and minor cracking.
- Sedimentation basins have high surface loading rates (>2.5 m/h) when flows exceed 500 ML/day for Eastbank. Performance is often above 2 NTU which is outside of the relevant operating parameters. The settled water turbidity directly impacts on the filtration performance as well as to treat water, and similarly, the raw water turbidity directly impacts on the performance and capacity of the basins.
- All sludge treatment supernatant recycle water to the head of Sedimentation Basins 3 and 4, making it difficult to take either of these basins out of service without stopping the entire Eastbank WTP. To remedy these issues, Seqwater has proposed capacity upgrades to its basins at both the Mt Crosby Eastbank and Westbank WTP sites. In considering the options (described below), Seqwater has assessed the timing and configuration of basins to be upgraded across both sites.

The proposed project assessed by KPMG relates to the Eastbank WTP only. This project seeks to address overloading of the sedimentation basins at the Eastbank WTP by installing lamella plates in basin 1. The plates (or settling tubes) increase the available surface area for solids to settle and thus enables a higher hydraulic capacity to be obtained without compromising water quality.

These works are required to be completed along with the filtration system upgrades and improvements (discussed in Section 7.6.2) however the works cannot be done together. Seqwater has also advised that the Westbank WTP sedimentation upgrade project may proceed first with filter upgrades to follow and works on the Eastbank WTP to commence once other works are completed. In this case, this project would likely be deferred for at least two years depending on the actual completion dates.

Key Assumptions and Status

Information source	• RFI 43 - D14 62997 Mt Crosby East bank TEB and West bank TWB Long Term Planning Report (LTPR)(2).pdf • RFI 40 - D16 161985 Mt Crosby TEB TWB WTP revised memo capital APMP 2017 for sedimentation capacity augmentations(2).pdf • RFI 40 - D14 90278 QE99091_Options Analysis Report_WP 1 and 2_Rev0 flocculation.pdf • RFI 40 - D14 62997 Mt Crosby East bank TEB and West bank TWB Long Term Planning Report (LTPR).pdf • RFI 40 - D1626850 APPENDIX B - QE99091 Cost Estimation - WP1 2 TEB East Bank Mt Crosby Flocculation Option 1.XLSX • RFI 55 D14 113184 QE99091_Preliminary Design Report_DP2_Rev0 MtCrosby Project SKM.pdf
Investment Driver	Growth – Growth in greater Brisbane region will require additional output from Mt Crosby, specifically, it is forecast that these plants will be required to reliably produce 750 ML/day from 2020 to 2027 requiring an extra 50-100 ML/day over existing capacity from the Eastbank WTP by this time.
Intended Outcome	Increased hydraulic capacity through the sedimentation basins and increased ability to treat higher raw water turbidity. Reduce process risk of 500 ML/day to low up to 5 m/h (medium to low).
Current Project Status	At the time of making its regulatory submission to the Authority, Seqwater noted this project to be at Gateway 1 and in the preliminary evaluation phase. During KPMG's interviews with Seqwater it was indicated that the project is at Gateway 2 – investment justification phase with a needs analysis completed.
Procurement and project delivery Process	Procurement – This is to be developed as part of the Business Case for the project Project delivery – This is to be developed as part of the Business Case for the project

Options analysis

Seqwater has assessed four options in considering potential responses to sedimentation issues at the Mt Crosby Eastbank WTP. These options include:

- Option 1: Install tube settlers;
- Option 2: Install lamella plates fibre glass;
- Option 3: Install lamella plates stainless steel (current preferred option); and
- Option 4: Install pre-sedimentation to take out peak sediment loads.

Seqwater note that lamella plates are a key component as they improve the reliability and performance of the basins, enabling a higher throughput over a wider range of raw water conditions.

Tube settlers and fibre glass options were deemed difficult to maintain by Seqwater and do not have the same life expectancy as stainless steel. The stainless steel option is considered less likely to block and therefore, for costs, the stainless steel option has been incorporated.

This project is at a relatively early stage of development through business case development and options analysis and is closely interrelated to other projects both at the Eastbank and Westbank WTP sites. KPMG understand certain options may need to be reassessed as other works are progressed

through the capital planning process and the impacts of these other works on the current project are assessed.

Proposed capital expenditure

This project was included in the allowed expenditure for the current regulatory period at a forecast cost of approximately $15.9 million. On 19 January 2017, approval was sought for revised cost estimates associated with the project. In seeking approval, it was noted the previous cost estimates (based on reports completed in 2013) were found to be incorrect and required increasing. Specifically, the costs initially included in the current regulatory period were based on an initial budget estimate that did not include design costs or contingency, nor were they based on the final concept designs for the works. The initial estimate of around $4 million per basin has now been adjusted to around $7.8 million per basin, leading to significant increases in the total cost. The current cost estimate for this project, as reflected in the 2017 APMP, is $33.3 million.

Table 25 below provides a year on year breakdown of costs as reported by Seqwater in the APMP (and subsequently its regulatory submission to the Authority) associated with this project.

Table 25. Forecast Capital Expenditure – Mt Crosby Eastbank WTP Sedimentation Upgrade ($ million, Real Dec 2016)

FY	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Seqwater Forecast	$1.4	$16.0	$16.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$33.3
Capitalised*	$0	$0	$33.7	$0	$0	$0	$0	$0	$0	$0	$33.7

** includes actual expenditure and interest during construction*

This project is at an early stage of development through the capital planning framework and is dependent on, and affected by, other works at the Mt Crosby Eastbank site. Seqwater stated in January 2017 that further work is required to be undertaken to confirm the staging of works and to determine the most efficient investment decision. It is KPMG's understanding that this work is still ongoing and that the works timing is still to be determined.

Assessment

Prudency

The key drivers of this project are growth and compliance. The long term planning report sets out known deficiencies at the Mt Crosby Eastbank WTP in relation to sedimentation basins which may prevent these assets from achieving the operational capacity requirements moving forward.

The drivers are well established through the Long Term Planning Reports for the Mt Crosby sites and through other supporting documentation.

Seqwater has demonstrated the prudency of the project, to maintain operational capacity requirements moving forward.

Efficiency

Scope of Works

The scope of works for this project is still yet to be fully defined. While it is understood that stainless steel lamella plates are to be installed in sedimentation basin 1, the key assets are still being determined and the full scope of ancillary works is currently unknown. A detailed planning study is required to determine both the scope of works and the timing of the works.

Potential project efficiencies may be realised if project timing can be set to coincide with the refurbishment of filters at the Eastbank site given that parts of the WTP will need to be off-line for a

period of time. In addition, the flocculation basin 1 at the WTP needs replacing in 2019/20 so another timing efficiency potential exists with this example.

Seqwater has not demonstrated that the scope of works is appropriate as the scope and timing of works are still to be finalised.

Standard of Works

The standard to which these works will be set is still an unknown at this stage of the project. Options assessment and business case approval are required prior to developing the design. Seqwater has developed unit process design guideline values to identify where treatment process units may have process risk that require rectification.

Whilst we expect the Seqwater will follow their standard works guidelines, we are not yet able to assess and confirm this.

As detailed design documents have not been provided, Seqwater has not justified the standard of works.

Cost of Works

The cost estimates for this project have changed significantly, and doubled since the project was included in the current regulatory period. The primary reason for this was that the original estimates (developed in 2013) were initial budget estimates not final concept design costs and the costs did not include allowances for design or any contingency.

The costs making up the current estimate are based on recent projects which had lamella plates installed and quotes from contractors. The contractor quotes have been used to set up a unit rates database that is referenced in the development of the updated costs. However the costs are based on 2013 figures and therefore likely out of date, even with escalations to bring them to current day dollars.

A full review of cost estimates would not be possible until the options analysis and business case process are completed. As such, Seqwater has not justified the cost of works.

Summary

Based on the preceding analysis, Seqwater:

- has demonstrated the need for the project, which ensures the operational capacity of critical network infrastructure;
- has not justified the proposed cost estimate, noting recent estimating errors that failed to include design costs of contingency;
- has not demonstrated that it has adequately considered the impacts of proposed works on the Eastbank and Westbank WTP sites, including project timing and cost;
- has not provided an appropriate level of supporting project justification for the proposed expenditure; and
- has not demonstrated that the appropriate options has been selected, to address the need.

Given this, KPMG recommend the Authority remove the majority of capital expenditure associated with this project from the next regulatory period, leaving some allowance for ongoing design and business case approvals, as show in Table 26.

Table 26. Recommended re-profiling of capital expenditure for Mt Crosby Eastbank WTP Sedimentation Upgrade ($ million, Real Dec 2016)

FY	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Seqwater Forecast	$1.4	$16.0	$16.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$33.3
KPMG Proposed	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
KPMG Proposed Adjustment	($1.4)	($16.0)	($16.0)	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	($33.3)

7.6.4 Project 4: North Pine WTP - TNP: Filtration Capacity Upgrade

Overview

Project Planning

North Pine WTP is Seqwater's second largest water treatment plant and an important contributor to the bulk water supply network. It was constructed in 1970 and draws raw water directly from Lake Samsonvale (North Pine Dam) from an allocation of 59,000 ML/year (at an average of just over 160ML/d). The overall hydraulic capacity of the original plant is 250 ML/day however the treatment capacity of the filtration process was downgraded to only 160 ML/day due to the risk of exceeding tightened treated water quality guidelines (taste and odour issues and health based targets on turbidity). The plant currently produces an average of 80-100 ML/d with peaks up to 170 ML/d through a conventional treatment process with coagulation, media filtration, disinfection and fluoridation.

Seqwater's WSP has identified the North Pine WTP as requiring production of up to 250 ML/d in approximately the year 2022, at which time it is expected that the WTP will also begin fully utilising the available raw water allocation from Lake Samsonvale.

The required capital works were first identified in a long term planning report prepared for the North Pine WTP in July 2013 and subsequently further assessed and defined in April 2014. This second assessment also developed the initial design boundaries and prepared cost estimates for a range of works to ensure the increase in plant capacity could be achieved.

Seqwater's needs analysis, which commenced in December 2015 and was approved in June 2016, identified a total of six projects were required at the North Pine WTP over the 10 year period to 2028. These projects include:

- Project 1 – Capacity upgrade to achieve 250ML/day across the WTP by 2022 by upgrading the key treatment systems (filtration);
- Project 2 – Destratification improvements to stabilise raw water quality;
- Project 3 – Taste and odour control system upgrade;
- Project 4 – Sedimentation improvements (settling and sludge collection);
- Project 5 – Polymer upgrade (settling); and
- Project 6 – Lime upgrade (correct pH and stabilise treated water).

Project 1 was originally scheduled as the final project given the need for the project to be completed by 2022, with the other five projects scheduled to be undertaken between 2017 and 2021. However the needs analysis identified that the planning stage for the capacity upgrade be brought forward and combined with the development of an overarching strategy for the six projects to ensure a consistent and holistic approach is followed. Once the planning stage was completed the filtration capacity

augmentation component of this project would then revert to original timing at the completion of the other five projects.

A broad program of works showing the timings expected for each of the six projects at the North Pine WTP was submitted by Seqwater, however the program is out of date. This is especially the case following Seqwater's recent decision to delay the project by a further two years. The original program had the work on this project commencing in October 2017, the APMP has a commencement date in 2020-21 and the final the delay to the project implies works are now to commence sometime in 2022/23.

Key Assumptions and Status

Information source	• RFI 41 - D14 85651 - Final Report Combined 230714 (note trim is email not PDF).pdf • RFI 41 Pages from D16 107684 Treatment planning program - Amelia Jewell projects.PDF • RFI 41 - D16 79327 TNP Capacity Upgrade - Needs Analysis.pdf
Investment Driver	Growth/Compliance – While the hydraulic capacity of the plant is 250ML/day, the current capacity of the filtration systems is 160ML/day to ensure compliance with tightened treated water quality guidelines (health based targets). To meet future demand growth, the capacity of the filtration system needs to be increased to 250ML/day.
Intended Outcome	Increased hydraulic capacity of the filtration system to 250 ML/day (over 24 hours) by the required date by installing three additional filters.
Current Project Status	An overarching upgrade strategy is being completed (expected late October 2017) prior to options being re-assessed to take account of the overarching strategy. The project was entered into the Submission in the Gate 1 – Preliminary Evaluation phase, however in our interviews with Seqwater it was stated the project is currently in options analysis phase – Gateway 2, with options analysis due to be completed by October 2017. This project commencement has been delayed by two years under Seqwater's proposed hybrid demand model.
Procurement and project delivery Process	Procurement process – to be confirmed under future Gateway steps. Project delivery – this project was scheduled as the last of the six projects to be delivered at North Pine WTP, however early planning for the project was proposed to occur during 2016/17. Key steps set out in the 2016 Needs Analysis (based on signoff in May 2016) were: • Options Assessment by February 2016; • RFQs for Part A issued May 2016; • RFQs for Part B issued July 2017; • Business Case (for construction) by March 2019; and • Construction by 2022 The 2017 APMP assessed the project with a completion date of 2022/23, however Seqwater identified in their regulatory submission to the Authority that the project has been delayed two years from the original timing in the APMP.

Options analysis

As noted above, this project is at an early stage of development in the project lifecycle and a full options assessment process has not been completed. A long term planning report identified the capacity constraint and basic options were scoped for achieving this capacity upgrade. These basic options were then reviewed and updated with expenditure estimates and design boundaries in the North Pine WTP – Strategy and Cost Review (April 2014). The options reviewed were:

- Refurbishment of existing filters to achieve the required hydraulic capacity;

- Construct three new filters to achieve the full hydraulic and treatment capacity;
- Install PAC dosing system and contact tank to treat taste and odour issues arising from operating beyond treatment capacity of filters; and
- Lamella plate settlers and sludge removal system including roof.

The 2014 report provided the design basis for the options above, developed risk based (P80 and P50) costs based on market benchmarked rates and appropriate contingency allowances but it did not recommend any specific option over another.

The 2014 report also provided the basis for the development of the 2015 needs analysis, which is required for the project to pass Gateway 1. The needs analysis identified the range of six projects that were required to achieve the capacity upgrade of the WTP and outlined the various options/issues that the capacity upgrade project would need to consider, however no list of options was suggested.

Seqwater has stated that the project is now in Gateway 2, with an options assessment process underway. During KPMG's interviews Seqwater stated that along with the augmentation of the filters, five additional options (and four sub-options) are being considered as potential solutions to treating taste and odour and turbidity issues at the WTP. These additional options / sub options are:

- Option 1: Do nothing / Business as Usual;
- Option 2a/b: Intermediate ozone/BAC;
- Option 3a/b: Tertiary ozone/BAC;
- Option 4a/b: Tertiary UV/H2O2; and
- Option 5a/b: PAC and coated media.

As indicated above, these options primarily relate to the risk based treatment of the filtered water rather than options for the filtration system itself. Seqwater has stated that the preferred option at this stage is Option 5, although there are some medium residual risks related to taste and odour and algal toxin issues.

The preferred option will be established once the overarching upgrade strategy is completed in late October 2017 and when a re-assessment of the filter options to take account of the overarching strategy is completed. At this stage, KPMG is unable to assess sufficient information to determine the robustness of the options identified, options assessment and prioritisation process, or the risks reviewed.

Proposed capital expenditure

This project is at an early stage of development with an overarching strategy, options analysis, preparation of a preliminary design, and analysis of the costs associated with the filtration capacity upgrade still to be completed.

Costs for the current estimate included in the 2017 APMP are consistent with the original North Pine WTP Strategy and Cost Review from April 2014. The 2014 review developed costs from first principles using benchmark or market rates from similar projects and selected contractors. The 2014 review cost estimate was $36.3 million, with a P50 cost estimate of $37.6 million, while both the 2017 APMP and regulatory model cost estimates are very similar at $37.5 million, as shown in Table 27.

However, Seqwater's regulatory submission to the Authority includes a capital cost of $40.6 million (with no specific details as to where this estimate was sourced). During the interviews, Seqwater advised that the total costs of the project may exceed the estimates included in the regulatory submission and 2017 APMP. KPMG has been unable to assess this as the project has been delayed by a further two years.

Table 27. Forecast Capital Expenditure – North Pine WTP Filtration Capacity Upgrade ($ millions, Real Dec 2016)

FY	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Seqwater Forecast	$0.0	$0.0	$0.0	$0.0	$3.9	$16.8	$16.7	$0.0	$0.0	$0.0	$37.5
Capitalised*	$0	$0	$0	$0	$0	$0	$46.7	$0	$0	$0	$46.7

** includes actual expenditure and interest during construction*

Assessment

Prudency

Seqwater's Water Security Program (WSP) has identified that the capacity of the North Pine WTP needs to be 250 ML/day by approximately 2022 to meet the needs of the local and regional demands. The current plant capacity is rated at 250ML/day however there is a restriction on the flow capacity through the current filters to a maximum of 160 ML/day. This restriction is needed to ensure that the filtered water complies with the relevant drinking water guidelines. An upgrade to the filtration process is required to increase the capacity of the filtration system to match the plant capacity and achieve the required WSP capacity target.

Seqwater has demonstrated the prudency of the project, being to allow adequate flow capacity through the filters.

Efficiency

Scope of Works

The scope of works for this project is only defined at a high level as neither the overarching strategy nor full options analysis has been completed for this project. Options development work done to date has identified different potential upgrades to the filtration process including refurbishment of the existing filters, new filters, a powdered activated carbon dosing system, and lamella plate settlers and sludge removal.

The final scope of works will not be determined until the options assessment process is complete and preferred option is chosen. As a result, Seqwater has not justified the scope of works.

Standard of Works

The works completed to date, North Pine WTP Strategy and Cost Review, identified that the Seqwater Unit Process Design Guideline Values have been adopted. It is expected that the future design work would follow the normal water industry standard design guidelines with appropriate consideration given to any new filtration related technology available at the time of conducting the options assessment and the design process.

Seqwater has not appropriately documented the standard of works, as the design process has not been commenced.

Cost of Works

The cost estimates for the project reflect the current preferred option, noting that a full options assessment has not been completed, and have been relatively consistent since the initial options and design works were completed in 2014. Given that options are still to be developed, there is a high likelihood that the final cost estimate will be different to the estimates included in the current submission. As such, Seqwater has not justified the cost of the works.

Summary

Based on the preceding analysis, Seqwater:

- has demonstrated the need for the project, which ensures flow capacity through the filters;

- has not justified the timing of the works, as the program is out of date and the project is delayed;
- has provided the design basis for the options listed, including development of risk based costs based on market benchmarked rates and appropriate contingency allowances, however it did not recommend any specific option over another;
- has not justified its cost estimates, as it has not completed robust supporting options analysis;
- has not provided appropriate supporting project justification, as this project is at an early stage of development with an overarching strategy, options analysis, preparation of a preliminary design, and analysis of the costs associated with the filtration capacity upgrade still to be completed.

Given that we can't establish the efficiency of the project, we propose to remove the main capital expenditure from the program while leaving a proportion of expenditure to allow the progression of options analysis and business case development prior to construction. We also note that the proposed expenditure for the project included in the regulatory model has already been delayed outside the next regulatory period and as such our adjusted expenditure will also be consistent with the revised timing of works. We would recommend that this project be assessed as part of a future price investigation, when more developed supporting information should be available to assess the proposed capital expenditure.

Table 28 summarises KPMG's recommended expenditure profile associated with this project.

Table 28. Recommended Profile of Expenditure – North Pine WTP Filtration Upgrade ($ million, Real Dec 2016)

FY	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Seqwater Forecast	$0.0	$0.0	$0.0	$0.0	$3.9	$16.8	$16.7	$0.0	$0.0	$0.0	$37.5
KPMG Proposed	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
KPMG Proposed Adjustment	$0.0	$0.0	$0.0	$0.0	($3.9)	($16.8)	($16.7)	$0.0	$0.0	$0.0	($37.5)

7.6.5 Project 5: Ipswich Office - Enterprise Resource Planning Program

Overview

Seqwater's Strategic Plan identifies ICT as having an important role in enabling Seqwater to meet its Statement of Obligations and to be a strategic enabler for a number of key business priorities. Seqwater's existing ICT Strategic Plan 2015-17 established four portfolios of work to focus on these two roles. In October 2016, the Seqwater Executive Leadership Team approved the approach to develop a new ICT strategy for the period 2018-2022, termed the Digital Technology Strategy, which was scheduled for completion in early 2017, although this strategy was not provided by Seqwater. This new strategy provides a focus on Digital Business Transformation for Seqwater.

In preparation for the Digital Business Transformation process, Seqwater began to:

- move more towards cloud based and managed services;
- increase investment in Enterprise Resource Planning (ERP) to ensure the ERP is ready for the new ICT approach;
- continue mobility investments;
- define an integration platform;
- produce business models; and

- prepare for digital service providers.

The increased investment in the ERP platform builds on an existing ERP relationship Seqwater has with Technology One and positions the ERP framework beyond the expiry of the Technology One alliance in 2019 and within the new overall Digital Technology Strategy for 2018-2022.

The ERP system is part of the ERP Program and is core to Seqwater's corporate functions. It includes finance, human resources (HR), payroll and a range of other critical processes that support the day to day operation of the organisation. Seqwater's current ERP system (Technology One) was consolidated as part of the merger of the previous three water management entities in 2009. The consolidation was time driven with limited focus on the functional and technical aspects of the solution itself and the future evolving needs of the new organisation. Only minor modifications have been made to the solution since this time and as a result the TechnologyOne ERP solution has not kept up with changing business requirements.

Seqwater's proposed ERP Program as reflected in its regulatory submission to the Authority is in its conceptual design stage with alignment to the new ICT for 2018-2022 and current ERP strategies being progressed. As part of the conceptual design stage, the business is to complete a root and branch process review of individual business functions and processes detailing the information requirements, workflows and downstream processes in which the ERP system interacts. This will establish detailed design requirements that will be tested against the current solution, as well as against other market options in alignment with the ERP Strategy.

This process would enable a technical design to evolve that balances organisational risk, functional fit, cost, implementation and change management considerations, amongst others. Further, this will allow for alignment with the ERP Strategy that is currently being developed and would aim to address the identified shortfalls with the current ERP solution.

Seqwater's vision for its ERP system is to be a business enabler and to support efficient and modern processes. A preliminary review of the established solution highlighted functional and system shortfalls that place Seqwater at risk in its ability to achieve this vision. Shortfalls across functional and technical aspects were identified by the business in the following areas:

- Data;
- Reporting;
- Integration;
- Automation;
- Processes;
- Training and system knowledge;
- Technology performance;
- System functionality and usability;
- Governance;
- Vendor; and
- Organisational culture.

Details of the individual shortfalls and their impact on the business are to be captured as part of the ERP Strategy. The business case for the development of an ERP strategy that will underpin the project was approved in the second quarter of 2017 and consultants were engaged in late June 2017 to develop this strategy, with an expected completion date around the end of September 2017.

Key Assumptions and Status

Information source	• RFI 38 Copy of D17 104742 Enterprise Resource Planning Capex - ICT - Summary Document.xlsx • RFI 38 D17 104657 HR Corporate Reporting - Business Case - Approval by GM, SPS and Manager, P&C.pdf • RFI 38 D17 104656 ICT Business case - ICT Strategies and digital business intent.pdf • RFI 38 D17 104654 ICT APMP 2017 Updated Briefing note 21042017 SIGNED.pdf • RFI 38 D17 104655 ICT BAU Budget Briefing Note 2017 18 21042017 SIGNED.pdf • RFI 38 D17 104653 IAS QCA - HR System (re platform) - ECB.docx • RFI 38 D17 104652 IAS QCA - Financial System (re platform) - ERP.docx • RFI 38 D17 104649 Capex QCA RFI 38.doc
Investment Driver	Renewal – this project focuses on the renewal of key ERP business systems including Finance and HR in preparation to take opportunities to re-platform and enable simpler processes and information sharing. The new systems will facilitate collection of better business data that can be integrated with other key ICT systems to improve Seqwater's operational performance.
Intended Outcome	Improve key business systems to enable the ERP to function effectively with the context of the new ICT strategy for 2018-2022, the Digital Technology Strategy.
Current Project Status	Gateway 0 – Strategic Assessment. This project is at a conceptual stage of development with alignment to the new ICT strategy being progressed. The project is currently in a discovery phase with an ERP Strategy being developed by end September 2017. It is currently expected that the definition of value streams and EOI documentation (for a technology partner) will be completed by the end of 2017/18 to allow progression through Gateway 1 with program delivery commencing at the end of 2018/19.
Procurement and project delivery Process	This is part of an existing program of works and long term contract with Technology One, which ends in 2019. The methods for delivery of works beyond this point are being investigated and include retaining the existing approach, selected system replacement, third party service providers, and hybrids approaches encompassing one of more of the approaches identified.

Options analysis

Detailed options have not yet been considered for this project given its early stage of development within Gateway 0 and Seqwater is yet to have finalised its ERP Strategy.

Seqwater, through interviews with KPMG, have noted the preferred solution will be based on the outcome of a process that considers all options, such as retaining TechnologyOne and improving and/or replacing selected modules, a hybrid approach with third party providers or a program of replacement with best of breed solution(s). Options will be driven by market testing for solutions that best reflect the objectives of the ERP Strategy, as well as technical and functional business requirements.

The preferred solution will be informed by, and aligned with the ERP Strategy, while commercial, functional fit and project delivery options will be determined as part of the business case and procurement process.

Proposed capital expenditure

As the project is still in the strategic assessment phase, a budget allocation of $29.3m has been included in the forecast of capital expenditure for the period 2018 to 2028 (see Table 29). This allocation is based on an assumption that some existing TechnologyOne functionality would be retained and

business requirement shortfalls would be addressed through solution modification. However, as noted previously, all options will be considered and the cost estimates assumption will be tested against the market.

A specific breakdown of expenditure for the ERP component of works was requested during KPMG's interviews with Seqwater. A number of supporting documents were submitted by Seqwater, however, the majority of these documents related to operating expenditure proposals or specific capital proposals for 2017/18. No breakdown of the capital expenditure associated with the ERP project was provided. We have therefore been unable to review exactly what has been proposed or what this expenditure is to be spent on.

Whilst this is a renewals program, the expenditure proposed is very lumpy indicating a number of one off or short term projects to be completed. However, the information provided by Seqwater does not break down the expenditure into components to facilitate an assessment. The expenditure profile suggests a base level expenditure of around $1.93m per year with additional expenditure peaks across the period. There is no expenditure allocated to this particular program for the historical period 2015-16 to 2017-18, which makes it hard to determine a trend, however the average base level historical ICT expenditure related to systems and information management and governance for the period 2014-15 to 2017-18 is just over $1m per year making the new base level of $1.93 per year a fairly major increase of around 80-90 per cent. With no breakdown of expenditure available we are unable to adequately compare the two program allowances and Seqwater has provided no supporting documentation for any expenditure.

There is, therefore, insufficient information available for us to adequately assess the costs forecast in the capital program for this project.

Table 29. Forecast capital expenditure – Enterprise Resource Planning program ($ million, Real Dec 2016)

FY	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Seqwater Forecast	$3.5	$3.5	$2.6	$1.9	$1.9	$1.9	$3.5	$2.6	$1.9	$1.9	$25.3
Capitalised*	$3.5	$3.5	$2.6	$1.9	$1.9	$1.9	$3.5	$2.6	$1.9	$1.9	$25.3

** includes actual expenditure and interest during construction*

Assessment

Prudency

ICT is an important component of Seqwater's capital expenditure program, as it is critical to ensure that the business can deliver the services expected of it from their customers. However, Seqwater has not provided sufficient justification for project. An overall ICT strategy and business case is yet to be developed and no breakdown of the actual tasks required has been provided. There is no indication of the timing required for tasks, which is important given that the current TechnologyOne services contract expires in 2019. There has been no details provided of how Seqwater is intending to procure the services required after the contract expiry.

Seqwater has not sufficiently demonstrated the prudency of this project to allow an increase in renewals over the base historical levels.

Efficiency

Scope of Works

No scope of works has been provided by Seqwater as an overall strategy is yet to be completed. The information provided was of a general nature around the existing system however no breakdown of tasks required was provided.

The final scope of works will presumably be clear once the overall strategy and initial Gateway 0 business case is completed. At this stage we consider that Seqwater has not justified the scope of works.

Standard of Works

Seqwater has not appropriately documented the standard of works, as there is no scope of works or list of tasks to undertake. We recognise that the overall strategy is assessing standards required, compatibility of renewals with existing infrastructure, and new technology options, however this strategy is yet to be completed.

Cost of Works

Seqwater has not provided any breakdown of the costs proposed to allow an assessment of this project. An existing renewals allowance was made in the historical period however it is has not been established why additional expenditure is required over this base.

As such, Seqwater has not justified the cost of the works.

Summary

Based on the preceding analysis, Seqwater:

- has yet to establish the prudency of the project, specifically around the increase in renewals over the base levels historically allowed;
- has not yet documented the proposed scope of works within the program, nor have the tasks been adequately defined;
- has not justified the basis of the cost estimate, as it is yet to complete detailed options (due to the early stage of development within Gateway 0) and Seqwater is yet to have finalised its ERP Strategy. Further, the expenditure proposed is very lumpy for a renewals program, indicating a number of one off or short term projects to be completed. The information provided by Seqwater does not break down the expenditure into components to facilitate an assessment;
- has not provided appropriate supporting project justification, as this project is at an early stage of the gateway process.

In the absence of further information, we recommend adjustments to the level of expenditure associated with the ERP Program in order to reflect the historic base level of annual spend around ($1m). This base level should apply to the period 2018-19 to 2019-20 in recognition of the existing contract with TechnologyOne. Beyond 2019, it is likely that renewals expenditure will significantly change with a new ICT service delivery arrangement in place. Despite this uncertainty, we propose to continue the historical base level expenditure consistent across the remaining years of the price path to 2027/28 (see Table 30).

Table 30. Proposed Adjustments to the ERP Renewals Project Expenditure to 2027-28 ($ million, Real Dec 2016)

FY	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Seqwater Forecast	$3.5	$3.5	$2.6	$1.9	$1.9	$1.9	$3.5	$2.6	$1.9	$1.9	$25.3
KPMG Proposed	$1.0	$1.0	$1.0	$1.0	$1.0	$1.0	$1.0	$1.0	$1.0	$1.0	$10.0
KPMG Proposed Adjustment	($2.5)	($2.5)	($1.6)	($0.9)	($0.9)	($0.9)	($2.5)	($1.6)	($0.9)	($0.9)	($15.3)

7.6.6 Project 6: Holts Hill Reservoir - RHH: pH Correction Upgrade

Overview

The Water Supply (Safety and Reliability) Act 2008 and supporting regulations require that Seqwater ensure that the water supplied meets minimum water quality standards. Performance risks and actions required for water treatment assets are outlined in the Drinking Water Quality Improvement Plan, which is regulated. The Plan states that the following actions are required at the Mt Crosby WTPs:

- review pH correction strategy to maintain <0.5 NTU at the point of supply; and,
- include impacts on stabilisation, operation and maintenance of Cameron's Hill reservoirs.

Poor water quality from the Mt Crosby WTPs is caused, in part, by the following:

- poor lime mixing and residuals in the reservoirs (for pH correction) resulting in turbidity issues in the treated water;
- Cameron's Hill reservoir capacity (minimum operating level) is under-utilised to reduce turbidity issues;
- higher pH's for primary disinfection mean less water can be produced to ensure sufficient disinfection occurs; and
- disinfection efficacy is a function of pH with an optimum at pH >8 and Seqwater have no means to change pH in the network after Cameron's Hill Reservoir.

Poor water quality is a key performance factor in the bulk supply agreements with the distribution / retailers with specific operating protocols setting targets particularly around turbidity and disinfection levels.

Lime solids by-products from pH correction dosing at the Mt Crosby WTPs are creating a major issue at the Camerons Hill Reservoir resulting in sludge build up in the reservoir. This issue also results in potentially inadequate secondary disinfection in water delivered to customers. This is due to sub-optimal pH levels caused by an inability to adjust pH beyond the WTPs. Inadequate disinfection in water supplied to Seqwater's customers, the distribution / retailers, is a potential breach of the Bulk Water Agreements and requires a solution.

The proposed works were originally identified in a review of flood resilience of the Seqwater network after a major flood event in January 2011. This work identified critical process improvements required at the Mt Crosby WTP sites (and the Holts Hill Reservoir, which is located in the same area) to improve the reliability, performance and capacity of the plants during and following wet weather events.

A needs analysis was subsequently conducted for the Mt Crosby WTPs between July and September 2012 which identified mixing issues at Holts Hill Reservoir leading to inadequate disinfection processes. A preliminary design report prepared in August 2013 for the Mt Crosby WTPs also identified these mixing issues and highlighted the requirement for lime saturators at Holts Hill Reservoir. However, the work package for Holts Hill was not progressed (no reasons were provided in the report). In July 2014, a Feasibility and Preliminary Design Options Analysis report was prepared for the non-progressed work packages identified in the August 2013 report.

Following the options assessment, Seqwater is proposing to install lime saturators at the Holts Hill Reservoir to allow for pH corrections to be made post WTP, thereby allowing an optimal disinfection process.

At the same time, Seqwater is taking this opportunity to negotiate with the distribution / retailers on developing a region wide strategy for secondary disinfection, to ensure consistency of approach and process. This project is currently on hold until these important discussions are completed. Once

completed, a Gateway 1 review will be undertaken to take into account the outcomes of the discussions.

Key Assumptions and Status

Information source	• RFI 43 - D14 90279 QE99091_Options Analysis Report_WP 3 and 4_Rev0 chemical storage handling dosing mixing and filter refur.pdf • RFI 43 - D14 84450 Needs Analysis (Asset) (Major Project) Mt Crosby Critical Process Improvements.doc • RFI 43 - D14 57466 TEB TWB- Mt Crosby WTP- Preliminary Design Report - Rev E - DP2 - Flowmeter, Flash Mixing, Sludge Accumu.pdf
Investment Driver	Service improvement – Install lime saturators the at the Holts Hill Reservoir for primary disinfection and final pH correction
Intended Outcome	Optimise pH for secondary disinfection with chloramine through the installation of a lime saturator. Reduce lime solids build up in Camerons Hill Reservoir and improve quality of treated water performance with respect to turbidity.
Current Project Status	Project is in Gateway 2, with concept and detailed designs completed for all of the eight options originally identified. However, the project is on hold at this gateway while discussions are undertaken with distribution / retail service providers to develop a common secondary disinfection process for adoption either across the Water Grid or at each connection point. Once completed, a Gateway 1 review will be undertaken to take into account the outcomes of the discussions.
Procurement and project delivery Process	Project delivery and procurement approach to be determined at later stage business cases.

Options analysis

Three options were shortlisted (out of eight total) and assessed in more detail in a July 2014 Feasibility and Preliminary Design Options Analysis report:

- Option 1: Caustic for pH control at Holts Hill Reservoir;
- Option 2: Lime saturators at Holts Hill Reservoir; and
- Option 3: Vacuum sludge removal at Camerons Hill Reservoir.

The recommended option (lime saturators) chosen in 2014 remains the current preferred option, however, all eight original options identified have had concept studies and designs completed for further analysis (noting that these designs have not been supplied or reviewed). Once discussions with the distribution / retailers have concluded, a preferred option (which is dependent on the outcomes of those discussions) will be progressed via a Gateway 1 review process. The preferred option will be developed in more detail ready for the Gateway 2 business case with detailed designs following this in Gateway 3.

Proposed capital expenditure

Cost estimates for this project were first developed in July 2014 in the Mt Crosby WTP Critical Process Improvements – Feasibility and Preliminary Design. The estimated cost for the project was $8.6m with a contingency of 50 per cent applied (this is considered reasonable given the preliminary design stage of the project). The costs were prepared using Seqwater's own Cost Estimation Guidelines, however a detailed breakdown of the costs was not included in the July 2014 report and is therefore unable to be assessed in detail to determine efficiency.

The July 2014 cost estimate is relatively similar to the current estimate of $8.94m as presented in Seqwater's regulatory submission to the Authority, as well as the estimate of $9.15m presented in the 2017 APMP as shown in Table 31.

Table 31. Forecast capital expenditure – Holts Hill Reservoir pH Upgrade ($ million, Real Dec 2016)

FY	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Seqwater Forecast	$1.4	$3.9	$3.8	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$9.1
Capitalised*	$0.0	$0.0	$9.3	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$9.3

** includes actual expenditure and interest during construction*

Cost estimates for the final preferred option may be different to the costs presented to date given that discussions with the distribution / retailers is ongoing and that a system wide common approach is the ideal outcome. Detailed costs for the preferred option will be developed and confirmed in later gateway stages.

Assessment

Prudency

The drivers for this work are clearly spelled out in the supporting documentation provided for this project and sufficient evidence has been provided to establish the need for the works. Seqwater has not yet established the final timing for the works as the project is currently on hold for discussions with the distribution/retailers. Once these discussions are completed, a Gateway 1 review is to be undertaken with updated options and timing to be examined to take into account the discussions.

Seqwater has sufficiently demonstrated the prudency of this project despite some uncertainty over the timing of the project.

Efficiency

Scope of Works

Scoping of three options was originally developed for this project in the 2014 Business case and while one is preferred, the development of options is on hold pending discussions with the retailers.

The final scope of works will presumably be clear once the discussions are complete and the Gateway 1 review of options undertaken. At this stage we consider that Seqwater has not justified the scope of works.

Standard of Works

The standard of works cannot be assessed at this time given that design has not progressed beyond preliminary design and a further review of options is still to occur.

As such, Seqwater has not demonstrated an appropriate standard of works for this project.

Cost of Works

The proposed expenditure for this project are based on 2014 estimates, which have not yet been updated to current figures as the project is on hold. The costs were developed from high level preliminary designs and while the process followed appears to be reasonable, no breakdown of the costs was provided and it is likely that the costs will change (after negotiations with the retail distributors is completed).

As such, we consider that Seqwater has not justified the cost of the works.

Summary

Based on the preceding analysis, Seqwater:

- Has established the prudency of the project, requiring the installation of lime saturators at the Holts Hill Reservoir to allow for pH corrections, thereby allowing optimal disinfection process. This is a

good example of a service improvement project, whereby the works provide an improved level of service across a number of areas;

- Has not justified the basis of the cost estimate, as the project is on hold until discussions are completed with distribution / retail service providers to develop a common secondary disinfection process for adoption either across the Water Grid or at each connection point. Once completed, a Gateway 1 review will be undertaken to take into account the outcomes of the discussions. Further, the final cost estimates are more than three years old;
- Has not established the final scope of works given the project is on hold and a further review of options is still to be undertaken;
- Has not provided up-to-date project justification documentation that supports the basis of the forecast expenditure;
- Has not established the standard of works as the options assessment phase has not been finalised;

Given this, KPMG recommends the majority of the capital expenditure be removed from the period but leaving an allowance of expenditure, deferred by one year, to undertake such works to review the options, update the cost of works, and undertake the required Gateway 1 review of the project. Table 32 highlights KPMG's recommended adjustments to Seqwater's proposed capital profile.

Table 32. Recommended re-profiling of capital expenditure for the Holts Hill pH Correction upgrade project ($ million, Real Dec 2016)

FY	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Seqwater Forecast	$1.4	$3.9	$3.8	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$9.1
KPMG Proposed	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
KPMG Proposed Adjustment	($1.4)	($3.9)	($3.8)	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	($9.1)

7.6.7 Project 7: Somerset Dam - DSO: Dam safety upgrade

Overview

In 2013, Seqwater commissioned an independent assessment of its 26 dams in order to identify for each dam critical safety issues and contributing risks. This report, referred to as the Portfolio Risk Assessment[18] (PRA), was commissioned on the grounds that a number of Seqwater's dams did not comply with current design standards, in particular flood capacity, and would therefore be in need of upgrade in the future. The PRA provided a detailed quantitative risk assessment using the ANCOLD Guidelines (2003) and was supported by expert panel workshops. The findings from the report, together with more targeted investigations completed in 2014, formed the basis for Seqwater's prioritisation of its risk management strategy and, in turn, its Dam Improvement Program.

Somerset Dam, located on the Stanley River near Kilcoy, has been identified as one of five key dams captured under the Dam Improvement Program. The dam has been classified as an Extreme Consequence under the PRA.

Specifically, the current spillway and outlet works configuration at the dam do not have sufficient capacity to safely pass a Probable Maximum Flood (PMF) in accordance with the Acceptable Flood Capacity (AFC) requirements under the DEWS Guidelines on Acceptable Flood Capacity for Dams.

[18] URS. Seqwater Dams Portfolio Risk Assessment. Dam Safety Risk Management Strategy. November 2013.

Without sufficient capacity to pass the PMF, the dam is at risk of overtopping. In addition to the known capacity issues, the following additional risks were identified[19]:

- erosion of the abutments was assessed as a potential risk to the stability of the dam;
- stability analysis has also shown the dam does not adequately address safety factors under the PMF and Maximum Design Earthquake;
- the dissipater basin slab does not satisfy current design standards for usual, unusual, and extreme flood events; and
- the dissipater training walls do not meet current design standards under submerged and rapid drawdown conditions, as well as current design criteria for overturning of the wall.

At the time of making the regulatory submission to the Authority, the proposed Dam Safety Upgrade project was in Gateway 0. Seqwater's proposed capital expenditure in relation to the project amounted to $125.680m, or $153.793m including IDC. The bulk of this expenditure was forecast to occur between 2022-23 and 2024-25. However, interviews with key Seqwater staff have indicated Dam Safety Upgrade project is now in Gateway 2 following the completion of a detailed independent options assessment.[20] Having completed the options assessment Seqwater are now forecasting expenditure to range between $240m and $251m for the various options being considered.

Key assumptions and Status

Information source	• RFI 48 D17 105237 D14 13009 Seqwater Referable Dams Mount Crosby Weir - Dams Portfolio Risk Assessment - URS 2013.pdf • RFI 49 D17 104955 Response to RFI 49.doc • RFI 48 D17 105236 Response to RFI 48.docx • RFI 37 - D15 13793 DSO - Somerset Dam - Flood Upgrade Options Feasibility Study.pdf • RFI 37 - D17 65489 - DSO - Somerset Dam - Geotech Inv_Concept Design - Upgrade Options Assessment Report (Rev 0) - AECOM - 1.pdf • D17 104951 Response to RFI 47(2).doc
Investment Driver	Compliance – the current spillway and outlet works configuration at the dam do not have sufficient capacity to safely pass a Probable Maximum Flood (PMF) in accordance with the Acceptable Flood Capacity (AFC) requirements under the DEWS Guidelines on Acceptable Flood Capacity for Dams.
Intended Outcome	The primary objectives of the dam safety upgrade are to 1. Achieve Acceptable Flood Capacity (AFC). 2. Satisfy dam stability requirements under design flood loadings. 3. Upgrade the dissipater basin.
Current Project Status	Gateway 0 – reported in Seqwater's regulatory submission to the Authority Gateway 2 – Options assessment underway (reported during interviews)
Procurement and project delivery Process	To be confirmed as part of future business case development.

Options Analysis

Seqwater completed an initial options assessment in February 2015. As part of this assessment, two options were considered:

- Option 1: The spillway configuration remains unchanged but the dam wall and associated infrastructure are upgraded to allow passage of the PMF, e.g. strengthening and stabilising the dam

[19] AECOM. Somerset Dam – Upgrade Options Assessment. July 2014.
[20] Ibid.

wall, providing erosion protection on the abutments, strengthening the stilling basin and walls, and upgrading the spillway and outlet works mechanical and operating equipment if required; and

- Option 2: The spillway and dam are upgraded or modified to include a secondary spillway, which would allow safe passage of the PMF at a lower peak lake level with reduced upgrade requirements for the associated infrastructure.

A second options assessment was completed in July 2017. This assessment provides for a more detailed consideration of a wider range of options (and sub-options) in order to achieve AFC, including:

- Option 1: Spillway Upgrades:
  a) Spillway Crest Lengthening
     - Reduce the number of bridge piers.
     - Convert monoliths H and Q into partial spillway monoliths.
     - Combination of the above.
  b) Spillway Crest Lowering.
  c) Modifying the Spillway Type.
- Option 2: Dam Raise – raise the abutment dam crest levels to allow all flow to pass over the spillway.
- Option 3: Allowing the dam crest at the abutments to overtop. If the dam were allowed to overtop, erosion protection along the abutments would be required.
- Option 4: Including an auxiliary spillway to provide additional discharge capacity.

To form different "upgrade scenarios", AFC upgrade options were considered individually and in combination to assess the resulting design flood level and associated upgrade works.[21] The options may be summarized as follows:

- "Dam Raise" – all flow over the main spillway.
- "Dam Overtopping" – flow over the main spillway and dam crest.
- "Auxiliary Spillway" – including flow over the main spillway, with and without dam overtopping.

Similarly, as part of the same options assessment Seqwater have considered potential solutions in order to satisfy the dam stability requirements in accordance with DEWS requirements and ANCOLD guidelines. These include:

- Post-tensioned anchoring;
- Mass concrete buttressing; and
- Combined Post-tensioned anchoring and mass concrete buttressing;

Further, work completed to prevent the dam crest from overtopping as per the AFC options, will simultaneously prevent potential erosion abutments that would otherwise compromise the monolith stability. Finally, Seqwater has considered a number of dissipater basin types as part of its options assessment.

Table 33 summarises those short listed options considered as part of the assessment.

Table 33. Somerset Dam Upgrade - Shortlisted options

Number	Category	Components
1	Dam raise	• Dam raise.

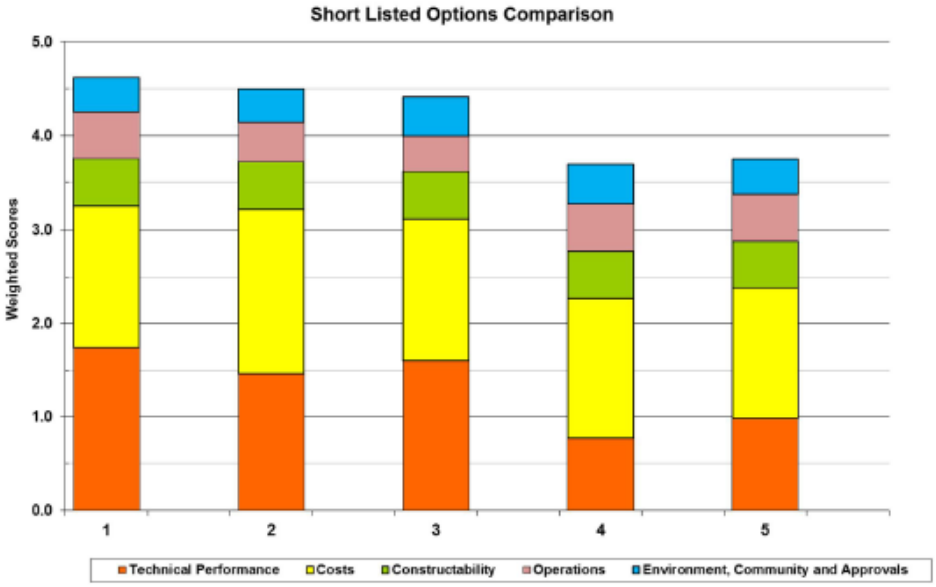
[21] AECOM. Somerset Dam – Upgrade Options Assessment. July 2014.

Number	Category	Components
		• Maintain current SCL and FSL. • Monolith buttressing. • Anchoring of upper abutment monoliths (in addition to buttressing). • Saddle dam. • Dissipater basin upgrade. • Sluice gate upgrade. • Two spillway bridge piers.
2	Dam raise and spillway lowering	• Dam raise. • Lower SCL to RL 99.0 mAHD • Maintain current FSL. • Monolith buttressing. • Anchoring of abutment monoliths (in addition to buttressing). • Saddle dam. • Dissipator basin upgrade. • Sluice gate upgrade. • Two spillway bridge piers.
3	Dam raise and spillway lengthening	• Dam raise. • Maintain current SCL and FSL. • Convert monoliths H and Q into partial spillway monoliths. • Decommissioning of regulator outlets. • Monolith buttressing. • Anchoring of abutment monoliths (in addition to buttressing). • Saddle dam. • Dissipator basin upgrade. • Sluice gate upgrade. • Two spillway bridge piers.
4	Dam overtopping	• Erosion protection along both abutments. • Maintain current SCL and FSL. • Monolith buttressing. • Anchoring of abutment monoliths (in addition to buttressing). • Dissipator basin upgrade. • Sluice gate upgrade.
5	Dam raise and auxiliary spillway	• Dam raise. • Maintain current SCL and FSL. • Monolith buttressing. • Anchoring of upper abutment monoliths (in addition to buttressing). • Auxiliary spillway (crest RL 107 mAHD and 100m length). • Dissipator basin upgrade. • Sluice gate upgrade. • Two spillway bridge piers.

The above options were assessed in accordance with five key selection criteria and provided with a weighted score out of 5. The selection criteria used to evaluate each option include: technical performance, cost, and constructability, dam operations, environmental, community and approvals.

Of the shortlisted options assessed, Options 1, 2 and 3 are considered warranting further investigation based on the weighted score.

Figure 40. Shortlisted options evaluation



Source: Seqwater/AECOM

Proposed capital expenditure

As part of the initial options assessment completed in February 2015, Seqwater consider the cost estimates in two separate, albeit related phases.

The Phase 1 cost estimates were prepared for the purpose of developing an indicative upgrade flood level versus cost curve, i.e. cost estimates were prepared for each dam component requiring upgrade works, across a range of flood levels. These estimates range from $16.9m to $70.5m with specific sensitivity testing performed on these estimates. The cost estimate for the Phase 2 upgrade option was $45.3 million (including percentage allowances and contingencies), ranging from $34.5 million (-30 per cent) to $67.9 million (+50 per cent).

Given the timing associated with the completion of the second options assessment, KPMG understands these estimates have been included in the APMP and therefore regulatory submission to the Authority. It is, however, unclear which combination of estimates Seqwater has chosen to report. Table 34 below provides a year on year breakdown of costs as reported by Seqwater in the APMP and Submission associated with the Somerset Dam Safety Upgrade project.

Table 34. Forecast capital expenditure – Dam Safety Upgrade project ($ million, Real Dec 2016)

FY	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Seqwater Forecast	$0.0	$0.0	$1.6	$2.6	$40.5	$33.9	$25.8	$0.6	$0.7	$0.5	$106.3
Capitalised*	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$153.8	$153.8

** includes actual expenditure and interest during construction*

It is likely the scope of work and associated cost estimates presented as part of the July 2017 options assessment might be a better reflection of the "true" costs associated with the project. Of the preferred shortlisted options (Options 1, 2 and 3) the current best estimate costs range from $240m to $251m as shown as shown in Figure 41. Further sensitivity analysis has been performed with results ranging from -30 per cent to +50 per cent relative to the best estimate reported. In delivering their budgeted cost estimates, Seqwater's independent consultant has noted further detailed assessment is required in order to finalise the costs proposed. Additional project costs to be considered include:

- Seqwater's requirements for infrastructure and facilities at the site including access roads, offices, workshops, car parking.
- Upgrades to the regional road network that will be impacted by construction activities.
- Works associated with managing construction impacts on the local residents, specifically related to noise associated with construction traffic and activities.
- Costs associated with environmental offsets that may be required e.g. to address impacts related to the quality of water discharged from the sluices or related to fish passage requirements that may be triggered by the scale of the proposed upgrade works.
- Costs associated with securing environmental and regulatory approvals for the works.

Figure 41. July 2017 options assessment - Cost estimates

Item		Shortlisted Option				
		1	2	3	4	5
		Dam Raise	Dam Raise and Spillway Lowering	Dam Raise and Spillway Lengthening	Dam Overtopping	Dam Raise and Auxiliary Spillway
Preliminaries and General		$16,275,000	$16,275,000	$16,275,000	$16,275,000	$16,275,000
Spillway Monolith Buttressing (monoliths I to P)		$23,064,444	$21,758,304	$21,726,993	$21,080,667	$21,732,593
Conversion to Spillway Monolith (H & Q)		-	-	$10,739,454	-	-
Abutment Monolith Buttressing (G, H, Q, and R)		$11,966,494	$10,747,054	$6,108,394	$9,501,294	$10,725,981
Breezeway Monolith Buttressing (B-F & S-W)		$32,656,794	$30,665,139	$30,567,323	$31,079,135	$30,616,231
Dam Overtopping Protection (GHD, 2015)		-	-	-	$4,679,331	-
Dissipator basin Upgrade		$18,318,975	$18,318,975	$18,318,975	$18,318,975	$18,318,975
Foundation Drainage Improvement		$500,000	$500,000	$500,000	$500,000	$500,000
Sluice Gate Upgrades and Gantry Crane		$21,908,000	$21,908,000	$21,908,000	$21,908,000	$21,908,000
Saddle Dam		$2,451,798	$2,451,798	$2,451,798	$2,451,798	-
Auxiliary Spillway		-	-	-	-	$9,518,700
Site Rehabilitation, Clean-Up, Facilities		$4,130,000	$4,130,000	$4,130,000	$4,130,000	$4,130,000
CONSTRUCTION COSTS						
Total Direct Cost		$131,271,505	$126,754,270	$132,725,937	$129,924,200	$133,725,480
Contractor Supervision and Site Overhead	15%	$19,690,726	$19,013,141	$19,908,891	$19,488,630	$20,058,822
Contractor Profit	10%	$13,127,151	$12,675,427	$13,272,594	$12,992,420	$13,372,548
CONTRACT COST		$164,089,382	$158,442,838	$165,907,421	$162,405,250	$167,156,850
Contingency & Risk (construction)	30%	$49,226,814	$47,532,851	$49,772,226	$48,721,575	$50,147,055
Total Construction Cost (incl. contingency)		$213,316,196	$205,975,689	$215,679,648	$211,126,824	$217,303,905
INDIRECT COSTS						
Engineering Support During Construction	5%	$10,665,810	$10,298,784	$10,783,982	$10,556,341	$10,865,195
Seqwater Management and Support During Construction	5%	$10,665,810	$10,298,784	$10,783,982	$10,556,341	$10,865,195
Planning, environmental, and heritage approvals	2.5%	$5,332,905	$5,149,392	$5,391,991	$5,278,171	$5,432,598
Indirect Costs (excl. contingency)		$26,664,525	$25,746,961	$26,959,956	$26,390,853	$27,162,988
Contingency (indirect costs)	30%	$7,999,357	$7,724,088	$8,087,987	$7,917,256	$8,148,896
Total Indirect Cost (incl. contingency)		$34,663,882	$33,471,049	$35,047,943	$34,308,109	$35,311,884
PROJECT COST						
Project Cost (best estimate)		$247,980,078	$239,446,739	$250,727,590	$245,434,933	$252,615,789
Low Range	-15%	$210,783,066	$203,529,728	$213,118,452	$208,619,693	$214,723,421
High range	30%	$322,374,101	$311,280,760	$325,945,867	$319,065,413	$328,400,526

Source: Seqwater/AECOM

Assessment

Prudency

The drivers for this work are clearly spelled out in the supporting documentation provided for this project and sufficient evidence has been provided to establish the need for the works. Seqwater has not yet established the final timing for the works as the project is at an early stage in the Gateway 2 process.

Seqwater has sufficiently demonstrated the prudency of this project despite some uncertainty over the timing of the project.

Efficiency

Scope of Works

This project is still at an early stage in the Gateway process (reported in Submission as Gateway 0 but updated to Gateway 2) with options development and assessment for five possible options still ongoing. As such there is no specific scope of works for the project as defined under a preferred option.

The final scope of works will presumably be clear once the discussions are complete and the Gateway 2 business case is completed and a preferred option is recommended. At this stage we consider that Seqwater has not adequately justified the final scope of works as a preferred option has not yet been identified.

Standard of Works

The standard of works cannot be assessed at this time given that design has not progressed beyond preliminary design and a further review of options is still to occur. We note there are specific requirements for dam safety projects, but these have not yet been documented in the still to be commenced design process.

As such, we consider that Seqwater has not yet established the standard of works for this project.

Cost of Works

The proposed cost estimates for this project have not been developed to a robust stage as options assessment is still underway. We note recent significant changes to costs estimates as evidence that the process of developing robust cost estimates still has a long way to go. The previously identified cost estimates (as included in the APMP) were very early stage estimates and cannot be relied upon.

We consider, at this stage, that Seqwater has not justified the cost of the works.

Summary

Based on the preceding analysis, Seqwater:

- Has established the prudency of the project, as the current spillway and outlet works configuration at the dam do not have sufficient capacity to safely pass a Probable Maximum Flood (PMF) in accordance with the Acceptable Flood Capacity (AFC) requirements under the DEWS Guidelines on Acceptable Flood Capacity for Dams;
- Has not yet established the scope of works required as the options assessment process is still ongoing. Five potential options are still be investigated with a preferred option still to be identified;
- Has not yet demonstrated that the required standards of work for dam safety projects have been implemented in the design process, given the design process is at a very early stage;
- Has not provided robust supporting project justification, noting that Seqwater stated during interviews that it is still completing the Gateway 2 process (options analysis); and
- Has not yet demonstrated robust cost estimates given recent, significant cost increases for the five options currently being considered, and the current options analysis remains at Gateway 2.

Consistent with our previous approaches to other major projects where we are unable to assess the efficiency of the proposed expenditure, we propose to remove the expenditure from the capital program. The deferment of expenditure should have little effect in the short term as the majority of expenditure is outside the next three years after which it is likely that another regulatory review will occur. KPMG's proposed re-profiled capital expenditure is presented in Table 35 below.

Table 35. Recommended re-profiling of capital expenditure for the Somerset Dam Safety Upgrade project ($ million, Real Dec 2016)

FY	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Seqwater Forecast	$0.0	$0.0	$1.6	$2.6	$40.5	$33.9	$25.8	$0.6	$0.7	$0.5	$106.3
KPMG Proposed	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
KPMG Proposed Adjustment	$0.0	$0.0	($1.6)	($2.6)	($40.5)	($33.9)	($25.8)	($0.6)	($0.7)	($0.5)	($106.3)

7.6.8 Project 8: Lake MacDonald Dam - PID01688 - DLM: Dam Upgrade Stage 2

Overview

Six Mile Creek Dam (Lake Macdonald) is one of the primary sources of water to the Noosa Water Treatment Plant (WTP); an important component of the water supply for the Sunshine Coast region due to its high capacity and low operating costs. The need for an augmentation or upgrade of the Six Mile Creek (Lake MacDonald) Dam was first identified in 2005 in a Dam Safety Review conducted by Seqwater and what followed over the next seven years to 2012 was a series of reports and investigations covering acceptable flood capacity assessments, dam design reviews, initial development of options, preliminary risk assessments, and detailed concept designs.

Figure 42 below shows the timeline of reports and investigations for this project. As noted in Section 7.6.7, Seqwater conducted a Portfolio Risk Assessment of its dams, which subsequently led to further investigations of the Lake MacDonald Dam. These included spillway anchor investigations and safety upgrade option selection and concept designs along with financial modelling and cost benefit analysis of alternative water supplies. These investigations culminated into a business case for a new dam being completed in May 2014. As a result, the proposed capital program associated with the new dam was included in the current regulatory period with an estimated expenditure of approximately $63.9m (in 2014 nominal terms). The project was reviewed and considered to be prudent and efficient at that time, with no adjustments recommended.

The 2014 business case was prepared, and the cost estimates developed, based on 30 per cent completed detailed design but on inferred geotechnical information from some of the recent studies in 2011 and 2013. However, no foundation specific geotechnical investigations were undertaken at that time. Seqwater subsequently commissioned a specific geotechnical investigation in 2015. This geotechnical investigation identified that the preferred option from 2014, was significantly more expensive than estimated, and as such, a full review of the options analysis was required. Specific work conducted and documentation prepared following the 2015 geotechnical investigation included:

- An options assessment memorandum was prepared in 2015 by the incumbent consultant
- Lake MacDonald Replacement Review was prepared by Seqwater in 2015
- A memorandum on a smaller reservoir downstream of the dam was prepared by the incumbent consultant in 2016
- An internal briefing note on the do nothing option was prepared by Seqwater in 2016
- A revised options assessment report and revised options analysis report were prepared by the incumbent consultant in 2016

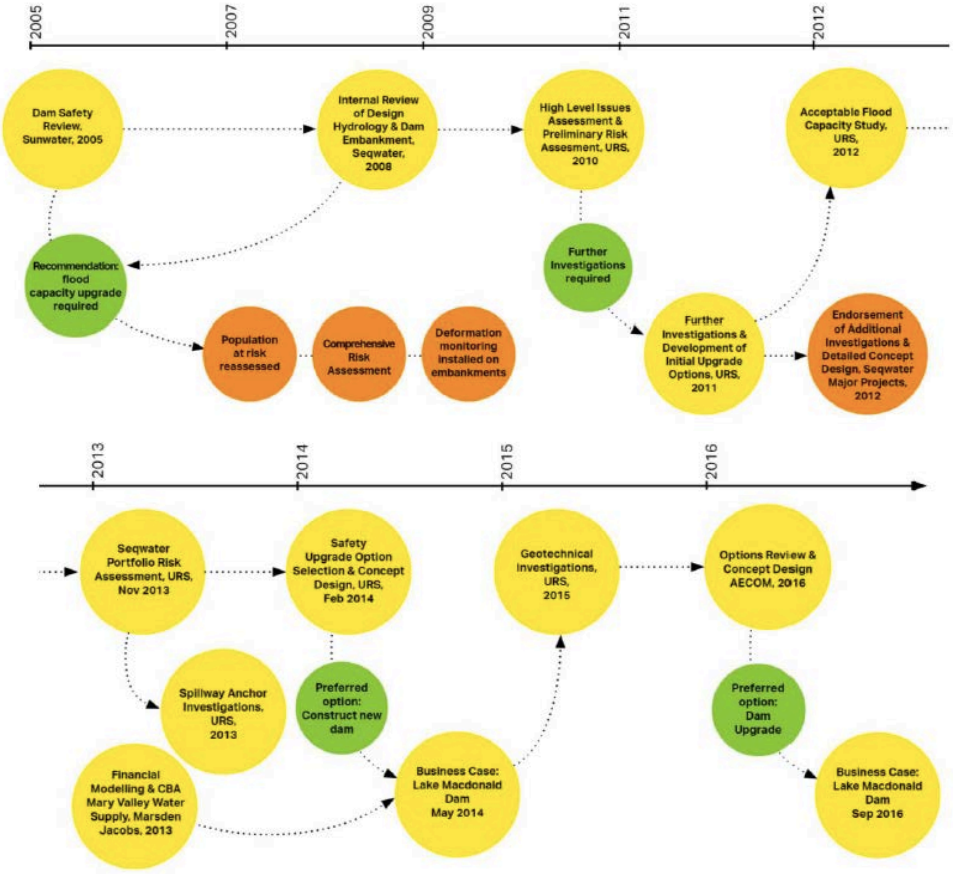
- A Dam Safety Upgrade Concept Design Repot was prepared by the incumbent consultant in 2016.

The 2016 options assessment and concept design report re-assessed three of the five original options from the 2014 business case with the aim of determining whether there was a lowest likely cost option that could achieve the required tolerable risk profile for the dam. One of the previously considered options, upgrading the dam, was assessed to be the preferred option was identified and an updated options assessment and the new preferred option were incorporated into a new Gate 2 business case completed in September 2016 and approved by the Board on 22 December 2016.

The business case sought approval to progress to a detailed design and competitive construction tendering process. Post approval, works to be undertaken included further development of the construction options, value management processes to challenge key assumptions, continuing the gateway approval process, and continuing the independent expert review process.

Seqwater has advised that the detailed design process in relation to the preferred option is well underway and is expected to be completed in October 2017, as per the general project delivery timeframes outlined below.

Figure 42. Timeline of strategic planning, financial, and design documentation for Lake MacDonald Dam Safety Upgrade – 2005 to 2017



Source Seqwater

Key Assumptions and Status

Information source	• RFI36-D16 138666 PID01688 - DLM - Lake Macdonald - Six Mile Creek Dam - Dam Safety Upgrade - Business Case - Asset Planning.pdf • RFI 48 D17 105237 D14 13009 Seqwater Referable Dams Mount Crosby Weir - Dams Portfolio Risk Assessment - URS 2013.pdf • RFI 49 D17 104955 Response to RFI 49.doc

	• RFI 48 D17 105236 Response to RFI 48.docx • RFI 36 - D16 178714 PID01688 - Lake Macdonald Dam Upgrade - Revised Concept Design Report for Upgrade Option - AECOM - 12 D.pdf • RFI 36 - D16 165696 PID01688 - Lake Macdonald Dam Upgrade - Detailed Design Phase Procurement Strategy - 01 Nov 2016.pdf • RFI 36 - D16 161273 PID01688 - DLM - Lake Macdonald - Six Mile Creek Dam - Dam Safety Upgrade - IPC Paper - Asset Planning.docx • D17 104951 Response to RFI 47(2).doc
Investment Driver	Compliance – address specific dam safety risks
Intended Outcome	Bring structure into compliance with the current DEWS guidelines and industry guidelines as reflected by ANCOLD to meet Seqwater's obligations under the Water Supply (Safety and Reliability) Act 2008
Current Project Status	Gateway 2 Major Projects business case was approved in 22 December 2016 with detailed designs progressing to October 2017. The project is currently progressing through to Gateway 3 Investment Decision with a construction business case to be prepared in November 2017.
Procurement and project delivery Process	Preferred delivery method / procurement approach for this project is detailed design then construction. A consultant would be engaged to complete, or substantially complete, the detailed design (single sourced using incumbent preliminary design consultant). A competitive tendering process would be used to preselect tenders based on either a complete design – construction only tender; or a substantially complete design – design and construct tender. An Expression of Interest process would identify likely contractors during the detailed design process so that contractor input to the design can be optimised. The program of works outlined in the 2016 Business Case was: • Approval of business case (Gateway 2) by December 2016 • Final design completed October 2017 • Construction business case approval (Gateway 3) by November 2017 • Construction contract awarded December 2017 • Site mobilisation January 2018 with works commencement April 2018 • Complete construction by July 2019 • Commissioning of project by November 2019 (Gateway 4) • Project closure by December 2019 (Gateway 5)

Options Analysis

The five key options assessed in relation to the dam upgrade (options 2, 4 and 5 were identified and assessed in the 2014 Business Case for this project) include:

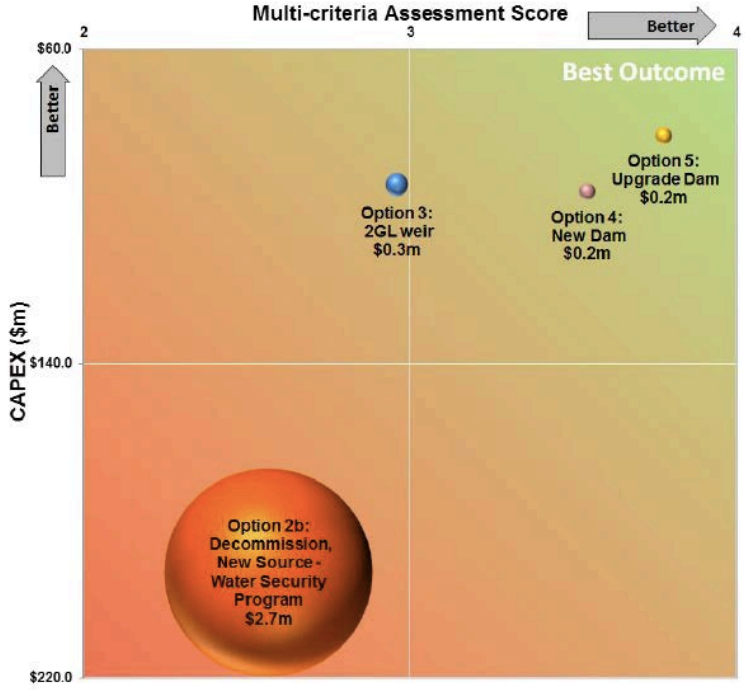
- Option 1: Do the minimum (risk reduction strategy) – involving limiting the consequence of dam failure by purchasing downstream properties which were are at risk and improving monitoring and early warning systems.
- Option 2: Decommission the dam – removal of embankment, spillway, and intake structure; and rehabilitation of dam footprint. This option would also require a replacement water source to service future population growth.
- Option 3: Smaller reservoir downstream of Lake MacDonald providing 25 per cent replacement supply plus an on-stream weir. This option requires re-location of water supply pipelines, treatment facilities, and access roads.

- Option 4: New dam (previously preferred option) – construct a new dam upstream of the existing dam plus a significant temporary coffer dam and diversion channel on the right abutment of the dam. The key changes to this option from the option reviewed in the 2014 business case were the design of the temporary coffer dam and the foundation levels of the new dam.
- Option 5: Upgrade existing dam (current preferred option) – remediating existing dam by replacing spillway, upgrade wing embankments and support with downstream filter buttress, and constructing a new outlet structure. The works also require construction of a temporary pump station to keep reservoir levels acceptable during construction works (dam level requires lowering by 4.3m).

The options identified were assessed using a multi-criteria analysis process which contrasted the options in terms of their technical performance, costs, environmental impacts and benefits, approvals pathway and community impacts, and the impact on Seqwater's operations.

All options assessed were costed to develop both direct capital cost and a net present value cost and all options were assessed to identify the key risks specific to that option. The multi-criteria analysis assessed each project against all these options and assigned a score for the project. The multi-criteria analysis, the annual operating expenditure and the required capital expenditure were then used to rank options as per the approach outlined in Figure 43 below.

Figure 43. Comparison of options based on capital and operating expenditure plus multi-criteria analysis score



Source: Seqwater

Proposed capital expenditure

Cost estimates for the key options considered for this project were first developed in the 2014 Business Case, however as outlined above, these cost estimates were not based on a sufficiently robust foundation. The 2016 Business Case process (leading on from the 2016 review of options and concept designs) examined the five options in detail with the comparative net present cost (NPC) estimates for each option outlined below:

- Option 1: Do the minimum (risk reduction strategy) – NPC = $25.4m to $114.1m
- Option 2: Decommission the dam – NPC = $220.3m to $381.7m

- Option 3: Smaller reservoir downstream of Lake MacDonald providing 25 per cent replacement supply plus an on-stream weir – NPC = $78.2m
- Option 4: New dam (previously preferred option) – NPC = $99.8m
- Option 5: Upgrade existing dam (current preferred option) – NPC = $85.7m

Construction cost estimates for all five options assessed were developed using unit rates from civil contractors which were benchmarked against recent Seqwater projects. Contingency levels were applied based on construction cost estimating guidelines set by the United States Society on Dams. A level of 20-25 per cent contingency was recommended in the guidelines based on the level of design completed to date. Seqwater has adopted a 25 per cent contingency allowance for this project.

The recommended option was developed to a preliminary design stage with a design cost accuracy of 30 per cent assumed. A probabilistic cost estimate was determined to a P90 confidence level as per Building Queensland guidelines with the contingency calculated using the probability simulation process @Risk.

It is noted that the detailed assessment of this project for the 2015 review identified that the upgrade option for the dam was not considered favourable as it had the highest Net Present Cost (NPC) (at approximately $80m compared to $62.5m for the new dam option) of all the options investigated. However as stated previously, the new dam option was based on inferred geotechnical conditions which turned out to be incorrect resulting in a significantly higher cost of the works.

The other options considered, particularly the decommissioning option and the lowered dam option, did not include the significant costs of alternative water supplies to replace the lowered or removed system capacity resulting from these options. In addition, the Do Nothing option considered in the 2015 review did not include the costs associated with reducing the public risk of the dam, that is, the purchase of properties at medium or low risk of flooding.

Table 36. Forecast capital expenditure – Lake MacDonald Dam Upgrade ($ million, Real Dec 2016)

FY	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Seqwater Forecast	$2.4	$40.0	$35.0	$6.8	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$84.2
Capitalised*	$0.0	$0.0	$0.0	$95.6	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$95.6

** includes actual expenditure and interest during construction*

Assessment

Prudency

The drivers for this work are clearly spelled out in the supporting documentation provided for this project and sufficient evidence has been provided to establish the need for the works. The timing of works is set out in the documentation.

As such we consider that Seqwater has sufficiently demonstrated the prudency of this project.

Efficiency

Scope of Works

This project is at detailed design stage with design expected to be complete in October 2017. We have not viewed the detailed design reports to establish the final scope of works however we would expect the scope to be well defined.

At this stage, and subject to confirmation from the detailed design reports, on balance we consider that Seqwater has justified the scope of works.

Standard of Works

As previously identified, we note there are specific requirements for dam safety projects and we would expect these requirements to be clearly outlined in the detailed design documents but these have not been provided for assessment.

At this stage, and subject to confirmation from the detailed design reports, on balance we consider that Seqwater has established the standard of works for this project.

Cost of Works

We consider that an appropriate process has been followed to establish the costs estimates developed to date, however we note that the final costs estimates for the preferred option have not been provided. These cost estimates would be included in the detailed design reports which have not been made available.

At this stage, and subject to confirmation from the detailed design reports, on balance we consider that Seqwater has likely justified the cost of the works.

Summary

Based on the preceding analysis, Seqwater:

- Has established the prudency of the project with the need for the project and how the need might be addressed well established in the supporting documentation;
- Has developed robust project justification documentation in the 2014 business case, detailing a robust options analysis and risk assessment approach;
- Is likely to have established the scope of works for the preferred option in the detailed design reports, which are to be provided for confirmation;
- Is likely to have appropriately set out the standards of work in the detailed design reports which are to be provided for confirmation; and
- Is likely to have justified the final cost estimates in the detailed design reports which are to be provided for confirmation.

Subject to the provision of the detailed design reports, KPMG consider the project to be prudent, and the work completed in developing the proposed cost estimates to be efficient. Based on our assessment KPMG recommend the Authority accept the proposed capital expenditure forecast presented by Seqwater as shown in Table 37.

Table 37. Recommended profile of capital expenditure for the Lake MacDonald Dam Safety Upgrade project ($ million, Real Dec 2016)

FY	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Seqwater Forecast	$2.4	$40.0	$35.0	$6.8	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$84.2
KPMG Proposed	$2.4	$40.0	$35.0	$6.8	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$84.2
KPMG Proposed Adjustment	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0

7.6.9 Project 9: Leslie Harrison Dam - PID01430 - DLH: Leslie Harrison Dam Upgrade Stage 1

Overview

Leslie Harrison Dam is the only raw water source for the Capabala Water Treatment Plant, with the WTP one of three sources supplying the Alexandra Hills Reservoir complex, the main supply for the Capabala and Cleveland regions, with a population of over 90,000.

The original dam was constructed in 1968 with an uncontrolled spillway and was raised in 1984 by installing four vertical lift gates on the spillway crest. With these works, the capacity of the dam increased from 12,955 ML to 24,800ML.

The key driver for this project is compliance based on a dam classification as an Extreme Hazard and that the dam does not meet the required limit of tolerability for risk of failure. The Leslie Harrison Dam is considered to present an unacceptable risk of failure given a 5 per cent probability of failure over a period of 100 years, a population at risk of over 6,500 and a potential loss of life of 120, and an estimated incremental economic damage caused by failure of over $900m with a total damages estimate of over $2.1b. Determining the actual extent of exceedance of the dam is dependent on more detailed loss of life estimates and warning time investigations.

The dam is classified as an Extreme Hazards Dam with a risk that exceeds the limit of tolerability, with the extent of exceedance dependent on more detailed loss of life estimates and warning time investigations.

The original need for this project and various recommended options have been established by many reports including:

- Raising the Leslie Dam Design Report (1980);
- Cost estimate for preliminary design of upgrading the dam (1999);
- Safety Review – Gates test operation (2000);
- Report on Risk Assessment (2002);
- Spillway Investigations – Geotechnical / Geological Report (2003);
- Failure Impact Assessment (2002);
- Probable Maximum Flood Revision (2003);
- Preliminary Analysis of Intake Tower (2008);
- Assessment of Remaining Corrective Actions (2008); and
- Acceptable Flood Capacity Study (2011).

As noted in Section 7.6.7, Seqwater completed its PRA, which quantified the risks posed by all of the identified dam safety issues across Seqwater's portfolio. The assessment identified that the Leslie Harrison Dam should be a key priority and recommended actions to be undertaken with priorities ranging from one month to two years to manage risks. Expert panels engaged to review the Acceptable Flood Capacity project from 2011, and the PRA outcomes from 2013, recommended that the Leslie Harrison Dam be upgraded as soon as practicable.

In January 2014, Seqwater identified short term risk reduction actions that could be implemented to reduce risk, resulting in the lowering of the storage level and removal of the vertical lift gates. Later in

2014, a Dam Safety Review was commenced to review the outcomes of the PRA and progress the recommendations of the assessment. The Dam Safety Review identified a number of actions including further investigation of geotechnical conditions, analysis and optimisation of the dam design and assets.

In 2015, a geotechnical investigation and Preliminary Design process were commenced to address the recommendations of the Dam Safety Review and to develop preliminary designs suitable for the preparation of a business case. This preliminary design report forms the basis of the preferred option identified in the business case.

Seqwater provided an update on the project in the form of minutes from a July 2017 Ordinary Board meeting which outlined that the detailed design process was almost complete with final documents under review for inclusion in an October 2017 Business Case for approval to commence construction in 2018-19.

Key Assumptions and Status

Information source	• RFI 48 D17 105237 D14 13009 Seqwater Referable Dams Mount Crosby Weir - Dams Portfolio Risk Assessment - URS 2013.pdf • RFI 49 D17 104955 Response to RFI 49.doc • RFI 48 D17 105236 Response to RFI 48.docx • RFI 35 - PID01430 Leslie Harrison Dam Upgrade Project Info Sheet.pdf • RFI 35 - OM6 - 02.8 - Leslie Harrison Dam Safety Upgrade Project - Board Meeting July 2017.DOCX • RFI 35 - D16 15841 Leslie Harrison Dam Preliminary Design Report - GHD 2015 - Final_Part1.pdf • RFI 35 - D16 15841 Leslie Harrison Dam Preliminary Design Report - GHD 2015 - Final.pdf • RFI 35 - LHDU - Stage 1 Works - Project Overview and Phasing.pdf • RFI 35 - D15 202528 DLH - Leslie Harrison Dam - Dam Safety Upgrade Stage 2 - Asset Planning Implementation Business Case - Manager Review - November 2015.pdf • D17 104951 Response to RFI 47(2).doc • RFI 35 - D16 15841 Leslie Harrison Dam Preliminary Design Report - GHD 2015 - Final_Part4.pdf
Investment Driver	Compliance – based on dam classification as Extreme Hazard and not meeting required limit of tolerability.
Intended Outcome	To address identified design issues, satisfy requirements of best practice design, substantially reduce risk of failure, future proof dam against further downstream development, and allow case for meeting ALARP principle to potentially remove or delay need for stage 2 upgrade.
Current Project Status	Gateway 2 – Business Case approval received to proceed with detailed design works through Gateway 3. Draft detailed designs and drawings were completed in June 2017
Procurement and project delivery Process	The December 2015 Business Case outlined the following delivery process: • Detailed design completion by December 2016; • Project implementation business Case approval by end of December 2016; • Procurement of contractors by March 2017; • Site mobilisation by April 2017; • Construction completed by December 2018; • Commissioning by January 2019; and

	• Project closure by February 2019. Planning and design services were proposed for delivery through Seqwater's Standing Offer Arrangement, while specific procurement and delivery options are yet to be decided.

Options Analysis

This project involves two overall stages of work, with stage 1 (this project) covering upgrade of the spillway and upgrade of the embankments and main conduits. Stage 2 (not part of this project) comprises upgrading the spillway chute, raising the spillway crest, and extending downstream filters and filter buttresses to providing protection to the downstream face of the main embankment. Trigger events for stage 2 works in the future would include growth or a drought response requirement.

The original scope of work for this project was identified in 1980 and since then a series of investigation reports, safety reviews and failure assessments have followed to reach this point. The scope of works has been fully developed by Seqwater's consultant in a detailed design report completed in June 2017 and presented to the Seqwater Board in July 2017.

Seven key options were developed in the preliminary design document including a number of sub-options for each with a total of 36 options assessed in relation to technical performance, project delivery risks, approvals required, environmental impacts, social and community impacts and implications for Seqwater business operations.

The following five options were shortlisted for inclusion in the business case:

- Option 1: Status quo / continue current operation – does not meet dam safety guidelines or good business practice
- Option 2: decommission the dam – prohibitively high capital costs, introduction of operational and water security risks to the area
- Option 3: permanent lowering of the storage and strengthening the spillway – making the temporary lowering of the dam storage level permanent, stabilising the spillway, and returning the spillway to a free flow. This option addresses the risk of overtopping and the highest probability of failure at the spillway crest, but does not address the main structural issues with the main embankment.
- Option 4: risk based two stage upgrade of dam – the current preferred option was established during the options selections workshops. This involves two stages of work, with stage 1 (this project) covering upgrade of the spillway and upgrade of the embankments and main conduits. Stage 2 (not part of this project) comprising upgrading the spillway chute, raising the spillway crest, and extending downstream filters and filter buttresses to providing protection to the downstream face of the main embankment. Trigger events for stage 2 works would include future growth or a drought response.
- Option 5: Full standards based upgrade of dam – completing both stage 1 and 2 works (as outlined above) immediately.

Risk assessments have been completed for each of the five shortlisted options along with a financial analysis covering capital costs, operational costs and any capital bring forward costs with estimates assessed with a net present cost over 30 years.

Table 38. Scope of Works for preferred option 4 – Leslie Harrison Dam Safety Upgrade Project

Dam component	Description of the proposed works for Stage 1
Spillway works	☐ Modification of the spillway chute floor transition into the stilling basin ☐ Anchors to the ogee crest, designed so the crest will remain stable under flood and earthquake loading ☐ Provision of a code compliant and more convenient access system into the chute for Seqwater personnel ☐ Waterproofing the approach wall system to prevent the development of uplift pressures beneath the upper block wall.
Outlet works modifications	☐ Modifications to the intake tower to increase flood immunity to current crest level of RL 22.25 m ☐ Modifications to the existing access shaft ☐ A new access shaft downstream of the existing access shaft ☐ Extension of the conduit required to account for the toe trench and new weighting berm works.
Embankment upgrades	☐ Construction of a key trench located at the downstream toe of the existing berm through the alluvium and onto the bedrock ☐ Construction of a weighting berm to RL 12.1 m to provide adequate post-earthquake stability ☐ Extension of the filter along the downstream slope of the embankment to the crest of the dam. The crest will be widened to allow for the Stage 2 upgrade.

The preferred option being sought is Option 4. It is noted that Seqwater are aiming to complete stage 1 of this project and then undertake an assessment to determine whether stage 2 can be deferred further or removed from the program of work all together. A detailed design report was completed in June 2017 with the preferred option defined as outlined in Table 38 above, which is an extract from the July 2017 Seqwater Board meeting business papers.

Proposed capital expenditure

Cost estimates for the key options considered for this project were first developed in the 2015 Preliminary Design report and were refined for inclusion in the 2015 Business Case.

Construction cost estimates for all five options assessed appear to be predominantly based on estimates rather than unit rates or benchmarking against similar projects. Only three items of the cost estimate breakdown provided were based on quotes from previous work.

The recommended option was developed to a preliminary design stage with a design cost accuracy of 30 per cent assumed. A probabilistic cost estimate was determined to P50 and P80 confidence levels with the contingency calculated using the probability simulation process @Risk.

Table 39. Forecast capital expenditure – Dam Upgrade Stage 1 ($ million, Real Dec 2016)

FY	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Seqwater Forecast	$5.0	$17.5	$2.2	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$24.7
Capitalised*	$0.0	$0.0	$29.6	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$29.6

** includes actual expenditure and interest during construction*

Insufficient information on the cost estimates was provided to adequately assess whether they are efficient. The detailed design reports under review by Seqwater (as at July 2017) would include significantly more detailed information however these reports have not been made available.

Assessment

Prudency

Seqwater has established the key driver for this project, being based on dam classification as Extreme Hazard and not meeting required limit of tolerability. Further, it has completed a series of investigations over a 30 year period that support the need for the proposed woks to go ahead.

As a result, Seqwater has demonstrated the prudency of this project.

Efficiency

Scope of Works

This project is at detailed design stage with designs completed in July 2017. The scope of works has been fully developed by Seqwater's consultant in a detailed design report completed in June 2017 and presented to the Seqwater Board in July 2017. The scope of work for the preferred option is detailed in Table 38.

Whilst we have not viewed the detailed design reports used to establish the final scope of works, and subject to confirmation from the detailed design reports, we consider that Seqwater has justified the scope of works.

Standard of Works

As previously identified, we note there are specific requirements for dam safety projects and we would expect these requirements to be clearly outlined in the detailed design documents but these have not yet been provided for assessment. At this stage, and subject to confirmation from the detailed design reports, on balance we consider that Seqwater has established the standard of works for this project.

Cost of Works

We consider that an appropriate process has been followed to establish the costs estimates developed to date, however we note that the final costs estimates for the preferred option have not been provided. These cost estimates would be included in the detailed design reports which have not yet been made available.

Seqwater has demonstrated appropriate consideration of uncertainty, with a design cost accuracy of 30 per cent assumed, and probabilistic cost estimates determined to P50 and P80 confidence level with the contingency calculated using the probability simulation process @Risk

At this stage, and subject to confirmation from the detailed design reports, on balance we consider that Seqwater has likely justified the cost of the works.

Summary

Based on the preceding analysis, Seqwater:

- Has established the prudency of the project, as the key driver for this project is compliance based on a dam classification as an Extreme Hazard and that the dam does not meet the required limit of tolerability for risk of failure. This is supported by the outcomes of 11 different studies between 1980 and 2011;
- Has justified the proposed scope of works, which has been fully developed by Seqwater's consultant in a detailed design report completed in June 2017 and presented to the Seqwater Board in July 2017;
- Is likely to have justified the basis of cost estimates, including robust supporting options analysis, utilisation of quotes from previous work, and appropriate consideration of project risks;
- Is likely to have appropriately set out the standards of work in the detailed design reports which are to be provided for confirmation;

- Has robust supporting project justification documentation that justifies the project's cost and timing.

Subject to the provision of the detailed design reports, KPMG consider the project to be prudent, and the work completed in developing the proposed cost estimates to be efficient. Based on our assessment, and subject to our condition of seeing the detailed design reports, KPMG recommend the Authority accept the proposed capital expenditure forecast presented by Seqwater as efficient. Table 31 highlights KPMG's recommended adjustments to Seqwater's proposed capital profile.

Table 40. Recommended re-profiling of capital expenditure for the Leslie Harrison Dam Safety Upgrade project ($ million)

FY	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Seqwater Forecast	$5.0	$17.5	$2.2	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$24.7
KPMG Proposed	$5.0	$17.5	$2.2	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$24.7
KPMG Proposed Adjustment	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0

7.6.10 Project 10: Administration Indirect Costs - Mobile Plant and Fleet Renewals

Overview

Seqwater maintains a fleet of vehicles including passenger, light commercial, and trucks along with mobile plant including boats, mowers, trailers, and forklifts. A renewals program keeps the fleet and mobile plant up to date and in compliance with internal and external guidelines primarily related to the employees' safe use of these assets.

The Mobile Plant and Fleet Policy statement (POL-00029) commits Seqwater to providing fit for purpose fleet and mobile plant solutions that optimises whole of life outcomes and supports the safe use of those assets. The Procedure for Fleet, Mobile Plant and Private Use specifies an asset replacement program for commercial vehicles of 120,000 kilometres or five years whichever comes first, while passenger vehicles are replaced at 75,000 kilometres or three years whichever comes first.

Seqwater have an internal specifications guideline covering the expected ANCAP rating of both passenger and light commercial vehicles, which aims to mandate the purchase of vehicles with a minimum 5 star ANCAP rating for passenger vehicles and a minimum 4 star rating for light commercial vehicles purchased up to 2016 and a minimum of 5 star rating for light commercial vehicles purchased after 2016.

A business case is prepared every five years to approve the renewals expenditure, while for the 2017 APMP, the expenditure is forecast out 20 years. The Business case for the next five years is currently going through the Gateway process.

Seqwater maintains a fleet of around 313 vehicles, with approximately 279 fit for purpose vehicles, 28 pool vehicles, and six private use vehicles (manager level contracts). At the current total FTE, this leads to a ratio of vehicles to staff of around 1:3, which is relatively consistent with other jurisdictions.

Seqwater is currently installing Vehicle Management Systems into existing and new fleet vehicles which is providing vehicle specific data on driving habits and behaviour leading to vehicle use optimisation reviews and driver training programs.

Key Assumptions and Status

Information source	• RFI 39 - SUMMARY - D17 97996 Medium and Major Complexity Project - Gateway 2 - Investment Justification - Mobile Plant an.docx • RFI 39 - PRO-01864 Property, Fleet & Facilities - Fleet & Mobile Plant Policy and Procedure.docx • RFI 39 - PRO-00867 Corporate Safety - WHS Safe Work with Plant Procedure.docx • RFI 39 - D17 99445 FPM002-Process Mapping Disposal.docx • RFI 39 - D17 99444 FPSC002-MPF Disposal Documents -FINAL Checklists.pdf • RFI 39 - D17 99442 FPM001-Process Mapping Procurement.docx • RFI 39 - D17 99441 FPM001A-Process Mapping Procurement-Delivery (1).docx • RFI 39 - D17 99441 FPM001A-Process Mapping Procurement-Delivery.docx • RFI 39 - D17 99439 FPSC01 - Procurement Documents-FINAL Checklist.pdf • RFI 39 - D17 99437 FRG006-Fleet Procurement Plan & Rates.xlsx • RFI 39 - D17 99154 Whole of Life Costs Isuzu vs Ranger.pdf • RFI 39 - D17 99151 2015 - ANCAP Rating - Vehicle Specification - ELT Memo.docx • RFI 39 - D16 150591 Memorandum - Fleet and Mobile Plant Capital Investment Update for 2017 Asset Portfolio Master Plan APMP.pdf • RFI 39 - D17 100409 Final 5 Year Mobile Plant and Fleet Replacement Plan as at 8 August 2017.xlsx RFI 39 - D16 115232 FBC023 - Seqwater Collaborative Maintenance Contract (SCMC) Fleet - Approval SIGNED COPY.pdf
Investment Driver	Compliance / Renewals – fleet and mobile plant are scheduled for replacement to meet internally defined conditions for safe use by employees.
Intended Outcome	The expected outcomes of this renewals program is the continued safe use of fleet and mobile plant by employees while maintaining an optimum whole of life outcome and improving safety.
Current Project Status	This is an ongoing program of expenditure, however the current five year business case is in Gateway 2 and is under preparation.
Procurement and project delivery Process	This program is governed by the Mobile Plant and Fleet Policy statement (POL-00029) and PRO-01864 Fleet and Mobile Plant Policy and Procedure. Safe working with plant is covered by PRO-00867 Workplace Health and Safety Safe Work with Plant. Procurement approaches are outlined in FPM001 – Procurement Process.

Options analysis

Options are not applicable to this project.

Proposed capital expenditure

A set allowance of $1.7m has been determined for each year of the forecast period with actual renewals prioritised within this limit as shown in

Table 41. Additional expenditure is added in special circumstances, for example, in 2017/18 where the number of vehicles was increased to reflect a new insourcing arrangement around collaborative maintenance.

The allowance of $1.7m has remained consistent across the forecast period, and is consistent with that proposed under the current regulatory period. The amount does not get escalated within the 2017

APMP each year into the future implying that Seqwater is seeking to improve the efficiency of delivery within a strict budget level.

The cost estimates are not offset by the revenue received when disposing of vehicles as this is separately accounted for under asset disposals.

Table 41. Forecast capital expenditure – Mobile Plant and Fleet Renewals ($ million, Real Dec 2016)

FY	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Seqwater Forecast	$1.7	$1.7	$1.7	$1.7	$1.7	$1.7	$1.7	$1.7	$1.7	$1.7	$17.0
Capitalised*	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$19.3	$19.3

** includes actual expenditure and interest during construction*

Assessment

Prudency

The drivers for this renewals program are clearly spelled out in the supporting documentation provided for this project and sufficient evidence has been provided to establish the need for the works. Seqwater's procedure for Fleet, Mobile Plant and Private Use specifies an asset replacement program for commercial vehicles of 120,000 kilometres or five years whichever comes first, while passenger vehicles are replaced at 75,000 kilometres or three years whichever comes first.

As such we consider that Seqwater has sufficiently demonstrated the prudency of this project.

Efficiency

Scope of Works

The process for renewals and the scope of the assets covered by the renewals program are well established in the supporting documentation, and during the previous review. It is well accepted that fleet vehicles are replaced consistent with the aforementioned timing.

As such, we consider that Seqwater has justified the scope of works.

Standard of Works

The renewals program is based on key standards which are well established in the supporting documentation which includes policies and procedures for the specific asset renewals.

As such, we consider that Seqwater has established the appropriate standard of works for this project.

Cost of Works

This program of renewals has been ongoing and we note a general reduction in expenditure allowances implying the delivery of efficiency gains.

The process for renewals is also well established in policies and procedures. As such, we consider that Seqwater has likely justified the cost of the works.

Summary

Based on the preceding analysis, Seqwater:

- Has established the prudency of the project, being the replacement of fleet vehicles consistent with agreed replacement policies.
- Has sufficiently established the scope of works covered under the renewals program, being the age of the vehicle, or distance travelled;

- Has sufficiently defined the standard of works under the policies and procedures governing the program;
- Has sufficiently established the cost of the works with an ongoing program lower than historical trends.

KPMG recommends the Authority accept Seqwater's proposed capital expenditure associated with mobile plant and fleet renewals as prudent and efficient as outlined in Table 42.

Table 42. Recommended capital expenditure for the Fleet and Mobile Plant Renewals project ($ million, Real Dec 2016)

FY	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Seqwater Forecast	$1.7	$1.7	$1.7	$1.7	$1.7	$1.7	$1.7	$1.7	$1.7	$1.7	$17.0
KPMG Proposed	$1.7	$1.7	$1.7	$1.7	$1.7	$1.7	$1.7	$1.7	$1.7	$1.7	$17.0
KPMG Proposed Adjustment	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0

7.6.11 Project 11: Mudgeeraba WTP Renewals

Overview

Seqwater has indicated that the single largest renewals program (by expenditure) is the long term Mudgeeraba water treatment plant renewals program. This program is designed to consolidate renewals requirements for different classes of assets at the water treatment plant to provide a focus area of works, package works to provide some economies of scale, and to reduce shared / common works at the site.

Seqwater undertakes renewals using an asset lifecycle approach to provide an optimised whole of life approach to delivering the asset investment program and to maintaining assets already within the program.

When applied to renewals specific works, the key focus areas include the following aspects of the asset life cycle - operations, monitoring, preventative maintenance, renewal, refurbishment and replacement. The approach facilitates the development of planned intervention activities that assist in maximising asset life, with these including inspections, maintenance, repairs, refurbishments, renewals and replacements. The intervention activities are designed to reduce the risk of asset failure and to maximise asset life to achieve the nominal end of life of the asset and extend beyond this life if it is the optimal solution.

The proposed WTP renewals program covers the asset classes outlined below, with expenditure allocated to each class as defined by the timing and costs of the intervention activities:

- Filter media;
- Electrical;
- Instrumentation;
- Pumps and motors;
- Mechanical; and
- Civil.

Key Assumptions and Status

Information source	• RFI 94 Mudgeeraba Water Treatment Plant & East Bank Raw Water Pump Station Renewals.doc • RFI 94 D15 118833 Filters - ACP clean.docx • RFI 94 D15 136907 Pumps - ACP clean.docx • RFI 94 Intervention Unit Rates - Cost Model Derivation.pdf • RFI 94 Asset Renewals Modelling & Forecast - Presentation to Expert Review Panel.pdf • RFI 94 Asset Lifecycle Management Plan.PDF
Investment Driver	Renewals – of assets located at the Mudgeeraba WTP to provide an optimised and whole of life approach to operations achieving efficiencies in operating costs.
Intended Outcome	To ensure that assets reach their optimal asset life and deliver the services intended.
Current Project Status	Ongoing program of works
Procurement and project delivery Process	Delivery and procurement process not specified.

Options analysis

The proposed expenditure for the next regulatory period focusses on the renewal of the filters at the treatment plant. A filter media renewals project includes the replacement of the media material and supporting layers, and refurbishment of the filter structure, filter nozzles, under drains and backwash launders. Filter media typically has up to a fifteen year useful life. Routine visual inspection and testing of filter media occur annually and a detailed engineering condition assessment every five years.

For renewals there are usually few alternative options to consider as the renewal is related to maintaining an existing asset. There are appropriate processes for investigating when a renewals program might become a replacement program or when a new approach is required. This program is focussed on maintaining an operating expenditure solution for as long as is efficient before a capital solution is required.

For this project, the optimum response is the continued renewal of assets at the Mudgeeraba WTP.

Proposed capital expenditure

The initial unit rates for interventions across all asset class plans were first developed in 2014 and were reviewed in December 2016 using actual project delivery costs where possible. The allocated expenditure across the various asset classes is outlined below:

- Filter media = $14,101,250
- Electrical = $285,450
- Instrumentation = $1,090,875
- Pumps & Motors = $886,000
- Mechanical = $901,226
- Civil = $146,750

Overall there are 380 projects which comprise the renewals program of work with a total program estimate of $17.4m as shown in Table 43.

Table 43. Forecast capital expenditure – Mudgeeraba WTP Long Term Renewals program ($ million, Real Dec 2016)

FY	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total

Seqwater Forecast	$0.0	$0.2	$0.7	$0.5	$0.4	$0.0	$10.5	$3.9	$0.4	$0.8	$17.4
Capitalised*	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$21.2	$21.2

** includes actual expenditure and interest during construction*

The derivation of cost estimates for this program is outlined in Seqwater's Intervention Unit Rates – Derivation of Unit Rates for Cost Modelling document which is dated November 2016. The methodology is outlined as to how intervention specific costs are developed for input to the 30 year asset replacement and renewals forecast.

Renewals costs are derived from a combination of unit rates, including Basic Intervention Unit Rates, which allow development of a Basic Intervention Cost with an asset specific Intervention Cost multiplier applied to develop an Intervention Cost. Other factors used to develop the final renewals cost estimates include asset characteristics such as the asset dimension and asset class; specific cost sets including acquisition, installation, design, mobilisation unit rates; and brownfield specific unit rates. Final Intervention Costs are then validated against historical actual costs from a sample of previous projects.

Seqwater undertake a relatively comprehensive process to determine the estimated cost of renewals across the program. The costs are rolled into the ongoing program to provide an allowance of funding. Specific works within the renewals program are individually reviewed and approved as required.

The total allowance for this project across the 10 year price path is $17.4m however this amount includes a significant expenditure of $10.5m in 2024/25 and $3.9m in 2025/26 for the replacement of filters at the WTP. Typically, the average annual allowance for renewals across the 10 year price path excluding these large expenditures is around $0.41m. This is slightly lower than the average annual expenditure forecast proposed for the current regulatory period of $0.52m (noting that this figure includes a larger allowance of $2.2m in the first year - 2014/15).

Assessment

Prudency

The drivers for this renewals program are clearly spelled out in the supporting documentation provided for this project and sufficient evidence has been provided to establish the need for the works. The project is designed to consolidate renewals requirements for different classes of assets at the water treatment plant to provide a focus area of works, package works to provide some economies of scale, and to reduce shared / common works at the site

As such we consider that Seqwater has sufficiently demonstrated the prudency of this project.

Efficiency

Scope of Works

The process for renewals and the scope of the assets covered by the renewals program are established in the supporting documentation, being the replacement of the media material and supporting layers, and refurbishment of the filter structure, filter nozzles, under drains and backwash launders. As such, we consider that Seqwater has justified the scope of works.

Standard of Works

The renewals program is based on key standards which are established in the supporting documentation which includes policies and procedures for the specific asset renewals.

As such, we consider that Seqwater has established the appropriate standard of works for this project.

Cost of Works

This program of renewals has been ongoing and we note a general reduction in base level expenditure allowances (excluding once–off larger expenditure) implying the delivery of efficiency gains. Further,

the cost of the program is focussed on maintaining an operating expenditure solution for as long as is efficient before a capital solution is required. This demonstrates a desire to minimise cost.

The unit rates for interventions across all asset class plans were reviewed in December 2016 using actual project delivery costs where possible, supporting the basis of the estimate.

As such, we consider that Seqwater has likely justified the cost of the works.

Summary

Based on the preceding analysis, Seqwater:

- Has established the prudency of the project, being the renewal of assets located at the Mudgeeraba WTP to provide an optimised and whole of life approach to operations achieving efficiencies in operating costs;
- Has demonstrated the rigour of cost estimates, through use of current unit rates, including asset characteristics such as the asset dimension and asset class; specific cost sets including acquisition, installation, design, mobilisation unit rates; and brownfield specific unit rates. Further, the ongoing program costs are lower than historical trends;
- Has sufficiently established the scope of works covered under the renewals program;
- Has sufficiently defined the standard of works under the policies and procedures governing the program

KPMG recommends the Authority accept Seqwater's proposed capital expenditure associated with the Mudgeeraba WTP Long Term Renewals program. Table 44 summarises the recommended capital expenditure over the forecast period.

Table 44. Recommended capital expenditure for the Mudgeeraba WTP Long Term Renewals ($ million, Real Dec 2016)

FY	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Seqwater Forecast	$0.0	$0.2	$0.7	$0.5	$0.4	$0.0	$10.5	$3.9	$0.4	$0.8	$17.4
KPMG Proposed	$0.0	$0.2	$0.7	$0.5	$0.4	$0.0	$10.5	$3.9	$0.4	$0.8	$17.4
KPMG Proposed Adjustment	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0

7.6.12 Project 12: Mt Crosby Eastbank Raw WPS Renewals

Overview

As noted in Section 7.6.11, Seqwater undertakes renewals using an asset lifecycle approach to provide an optimised whole of life approach to delivering the asset investment program and to maintaining assets already within the program. When applied to renewals specific works, the key focus areas include the following aspects of the asset life cycle - operations, monitoring, preventative maintenance, renewal, refurbishment and replacement. The approach facilitates the development of planned intervention activities that assist in maximising asset life with these including inspections, maintenance, repairs, refurbishments, renewals and replacements. The intervention activities are designed to reduce the risk of asset failure and to maximise asset life to achieve the nominal end of life of the asset and extend beyond this life if it is the optimal solution.

The Water Pumping Station (WPS) long term renewals program is a critical program of works to keep key water infrastructure at optimal operational levels. There is a significant program of work at the Mt

Crosby Eastbank WPS site including this proposed renewals program. Much of the Eastbank assets were built between late 1800's and mid 1900's and it is expected that this infrastructure will require major renewals potentially commencing from 2031-32 onwards. The objective until this timeframe is reached is to provide ongoing renewals to keep key assets in service and operating efficiently.

The proposed Mt Crosby Eastbank Raw WPS renewals program covers the asset classes outlined below, with expenditure allocated to each class as defined by the timing and costs of the intervention activities:

- Pipework;
- Electrical;
- Instrumentation;
- Pumps and motors;
- Mechanical; and
- Civil.

This program is designed to consolidate renewals requirements for different classes of assets at the WPS to provide a focus area of works, package works to provide some economies of scale, and to reduce shared / common works at the site.

Key Assumptions and Status

Information source	• RFI 43 - D14 62997 Mt Crosby East bank TEB and West bank TWB Long Term Planning Report (LTPR)(2).pdf • RFI 55 D14 113184 QE99091_Preliminary Design Report_DP2_Rev0 Mt Crosby Project SKM.pdf • RFI 94 Mudgeeraba Water Treatment Plant & East Bank Raw Water Pump Station Renewals.doc
Investment Driver	Renewals – of assets located within the Mt Crosby Eastbank WPS to provide an optimised and whole of life approach.
Intended Outcome	To ensure that assets reach their optimal asset life and deliver the services intended.
Current Project Status	Ongoing program of works
Procurement and project delivery Process	Delivery and procurement process not specified

Options analysis

The key projects for this program of work are the replacement of the raw water pumps, pump motors and electrical switchboards located at the pump station. The asset management strategy for pumps is detailed in the Pump Asset Class Plan. Raw water pumps are used to harvest and deliver raw water of varying turbidity from the source to a water treatment plant. These are centrifugal pumps and at this pump station are dry mount.

The dry mount centrifugal pump system includes the shaft, mechanical or gland seals, shaft sleeves, neck rings, impellers, impeller rings, lock nuts, and bearings. Due to the limited industry technical information available for pump effective lives and the variety of applications that raw water pumps are expected to operate within, Seqwater has adopted the Financial Asset Lives for this group of assets. Like all pumps, the higher the solid content of the fluid being pumped, the higher the rate of internal wear and as a result, raw water pumps can vary widely in effective life due to differences in source water turbidity.

The Mount Crosby Raw WPS is located on the banks of the Brisbane River and harvests water from the Mount Crosby Weir pool. This source water is a mix of inflows from the Lockyer industrial and grazing districts and releases from Wivenhoe Dam. As a result, this source water supply can have times of very high turbidity.

The typical effective life of the raw water pumps is fifteen years. Preventative actions on raw water pumps are currently time based intervals for inspection and service and engineering condition inspections, which are performed five yearly. These pumps are overhauled upon reaching the trigger condition rather than a full replacement which is typically between a seven and ten year interval for this site with an average effective life of up to forty-five years.

Proposed capital expenditure

The unit rates for interventions across all Asset Class Plans were initially developed in 2014 and were reviewed in December 2016 using actual project delivery costs where possible. The specific unit rates used for the cost estimates for the switchboard renewals, and the pumps and motors renewals for this program, were derived from initial estimates in 2014 and actual similar renewals projects. The allocated expenditure across the various asset classes is outlined below:

- Pipework = $0;
- Electrical = $10,787,000;
- Instrumentation = $136,000;
- Pumps and motors = $9,082,000;
- Mechanical = $2,359,000; and
- Civil = $20,000.

Overall there are 132 projects which comprise this program of work at the Mt Crosby WPS with a total program estimate of $22.3m as shown in Table 45.

Table 45. Forecast capital expenditure – Mt Crosby WPS Long Term Renewals ($ million, Real Dec 2016)

FY	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Seqwater Forecast	$0.0	$4.1	$1.5	$3.0	$4.7	$8.0	$0.1	$0.8	$0.0	$0.0	$22.3
Capitalised*	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$24.8	$0.0	$0.0	$24.8

** includes actual expenditure and interest during construction*

The derivation of cost estimates for this program is outlined in Seqwater's Intervention Unit Rates – Derivation of Unit Rates for Cost Modelling document which is dated November 2016. The methodology is outlined as to how intervention specific costs are developed for input to the 30 year asset replacement and renewals forecast.

Renewals costs are derived from a combination of unit rates, including Basic Intervention Unit Rates that allow development of a Basic Intervention Cost, with an asset specific Intervention Cost multiplier applied to develop an Intervention Cost. Other factors used to develop the final renewals cost estimates include asset characteristics, such as the asset dimension and asset class; specific cost sets including acquisition, installation, design, mobilisation unit rates; and brownfield specific unit rates. Final Intervention Costs are then validated against historical actual costs from a sample of previous projects.

Seqwater undertake a relatively comprehensive process to determine the estimated cost of renewals across the program. The costs are rolled into the ongoing program to provide an allowance of funding. Specific works within the renewals program are then individually reviewed and approved as required.

The proposed program of works for the next regulatory period and the remainder of the 10-year forecast horizon totals $22.3m, with an average annual expenditure of $3.2m. This is significantly higher than the expenditure originally proposed for the same period (2018-19 to 2027-28) under the last pricing

investigation, which totalled only $3.4m with an average annual expenditure of just over $0.86m. In addition, the last price investigation saw significant deferment of renewals for various reasons, primarily around the availability of better asset condition data indicating assets were in better condition than expected and therefore not in need of renewal.

The majority of the renewals expenditure for this program is on electrical switchboards and pump/motor replacements, which are overhauled or replaced on a regular schedule. Despite this, it appears that no allowance was made in Seqwater's previous regulatory submission for these regular activities, at least not at the expected cost identified in the current submission. This omission makes it difficult to assess the efficiency of the investment by comparing how the current expenditure relates to what was previously requested or actually spent.

We note that approximately one quarter of the proposed expenditure is scheduled to occur within the next regulatory period. We are willing to accept the efficiency of the renewals for the next regulatory period noting that the actual expenditure incurred in this period will serve as a guide for assessing the requested expenditure for the following years.

Assessment

Prudency

The drivers for this renewals program are clearly spelled out in the supporting documentation provided for this project and sufficient evidence has been provided to establish the need for the works. Seqwater proposes to continue renewing this asset until at least 2031-32, where it is anticipated that it will require replacing. As such, the objective until this timeframe is reached is to provide ongoing renewals to keep key assets in service and operating efficiently.

We therefore consider that Seqwater has sufficiently demonstrated the prudency of this project.

Efficiency

Scope of Works

The process for renewals and the scope of the assets covered by the renewals program are established in the supporting documentation. This program is designed to consolidate renewals requirements for different classes of assets at the WPS to provide a focus area of works, package works to provide some economies of scale, and to reduce shared / common works at the site

As such, we consider that Seqwater has justified the scope of works.

Standard of Works

The renewals program is based on key standards which are established in the supporting documentation which includes policies and procedures for the specific asset renewals. As such, we consider that Seqwater has established the appropriate standard of works for this project.

Cost of Works

This program of renewals has been ongoing and we note a general reduction in base level expenditure allowances (excluding once–off larger expenditure) implying the delivery of efficiency gains. The process for renewals is also well established in policies and procedures.

The unit rates for interventions across all Asset Class Plans were reviewed in December 2016 using actual project delivery costs where possible. This supports the basis of the cost estimate.

As such, we consider that Seqwater has likely justified the cost of the works.

Summary

Based on the preceding analysis, Seqwater:

- Has established the prudency of the project, being to avoid asset replacements at the Mt Crosby WPS until beyond the 10 year analysis period;
- Has appropriately documented the scope of works required to support renewal of this asset;
- Has sufficiently defined the standard of works under the policies and procedures governing the program; and
- Has sufficiently established the cost of the works, by using recently established unit rates and by forecasting cost estimates that are lower than historical trends.

KPMG recommends the Authority accept Seqwater's proposed capital expenditure associated with the Mt Crosby Eastbank WPS Long Term Renewals program. Table 46 summarises the recommended capital expenditure over the forecast period.

Table 46. Recommended capital expenditure for the Mt Crosby Eastbank WPS Long Term Renewals project ($ million, Real Dec 2016)

FY	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Seqwater Forecast	$0.0	$4.1	$1.5	$3.0	$4.7	$8.0	$0.1	$0.8	$0.0	$0.0	$22.3
KPMG Proposed	$0.0	$4.1	$1.5	$3.0	$4.7	$8.0	$0.1	$0.8	$0.0	$0.0	$22.3
KPMG Proposed Adjustment	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0

7.7 Assessment of Systemic Issues

Overview

For this section we undertook an analysis of our major project assessment to determine if any systemic issues could be identified, that is, issues that are likely transferrable from the major project reviewed to the broader capital program. These systemic issues may then give cause to apply a broader expenditure adjustment across the remaining capital program. Our analysis also relied on the results of the corporate governance review and the capital planning and asset management review sections of the report.

Systemic issues are most commonly identified in ongoing programs of work such as renewals and in specific components of the processes used to develop and deliver major projects. Our assessment of renewals expenditure to date has not identified any specific issues that could be deemed systemic. The latter issues around delivery of expenditure might include issues such as the incorrect application of contingency measures or in the use of incorrect or inefficient unit rates. Further issues assessed as systemic would also include poor performance in the delivery of expenditure such as consistent delays or in the underestimation of time required for key project stages (often around planning approvals or specialist works such as environmental studies or community engagement).

For historical context, the 2015 review of expenditure did not identify systemic issues that resulted in a portfolio wide adjustment despite the number of comments made regarding Seqwater's delivery processes and corporate governance arrangements. In response to comments and recommendations made in the 2015 Review, we note that Seqwater has undertaken to improve their systems and processes in relation to capital planning systems and processes.

Capital Planning Issues

In our review, despite the improvements made to capital planning systems, we have identified a systemic issue in this area which affects our ability to undertake a robust prudency and efficiency assessment of Seqwater's program of capital expenditure.

A large number of the sample projects we reviewed in section 7.6 above were assessed as inefficient due to the lack of robust documentation supporting the project, with the lack of documentation predominantly being related to where the project was currently sitting in the Gateway process. For the twelve sample projects, we noted the following about their Gateway status, as shown in Table 47.

Table 47. Major Projects correlation between Gateway status and commencement date against prudency and efficiency

Project	Commencement	Gateway	Prudent	Efficient
Beaudesert WZX Upgrade	2018-19	2	Yes	No
Mt Crosby Filters Upgrade	2017-18	3	Yes	Yes
Mt Crosby Sedimentation Upgrade	2017-18	1/2	Yes	No
North Pine WTP Filters Upgrade	2022-23	1/2	Yes	No
ICT ERP Renewals	2018-19	0	No	No
Holts Hill pH Correction Upgrade	2018-19	2/1	Yes	No
Somerset Dam Upgrade	2020-21	0	Yes	No
Lake MacDonald Dam Upgrade	2015/16	3	Yes	Yes
Leslie Harrison Dam Upgrade	2015/16	3	Yes	Yes
Fleet & Plant Renewals	2018-19	2	Yes	Yes
Mudgeeraba WTP Renewals	2019-20	N/A	Yes	Yes
Mt Crosby WPS Renewals	2019-20	N/A	Yes	Yes

There is a fairly clear correlation shown in Table 47 between gateway status and whether a project has been assessed as efficient, with all of the projects at Gateway 0, 1 or 2 being assessed as inefficient.

This correlation is unsurprising as the Gateway 3 process – detailed design of one option ready for construction and final cost estimates – results in a robust set of supporting documents for the project. The Gateway 0, 1, and 2 processes involve a wider suite of options with higher level cost estimates and a correspondingly higher degree of uncertainty.

The commencement date of the project will have an impact on the assessment of likely efficiency as well (we are defining commencement as representing the first year that expenditure is included in the capital program). Whilst our scope of works requires an assessment of the prudency and efficiency of all capital projects in the ten year price path period, we note that this approach is likely to result in a large number of projects failing the efficiency test primarily due to the lack of supporting documentation (outlining the detailed scope of works for the preferred option, the standard of works applied in the detailed design, and the detailed final cost estimate) available for the projects at the time of review.

We would expect that projects commencing within the next three years would have a robust level of supporting documentation, as described above. Whereas for projects commencing beyond the next three years, it would be unreasonable to expect that fully developed documentation is available to support the recommendation of a single preferred option, a robust detailed design, and fully developed cost estimates.

This is a standard function / outcome of the normal capital planning process where documentation is developed in a logical progression over a period of time to meet the required completion date for the project. In our general experience, completing detailed project documentation greater than three years in advance is likely to result in some re-work of the documentation at the time the documents are

needed. As a result, we have only applied our assessment of systemic capital planning issues to those projects that are commencing (as defined above) in the first three years of the ten year price path period, that is, the period from 2018-19 and 2021-22 (inclusive).

The correlation we have identified in Table 47 above does not apply to renewals projects which are ongoing programs of expenditure and are assessed in a manner more analogous to operating expenditure, that is, comparing the proposed expenditure to a base historical level and justifying incremental changes to expenditure. For this reason, we have removed any expenditure related to renewals programs from this assessment of systemic issues.

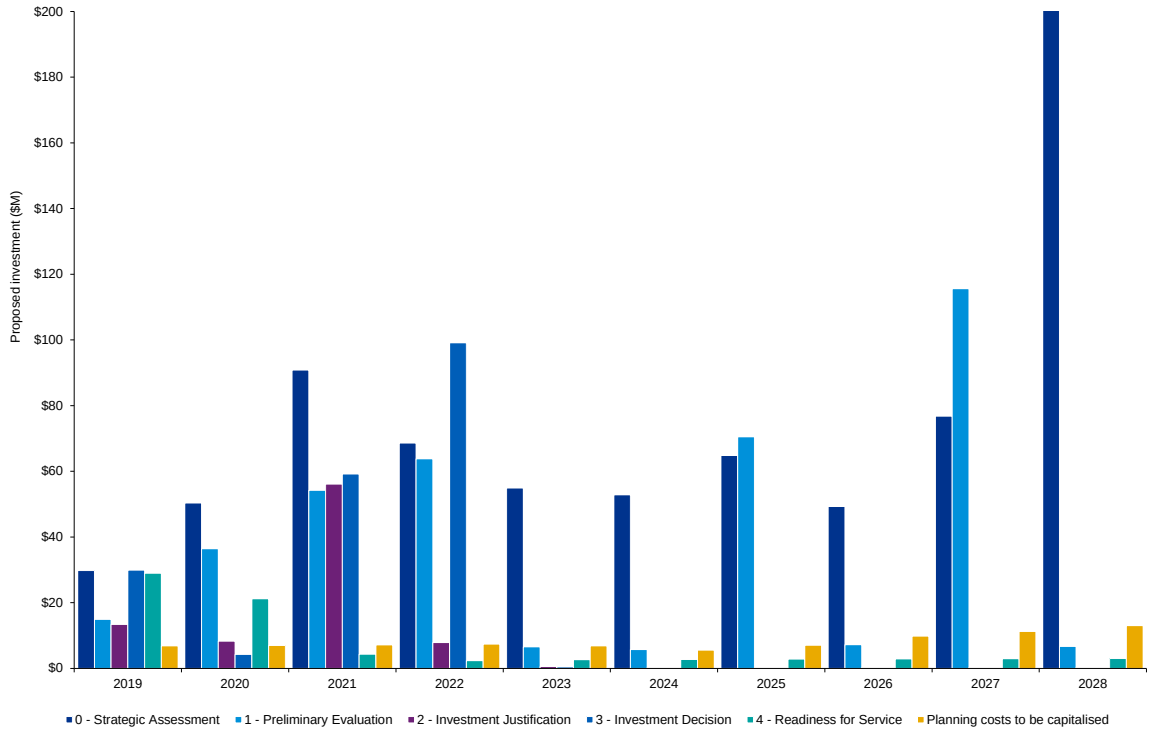
Taking into account these comments and issues above, lead us to a fuller definition of the systemic issue we have identified, that is, where a project (excluding renewals) is currently going through Gateway 0, 1 or 2 processes, and where the project commencement date is within the next three years (2018-19 to 2020-21); then there is a high likelihood that the level of supporting documentation will be insufficient to adequately demonstrate both prudency and efficiency.

Applying the correlation shown in Table 47 and the definition outlined above to the wider capital program would therefore highlight potentially inefficient expenditure. Our first step is to identify the total capital program broken down by the gateway stage that the project expenditure is located within. Figure 44 below shows the quantum of capital expenditure in the program for each year and for each Gateway.

Our analysis of the data supporting Figure 44 shows that:

- There is a total capital expenditure of approximately $1,282.4m in the ten year price path period.
- Of this total expenditure over the ten year period, 79.3 per cent, or approximately $1,017.1 million, of the proposed capital expenditure is from projects in Gateway 0, 1 and 2;
- Of the total capital expenditure over the ten year period, 22.5 per cent, approximately $288.9 million, of the proposed capital expenditure is related to renewals programs, which, as identified above, are excluded from this analysis of systemic issues.

Figure 44. Breakdown of Annual Capital Expenditure 2018-19 to 2027-28 by Gateway (nominal, capitalized)



We have already assessed sample projects (refer section 7.6) with a total value of $316.1 million during the ten year period, that are at Gateway 0 to 2, and we have recommended separate adjustments to these projects and programs. However, these sample projects and programs are included in the total capital expenditure over the ten year period identified above and this value, therefore, needs to be removed.

As outlined previously, we are only applying our assessment of systemic issues to those projects which are at Gateway status 0, 1 or 2, are not renewals, are not already assessed sample projects, and finally that are projects which commence (as defined previously) within the three years 2018-19 to 2020-21. Our analysis of the capital program has identified that the value of projects which fulfil these criteria is $366.7 million.

Drawing on our analysis of projects and our identified correlation in our sample projects, we can therefore conclude that the projects comprising the total identified of $366.7 million for the ten year period; are highly likely to be considered inefficient if they were subject to a robust review (as per our sample projects analysis).

On the basis of the systemic issue identified above we recommend the exclusion of the entire $366.7 million expenditure over 2018-19 to 2027-28. Our process, as outlined in detailed above, is summarised in Table 48 below.

Table 48. KPMG recommended adjustments to total capital program – excluding renewals and sampled projects (real Dec 2016 $ million)

$ million	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Capex prior to Gateway 3 commencing 2018-2021*	$74.5	$90.1	$70.7	$60.6	$10.6	$16.3	$16.1	$9.6	$9.2	$9.1
Recommended Adjustment to Capex prior to Gateway 3*	($74.5)	($90.1)	($70.7)	($60.6)	($10.6)	($16.3)	($16.1)	($9.6)	($9.2)	($9.1)

** Excluding renewals and sampled projects*

We note that it is likely many of these projects will be required in the future and do not dispute the general prudency of these projects. As a result, and in particular for those projects with significant expenditure in the first three years, it is possible Seqwater may proceed with a project regardless of an allowance granted by the Authority, should that project pass through all of the investment gateway steps. If this were to occur we note the Authority may be required to complete an ex-post review of such expenditure as part of future pricing review.

Further, subject to the Authority's discretion in responding to its referral notice, its own considerations of the prudency and efficiency of Seqwater's capital program and the potential impacts on prices, it may choose to adopt one of the alternative approaches previously discussed.

Table 49. Alternative assessments of total capital program – excluding renewals and sampled projects (real Dec 2016 $ million)

FY	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Capex Commencing & Capitalised in 3 years	($61.1)	($65.6)	($19.9)							
Notional Discount (25%)	($18.6)	($22.5)	($17.7)	($15.6)	($3.4)	($5.7)	($6.5)	($5.5)	($4.9)	($2.6)

For example:

- Placing greater focus and scrutiny on only those projects impacting prices in the short term, specifically those projects which commence and are capitalised in the next three years. This approach would amount to an adjustment of $146.7m over the three years with no adjusts in the remaining years of the forecast as shown in Table 49; or
- Applying discounts for expenditure not at gateway 3 or above thereby reflecting the inherent uncertainty that exists with regards to the cost estimates for these projects. For example a 25% discount would result in a total adjustment of $103.0m over the full 10 year as shown in Table 49.

8 Forecast operating expenditure

A major component of the regulatory framework applied to Seqwater is quantification of forecast operating expenditure and a review of the prudency and the efficiency of historical and proposed operating expenditure. This review is an essential input upon which the Authority will form an opinion of Seqwater's revenue requirement (or maximum allowable revenue).

We note the Authority consider operating expenditure to be:

- prudent if it can be justified by reference to an identified need or cost driver; and
- efficient if it minimises Seqwater's long-run costs of providing bulk water supply services.

The assessment of prudence requires KPMG to investigate the rationale and drivers behind the levels of expenditure proposed and to determine whether the reasoning underlying Seqwater's forecast operating expenditure is appropriate. This entails assessing whether the expenditure is consistent with and clearly linked to Seqwater's obligations, be these legislative, driven by corporate vision or mission statements, or by customers' willingness to pay. Efficiency refers to whether the forecasted expenditure is reasonable given time and resource constraints and in some cases whether the forecast expenditure represents the least cost option for providing the associated service. Evidence of efficiency can include feasibility and options studies, independent peer review of costs, and market based contracting.

This assessment has been undertaken by reviewing documentation supporting the expenditure under review ranging from statements of corporate intent to planning and strategy studies, asset management plans or more specifically to design investigations. In the case of operating expenditure, supporting documentation may include operating budgets and plans, evidence of regulatory obligations, levels of service requirements or simply evidence of capital assets requiring ongoing operating expenditure.

The types of evidence that KPMG considered in assessment of Seqwater's proposal include:

- evidence of prudency;
- correspondence from the relevant Minister outlining legislative requirements;
- growth and population projections;
- evidence of an appropriate and robust decision making process;
- surveys and consultations undertaken with customers;
- evidence of efficiency;
- feasibility studies;
- options analysis;
- independent peer reviews of costs; and
- supporting documentation for the determination of contingencies, allowances and escalation factors.

The following tables summarise Seqwater's proposed operating expenditure and KPMG's recommended expenditure profile.

Table 50: Seqwater proposed opex $million

$ million	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Base year (fixed) plus escalation	$207.8	$213.9	$220.2	$227.4	$234.7	$242.2	$250.0	$258.0	$266.3	$274.9
Step changes	$2.6	$2.6	$2.6	$2.6	$2.6	$2.6	$2.6	$2.6	$2.6	$2.6
Efficiency	$0.0	($0.3)	($0.6)	($0.9)	($1.2)	($1.6)	($1.9)	($2.3)	($2.8)	($3.2)
Total fixed opex costs	$210.4	$216.3	$222.3	$229.1	$236.1	$243.3	$250.6	$258.3	$266.2	$274.3
Total variable opex costs	$38.6	$40.8	$43.5	$45.8	$50.5	$55.4	$60.8	$65.9	$71.3	$75.6
Total opex costs	$249.1	$257.1	$265.8	$274.9	$286.6	$298.7	$311.4	$324.2	$337.5	$350.0
Offset costs	($3.6)	($3.7)	($3.8)	($3.9)	($4.0)	($4.1)	($4.3)	($4.4)	($4.6)	($4.7)
Seqwater proposed opex (excl. offsets)	**$245.5**	**$253.4**	**$262.0**	**$271.0**	**$282.6**	**$294.6**	**$307.1**	**$319.7**	**$332.9**	**$345.3**

Table 51: KPMG recommended opex $million

$ million	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Base year (fixed) plus escalation	$207.4	$212.9	$218.8	$225.6	$232.5	$239.5	$246.7	$254.3	$262.2	$270.4
Step changes	$1.1	$1.1	$1.9	$0.8	$0.8	$0.8	$0.8	$0.8	$0.8	$0.8
Efficiency	$0.0	($2.2)	($4.5)	($6.9)	($9.5)	($12.3)	($15.1)	($18.2)	($21.5)	($24.9)
Total fixed opex costs	$208.5	$211.8	$216.2	$219.4	$223.8	$228.0	$232.3	$236.9	$241.5	$246.2
Total variable opex costs	$37.5	$38.4	$39.9	$41.4	$45.0	$47.9	$51.2	$54.7	$58.2	$61.6
Total opex costs	$246.0	$250.2	$256.0	$260.8	$268.8	$275.9	$283.6	$291.6	$299.6	$307.8
Offset costs	($3.6)	($3.7)	($3.8)	($3.9)	($4.0)	($4.1)	($4.2)	($4.4)	($4.5)	($4.7)
KPMG recommended opex (excl. revenue offsets)	$242.5	$246.6	$252.3	$256.9	$264.8	$271.8	$279.3	$287.2	$295.1	$303.2

Figure 45. Difference between Seqwater proposed net opex and KPMG recommended net Opex

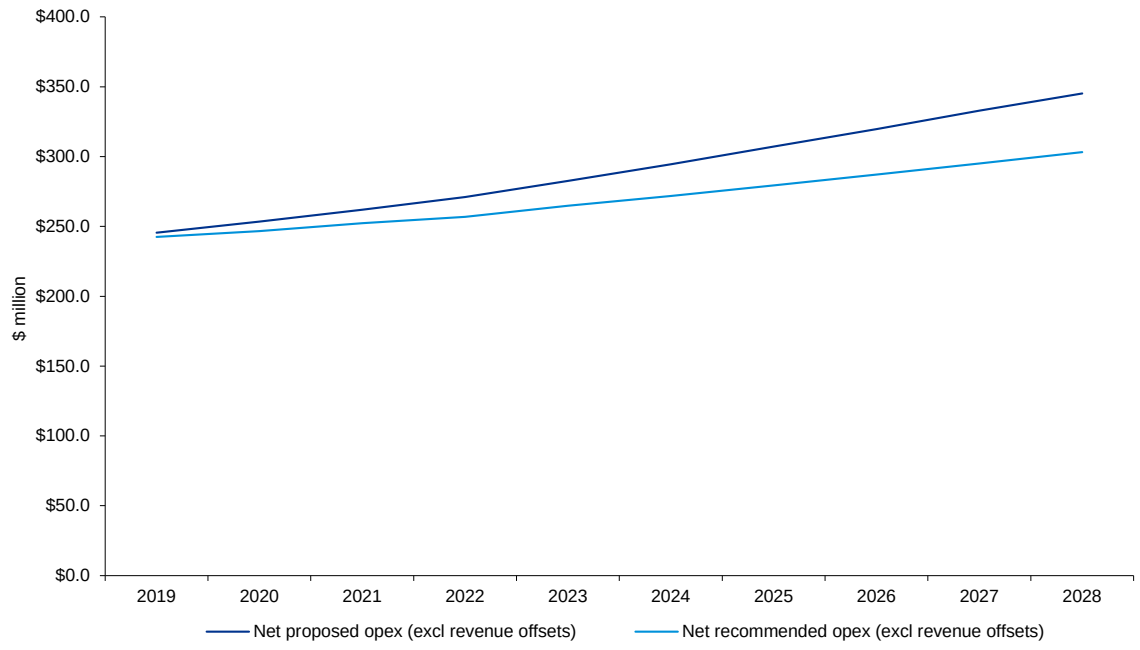


Table 52: Difference between proposed expenditure and KPMG recommendations

$ million	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Annual difference	$3.1	$6.8	$9.8	$14.1	$17.8	$22.8	$27.8	$32.6	$37.8	$42.1
NPV of difference	**$142.5**									

Note: NPV calculations based on a 6% discount rate

8.1 KPMG's analytical approach

Seqwater has developed its operating and maintenance expenditure forecasts for the regulatory period 2018-19 to 2027-28 based on the adoption of a base, trend and step approach. The adoption of this approach dictates the structure that we have developed for our analytical approach to the review of these forecasts.

Base, trend and step approaches have three main elements (the base, the trends and the steps). Our analytical approach has four main components accounting for each of these elements including:

1 **A review of the preceding pricing determination** –KPMG commenced its assessment by first reviewing the Authority's past bulk water price investigations with particular reference to the last operating expenditure review undertaken by CH2M Hill. The purpose of this review was to identify any issues or actions recommended by CH2M Hill and the Authority, which Seqwater have subsequently sought to address over the course of the current regulatory period.

2 **A review of the robustness of the base year (2018-19) for both fixed and variable opex** – KPMG sought to verify that the baseline operating expenditure reflects efficient controllable costs and has appropriate adjustments for non-recurring expenditure and efficiency savings. In doing so, KPMG has assessed the proposed base year against historical opex, reviewing the proposed inclusions and exclusions and assessing the underlying expenditure for potential non recurrent expenditure.

3 **A review of the robustness of the proposed trends** – KPMG's review has sought to provide an independent assessment of the basis for the operating expenditure roll-forward calculations and how key assumptions have been used to determine future operating expenditure requirements. This element of the review addresses the:

- operating expenditure input price inflation forecasts;
- forecast volume growth;
- assumed efficiency improvements; and
- internal consistency of proposed operating expenditure with the capital program.

4 **A review of the proposed step changes –**finally, KPMG considered the proposed expenditure associated with major new initiatives or variations that change the operating expenditure trend.

8.2 Seqwater Bulk Water Price Investigation 2015-18

Seqwater's operating expenditure forecasts were last reviewed as part of the Seqwater Bulk Water Price Investigation 2015-18. The Authority engaged CH2M Hill to undertake the independent review of operating expenditure (CH2M Hill 2015). The expenditure review by CH2M Hill adopted a bottom up approach. This approach identified different streams of activity within Seqwater and then heavily sampled each stream for expenditures and streams of expenditures that are then subject to an assessment based primarily on benchmarking and unit rate analysis.

CH2M HILL identified significant opportunities for efficiency when comparing actual operational expenditure with Seqwater's proposed forecasts. There were three main factors contributing to the inefficiency:

- a lack of substantiation of large cost movements (generally increases) from actual costs to the forecasts, especially when considering the demand data made available;
- a lack of transparency in the cost code transition from actual to forecast figures, with the resulting potential for double-counting of costs; and
- the perpetuation of short-term or one-off expenditures from the 2013/14 year into the annual forecasts.

CH2M Hill found limited justification was provided for cost movements of many of the reviewed operational expenditure items, based on the information provided by Seqwater. To satisfy efficiency review requirements, the proposed investment movements need to be well linked to defined business drivers (both performance and demand) and proven by evidence to be cost effective.

CH2M Hill found that in many cases these requirements were not met. Cost code movements that could not be effectively explained (as opposed to justified) were generally the result of forecasted cost codes rolling-up a number of actual cost items. Seqwater did clarify which cost codes were rolled-up, but CH2M HILL found that some of these were also carried-through in the forecasts. A number of the cost adjustments recommended by CH2M HILL were to eliminate double counting of expenditures that resulted from this.

8.3 Seqwater's forecasting approach

As noted above, Seqwater have adopted a base, trend and step approach to the development of its proposed operating expenditure forecast.

Base, trend and step approaches are the most common approach to forecasting operating expenditure for regulatory purposes. Such approaches have been used by businesses and accepted by regulators across most Australian jurisdictions, including NSW water businesses and IPART, Victorian water businesses and the ESC, Taswater and OTTER, along with regulators of other sectors such as energy network businesses and the AER (see Table 53).

Table 53: Regulatory precedent of Base, trend and step approaches

Price Review	Regulator	State
Water price review 2018	Essential Services Commission of Victoria	VIC
ActewAGL 2015	Australian Energy Regulator	ACT
Ergon Energy 2015	Australian Energy Regulator	QLD
Hunter Water 2016	Independent Pricing and Regulatory Tribunal	NSW
TasWater 2019	Office of the Tasmanian Economic Regulator	TAS

This approach establishes an efficient base year, rolls forward the efficient base operating expenditure to take account of a combination of scale growth, input price growth and efficiency improvements and includes adjustments for material step changes to costs. Step changes could, for example, flow from new regulatory obligations.

While Seqwater has adopted a base, trend and step approach, its approach differs from that typically applied in a number of significant aspects:

- Typically the base year will be either the last year of actual data or a summation of the last couple of years of actual data, Seqwater have chosen to base the base year on two years of detailed bottoms up budgeted data (2017-18 and 2018-19).
- The model accounts for growth escalation over the regulatory period through variable operating expenditure.

Along with the adoption of a base, trend and step approach, Seqwater has made a clear distinction between forecasts of fixed operating expenditure and variable operating expenditure. Variable costs are defined as those that vary with the level of service provided whereas fixed costs are those that don't.

These difference between the Seqwater's base, trend and step approach and the typical approach are discussed in more detail within the following sections.

8.4 Base year

8.4.1 Fixed opex: approach

The base year is intended to be a normalised year of efficient operating expenditure. It is typically based on either the last preceding year of actual expenditures or actual efficient costs incurred over the last couple of years. These actual costs are typically adjusted as follows:

- the removal of any one-off or non-recurring expenditure items incurred in that year, or the addition of any normally occurring items that did not occur in that year;[22]
- the removal of any further ongoing cost savings or efficiency commitments that will be realised in the final year of the current regulatory period (2017-18).

Seqwater has taken a different approach. Its base year (2018-19) is based on two years of bottom up budget forecasts (2017-18 and 2018-19). The budget utilised a zero based budgeting process that required all budgeted expenditure to be justified and supported by evidence such as contractual arrangements, efficiency programs, baseline operating scenarios and trends in actual expenditure for the preceding two years.[23]

KPMG's expectation is that the zero based budgeting process will account for the removal on non-recurring expenditures and the inclusion of unaccounted items deemed to normally occur. It should also account for the removal of any efficiency requirements realised in the last year of the current regulatory period.

In practice we have found that the adoption of a base year developed over two budgeted years of forecasts makes it extremely difficult to verify that the appropriate base year adjustments have occurred. The budget process is an internal process not one that has been developed with transparency to third parties as a primary objective. Identifying non-recurring and recurring costs has therefore been problematic and could only be achieved in an indirect manner (see discussion in section 8.4.3).

[22] Normally occurring items that have not been included are different from the step changes discussed later in the chapter. These items are simply expenditures that would normally be accounted for but for some reason are excluded from that particular year. Such expenditures may range from small to large. Steps as defined in the report relate to materially large expenditures associated with significant changes in Seqwater's operating environment (such things as new obligations or new large scale capacity being brought on line).

[23] Sewqwater 2017-18 Budget Guidelines RFI 57

We recommend that at the next price review Seqwater adopt a base year that is based on the last preceding year of actual expenditures. This approach would provide for greater simplicity and a higher degree of transparency.

Seqwater's proposed opex including the base year expenditure is outlined in Table 54.

Table 54: Seqwater's proposed base year operating expenditure ($million)

$ million	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Revenue offsets	($14.9)	($15.3)	($15.6)	($16.0)	($16.6)	($17.3)	($17.7)	($18.1)	($18.6)	($19.0)
Base year (fixed) plus escalation	$207.8	$213.9	$220.2	$227.4	$234.7	$242.2	$250.0	$258.0	$266.3	$274.9
Step changes	$2.6	$2.6	$2.6	$2.6	$2.6	$2.6	$2.6	$2.6	$2.6	$2.6
Efficiency	$0.0	($0.3)	($0.6)	($0.9)	($1.2)	($1.6)	($1.9)	($2.3)	($2.8)	($3.2)
Total fixed opex costs	$210.4	$216.3	$222.3	$229.1	$236.1	$243.3	$250.6	$258.3	$266.2	$274.3
Total variable opex costs	$38.6	$40.8	$43.5	$45.8	$50.5	$55.4	$60.8	$65.9	$71.3	$75.6
Total opex costs	$249.1	$257.1	$265.8	$274.9	$286.6	$298.7	$311.4	$324.2	$337.5	$350.0
Offset costs	($3.6)	($3.7)	($3.8)	($3.9)	($4.0)	($4.1)	($4.3)	($4.4)	($4.6)	($4.7)
Seqwater proposed opex (excl. offsets)	**$245.5**	**$253.4**	**$262.0**	**$271.0**	**$282.6**	**$294.6**	**$307.1**	**$319.7**	**$332.9**	**$345.3**

Another difference with Seqwater's approach is that it does not remove non-controllable expenditure from the base year. Seqwater have estimated the annual efficiency or productivity gains that result through its efficiency target separately by applying the efficiency rates to controllable opex separate from the base year calculations and then accounted for the dollar value of the efficiencies in the roll forward of the baseline expenditure.

8.4.2 Fixed Opex: Assessing the validity of the base year

One of the core activities in this review is an assessment of the appropriateness of the base year for extrapolation. Ideally the base year should represent a normalised year of prudent and efficient expenditure that is representative of the base or underlying expenditures that will be incurred over the regulatory period.

The degree to which the base year is normalised is discussed in section 8.4.3.

In the absence of activity based costing it is difficult to make definitive statements regarding the efficiency of the expenditure in the base year. In order to make a judgment on efficiency we have adopted an approach that considers efficiency from multiple aspects. We have assessed the base year relative:

- To historical levels of actual operating expenditure. Decreasing trends in expenditure are consistent with the contention that Seqwater is transitioning towards the frontier in terms of efficiency and that given growth in volumes, has most likely remained efficient since the CH2Hill review (assuming no material changes in operating environment).
- To the operating expenditure approved by the QCA in the current revenue requirement: During the previous review CH2Hill conducted a highly detailed bottoms up assessment of expenditure. This implies that the current revenue requirement is based on what would be considered the best assessment of efficient expenditure possible at the time the review was undertaken.
- In terms of per volume measures, to other comparable water utilities. Such benchmarking will give some indication of how Seqwater operates relative to its peers and will help inform our assessment. We note that care needs to be taken when in interpreting the results of benchmarking. There are many factors that can influence costs that are geographically specific or specific to the utility and

its individual obligations, for this reason we have exercised care in the interpretation of our benchmarking.

- To the typical approach. Finally, we have taken the last year of actual expenditure 2015-16 and extrapolated this forward to the base year 2018-19 using the approach developed by Seqwater. This approach is similar to the base step trend approaches adopted in other jurisdictions and gives us a point of comparison. As with benchmarking, we have interpreted the results of this analysis with care.

Comparisons with historical opex

The first step in considering the base year is to compare the proposed expenditure (adjusted for inclusions and exclusions) against historical trends in operating expenditure. The expectation is that the base year will be largely consistent with historical operating expenditure, assuming that Seqwater is operating in a fairly steady state environment.

Seqwater's proposed fixed opex for 2018-19 is compared in the following graphs with opex from 2015-16. Based on figure 51, opex appears to be relatively stable with an increase in 2017-18 due primarily to employee expenses and an increase in contractor service delivery costs (see Table 55).

Figure 46: Total fixed opex (net of cost offset)

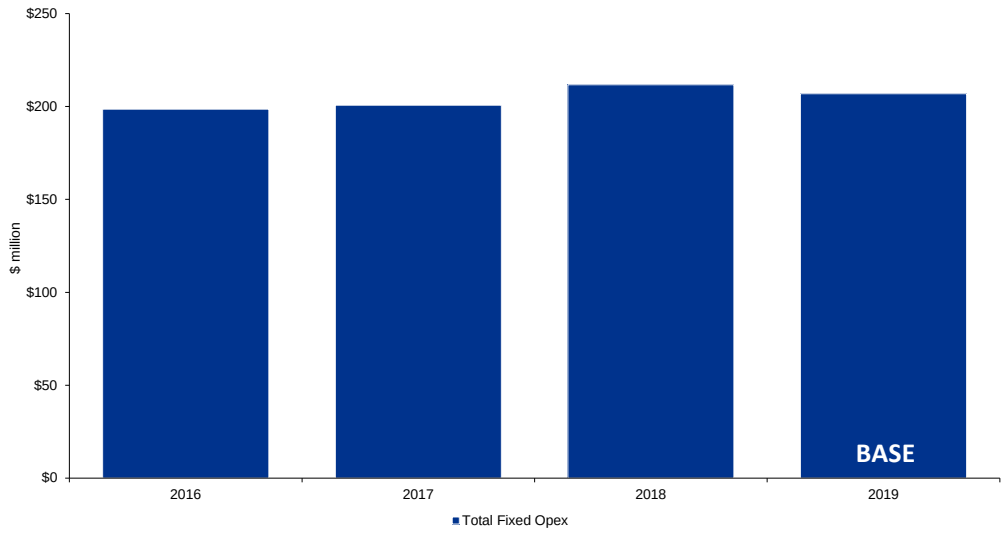


Table 55: Total fixed opex (net of cost offset, $ millions)

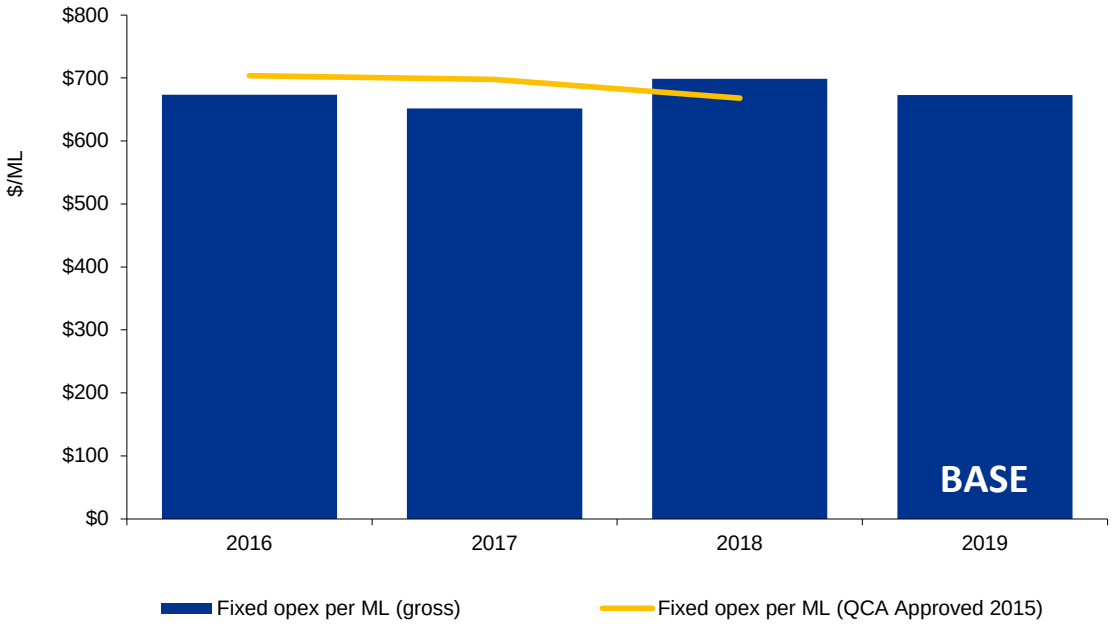
Opex categories	2016	2017	2018	2019 (Base Year)
Employee Expenses	$81.2	$87.5	$91.8	$94.0
Contract Labour	$3.0	$2.2	$1.3	$1.2
Other Materials and Services	$47.6	$47.1	$48.2	$39.0
Insurance	-	-	-	$5.0
Contractors (Service Delivery)	$60.2	$58.0	$64.4	$67.5
Chemicals	$0.5	$0.6	$0.4	$0.4
Electricity	$6.0	$5.4	$5.5	$5.6
Total gross fixed opex	**$198.5**	**$200.8**	**$211.6**	**$207.8**

Source: Sewqwater reguatory finance model

We have also examined opex for the base year 2018-19 relative to historical opex on a unit basis for total volume of bulk water (i.e. opex per ML). This analysis allows us to account for the impact of growth

on opex over time (see figure below). To complete this analysis we first reviewed the historical fixed opex taking into consideration the actual demand for the period as shown in Figure 47. We compared actual fixed opex per ML of actual volumes to the forecasted fixed opex per ML of forecasted volume (as approved by the QCA. For the first two years of the regulatory period (2015-16 and 2016-17) we note the fixed opex was below that approved by the QCA. However, in 2017-18 fixed opex per ML is above the approved per ML rate.

Figure 47: Fixed gross opex per unit (actual ML bulk water) historical and base year

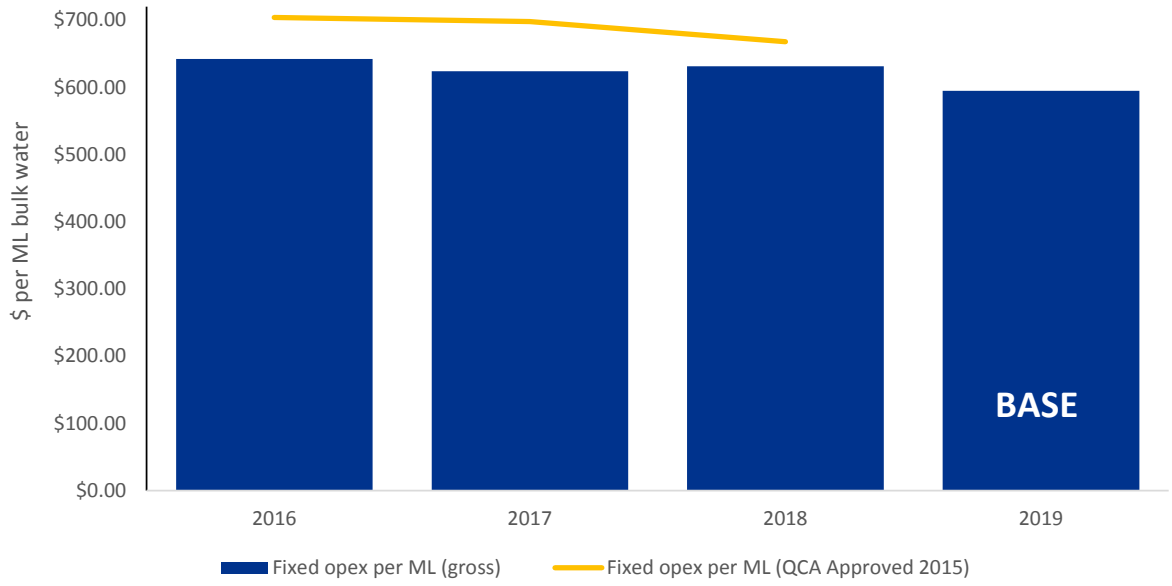


This observed increase in the per ML rate of fixed opex is driven by an unanticipated contraction in actual demand in 2017-18 of approximately 10%.

Fixed opex is by definition non responsive (in the short run) to changes in volumes (or demand). Demand itself is exogenous to Seqwater and is largely outside of its control. In order to provide meaningful comparisons of productivity in relation to fixed opex we should account for uncontrollable changes in volume or demand. For comparison purposes, we have reviewed the historical opex and approved opex on a per ML basis based on a common volume denominator. We adopted QCA's forecast volumes and applied them across both the actual fixed opex and the approved fixed opex. Equally, we could have adopted actual volumes as a common denominator across both approved and actual fixed opex. If we had done so, the results would have led to similar outcomes.

Figure 47 reports the outcomes of comparisons based on a common volume denominator. It is readily apparent from the figure that once the decline in 2017-18 demand is accounted for, actual opex per ML is lower than that of each year of QCA approved expenditures. Given that demand is largely outside of Seqwater's control we do not believe that per ML cost comparisons of fixed opex indicate gross inefficiencies in the base year fixed opex.

Figure 48. Fixed gross opex per unit (QCA approved ML bulk water) historical and base year

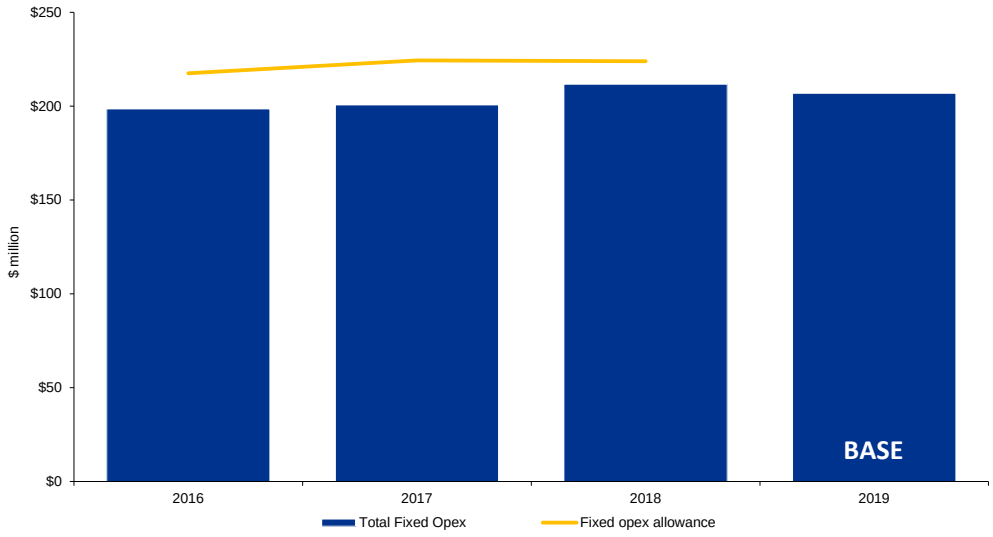


Despite an increase in 2017-18, it is evident on a per ML basis that fixed opex per ML in the base year is relatively stable when compared to the previous three years. Further, fixed opex per ML in the base year is projected to be slightly lower than the fixed opex per ML projected for 2017-18. This decline in fixed opex is consistent with Seqwater's contention that it has achieved economies of scale and scope over the course of the current regulatory period.

Comparisons with opex allowance

The second step in considering the base year is to compare it against the opex allowance approved by QCA in the current revenue requirement. Actual expenditure and for 2015-16 and 2016-17 is lower than that approved and allowed for by QCA in the previous decision. The two budgeted years of 2017-18 and 2018-19 are also lower than the level of operating expenditure approved by the QCA in the previous price determination.

Figure 49: Total fixed opex (net of cost offset)



The figure shows the relative difference between actual opex and that recommended by the Authority as efficient for the last regulatory period. Recommended opex is represented in the figure by the orange trend line. As can be observed, for each year of the current regulatory period Seqwater has been able to deliver services at a level materially lower than that approved as efficient in the previous price investigation. The delivery of services at costs lower than those independently reviewed by CH2HILL and recommended by the Authority is consistent with the contention that the opex comprised within the base year is efficient.

Comparisons with other utilities

Drawing useful comparisons in relation to efficiency or productivity with comparable utilities is problematic and requires access to adequate data. Detailed frontier based statistical analysis is outside the scope of our current review of Seqwater's expenditure, however there is value in comparing Seqwater's operating expenditure per unit of output against those levels experienced by other water utilities.

The cost per ML of water supplied by Seqwater as implied by its proposed base year is outlined in the table below. We also note that these comparisons are by necessity based on total opex as the National Performance report does not distinguish between fixed and variable opex.

Table 56: Total opex per ML Seqwater

Financial Year	2015-16	2016-17	2017-18	2018-19 (Base Year)
$ per ML	$814.4	$810.3	$782.5	$769.4

Source: BOM National Performance Report 2015-16

The degree to which such analysis can inform our decision is heavily qualified and is dictated by the quality of the available data. We have sourced public data from the National performance report 2015–16: urban water utilities published by the Bureau of Meteorology. In making comparisons we are aware that individual utilities are engaged in a number of activities and provide a number of services that differ from those provided by Seqwater. These utilities may also differ in their size and networks density along, the nature or composition of their customer base and the regulatory environments in which they operate. Nevertheless, broad comparisons across a multitude of utilities does provide a broader context to Seqwater's proposal.

The following table outlines the opex per ML of water delivered by bulk water utilities.

Table 57: Opex per ML of water delivered, bulk water utilities

$ per ML	2012-13	2013-14	2014-15	2015-16
Gladstone Area Water Board	-	$1,041.9	$969.2	$866.8
Goldenfields Bulk Water Supply	$341.9	$333.5	$330.9	$327.6
Melbourne Water	$1,334.1	$1,892.3	$1,824.1	$1,618.3
Rous Water	$1,161.0	$1,140.7	$1,135.1	$1,117.1

Source: BOM National Performance Report 2015-16
Note Opex per ML is calculated as 'operating cost – water' divided by 'volume of bulk water exports ML'.

Compared to the bulk water utilities that are included in the National Performance report, Seqwater is broadly consistent with the Gladstone Area Water Board while being material less than Melbourne Water and Rous Water.

In relation to large water utilities (see following table), with the exception of Hunter Water, Seqwater' opex per ML is materially lower than most large utilities. This difference is most likely attributable to the additional levels of activity and service undertaken by these utilities (such as the provision of retail services and potentially higher levels of treatment). On balance there does not appear to be any evidence of inefficiency in the Seqwater proposal.

Table 58: Opex per ML of water delivered, large water utilities

$ per ML	2012-13	2013-14	2014-15	2015-16
Barwon Water	$1,363.9	$1,529.2	$1,472.6	$2,308.8
City West Water	$2,010.7	$2,787.9	$2,474.3	$2,520.7
Gold Coast City Council	$2,778.1	$2,875.8	$3,146.8	$3,036.1
Hunter Water Corporation	$764.5	$706.6	$872.4	$779.7
ICON Water	$1,275.6	$1,097.1	$1,037.2	$1,405.8
Logan City Council	$4,149.1	$4,079.1	$4,193.2	$4,027.9
Queensland Urban Utilities	$2,954.5	$3,223.2	$3,334.7	$3,370.2
SA Water - Corporation	$0.0	$1,491.3	$1,398.0	$1,449.4
South East Water Ltd	$1,943.6	$3,051.8	$2,508.4	$2,661.3
Sydney Water Corporation	$1,454.2	$1,410.7	$1,388.5	$1,407.7
Tasmanian Water and Sewerage Corporation	$0.0	$0.0	$1,550.6	$1,698.1
Unitywater	$2,799.5	$3,059.3	$3,270.9	$3,354.9
Water Corporation - Perth	$1,109.9	$1,143.3	$1,172.0	$1,173.0
Yarra Valley Water	$1,932.6	$2,869.7	$0.0	$2,725.0

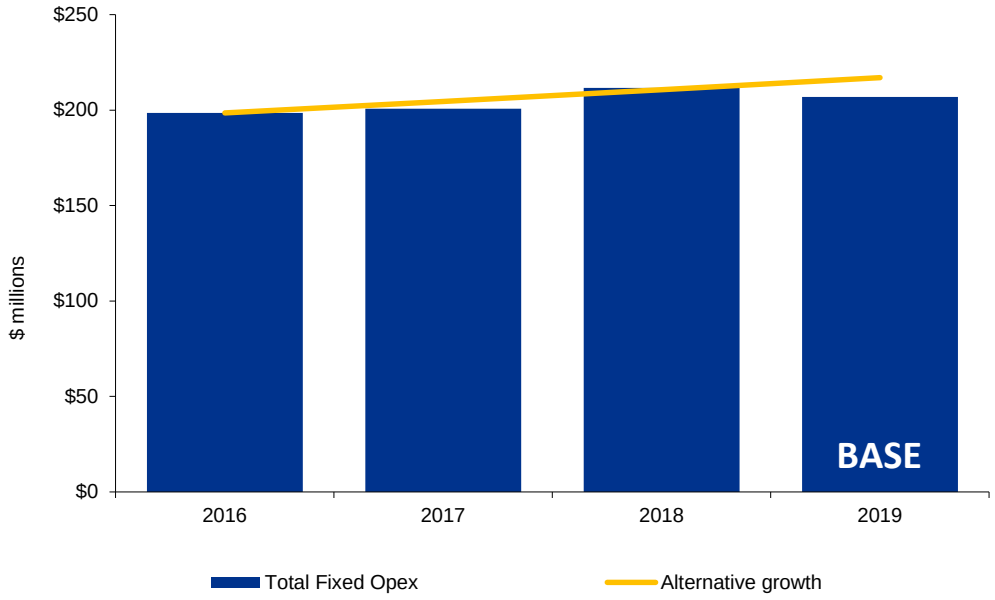
Source: BOM National Performance Report 2015-16
Note Opex per ML is calculated as 'operating cost – water' divided by 'volume of water supplied' – across all user groups.

Comparisons with alternative approaches to establish a base year

The final comparison of the base year for fixed opex that we made was to assess the budgeted base year of 2018-19 against what would typically be construed to be the base year under a base step and trend approach, in this case the last year of actual expenditure data 2015-16. We note that we were not able to account for non-recurrent expenditures in the 2015-16 year, however the analysis does provide for a useful point of comparison. KPMG took the final year of actual expenditure data and escalated it to 2018-19 based on extrapolating the first year of the escalation factors proposed by Seqwater back to 2015-16.

The comparison indicates that the Seqwater's proposed base year is lower than it would have been had it been based on the last year of actual expenditure ($236.9million). This analysis is indicative only and must be treated carefully as we cannot verify the extent of non-recurrent expenditure in the last year of actuals (although we note that total expenditure is lower in 2015-16 than in subsequent years) we also note that the growth trends proposed by Seqwater were not developed to extend back to 2015-16 and reflect Seqwater's expectations from 2018-19 onwards. Based on these observations and subject to our review of inclusions and exclusions, KPMG recommends QCA accept Seqwater's proposed base year.

Figure 50: Total fixed opex (net of cost offset)



Addition of further inclusions and exclusions

In section 8.6.2 we review the step changes proposed by Seqwater to apply to the base line expenditure over the course of the regulatory period. In our analysis we identify a number of proposed steps that we consider to not be consistent with nature of step change as typically defined within a base trend and step approach to opex forecasting. These expenditures are either non-material in nature or do not relate to new obligations. Under a base trend and step approach, these expenditures should be considered as either exclusions or inclusions to the base year. Accordingly we have recommended that an additional $0.2 million dollars be added to the base year. This amount represents an annualised expenditure stream that provides Seqwater with an NPV equivalent to that of the relevant proposed steps. This additional inclusion when combined with further exclusions identified in section 8.4.3 of approximately $0.5 million, result in a base year lower than that proposed by Seqwater and is therefore one that meets the efficiency measures identified in the above analysis (base year lower than historical opex, base year lower than previously allowed opex, and a cost per ML comparable to other utilities).

8.4.3 Fixed opex adjustments to baseline inclusions and exclusions

The second aspect of the base year that we need to review is the degree to which it represent what would be considered a normative year. The core activity in ensuring that the year is normative is providing the Authority with advice as to whether the year does or does not include the right activity base and in particular:

- excludes expenditures that are non-recurrent in nature; and
- includes expenditures that, while not currently being incurred, are reasonable to expect over the course of the regulatory period and are recurrent in nature.

This entails both a review of the inclusions and exclusions proposed by Seqwater (assessing the validity of those proposals) and a review of the remaining asset base (assessing the comprehensiveness of the proposal). The first component of this review is relatively straight forward and involves an assessment by KPMG of the nature of each proposed inclusion or exclusion in terms of the likelihood of its recurrence.

Seqwater's budgeted approach to setting the base year is much less transparent than the typical practice of normalising a year of actual cost data. Another complicating factor is the manner in which Seqwater has characterised expenditure. Rather than adopting an activity based costing framework, Seqwater have characterised cost according to service and to cost type (e.g. salaries and wages, property expenses, consultants and consultancies). This classification of costs makes it extremely difficult to account for activities that are considered to be non-recurrent or recurrent in nature which in turn makes it difficult to verify Seqwater's proposed inclusions and exclusions. Seqwater's proposed inclusions and exclusions are outlined in Table 59.

We recommend that in future price reviews Seqwater develop an activities based costing framework.

Table 59: Proposed inclusions and exclusions from the base year

Expenditure driver	Base Year (2018-19 $ millions)
Base year expenditure 2018-19	$212.3
Inclusions (add)	$0
Exclusions (less)	($4.5)
Total	**$207.8**

Source: Seqwater RFI 93

Seqwater have proposed to exclude costs associated with operating the Western Corridor Recycled Water Scheme in 2018-19 for local industrial use, which is currently under consideration and subject to a business case. Seqwater have elected to remove this expenditure due to the uncertainty of the associated project being undertaken.

On the basis of the data provided, Seqwater's proposed exclusion is appropriate given that it relates to a project that Seqwater holds to be subject to uncertainty.

Fixed opex: Assessment of the base year for non-recurrent expenditure

Ideally a review of the base year opex to account for the comprehensiveness of the proposed inclusions and exclusions relies on the reviewer being able to directly identify the activities associated with the expenditure. Through interviews with Seqwater staff, KPMG understand activity based expenditure data is not available. Instead the most detailed data available is based on input costs for each of the Authority's categorized functions. This data does not identify individual activities but rather the costs associated with inputs, such as labour and power, for a core number of functions including Corporate Finance, General Counsel, WSSP, and Operations.

While the available data does not allow us to directly identify activities it does allow us to identify material changes in input costs associated with the core functions and thus indirectly identify changes in the scale, scope or nature of activities. These material changes in cost can only result from a small number of circumstances:

- changes in the costs of inputs (e.g. increases in labour rates or bulk prices for electricity and chemicals);
- the restructuring of existing activities between different core functions (e.g. reallocating activities from one function to another); and
- the cessation of existing activities or the implementation of new activities.

Material changes in input costs due to movement in the prices for inputs should be observable across all functions utilizing that input. For example, broad based unit increases in the price for labour should affect both operations and corporate finance costs.

As a result, KPMG has adopted the following process in its review of non-recurrent expenditure:

- reviewed the group summaries of each of the Authority's functional categories to identity outlier costs — that is identify instances where costs exhibit significant changes from one year to the next or from actuals to forecasts; and
- consulted with Seqwater to determine the driver for cost changes including:
    - Increased input prices;
    - Restructuring of activities across functions; and
    - Cessation of existing activities or inclusion of new activities.

The cessation of existing activities or inclusion of new activities relates directly to the issue of proper base year inclusions and exclusions. Any such identified activities were separately reviewed by us for either inclusion or exclusion.

KPMG's review considered every individual expenditure stream included by Seqwater in its estimation of the base year. The review covered two years of actual costs for 2015-16 and 2016-17 and two years of budget costs for 2017-18 (budget for the current year) and 2018-19 (budget based on an escalation of the current year), where 2018-19 constitutes the base year.

KPMG reviewed the expenditure for potential costs relating to both inclusions and exclusions. KPMG's identification of potential costs relating to exclusions was premised on observable recurrent actual expenditure that was discontinued in the budget years or observable material step decreases in expenditure in the budget years (see following tables) Querying these expenditures with Seqwater allowed us to identify potential exclusions that have not been accounted for in the proposed base year.

Table 60: Potential inclusions identified by KPMG in the budgeted base year $000s

Operations group	Sub group	2015-16 Actual	2016-17 Q3 Forecast	2017-18 Budget	2018-19 Budget
Employer Contribution - Accumulation Schemes	Superannuation	(1,528)	(2,335)	(4,376)	(4,519)
Contractor - General Mtce	Operations and Maintenance	(904)	(2,774)	(5,653)	(5,693)
Contractor - Process Improvement	Operations and Maintenance	0	(51)	(136)	(133)
WTP Residuals Disposal - Landfill (Fixed)	Operations and Maintenance	0	0	(50)	(51)
MP-Control System Mtce Svces	Operations and Maintenance	(489)	(326)	(803)	(823)
Wood Group Timesheet Costing	Woodgroup Contract	0	(6,215)	(9,508)	(9,746)
Wood Group Lump Sum Services	Woodgroup Contract	0	(869)	(633)	(649)
Carbon Dioxide	Chemicals	(530)	(441)	(816)	(884)
Vacancy Rate	Salaries and Wages	0	0	78	79
Training – Professional Development	Training / Professional Development	(3)	(4)	(80)	(82)
Insurance - Other	Insurance	(2,021)	(1,817)	(4,500)	(4,613)
Other Allowances	Allowances	(97)	(80)	(487)	(487)
Employer Contribution - Accumulation Schemes	Superannuation	(177)	(435)	(922)	(948)
Uniforms	Uniforms	(121)	(200)	(280)	(615)
FLT-Diesel Fuel	Operations and Maintenance	(381)	(485)	(566)	(722)
FLT-Fleet Repair & Mtce	Operations and Maintenance	(478)	(444)	(536)	(712)
EBA Savings Efficiencies	Internal Charges	0	0	1,946	1,994
Vacancy Rate	Salaries and Wages	0	0	964	968

Operations group	Sub group	2015-16 Actual	2016-17 Q3 Forecast	2017-18 Budget	2018-19 Budget
Employer Contribution - Accumulation Schemes	Superannuation	(175)	(745)	(2,044)	(2,114)
Contractor - General Mtce	Operations and Maintenance	(17)	(7)	(89)	0
Consultants - Engineering Scientific	Consultants and Contractors	(4,075)	(4,845)	(8,417)	(7,732)
Consultants - Communication	Consultants and Contractors	0	(2)	0	0
Vacancy Rate	Salaries and Wages	0	0	137	138
Employer Contribution - Accumulation Schemes	Superannuation	(252)	(404)	(716)	(722)
Memberships and Subscriptions	Administrative Expenses	(0)	(50)	(170)	(174)
Personal Leave	Leave Entitlements	(121)	(182)	(247)	(241)
Employer Contribution - Accumulation Schemes	Superannuation	(301)	(439)	(818)	(798)
Room Hire - Training	Training / Professional Development	(1)	(1)	(101)	(1)
Training – Professional Development	Training / Professional Development	(1)	(11)	(400)	0
VET	Training / Professional Development	(4)	(2)	(400)	(410)
Safety	Operations and Maintenance	(198)	(256)	(428)	(476)
Contractor - Civil Construction	Operations and Maintenance	0	0	(350)	0
Public Comms/ Mktg & PR	Administrative Expenses	(39)	(259)	(828)	(281)
Marketing and Advertising	Administrative Expenses	(112)	(32)	(674)	(106)

Source: Seqwater

Table 61: Potential exclusions identified by KPMG in the budgeted base year $000s

Operations group	Sub group	2015-16 Actual	2016-17 Q3 Forecast	2017-18 Budget	2018-19 Budget
Time Off In Lieu	Leave Entitlements	(821)	(475)	0	0
Employer Contribution - Sal Sac - Accumulation Schemes	Superannuation	(1,994)	(1,532)	0	0
Employer Contribution - Defined Benefit Schemes	Superannuation	(128)	(83)	0	0
Employer Contribution - Sal Sac - Defined Benefit Schemes	Superannuation	(217)	(145)	0	0
Training	Training / Professional Development	(91)	(41)	0	0
Materials and Consumables	Operations and Maintenance	(1,050)	(988)	(69)	(71)
Minor Material & Consumables	Operations and Maintenance	(2,269)	(2,052)	(843)	(865)
Contractor - Electrical Mtce	Operations and Maintenance	(710)	(724)	(5)	(5)
Contractor - Mechanical Mtce	Operations and Maintenance	(722)	(616)	(15)	(15)
Contractor - Plumbing & Drain	Operations and Maintenance	(151)	(111)	(10)	(10)
MP-Electrical Mtce Svces	Operations and Maintenance	(1,651)	(651)	(3)	(3)
MP-Instrument Mtce Svces	Operations and Maintenance	(206)	(121)	(7)	(7)
MP-Mechanical Mtce Svces	Operations and Maintenance	(2,446)	(1,118)	(78)	(80)
MP-Pipeline Mtce Svces	Operations and Maintenance	(135)	(173)	(7)	(7)
Energy Emission Expenses (Fixed)	Property Expenses	(454)	(563)	0	0

Operations group	Sub group	2015-16 Actual	2016-17 Q3 Forecast	2017-18 Budget	2018-19 Budget
Contractor - Other	Consultants and Contractors	(219)	0	0	0
Consultancy - Dam Safety Moni	Consultants and Contractors	(203)	16	0	0
Consultancy - Others	Consultants and Contractors	(667)	(4)	0	0
Consultancy - Engineering	Consultants and Contractors	(368)	10	0	0
Consultancy – Process Improvement	Consultants and Contractors	(10)	0	0	0
Contractors	Consultants and Contractors	(9,075)	(601)	0	0
Professional Services Contract	Consultants and Contractors	(27)	(79)	0	0
Labour Hire (Agency) FTE	Consultants and Contractors	(73)	(101)	0	0
Labour Hire (Apprenticeship) Non FTE	Consultants and Contractors	(169)	(430)	0	0
WTP Residuals Disposal - Landfill (Variable)	Residuals Disposal Costs	(318)	(174)	(20)	(21)
Other Allowances	Allowances	(62)	(63)	0	0
Employer Contribution - Sal Sac - Defined Benefit Schemes	Superannuation	(60)	(39)	0	0
Consultancy - Others	Consultants and Contractors	(61)	(50)	0	0
Insurance - Industrial Special	Insurance	(2,609)	(2,000)	0	0
Insurance - Public Liability	Insurance	(244)	(264)	0	0
Insurance - Directors & Offcrs	Insurance	(292)	(377)	0	0
Time Off In Lieu	Leave Entitlements	(94)	(103)	0	0
Employer Contribution - Sal Sac - Accumulation Schemes	Superannuation	(465)	(299)	0	0

Operations group	Sub group	2015-16 Actual	2016-17 Q3 Forecast	2017-18 Budget	2018-19 Budget
Consultants - Strategic	Consultants and Contractors	(148)	(43)	0	0
Contractors	Consultants and Contractors	(257)	(71)	0	0
Professional Services Contract	Consultants and Contractors	(246)	(30)	0	0
Labour Hire (Agency) FTE	Consultants and Contractors	(178)	(289)	0	0
PA-Other PA Equipment	Portable Equipment	(398)	(194)	0	0
Salaries and Wages - Awards	Salaries and Wages	(962)	(879)	(569)	(589)
Employment Termination / Redundancy Payments	Employment Termination / Redundancy Payments	0	(219)	0	0
Consultancy - Others	Training / Professional Development	(75)	(36)	0	0
Consultants - Strategic	Consultants and Contractors	(199)	0	0	0
Consultants - Engineering Scientific	Consultants and Contractors	(70)	(201)	0	0
Consultants - Communication	Consultants and Contractors	(96)	(108)	0	0
Professional Services Contract	Consultants and Contractors	(533)	11	0	0
Marketing and Advertising	Consultants and Contractors	(538)	(650)	0	0
Overtime Expenses	Administrative Expenses	(906)	(732)	0	0
Time Off In Lieu	Salaries and Wages	(72)	(89)	0	0
Other Allowances	Leave Entitlements	(392)	(286)	0	0
Employer Contribution - Sal Sac - Accumulation Schemes	Allowances	(223)	(231)	0	0
Repairs & Maintenance	Superannuation	(1,337)	(1,027)	0	0

Operations group	Sub group	2015-16 Actual	2016-17 Q3 Forecast	2017-18 Budget	2018-19 Budget
Contractor - Civil Maintenance	Operations and Maintenance	(253)	(26)	0	0
Contractor - Civil Construction	Operations and Maintenance	(55)	0	0	0
Contractor - Electrical Mtce	Operations and Maintenance	(621)	(90)	0	0
Contractor - Mechanical Mtce	Operations and Maintenance	(361)	(1)	0	0
Contractor - Mowing & Slashing	Operations and Maintenance	(68)	(2)	0	0
MP-Specialised Mtce Svces	Operations and Maintenance	0	(23)	0	0
CP-Fencing Services	Operations and Maintenance	(85)	(19)	0	0
CP-Vegetation Mgmnt Svces	Operations and Maintenance	(3)	(11)	0	0
Consultancy - Water Quality	Operations and Maintenance	(43)	(35)	0	0
Consultancy - Engineering	Consultants and Contractors	(107)	0	0	0
Consultancy – Process Improvement	Consultants and Contractors	(584)	(552)	0	0
Consultancy – Natural Assets	Consultants and Contractors	(64)	(60)	0	0
Consultancy – Asset Management Planning	Consultants and Contractors	(57)	0	0	0
Consultancy - Project Management	Consultants and Contractors	55	(8)	0	0
Contract Labour - Non FTE	Consultants and Contractors	(242)	(11)	0	0

Operations group	Sub group	2015-16 Actual	2016-17 Q3 Forecast	2017-18 Budget	2018-19 Budget
Contractor - Environ Serv - Restoration	Consultants and Contractors	(64)	0	0	0
Contractors	Consultants and Contractors	(239)	0	0	0
Professional Services Contract	Consultants and Contractors	(741)	(196)	0	0
Labour Hire (Agency) FTE	Consultants and Contractors	(1,540)	(2,123)	0	0
Labour Hire (Agency) Non FTE	Consultants and Contractors	(163)	(197)	0	0
Licences and Permits	Consultants and Contractors	(2,006)	(876)	(230)	(236)
Time Off In Lieu	Licences and Permits	(190)	(8)	0	0
Other Allowances	Leave Entitlements	(97)	(49)	0	0
Employer Contribution - Sal Sac - Accumulation Schemes	Allowances	(117)	(93)	0	0
Consultants - Governance Compliance	Superannuation	(280)	(176)	0	0
Contractors	Consultants and Contractors	0	(68)	0	0
Professional Services Contract	Consultants and Contractors	(14)	(31)	0	0
Labour Hire (Agency) FTE	Consultants and Contractors	(487)	(119)	0	0
Grants Expense	Consultants and Contractors	(46)	(74)	0	0
Time Off In Lieu	Grants Subsidies and Partnerships	(255)	(50)	0	0
Employment Termination / Redundancy Payments	Leave Entitlements	(180)	(103)	0	0

Operations group	Sub group	2015-16 Actual	2016-17 Q3 Forecast	2017-18 Budget	2018-19 Budget
Leadership: Connect to Learn	Employment Termination / Redundancy Payments	(42)	(130)	0	0
Training - Internal	Training / Professional Development	(289)	(289)	(60)	(62)
Prop - Repairs & Maintenance	Training / Professional Development	(272)	(89)	0	0
Contractors	Property Expenses	0	545	0	0
Professional Services Contract	Consultants and Contractors	(125)	(57)	0	0
Labour Hire (Agency) FTE	Consultants and Contractors	(292)	(198)	0	0

Source: Seqwater

Conversely, KPMG's identification of potential costs relating to inclusions was premised on the identification of new costs in the budget years that were not preceded by the incursion of actual costs over the preceding 2015-16 to 2016-2017 period. The analysis also included identifying material step increases in expenditure into the budget years. Querying these expenditures with Seqwater allowed us to both confirm the validity of the proposed inclusions and potentially identify inclusions that are non-recurrent in nature and should therefore be removed from the base year.

KPMG's review identified 86 expenditure streams constituting $23 million that potentially related to exclusions. Through consultation with Seqwater on each of these expenditure streams we were able to identify that the majority of these expenditures related to valid exclusions and that a small number of the expenditures related to changes in budgeting accounting.

KPMG's review identified 33 expenditure streams constituting $41 million that potentially related to inclusions. Through consultation with Seqwater on each of these expenditure streams we were able to identify that as with exclusions, the majority of these expenditures were related to valid inclusions or changes in budgeting accounting. However, there were a small number of expenditures that either Seqwater indicated should be removed from the base year or alternatively KPMG did not believe that the feedback provided by Seqwater justified their inclusion. These expenditures are listed in Table 62. KPMG did not make any adjustments to account for additional inclusions.

Another consequence of Seqwater's cost characterisations is that we were unable to account for non-regulated services in the base year. QCA have indicated that there is a cost allocation framework for declared irrigation services and services provided to high priority water entitlement holders in declared irrigation schemes. The allocation is mainly on the basis of the share of water access entitlements. For other non-bulk water supply services, the referral notice contemplates a revenue offset approach.

Table 62: Additional identification of non-recurrent expenditure for exclusions ($2018)

Expenditure item	Discussion	Base Year Adjustment ($)
Training professional development (code 515341)	Seqwater advised that diversity training costs (Initiative to cover 3 years), actual costs for 2016-17 held in CEO office. This is proposed to be ending by 30 June 2019 and not treated as recurring. Given its non-recurrent nature KPMG is recommending the expense be excluded from the base year	($82,000)
Other allowances (code 511108)	Seqwater advised that the expenditure previously related to an 'Ipswich Relocation Allowance' which expired in March 2017. Given the uncertainty associated with the expenditure and in the absence of any further information from Seqwater, KPMG is recommending that the expenditure be excluded from the base year.	($487,000)
Total Adjustment		**($569,000)**

Table 63: KPMG recommendation: base year additional inclusions and exclusions ($2018)

Expenditure driver	Base Year (2018-19 $ millions)
Seqwater proposed base year	$207.8
Additional exclusions identified by KPMG	($0.6)
KPMG proposed base year (additional exclusions)	**$207.2**

Note: This base year valuation does not include the steps that we identified as inclusions in section 8.6.2

8.4.4 Fixed opex adjustments for offsetting costs

There are a number of non-bulk water costs that are also accounted for in the base year. These expenditures relate primarily to irrigation cost offsets. In the base year they total to approximately $3.6m (based on the data provided in the financial template). These proposed cost offsets are consistent with historic actuals as reported by Seqwater (see Table 64).

QCA have indicated that under the terms of the referral notice, it must assess whether the cost allocation approach adopted by Seqwater is the same as the cost allocation approach it recommended in the 2013 irrigation price review. QCA have requested information from Seqwater to confirm that this is the case. Seqwater has provided information which confirms an irrigation cost offset of $3.4 million in 2016-17 and a cost offset for HP water entitlement holders of $0.2 million in 2016-17.

Table 64: Offsetting costs ($million nominal)

Offsetting costs	2016	2017	2018	2019
Non-bulk water costs	$3.4	$3.3	$3.3	$3.6

Note: Seqwater Submission part B and Seqwater regulatory finance model

Table 65: Summary of KPMG recommended base year ($millions)

Expenditure driver	Base Year (2018-19 $ millions)
Seqwater proposal base year	$207.8
KPMG base year adjusted for inclusions and exclusions	$207.2
Offsetting costs	-$3.6
KPMG recommended base year	**$203.7**

Note: Seqwater's proposed base year is determined using data from RFI 93 and the regulatory finanical templates

8.4.5 Variable Opex: assessing the validity of the base year

Seqwater have proposed three categories of variable opex over the course of the regulatory period: chemicals, electricity and sludge (in the accompanying regulatory finance model sludge is referred to as "other materials and serviced"). Seqwater's proposed variable opex forecast is outlined below.

After taking account of inflation the proposed increase in opex for the period 2017-18 to 2020-21 is approximately 14% while over the remainder of the regulatory period (2020-21 to 2027-28) the increase in variable costs in real terms is 46.5%.

Table 66: Seqwater's proposed variable opex $ millions

Variable Opex	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Chemicals	$15.0	$15.6	$16.2	$16.9	$18.0	$19.3	$20.6	$22.0	$23.4	$24.4
Electricity	$21.2	$22.6	$24.6	$26.1	$29.3	$32.8	$36.5	$40.0	$43.8	$47.0
Sludge	$2.3	$2.4	$2.5	$2.7	$2.9	$3.1	$3.4	$3.6	$3.8	$4.0
Total	$38.4	$40.6	$43.3	$45.6	$50.2	$55.2	$60.5	$65.6	$71.0	$75.4

Seqwater's variable costs are based on a bottoms up base year budget of costs for 2018-19. These costs are in total are lower than those approved by the QCA for the current regulatory period.

Total production per asset and input costs (chemicals, electricity and other) per asset are used to generate per asset unit costs. These costs are then utilised to generate forward cost estimates for each year of the regulatory period using the demand forecasts discussed in section 5 of this report.

For those assets such as dosing stations and pump stations that are focused primarily on throughput and not output, per unit cost is based on the total cost per asset over the total level of production.

KPMG acknowledges that this approach adopted by Seqwater would lower per unit cost relative to any alternative based on an allocation of flows to specific assets. By adopting this approach Seqwater is effectively absorbing the risk associated with error rather than passing it on to its customers.

KPMG also notes that the allocation of predominately chemical costs to dosing stations and the allocation of predominately electricity costs to pumping stations is consistent with KPMG's expectations of cost given the nature of the assets and the activities they undertake.

Comparisons with historical costs

Historical actual costs are compared with forecasts in the following figures. The base year variable costs for chemicals is higher than historical costs. However this increase appears consistent with an observable trend in actual opex over the period 2014-15 to 2016-17. Similarly, the base year variable costs for electricity is higher than historical costs, consistent with an observable trend in actual opex over the period 2014-15 to 2016-17.

Variable cost data for the base year 2018-19 for sludge (other materials and services) is greater than actual data for 2015-16 and 2016-17, but is lower than expenditure in 2014-15.

Figure 51: Variable costs total

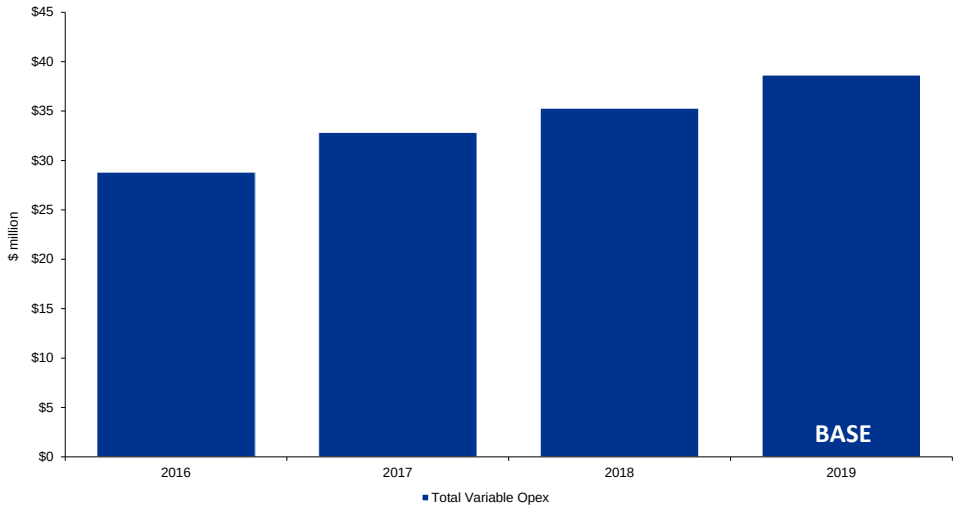


Figure 52: Variable costs chemicals

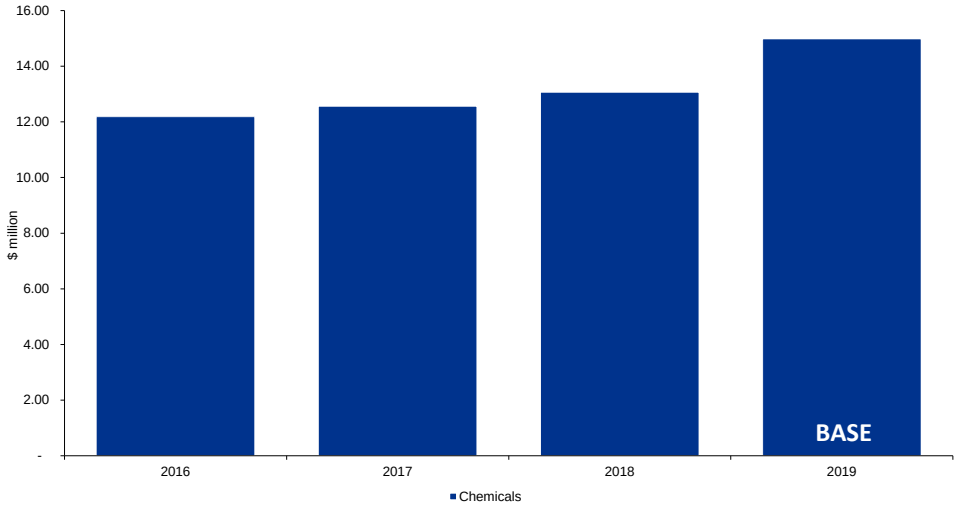


Figure 53: Variable costs energy

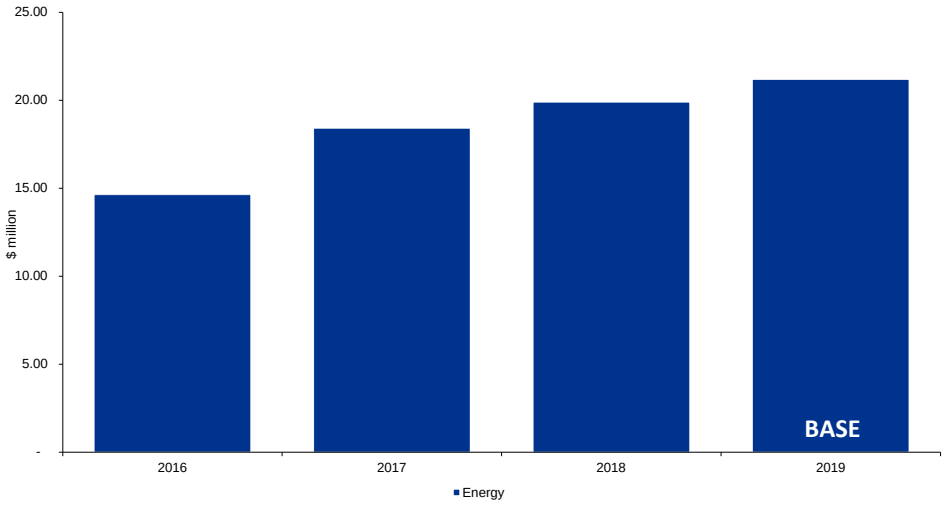
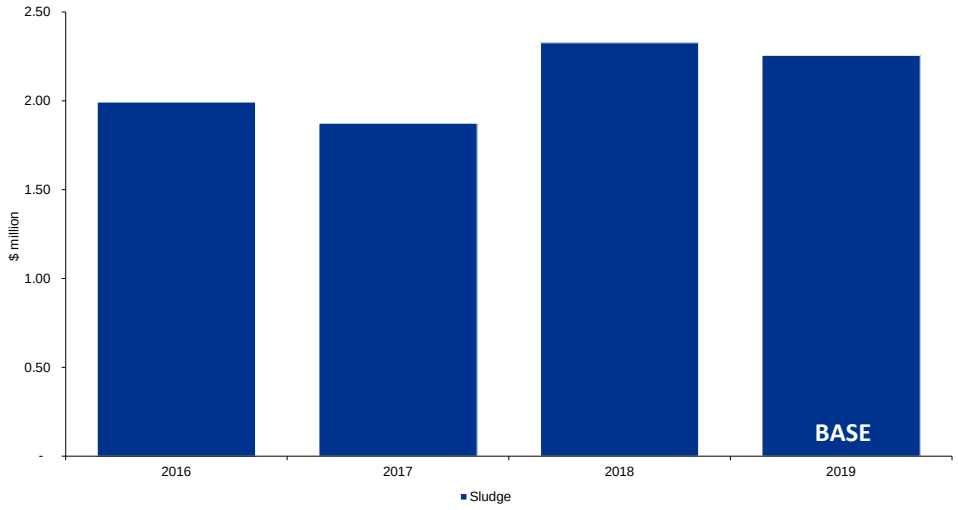


Figure 54: Variable costs sludge (other materials and services)



We have also examined variable opex for the base year 2018-19 relative to historical opex on a unit basis for each category of variable opex (i.e. chemical opex per ML). This analysis allows us to account for the impact of growth on variable opex over time (see chart below). Chemical and sludge costs per ML appear to be relatively stable over the period in terms of actuals and are consistent with the base year. Actual energy costs per ML appear to have been increasing over the period. This trend appears to have been extended into the base year.

Figure 55: Variable gross opex per unit (ML bulk water) historical and base year

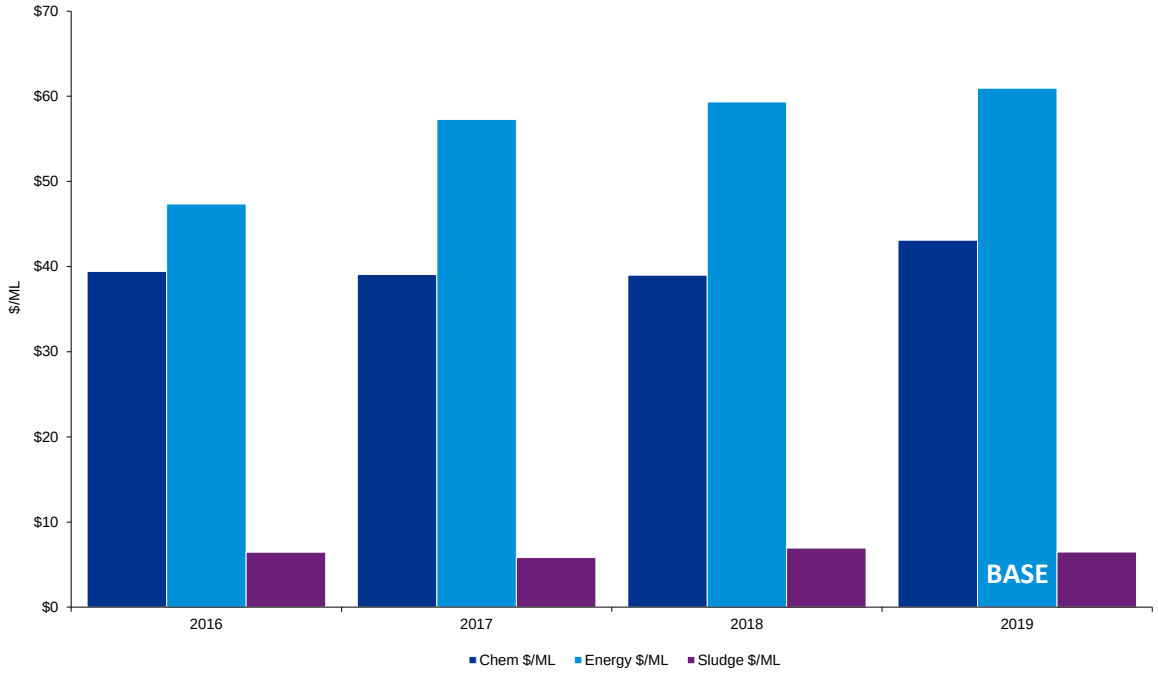


Table 67: Total variable opex per ML Seqwater

	2015-16	2016-17	2017-18	2018-19 (Base Year)
$ Total variable per ML	$93.2	$102.2	$105.3	$110.5

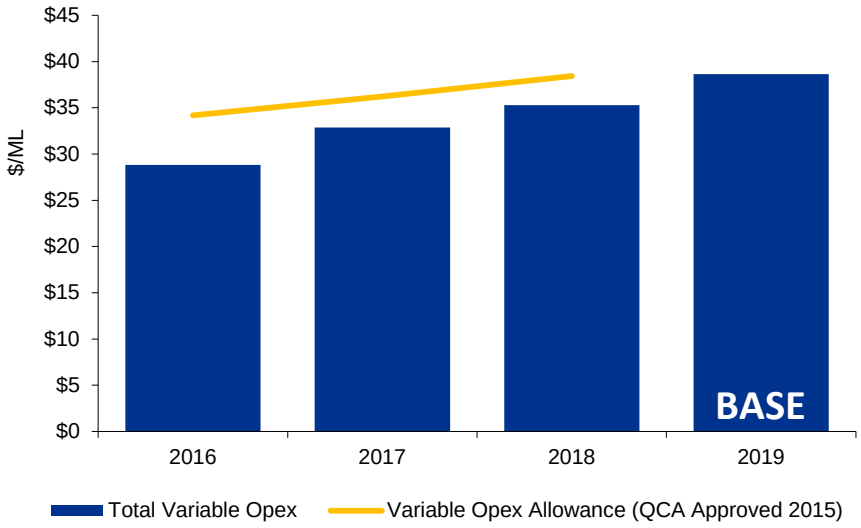
Source: Seqwater regulatory finance model

In total variable cost terms there is an observable trend of a slight per annum increase over the period which is extended into the base year (see table above).

Comparisons with allowed costs

In relation to the expenditure recommended by the Authority as prudent and efficient in the previous price investigation, Seqwater has been able to deliver services and achieve significant efficiencies on both chemicals and sludge approved expenditure. In relation to power, Seqwater achieved significant efficiencies over 2014-15 to 2015-16 but converged on the approved level of expenditure towards the latter half of the current regulatory period.

Figure 56: Variable opex base year and allowed



The table below sets out total opex approved by QCA against actual opex incurred over the current regulatory period by Seqwater. As can be observed in the table Seqwater generated material efficiencies in opex for each year in the current regulatory period. The proposed base year 2018-19 of $38.6 million is broadly consistent with the total approved for 2017-18 of $38.4 million.

Table 68: Seqwater's variable opex performance over the current regulatory period $ millions

Variable opex	2015	2016	2017	2018
Total opex recommended by QCA	$32.1	$34.2	$36.2	$38.4
Actual opex	$28.0	$28.8	$32.9	$35.3
Efficiency achieved	13%	16%	9%	8%

8.4.6 Variable opex: Inclusions and exclusions in the base year

The only stated inclusion by Seqwater relates to a contingency of $1.2 million per annum to account for variation in the feedwater quality. The contingency addresses the impacts of dirty water events (turbidity, colour and salinity) and algal blooms (toxicity) that occur and are dependent on seasonal and climatic variations. The extra costs cover additional aluminium sulphate, sodium hydroxide and powdered activated carbon (PAC).

This contingency does not relate to major events (such as cyclones or floods). The expenditure associated with major events is addressed through mid-period or end of period adjustments.

Managing the risk associated with events such as these is a core activity for Seqwater. We have not had sufficient information to assess the validity of the contingency for this report. We note that prudency and efficiency will be largely determined by the probability of events occurring and the associated cost impacts of such events. In order to determine prudency and efficiency Seqwater would need to provide:

- The number of each type of event anticipated over the course of the regulatory period and their frequency
- The anticipated cost of each type of event

In the absence of this information we have not been able to assess the efficiency of the proposed expenditure we have recommended that the $1.2 million per annum inclusion in variable costs be excluded.

If Seqwater believe that the contingency fund is a valid inclusion under the QCA's regulatory framework, it should respond either to this report or the QCA's draft decision with further information regarding the probability of events occurring and the associated nature of events and their cost impact. Included in this information should be sufficient historical data of actual events to allow KPMG or QCA to inform its assessment of the probability of future events.

8.5 Trend analysis

The second component of the base-trend-step approach are the trends in input costs and output growth that Seqwater have applied to its extrapolation of the base year opex over the course of the regulatory period.

8.5.1 Output Growth

Extrapolating the base year out over the regulatory period requires an adequate accounting of the cost impact of growth in the customer base, in this case growth in the volume of water delivered by Seqwater. It is reasonable to assume that any increase in the consumption or water and thus the volume of water delivered will have a material impact on the costs incurred by Seqwater.

Seqwater account for growth exclusively through their forecasting approach to variable costs. They adopt a bottoms up approach at the level of the individual asset to apply volume growth to each sub stream of variable expenditure. These volumes are discussed in the demand chapter.

In contrast, the approach undertaken in Victoria is to apply one simple growth factor based on the year on year growth rate in total output. The ESC has taken the position that it is reasonable to expect that total opex will trend with growth. That is, the greater the number of customers being serviced, the greater the associated opex used to fund those services will be. The growth escalator is applied to all controllable opex.[24] The ESC also differs in that it approves real expenditures (not nominal) and real prices, prices are then adjusted annually to account for real inflation.

Its worth noting that the ESC's expectation is that changes in input costs (e.g. chemicals and electricity) over the course of the regulatory period will be manageable within the bounds of the growth escalator. ESCOSA in South Australia has taken a similar approach in regard to SA Water:

Under the AER framework growth is accounted for in a slightly more complicated manner. Output drivers are used to escalate expenditure over the regulatory control period. These drivers are used to account for an increase to the opex program as a result of an increase in the size, or a change to the

[24] In practice the ESC nets the productivity target off the escalator before its application.

characteristics of the distribution network. A relatively small number of output drivers are identified for use as scale escalators in the base-step-trend model. Each functional area has been assigned to an output driver (or composite) to escalate expenditure over the regulatory control period. The output drivers provide the gross growth rate. A subsequent allowance for economies of scale is included to calculate the net growth rate.

KPMG has reviewed Seqwater's approach and application in its regulatory finance model and believe the approach is logical consistent and valid. We have also compared the outcomes of Seqwater approach with the outcomes of an approach similar to that adopted by the ESC and found that the Seqwater approach is relatively conservative and provides for lower growth outcomes.[25]

Given the logical validity of Seqwater's growth escalation and its relatively conservative outcomes in comparison to other approaches we recommend that QCA accept Seqwater's approach to growth.

8.5.2 Input cost escalation approach

The approach adopted by Seqwater differs from a typical base trend and step approach in that the business has chosen to develop a relatively large number of input cost escalation factors. These escalation factors have been applied to both the fixed and variable components of the base year.

Seqwater have developed separate input cost escalation factors for seven different opex cost categories ranging from electricity to chemicals and insurance as shown in Table 69. Seqwater categorises its fixed and variable opex into classes consistent with each escalation factor then applies the escalation factor to extrapolate each class of expenditure over the course of the regulatory period.

Table 69: Seqwater's proposed escalation factors

Cost category	Escalation factor
Employee Expenses	• Seqwater enterprise agreement 2018-19 • Queensland Treasury WPI Forecast for 2019-20 to 2020-21 • Long term (15 year) historical growth in the Queensland WPI for the remainder of the regulatory period.
Contract Labour	• Seqwater enterprise agreement 2018-19 • Queensland Treasury WPI Forecast for 2019-20 abd2020-21 • Long term (15 year) historical growth in the Queensland WPI for the remainder of the regulatory period.
Other Materials and Services	• RBA inflation forecasts to 2018-19, mid-point of RBA inflation target range for the remainder of the regulatory period
Insurance	• Seqwater applied a flat 5% per annum escalation factor
Contractors (Service Delivery)	• Weighted index of the Qld WPI (forecasts and long run growth forecasts) and CPI (RBA inflation forecasts to 2018-19 and mid-point of the RBA inflation target) for remainder of period. • Escalation factor = 0.56(WPI) +0.44(CPI)
Chemicals	• RBA inflation forecasts to 2018-19, mid-point of RBA inflation target range for the remainder of the regulatory period
Electricity	• Average annual growth rate in AEMO Qld commercial electricity price forecasts between 2020 and 2030 over the regulatory period • Annual growth in AEMO QLD commercial electricity price for the remainder of the forecast period

[25] We note that a comparison between Seqwater's approach and the ESC's must be treated with care. The broader context of the ESC's growth factor is that the regulator's base expectation is that businesses will be able to manage their input costs within the bounds of the growth escalation and as a result the regulator does not typically allow for separate input escalators.

8.5.3 Employee expenses and contract labour

Labour costs are one of the most significant contributors to total operational expenditure proposed by Seqwater. For example, in 2018-19, labour costs comprised 40% of Seqwater's 2017-18 forecast opex. Labour costs include such things as salaries, wages, superannuation, leave, penalty and overtime payments.

Total labour costs are a function of both wage levels and the number of employees (typically measured as full time equivalents (FTEs)). For Seqwater wage increases for the vast majority of its employees occur subject to enterprise bargaining agreements (EBAs) – the exception is senior employees who are engaged under separate contractual arrangements. Seqwater's current EBA outcomes are outlined in Table 70

Table 70: Seqwater's EBA wage increases

Element	2016	2017	2018
Annual wage increase	3%	3%	3%

Source: PWC 2017 Cost escalation factors

Seqwater's proposed employee and contract labour escalation factors are outlined in Table 71. The escalation factor applies to employees and fixed term contractors. Seqwater's proposed escalator has three distinct components based on timing:

- For the remainder of the current term of Seqwater's EBA (to 2018/19), Seqwater is proposing escalating employee costs in-line with wage increases stipulated in the EBA (3 percent per annum in nominal terms).
- For 2019/20 and 2020-21 Seqwater is applying the Queensland Treasury forecast of WPI growth (3.0 percent in both years). This reflects Treasury's current expectation that while nominal wage growth is expected to pick-up from current levels over coming years, it will not have yet returned to long- term historical trends by the end of the forecast period.
- For the remainder of the period (to 2021/22 to 2027/28), Seqwater proposes to apply the long-term average growth in the Queensland WPI of 3.4 percent in nominal terms (between 2002 and 2016). This is the more conservative of the two WPI estimates commonly applied in the water sector (the other being the WPI for the national EGWWS sector, which has an average long-term growth rate of 3.9 per cent annually over the same period).

Table 71: Seqwater's proposed employee and contractor labour escalation rates

Escalation factor	2017	2018	2019	2020	2021	Remaining forecast years to 2028
Inflation	2.0%	2.0%	2.5%	2.5%	2.5%	2.5%
Nominal escalation factor	3.0%	3.0%	3.0%	3.0%	3.0%	3.4%
Real escalation factor	1.0%	1.0%	0.5%	0.5%	0.5%	0.9%

Source: PWC 2017 Cost escalation factors.
Note: 2016-17 and 2017-18 represent actual outcomes. CPI forecast produced by the RBA (for years this is available), and beyond this period the mid-point of the RBA's inflation target (2.5 per cent).

We note the proposed approach is broadly similar to that recommended by the Authority in the previous investigation for 2015-16 to 2017-18. Seqwater escalated labour costs according to the escalation provisions provided for in its Certified Agreement (CA) for the period of the agreement (to June 2016) of 2.5% per year (nominal). For the remainder of the regulatory period (to 2016/17), Seqwater applied the Queensland WPI forecast developed by Queensland Treasury of 3.5% (nominal) annually.

We also note that the WPI growth and long term average WPI growth is consistent with that determined by Authority in its recent review of the Gladstone Area Water Board for 2015-16 to 2019-20. The Authority determined that labour costs be escalated by the Queensland State Budget forecast of WPI growth for three years, and by the ten year average of the Queensland WPI for the remaining two years of the regulatory period.

The forecasts are also broadly consistent or less than those recently developed by BisShrapnel for Icon Water in its 2017 pricing submission to ICRC (Act). The BisShrapnel forecasts are outlined in the following table.

Table 72: BisShrapnel wages growth forecast

Year	2017	2018	2019	2020	2021	2022	2023
Wage Price Index (collective agreements)	3.1%	3.0%	3.0%	3.0%	3.1%	3.3%	3.5%

Source: BisShrapnel 2017. All Industries Australia (by Workforce segmented by pay setting method).Year average percent change

An alternative approach to adopting Qld WPI forecasts would be to consider the ABS average weekly ordinary time earnings data as a basis for forecasts. However, the Authority in its Aurizon Network 2013-14 to 2016-17 review considered the ABS WPI index to be a better estimate of wage cost inflation because it is designed to measure pure prices changes in wages independent of workforce composition factors.

While both the WPI and Average Weekly Ordinary Time Earnings (AWOTE) are measures of the value of labour they are different. The WPI measures changes in the wages and salaries paid by employers for a unit (i.e. hour) of labour where the quality and quantity of labour are held constant. It has the dual purpose of monitoring wages and salaries inflation in the economy and supporting the compilation of the Australian System of National Accounts. To achieve this, the WPI is designed to produce a measure of pure price change in wages and salaries independent of compositional factors (i.e. the quantity and quality of labour are held constant).

In contrast, an average weekly earnings based series such as the AWOTE is designed to provide an accurate estimate of the current average value of wages and salaries paid to employees by an employer over a specified period. The emphasis placed on producing a contemporary measure of average wages and salaries means that the series reflects structural changes that occur over time (such as changes in hours paid for and employment).[26]

Based on regulatory precedent and the use of WPI based indexes, KPMG recommends that Seqwater's cost escalator for employee expenses and contractors be accepted.

8.5.4 Other materials and services

Other materials and services are one of the less significant contributors to total operational expenditure proposed by Seqwater. For example, in 2018-19, such costs comprised 24% of Seqwater's opex costs. Other materials and services costs include such things as administrative expenses, property related expenses, operations and maintenance costs (not related to external contractors or internal labour), Insurance costs and residuals disposal.

[26]ABS (2015) feature article: average weekly earnings and wage price index – what do they measure? Last accessed 24/09/2017<http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/6302.0main+features9May%202014>

Table 73: Seqwater's proposed other materials and services escalation rates (%)

Escalation factor	2017	2018	2019	2020	2021	Remaining forecast years to 2028
Inflation	2.0%	2.0%	2.5%	2.5%	2.5%	2.5%
Nominal escalation factor	2.0%	2.0%	2.5%	2.5%	2.5%	2.5%
Real escalation factor	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Source: PWC 2017 Cost escalation factors.
Note: 2016-17 and 2017-18 represent actual outcomes. CPI forecast produced by the RBA45 (for years this is available), and beyond this period the mid-point of the RBA's inflation target (2.5 per cent).

Seqwater's has proposed escalation factors that in practicable terms equate with CPI (inflation). In doing this Seqwater has proposed to maintain the value of these expenditures in real terms at constant level over the course of the regulatory period. We note that the nature of the costs covered by this escalation factor is relatively broad and we have uncovered no evidence in broad based costs indices to indicate a general decline in real prices over the course of the regulatory period. This approach is equivalent with other regulators such as the ESC that update approved prices and revenues annual to account for CPI adjustments.

We note that forecasts beyond 2018-19 are based on the mid-point of the Reserve Bank of Australia's (RBA) inflation target. There is an increasing argument that this approach could be too high given that in recent years inflation has constantly under-shot the target rate. However, to date there has been no regulatory precedent set for the adoption of an alternative forecast.

Based on the appropriate maintenance of the real values of costs over the period KPMG recommends that Seqwater's cost escalator for other materials and services be accepted.

8.5.5 Insurance

Insurance costs are one of the less significant contributors to total operational expenditure proposed by Seqwater. For example, in 2018-19, such costs comprised 2% of Seqwater's total operating costs.

Unlike the other escalation factors, this factor is not discussed in the accompanying PWC *Cost Escalation Factors Final Report* or in *Seqwater Submission Part A and Part B*. This escalator is presented solely in the regulatory financial pricing model.

Table 74: Seqwater's proposed insurance escalation rates (%)

Escalation factor	2017	2018	2019	2020	2021	Remaining forecast years to 2028
Inflation	2.0%	2.0%	2.5%	2.5%	2.5%	2.5%
Nominal escalation factor	2.0%	2.0%	2.5%	5.0%	5.0%	2.5%
Real escalation factor	0.0%	0.0%	0.0%	2.5%	2.5%	2.5%

Source: Seqwater regulatory finance pricing model
Note: 2016-17 and 2017-18 represent actual outcomes. CPI forecast produced by the RBA45 (for years this is available), and beyond this period the mid-point of the RBA's inflation target (2.5 per cent).

KPMG notes that one of the cost drivers included by Seqwater in its derivation of an escalator for other materials and services is insurance. Given the lack of explanatory documentation KPMG cannot recommend the Authority accept this escalator. Instead KPMG recommends the Authority apply the other material and services escalator to the insurance costs identified in the regulatory model.

We are also concerned that it may be inappropriate to pass on the costs of risks to customers. If the costs of insurance are increasing in real terms then there is a question of whether it would be more

appropriate for Seqwater (as the entity most able to manage risk) to account for the costs of risk rather than the customer base.

If Seqwater believes that the insurance escalator it proposed is valid then it should respond to this report with sufficient supporting documentation to allow KPMG to verify the escalator. In its response Seqwater will need to outline how a separate insurance escalator impacts on its calculation of the other material and services escalator. Ideally insurance related costs should only be included in a single escalator.

Table 75: KPMG's proposed insurance escalation rates (%)

Escalation factor	2017	2018	2019	2020	2021	Remaining forecast years to 2028
Inflation	2.0%	2.0%	2.5%	2.5%	2.5%	2.5%
Nominal escalation factor	2.0%	2.0%	2.5%	2.5%	2.5%	2.5%
Real escalation factor	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

8.5.6 Contractors (service delivery)

Third party service delivery costs are a significant contributor to total operational expenditure proposed by Seqwater. For example, in 2018-19 such costs comprised 23% of Seqwater's total operating expenditure. Seqwater outsources a number of services to third party providers on a contract basis, including collaborative maintenance contracts, standard operations and maintenance service contracts, and consulting services.

Of total contractor (service delivery) costs, approximately three quarters relate to operations and maintenance contractors, with the remaining cost relating to consulting and general contractors. Seqwater's proposed escalation factor is outlined in Table 76. The escalation factor is based on a weighted average of the WPI (Queensland) and CPI.

Table 76: Seqwater's proposed contractors (service delivery) escalation rates (%)

Escalation factor	2017	2018	2019	2020	2021	Remaining forecast years to 2028
Inflation	2.0%	2.0%	2.5%	2.5%	2.5%	2.5%
Nominal escalation factor	2.0%	2.1%	2.5%	2.8%	2.8%	3.0%
Real escalation factor	0.0%	0.1%	0.0%	0.3%	0.3%	0.5%

Source: PWC 2017 Cost escalation factors.
Note: 2016-17 and 2017-18 represent actual outcomes. CPI forecast produced by the RBA45 (for years this is available), and beyond this period the mid-point of the RBA's inflation target (2.5 per cent).

The WPI (Qld) index is intended to cover labour costs, which comprise a significant share of operations and maintenance contract costs (particularly long term operations and maintenance contracts for major assets, and the recently implemented collaborative maintenance contract) and are expected to drive the vast majority of general consulting and contractor costs (of which labour is the major input).

The CPI index is intended to cover general materials or 'other' costs, which represent a range of goods and services associated with service contracts (for example, equipment purchases).

The following assumptions have been applied to allocate contract costs to either the WPI basket or CPI basket:

- for the major service contracts currently in place, Seqwater provided a disaggregation of labour costs and other costs;

- for consulting and contractor costs, Seqwater have assumed that the major cost driver is labour, and allocated all costs to the WPI basket; and
- general operations and maintenance contract costs (which tend to represent shorter- term, smaller-scale contracts) have been allocated CPI basket of costs.

Based on these assumptions, the weights applied to each index to develop the weighted contractor (service delivery) index are: WPI (Queensland) – 56 percent, and CPI – 44 percent. The derivation of the escalation factor is outlined in Table 77.

Table 77: Seqwater's calculation of the contractors (service delivery) escalation rates (%)

Escalation factor	Weight	2017	2018	2019	2020	2021	Remaining forecast years to 2028
CPI	44%	2.0%	2.0%	2.5%	2.5%	2.5%	2.5%
WPW	56%	2.0%	2.3%	2.5%	3.0%	3.0%	3.4%
Escalation factor		2.0%	2.1%	2.5%	2.8%	2.8%	3.0%

Source: PWC 2017 Cost escalation factors.
Note: 2016-17 and 2017-18 represent actual outcomes. CPI forecast produced by the RBA45 (for years this is available), and beyond this period the mid-point of the RBA's inflation target (2.5 percent). Queensland Treasury forecast of the Queensland WPI43 (for years this is available), and beyond this period applied the long term (15 year) average historical growth rate in the Queensland WPI (as produced by the ABS)

We note that Authority accepted Seqwater's proposed escalator in the previous 2015-16 to 2017-18 price investigation. Seqwater's previous index resulted in higher estimations. Seqwater proposed 3.46% (nominal) for 2013/14 and 2014/15 and 3.38% (nominal) for each year thereafter. The escalator was based on a composite index of Qld WPI forecasts, forecast CPI and the 10 year average of the non- residential building index. Costs were weighted based on assumptions regarding rise and fall provisions in Seqwater contracts.

KPMG believes that PWC's proposed approach for this regulatory period represents an improvement on that previously adopted by Seqwater. The PWC escalator is relatively simpler, logically valid and is cost reflective. We also note that the PWC escalator appears to generate lower rates than the previous approach.

KPMG recommends QCA accept Seqwater's proposed escalation factor for this cost category.

8.5.7 Chemicals

Chemical costs are a significant contributor to variable operational expenditure proposed by Seqwater, 39% (2018-19) but a relatively minor cost driver of total opex 6% (2018-19). Of total chemical costs, approximately 80% are comprised of five chemicals – alum, sodium hypochlorite, lime, activated carbon and carbon dioxide. Seqwater's proposed escalation factor is outlined in Table 78.

Table 78: Seqwater's proposed chemicals escalation rates (%)

Escalation factor	2017	2018	2019	2020	2021	Remaining forecast years to 2028
Inflation	2.0%	2.0%	2.5%	2.5%	2.5%	2.5%
Nominal escalation factor	2.0%	2.0%	2.5%	2.5%	2.5%	2.5%
Real escalation factor	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Source: PWC 2017 Cost escalation factors.
Note: 2016-17 and 2017-18 represent actual outcomes. CPI forecast produced by the RBA45 (for years this is available), and beyond this period the mid-point of the RBA's inflation target (2.5 per cent).

Current commentary views the Australian chemical sector as relatively flat (see box below). IBIS's latest market report assesses chemicals as *unreactive: low demand and weak chemical price have constrained the industry.* This weak market state is forecast to improve slowly.

Figure 57: Chemical sector outlook 2016

Chemical sector outlook (IBIS 2016)

Unreactive: Low demand and weak chemical prices have constrained the industry's performance.

Over the five years through 2016-17, the industry's performance is expected to fluctuate in line with key downstream sectors. External variables, including changes in downstream demand, global chemical price variations and a weaker Australian dollar, have influenced the industry's performance. Industry revenue is projected to contract by 0.5 per cent annualised over the five years through 2016-17, to total $11.8 billion. This includes an expected 2.3 per cent contraction in the current year due to reduced demand from the Manufacturing and Construction divisions.

Over the next five years, the industry is expected to grow on the back of greater demand from manufacturing, agriculture, mining and construction firms. Industry revenue is forecast to increase by an annualised 1.1 per cent over the five years through 2021-22, to total $12.5 billion. Year-on-year growth rates will fluctuate in response to changing conditions in key market segments, including upstream manufacturing industries and downstream markets. Stringent regulatory controls relating to chemical production and use will continue to affect the industry's performance, as will requirements for the sustainable production and consumption of chemicals and chemically derived products.

In addition to a flat market, prices for chemicals appear to be experiencing limited growth (see Table 79 below). The combined index for organic and non-organic chemical shows a slight decline in prices over the period 2011-12 to 2016-17. The current state of the market and recent behaviour in prices do not support any contention that forecasts should exhibit real price increases.

Table 79: Chemicals price index – for organic and inorganic chemical manufacturing outputs (Australia)

Year	2012	2013	2014	2015	2016	2017
Index	100.0	99.4	103.3	104.6	101.2	98.5
% Change		-0.6	3.9	1.3	-3.3	-2.7

Source: IBISWorld Industry Market Research. Industrial, and agricultural chemical product wholesaling. Dec 2016.

Seqwater's has proposed escalation factors based on CPI (inflation). In doing this Seqwater has proposed to maintain the value of these expenditures in real terms at constant level over the course of the regulatory period.

KPMG recommends that Seqwater's cost escalator for chemicals be accepted on the basis that it is consistent with reasonable expectations given recent market activity in chemicals.

8.5.8 Electricity

Electricity costs are a minor contributor to total fixed operational expenditure proposed by Seqwater, but do account for over half of the variable operating costs. Seqwater has proposed to escalate its electricity costs by the average growth rate in Queensland commercial electricity prices contained in the AEMO National Electricity Forecasting Report between 2020 and 2030 over the regulatory period. For remaining years, it has escalated electricity costs in line with annual estimates contained in the AEMO series. Seqwater's proposed escalation factor is outlined in in the following table.

Seqwater's current retail electricity contract does not stipulate any escalation factors for electricity prices. The contracted component for electricity varies every three months, therefore movements in Seqwater's electricity costs largely reflect movement in the market price for electricity. From KPMG's

consultations with Seqwater we understand that it manages the risk of volatility in prices by engaging in derivatives.

Table 80: Seqwater's proposed electricity escalation rates (%)

Escalation Factor	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Inflation	2.0%	2.0%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Nominal escalation factor	4.3%	4.3%	4.8%	4.8%	4.8%	6.3%	5.4%	3.9%	4.1%	4.8%	5.2%
Real escalation factor	2.3%	2.3%	2.3%	2.3%	2.3%	3.7%	2.9%	1.3%	1.6%	2.2%	2.6%

Source: PWC 2017 Cost escalation factors.
Note: 2016-17 and 2017-18 represent actual outcomes. CPI forecast produced by the RBA45 (for years this is available), and beyond this period the mid-point of the RBA's inflation target (2.5 per cent).

Seqwater's current retail electricity contract does not stipulate any escalation factors to apply to Seqwater's electricity prices. The contracted component for electricity varies every three months, therefore movements in Seqwater's electricity costs largely reflect movements in the market price for electricity.

The adopted by Seqwater to determine the escalators it is proposing to apply over the period is based on a composite of constant growth over the first three years of the regulatory period followed by direct reference to AEMO year on year forecasts for the remainder of the period.

Seqwater have adopted this approach on the assumption that over the immediate period prices will grow in a continual manner T

In developing its proposal Seqwater has noted that the QCA has previously accepted electricity cost escalation factors that refer to recent decisions made by the Australian Energy Regulator (AER). In recent reviews for both Gladstone Area Water Board (GAWB) and Seqwater, the QCA revised the proposed electricity escalation factor estimates down to reflect recent decisions by the AER that resulted in downward revisions in relation to network cost growth.

- Seqwater (2015/16 to 2017/18 regulatory period) — The QCA revised figures based on network businesses submissions to the AER that foreshadow declining costs to 2020
- Gladstone Area Water Board (GAWB) (2015/16 to 2019/20 regulatory period) — QCA updated the Distribution Use of System (DUOS) component made by Jacobs to reflect the AER's decision on Ergon (2015).

As noted by Seqwater in the PWC escalator factors final report, the Essential Services Commission (ESC) in Victoria also relied on recent determinations of the AER in order to estimate network prices over the regulatory period for Melbourne Water.

Seqwater believes that the proposed AEMO real escalation factor (2.27%) should be considered within the context of both the AER determination on Energex price path and also the AEMC forecasts of residential electricity prices in SEQ. Both the AER and the AEMC forecasts suggest that electricity costs should start to level out, if not decline over the immediate future.

The AER determination for Energex for the July 2015 to June 2020 period resulted in nominal decreases for the network component of the electricity price over the period. This network component represents approximately 45% of the total price.

Table 81: AER final decision estimated impact on average bills for Energex's network

Percentage change	2015	2016	2017	2018	2019	2020
Annual change in residential bill	-1.7%	-1.2%	-1.5%	-1.2%	-1.0%	-1.6%
Annual change in small business bill	-1.7%	-1.2%	-1.5%	-1.2%	-1.0%	-1.9%

Source AER Final Decision Energex Determination 2015-16 to 2019-20

The AEMC forecast of residential electricity prices for SEQ from 2016-17 over the next two years to 2018-19 expected nominal 6% decrease in 2017-18 (driven by falling transmission prices) followed by a 4% nominal increase. The AEMC made the following observations:

- Residential electricity market offer prices for the representative consumer in South East Queensland are expected to:
  - decrease by 6.8% in 2017-18; and
  - increase by 4.2% in 2018-19.
- This is equivalent to an annual average decrease of 1.5% over the two years.
- The expected increases in residential market offer electricity prices in 2016-17 and 2018-19 are largely attributable to increases in the competitive market component of electricity prices in those years.
- The expected decrease in residential market offer electricity prices in 2017-18 is attributable to expected decreases in the regulated network component and environmental policy component of residential market offer electricity prices.[27]

The QCA published its final determination for Regulated Retail Electricity Prices for 2017-18 in June. QCA noted the primary drivers for change in cost over the course of this year were wholesale energy costs. As set out in its 2017–18 final report for the QCA, ACIL Allen has estimated that wholesale energy costs will increase for all retail tariffs in 2017–18 compared with 2016–17. The increase reflects the projected continuation of the increase in gas prices for gas-fired generation and the continued tightening of the supply–demand balance in the NEM due to:

- increased demand from in-field gas compression associated with the liquefied natural gas (LNG) export facilities in Queensland
- the closure of Hazelwood Power Station in 2017 and the continued operation of the Portland aluminium smelter in Victoria
- little new renewable energy capacity entering the market in 2017–18—particularly in Queensland.76

In addition to wholesale energy costs, the QCA also acknowledged the cost impact of other energy costs that a retailer incurs when it purchases energy from the NEM, which are:

- ☐ Renewable Energy Target (RET) costs
- ☐ NEMparticipation fees and ancillary services charges
- ☐ prudential capital costs.

KPMG acknowledges that it is extremely difficult to estimate long terms trends in electricity prices given current uncertainty and investment environment.

Overall, AEMO escalation factor is reasonable as an independent metric in the absence of doing separate market modelling. Therefore AEMO is appropriate escalation for the base year going forward to 2028. However, we are concerned that if AEMO escalation factor has been used to calculate the base year this may not capture the decrease in network costs resulting from the AER determinations of Energex and Powerlink. Ideally the base year should be based on actuals. In response to this report we request Seqwater clarify the basis upon which the escalator for 2016-17 and 2017-18 has been derived.

Post the current revenue control periods, future trends in transmission, distribution network and wholesale energy costs are subject to multiple and diverse factors which could either increase or decrease charges. For example, DUOS rates are sensitive to movements in the rate of return, the volume and cost of investment and electricity consumption. Past trends are not an appropriate metric

[27] AEMC Final Report 2016 Residential Electricity Price trends.

to forecast future costs given the current transformation and changes incurring in the electricity sector.

While KPMG support the use of AEMO forecasts for the final seven years of the regulatory period, it does not support the use of a composite forecast based on the 10 year average for the first three years of the regulatory period. Seqwater have not provided a compelling case that the AEMO year on year growth forecasts are not valid for these years. Our preference is to adopt the AEMO year on year forecasts from 2018-19 onwards, as this ensures that the forecasting method is consistent over the period and not subject to the error typically associated with composite approaches.

We also note that AEMO have updated its forecasts since Seqwater submitted its proposed escalators. While we support the use of AEMO forecasts we also believe that the escalators should be based on the most recent reliable information available and that subsequently the escalation factors should be update to reflect the forecasts contained within AEMO 2017 Retail Electricity Price History and Projected Trends.

The AEMO forecasts are well respected within the broader utility sector and have been utilised in regulatory decisions across a number of jurisdictions. KPMG have updated the escalators to:

- Take into account the most recent available AEMO forecasts in *Retail electricity price history and projected trends AEMO 2017.*[28]
- Amend the first three years to reflect year on year growth forecasts

The updated forecasts are set out in the table below.

Table 82: Seqwater's proposed escalation factors and KPMG recommendations (%)

		Seqwater proposal		KPMG recommendation	
Year	**Inflation**	**Real factor**	**Nominal factor**	**Real factor**	**Nominal factor**
2018-19	2.50%	2.27%	4.83%	5.26%	7.76%
2019-20	2.50%	2.27%	4.83%	-3.05%	-0.55%
2020-21	2.50%	2.27%	4.83%	-2.73%	-0.23%
2021-22	2.50%	3.70%	6.29%	0.95%	3.45%
2022-23	2.50%	2.86%	5.43%	0.25%	2.75%
2023-24	2.50%	1.34%	3.87%	-4.06%	-1.56%
2024-25	2.50%	1.56%	4.09%	-2.95%	-0.45%
2025-26	2.50%	2.24%	4.80%	-0.45%	2.05%
2026-27	2.50%	2.59%	5.16%	-0.42%	2.08%
2027-28	2.50%	1.93%	4.48%	1.86%	4.36%

8.6 Step changes

The base, trend and step forecasting method allows for Seqwater's revenue requirement to change to reflect the cost of new initiatives and new obligations, providing that such expenditure is justified. This allowance constitutes the step changes that can be applied under the method. Steps typically need to relate to changes in obligations imposed on Seqwater (e.g. through changes in government policies or technical regulation) or to serve a new or changed customer need where there is a clear willingness to pay established (and supported by cost benefit analysis).

28 AEMO (2017) http://forecasting.aemo.com.au/ last accessed 15-11-2017

This stage of KPMG's analysis involves the review of Seqwater's proposed step changes. Steps are typically:

- new or changed government obligations that come into effect over the course of the regulatory period or, alternatively, came into being prior to the regulatory period but are not expected to come into effect until the regulatory period and are not reflected in the base year;
- new or changed customer service demands; and
- changes in opex associated with the commissioning of new capacity

Step changes should relate to output changes that are not captured by the escalation factors discussed above. They should not relate to discretionary changes in inputs. Step changes should not relate to changes in volume. Under a typical approach, the application of a growth escalator to the base year is expected to provide for changes in volume.

8.6.1 Criteria for assessing step changes

In order to assess Seqwater's proposed step changes, we have identified a number of criteria that are consistent with regulatory best practice and KPMG's experience of the manner in which base, trend and step forecasts are developed. These criteria are:

1. Step changes should relate directly to:
    - new or changed obligations levied on Seqwater by government, and/or
    - new prudent and efficient operating expenditure.
2. The expenditure associated with Step changes needs to be material relative to the total operating expenditure proposed over the regulatory period.
3. The expenditure assoicated with Step changes must be prudent and efficient.

Steps are not intended to include expenditures that are relatively immaterial. Immaterial changes in expenditure are ideally accounted for thorough the application of escalation factors to the base year as it is extrapolated forward over the regulatory period or alternatively are expected to be offset over the regulatory period by unanticipated efficiencies. Immaterial steps can be either + or – (representing costs or savings) and KPMG's expectation is that they should balance out over the period.

We acknowledge that there is very little value in applying regulatory rigour to such expenditures and we also acknowledge that the base trend and step approach is intended to be a more simple cost effective forecasting approach relative to zero based bottoms up forecasts. The consideration of micro movements in expenditure over each year of the regulatory period is not consistent with the application of a base trend and step approach.

We have based our threshold for materiality on a 0.2% of the NPV of total step related expenditure relative to the NPV of total operating expenditure over the regulatory period. KPMG set its threshold in reference to Seqwater's proposed productivity hurdle, but also note that this hurdle is relatively conservative compared to the efficiency targets set in other jurisdictions (see section 6.8).

8.6.2 Seqwater's proposed steps

Seqwater's proposed steps are outlined in Table 83. Seqwater is proposing 14 separate steps that range in magnitude of cost from approximately $1million per annum to $50, 000 per annum. The steps are associated with a broad range of activities.

Table 83: Seqwater's proposed steps $ million

Proposed Step	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Assessment of major contracts	$0.0	$0.5	$0.5	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Water quality reporting	$0.4	$0.4	$0.4	$0.4	$0.4	$0.0	$0.0	$0.0	$0.0	$0.0
Gold Coast Desal and WCRWS contracts	$0.0	$0.2	$0.1	$0.1	$1.2	$0.2	$0.3	$0.6	$0.6	$0.9
ICT projects	$0.0	$0.2	-$0.3	-$0.3	$0.0	$0.6	$0.6	-$0.6	-$0.6	$0.0
Provision of additional drafting services	$0.0	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1
QCA reviews	$0.0	-$0.7	$0.3	-$0.7	-$0.8	$0.4	-$0.7	-$0.9	$0.4	-$0.8
Future water security program updates	$0.0	$0.0	$0.2	$0.1	$0.0	$0.0	$0.0	$0.3	$0.1	$0.0
Integrated master plan update	$0.0	$0.0	$0.1	$0.1	$0.0	$0.0	$0.0	$0.1	$0.1	$0.0
Communication and education for recycled water	$1.1	$1.1	$1.2	$1.2	$1.2	$1.3	$1.3	$1.4	$1.4	$1.5
EBA advice	$0.1	$0.0	$0.0	$0.1	$0.0	$0.0	$0.1	$0.0	$0.0	$0.1
Additional training spend leadership	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1
Budget Assumptions	$0.3	$1.2	$1.2	$1.2	$1.3	$1.3	$1.4	$1.4	$1.4	$1.5
Wyaralong WTP	$0.0	$0.0	$0.8	$0.8	$0.9	$0.9	$0.9	$0.9	$1.0	$1.0
Ewan Maddock	$0.8	$0.8	$0.8	$0.8	$0.9	$0.9	$0.9	$0.9	$1.0	$1.0
TOTAL STEP OPEX	**$2.6**	**$3.7**	**$5.4**	**$4.1**	**$5.2**	**$5.6**	**$5.0**	**$4.2**	**$5.5**	**$5.4**

The following table outlines KPMG's assessment of each of the proposed steps against the criteria outlined in section 6.8.2. Based on this assessment we have provided recommendations as to whether the proposed step is valid and justifiable under a base trend and step approach and whether in KPMG's view the expenditure is defendable in a regulatory context.

Table 84: KPMG's assessment of the proposed steps $million

Step	NPV (@6%)	% Total Opex	Assessment	KPMG Recommendation
Assessment of major contracts prior to expiry	$0.86	0.043%	• Relevant driver: expenditure appears to be associated with typical operational activity and not a new obligation or new capital. • Materiality: at 0.0432% of total proposed opex the expenditure is immaterial • Prudent and efficient. Given the step is an operational activity to be efficient the step should result in offsetting benefits and not net costs. We note that the 10 year regualtory peirod should provide ample time for efficiencies to be realised.	• Recommend step not be included on the basis of inappropriate driver, immateriality and concerns regarding efficiency. • Do not recommend the step be treated as an inclusion in the base year as it only relates to two years of the total regulatory period
Water quality reporting	$1.47	0.074%	• Relevant driver: expenditure only applies to the first five years of the regulatory period	• Recommend step not be included on the basis of inappropriate driver and immateriality.

Step	NPV (@6%)	% Total Opex	Assessment	KPMG Recommendation
			and is not an ongoing obligation or new capital. • Materiality: at 0.074% of total proposed opex the expenditure is immaterial • Prudent and efficient. Insufficent information to assess prudency and efficency.	
Gold Coast Desal and WCRWS contracts	$2.36	0.118%	• Relevant driver: expenditure appears to be associated with typically operational activity and not a new obligation or new capital. • Materiality: at 0.118% of total proposed opex the expenditure is immaterial • . • Related expenditure are ongoing in nature	• Recommend step not be included on the basis of inappropriate driver and immateriality. • Recommend proposed step be treated as an inclusion to the base year on the basis that it is related to a typical operating activity and is ongoing in nature.
ICT projects	-$0.20	-0.010%	• Relevant driver: expenditure appears to be associated with typically operational activity and not a new obligation or new capital. • Materiality: at-0.010% of total proposed opex the expenditure is immaterial • Prudent and efficient. Insufficent information to assess prudency and efficency.	• Recommend step not be included on the basis of inappropriate driver and immateriality.
Provision of additional drafting services	$0.39	0.019%	• Relevant driver: expenditure appears to be associated with typically operational activity and not a new obligation or new capital. • Materiality: at 0.019% of total proposed opex the expenditure is immaterial • Related expenditure are ongoing in nature	• Recommend step not be included on the basis of inappropriate driver and immateriality. • Recommend proposed step be treated as an inclusion to the base year on the basis that it is related to a typical operating activity and is ongoing in nature.
QCA reviews	-$2.15	-0.108%	• Relevant driver: expenditure appears to be associated with typically operational activity and not a new obligation or new capital. • Materiality: at -0.108% of total proposed opex the expenditure is immaterial • Related expenditure are ongoing in nature	• Recommend step not be included on the basis of inappropriate driver and immateriality. • Recommend proposed step be treated as an inclusion to the base year on the basis that it is related to a typical operating activity and is ongoing in nature.
Future water security program updates	$0.43	0.022%	• Relevant driver: expenditure appears to be associated with new obligation. • Materiality: at 0.022% of total proposed opex the expenditure is immaterial • Related expenditures occur on an cyclical basis over the course of the regulatory period	• Recommend step not be included on the basis of immateriality. • Recommend proposed step be treated as an inclusion to the base year.

Step	NPV (@6%)	% Total Opex	Assessment	KPMG Recommendation
Integrated master plan update	$0.22	0.011%	• Relevant driver: expenditure appears to be associated with typically operational activity and an existing obligation. • Materiality: at 0.011% of total proposed opex the expenditure is immaterial • Related expenditures occur on an cyclical basis over the course of the regulatory period and are correlated to fture waer security updates.	• Recommend step not be included on the basis of inappropriate driver and immateriality. • Recommend proposed step be treated as an inclusion the base year on the basis that it is related to a typical operating activity and is ongoing in nature.
Communication and education for recycled water	$8.10	0.405%	• Relevant driver: expenditure appears to be associated with typically operational activity. • Prudent and efficeint: note that expenditure is being proposed during a period of relatively stable supply.	• Recommend step be included at an amended rate. Given the step relates to the implementation of a three year program we suggest the expenditure be capped at three years. If Seqwater elects to continue the program into the next regulatory period it can propose for an extension of the program. • The driver for the step is not a new obligation or new capital program. The driver appears operational in nature. • In the absense of drought and high level restrictions we believe it would not be prudent to include 10 years of onoing recycled water eductation programing..
EBA advice	$0.30	0.015%	• Relevant driver: expenditure appears to be associated with typically operational activity and an existing obligation. • Materiality: at 0.015% of total proposed opex the expenditure is immaterial • Associated expenditure is cyclical and ongoing in nature. •	• Recommend step not be included on the basis of inappropriate driver and immateriality. • Recommend proposed step be treated as an inclusion the base year on the basis that it is related to a typical operating activity and is ongoing in nature.
Additional training spend leadership	$0.37	0.018%	• Relevant driver: expenditure appears to be associated with typically operational activity and an existing obligation. • Materiality: at 0.018% of total proposed opex the expenditure is immaterial • Prudent and efficient. Insufficent information to assess prudency and efficency. Seqwater QCA KPMG RFI 90 indicated that the expenditure related to a ongoing leadership training course and would primarily be spent on consultancies. The RFI provided no information about the value of the benefits or specific outcomes being sought from the program. In terms of	• Recommend step not be included on the basis of inappropriate driver and immateriality.

Step	NPV (@6%)	% Total Opex	Assessment	KPMG Recommendation
			efficiency our expectation is that the operational benefits (efficiencies) associated with program should outweigh the costs over the course of time.	
Budget Assumptions	$7.47	0.374%	• Relevant driver: expenditure appears to be corrections of the budget. RFI 80 indicated that the adjustements included incorrect allocations of costs that Seqwater wished to retain in order to consider potential technological changes over the long term. • Materiality: at 0.374% of total proposed opex the expenditure is material • Prudent and efficient. Prudency and efficiency: Insufficent information to assess prudency and efficency.	• Recommend step not be included on the basis of inappropriate driver, insufficient information and an inability to establish efficiency.
Wyaralong WTP	$5.59	0.280%	• Relevant driver: expenditure is related to capital expenditure over the course of the regulatory period. • Materiality: at 0.280% of total proposed opex the expenditure is material • Prudent and efficient. Prudency and efficiency will depend on the accepatance of the corresponding cpaital proposal by QCA. Seqwater QCA / KPMG RFI 91. • Seqwater's noted in its RFI 91that in transposing the Noosa WTP fixed costs, Fixed Operational Costs were incorrectly double counted. This should be corrected such that the 2018-19 dollar fixed costs change from $760,000 to the corrected $702,880.	• Recommend step be excluded on the basis that the associated capex was excluded.
Ewan Maddock	$4.20	0.210%	• Relevant driver: expenditure is related to capital expenditure over the course of the regulatory period. • Materiality: at 0.210% of total proposed opex the expenditure is materiall • Prudent and efficient. Prudency and efficiency will depend on the accepatance of the corresponding capital proposal by QCA.	• Recommend step be included on the basis of it being assoicatied with capex aimed at increasing capacity and securiing higher levels of security of supply.
TOTAL step OPEX	$29.41	1.472%		

KPMG notes that only two of the proposed steps are directly related to capex. KPMG's expectations based on our experience and the work we have undertaken in reviewing Seqwater's proposed capital expenditure is that there would or should be more opex steps relating to the commissioning of new

capex. If it is the case that Seqwater's submission was not comprehensive, it should reply to KPMG's report with documentation supporting additional capex related steps.

In relation to the steps that we have recommended be included in the base year, we calculated the NPV of the expenditure streams over the ten year period and determined an annualised amount that is NPV neutral to Seqwater (that is delivers the same revenue stream over the period). This annualised revenue stream was then added to the base year.

Table 85: Summary of KPMG findings steps $ million

Recommended Steps	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Communication and education for recycled water	$1.1	$1.1	$1.2	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Ewan Maddock	$0.8	$0.8	$0.8	$0.8	$0.9	$0.9	$0.9	$0.9	$1.0	$1.0

Steps to be treated as inclusions / exclusions in Base year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Gold Coast Desal and WCRWS contracts	$0.0	$0.2	$0.1	$0.1	$1.2	$0.2	$0.3	$0.6	$0.6	$0.9
Provision of additional drafting services	$0.0	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1
QCA reviews	$0.0	-$0.7	$0.3	-$0.7	-$0.8	$0.4	-$0.7	-$0.9	$0.4	-$0.8
Future water security program updates	$0.0	$0.0	$0.2	$0.1	$0.0	$0.0	$0.0	$0.3	$0.1	$0.0
Integrated master plan update	$0.0	$0.0	$0.1	$0.1	$0.0	$0.0	$0.0	$0.1	$0.1	$0.0
EBA advice	$0.1	$0.0	$0.0	$0.1	$0.0	$0.0	$0.1	$0.0	$0.0	$0.1
Total	**$0.1**	**$0.2**	**$0.4**	**$0.5**	**$1.3**	**$0.3**	**$0.5**	**$1.0**	**$0.9**	**$1.1**
NPV of total STEP	**$1.7**									
NPV neutral annualised revenue flow	**$0.2**	**$0.2**	**$0.2**	**$0.2**	**$0.2**	**$0.2**	**$0.2**	**$0.2**	**$0.2**	**$0.2**

8.7 Productivity targets

In the 2015 Review the Authority chose not to recommend an ongoing efficiency target on the basis of cost savings already identified by Seqwater in its proposal. Seqwater have proposed a cumulative ongoing efficiency target of 0.2% per annum of controllable costs.

We note that most regulators impose an efficiency target or productivity hurdle on controllable opex. In most cases these targets range from 1% to 2% per annum. For example the ESC in Water Price Review 2013 imposed a productivity hurdle of 1% per annum on each of the Victorian water businesses. We also note that under the ESC's new PREMO regulatory framework, businesses are incentivised to propose alternative efficiency targets (other than the 1% hurdle set by the regulator). While the ESC is yet to conduct its price review, we note that of the 17 participating water businesses, the average opex efficiency factor they have proposed is approximately 2.0% (with a minimum of 1%).

In 2015 IPART imposed on Sydney Water both continuing and catch-up efficiencies that maxed at 3% per annum in 2020.

Other recent reviews include that undertaken by ESCOSA of SA Water. The independent reviewer of SA Water's opex recommended:

> *"Acceptance of SA Water's proposed efficiency target of 1 % per annum (compounding) for the first two years of the RBP2016 regulatory period but applying an additional efficiency target equal to 50% of the general efficiencies identified by SA Water for the last two years of the regulatory period to reflect the level of ongoing efficiencies we consider that SA Water will be able to achieve."*

We note that continuing efficiency reflects the continuing efficiencies being gained across all major sectors through innovation and new technologies and is on-going in nature. Relative to efficiency targets in other jurisdictions the Seqwater proposal is low. This implies that there may be scope for QCA to consider higher targets.

KPMG think that there is a case for a more challenging efficiency target to be applied over the course of the regulatory period. We recommend a 1% per annum continuous target be applied over the coming regulatory period. We note that this recommendation is based primarily on regulatory precedent and industry standards. We acknowledge that we have not undertaken a Total Factor Productivity study or any frontier based statistical analysis (such analysis is outside the scope of this review). For this reason we have taken a conservative approach and recommended an efficiency target of 1% per annum, which is at lower end of targets currently being adopted by businesses in other jurisdictions as shown in the table below.

Table 86: Recent efficiency targets % per annum

Sydney Water	**2017**	**2018**	**2019**	**2020**
Continuing efficiency	0.3%	0.5%	0.8%	1.0%
Catch up efficiency	0.5%	0.8%	2.0%	2.0%
SA Water	**2016-17**	**2018-18**	**2018-19**	**2019-20**
Continuing efficiency	1.0%	1.0%	1.5%	1.5%
Victorian Urban Water	**2013-14**	**2014-15**	**2015-16**	**2016-17**
Continuing efficiency	1.0%	1.0%	1.0%	1.0%
Water Corporation	**2018-19**	**2019-20**	**2020-21**	**2021-22**
Continuing efficiency	2.5%	2.5%	2.5%	2.5%

Icon Water	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**
Continuing efficiency	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%

Source: Atkins Cardno 2015 Expenditure Review Final Report (Sydney Water), Cardno Atkins Review of Capital Expenditure Plans of SA Water (2016), ESC Water Price Review 2013-18. ERA 2017 The efficient costs and tariffs of the Water Corporation, Aqwest and Busselton Water Draft Report. ICON Water 2017 2018–23 Water and Sewerage Price Proposal.

We also note that Seqwater has applied the efficiency targets selectively to variable costs. Seqwater has classified both electricity related costs and chemical related costs as uncontrollable and therefore not subject to an efficiency target. Seqwater site IPARTs recent decision in regard to Hunter Water and Sydney Water as regulatory precedent. An alternative approach is adopted by the ESC in Victoria. Uncontrollable costs are defined strictly as costs that the business has no control over and include such items as licence fees set by government and environmental levies set by government. All other opex cost are subject to the Commissions set productivity hurdle (efficiency target).

KPMG does not consider electricity or chemical costs to be strictly uncontrollable. While Seqwater may be subject to market prices and have little negotiating power or ability to achieve discounts, the associated cost is a product of both price and quantity. Seqwater has direct control over the manner in which it utilises these inputs through its technological choices and service supply solutions and therefore has control over the quantity and manner in which these inputs are utilised. Accordingly we recommend that the efficiency factor be extended to include both variable chemical costs and variable electricity costs.

The efficiency factor has also been applied to controllable fixed opex costs. We have reviewed Seqwater's definition of its controllable opex cost base. There are a number of proposed non-controllable costs that we believe should be treated as controllable. We have included contract based costs in the controllable base on the basis that the 10 year length of the regulatory period provides Seqwater with opportunity to influence or exert control over contracts as they are negotiated or renegotiated. Similarly we believe the EBA represents a controllable cost as Seqwater has multiple opportunities within the 10 year period to negotiate for more efficient outcomes.

We have also included other expenditures such as property expense, initiatives, chemicals fixed, and portable equipment, which we believe should also be controllable in nature. Our approach is premised on the assumption that uncontrollable costs refer to those costs associated with a regulatory obligation and imposed by a third party or alternatively are totally outside of any capacity of Seqwater to control. Seqwater's proposed controllable cost base and our recommended controllable cost base are set out in the following table.

Its worth noting that a significant number of Victorian water utilities are currently investing in alternative sources of energy (including solar generation) to offset increasing electricity prices and to manage their electricity costs.

Table 87: Controllable cost base 2018-19 ($'000)

Seqwater proposed cost base	$'000	KPMG recommended cost base	$'000
Fixed operating costs			
Salaries and Wages	$62,085	Salaries and Wages	$62,085
Allowances	$1,801	Allowances	$1,801
Bonuses	$1,665	Bonuses	$1,665
Directors Fees	$380	Directors Fees	$380
Leave Entitlements	$14,281	Leave Entitlements	$14,281
Other employee costs - direct	$13,795	Other employee costs - direct	$13,795
Other employee costs - indirect	$2,813	Other employee costs - indirect	$2,813
Administrative Expenses	$15,741	Administrative Expenses	$15,741
Consultants and Contractors	$19,568	Consultants and Contractors	$19,568
FBTable Expenses	$11	FBTable Expenses	$11
Bank Charges	$10	Bank Charges	$10
		Operations and Maintenance	$25,586
		Operations & Mtce - Collaborative Mtce Contract (labour)	$9,746
		Operations & Mtce - Collaborative Mtce Contract (Other)	$649
		Property Expenses	$14,530
		Initiatives	-$4,530

Seqwater proposed cost base	$'000	KPMG recommended cost base	$'000
		Chemicals – Fixed	$746
		Portable Equipment	$319
		EBA Savings Efficiencies	-$1,994
Variable operating costs			
Residual disposal costs	$10	Residual disposal costs	$2,277
		Chemicals	$13,810
		Energy	$18,514
Total operating costs			
TOTAL	**$134,429**		**$211,806**

Table 88: Efficiency targets recommended by KPMG (%)

Target	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Seqwater	0.0%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
KPMG	0.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%

8.8 Adjustments for offsetting revenue

Another material driver of Seqwater's proposed opex forecast are the application of offsetting revenues. These revenues relate to activities associated with regulated assets but with non-bulk water services, such as the delivery of raw water to power stations and revenues from Hydro power schemes. The offsetting revenues are outlined in Table 89.

As can be observed in the table Seqwater is forecasting a significant drop in the offsetting revenues for the base year. The primary driver for this decline in revenue is a 43% decrease in the revenue associated with raw water sales to the Stanwell power station and Toowoomba Regional Council.

Table 89: Offsetting revenues ($m nominal)

Offsetting revenues	2015-16	2016-17	2017-18	2018-19 (Base Year)
Power Stations (Stanwell) and Toowoomba Regional Council	$21.8	$22.2	$23.8	$13.5
Raw water	$0.1	$0.1	$0.1	$0.1
Property and facilities	$0.8	$0.8	$0.9	$0.9
Wivenhoe boot scheme	$0.0	$0.0	$0.0	$0.1
Landers Schute Hydro	$0.2	$0.0	$0.2	$0.2
Total	**$23.0**	**$23.1**	**$25.0**	**$14.9**

Seqwater has indicated that the observable decline is attributable to a change in contract associated the Stanwell power station and Toowoomba regional council. Seqwater stated

"A new contract for water supply to Stanwell is with the Minister (Treasurer) for deeming. [redacted] which is from

1/7/17 to 30/6/23. There is provision for extension to 30/6/28 and subsequently to 30/6/33 at Stanwell's request." [29]

Seqwater has advised that it assumed the risk with the revenue offsets by assuming that the contract will continue to 2028, so there is another ten years of revenue offsets to the benefit of the bulk water price to other customers. Seqwater have also stated

"For Toowoomba Regional council a contract has been in place since 20/12/12 expiring 28/1/20 [redacted]*. There is an option to extend for a further 10 years which requires TRC to notify Seqwater by 28/7/19. At this point there is no negotiation contemplated until early 2019. Seqwater believes that TRC will seek to extend the contract in light of Toowoomba's historic and continuing issues with water supply and has included this revenue offset out to 2028."* [30]

KPMG has assessed Seqwater's proposed revenue offsets for inclusion in the base year and notes that the expenditure proposed for [redacted]. We note that the proposed revenue offset for TRC is consistent with the contract information provided by Seqwater.

Seqwater has indicated that difference between the contract values is to compensate Seqwater for ending the old contract 1 year early (i.e., 30 June 2017 instead of 30 June 2018) and moving to a new contract with a lower fixed charge.

[29] Seqwater RFI 070 / QCA RFI 1 Question 1 (a) and (b).

[30] Seqwater RFI 070 / QCA RFI 1 Question 1 (a) and (b).

9 Review events

In handing down its 2015 final recommendation, the Authority defined three types of review events to be considered as part of a future price review including:

- Emergency events;
- Law or government policy events; and
- Feedwater quality events.

Where Seqwater can demonstrate that it is not at fault for an emergency event, or it cannot manage the impact of a change in law or government policy or feedwater quality each of which may cause a change in revenue, or prudent and efficient costs, the Authority recommended:

a) a material change be eligible for a mid-price path review; and

b) where not subject to a mid-price path review, the change be recouped by an end-of-period adjustment.

In addition to these events, the referral notice to the Authority requires it to review additional costs incurred by Seqwater for drought response over the period 1 July 2015 to 30 July 2018.

The prudence and efficiency of costs associated with each event as identified by Seqwater and included in its submission has been reviewed below.

9.1 Approach to assessing review events

Consistent with KPMG's approach to reviewing Seqwater's proposed step changes, KPMG has applied a similar criteria aligned with regulatory best practice and our experience of the manner in which review events are typically treated within existing regulatory frameworks. Specifically, the expenditure (capex or opex) associated with a review events needs to be:

1. reflective of an external event outside of the control of Seqwater which is not reasonable foreseeable or which cannot be responded to under normal operation;
2. both prudent and efficient; and
3. material relative to the total capital or operating expenditure proposed over the regulatory period.

The expenditure associated with a review event is not intended to form part of the forecast base revenue requirement moving forward. Instead, as an end of period adjustment the recovery of these costs occur over a defined period subject to their materiality.

9.2 Emergency events

Ex-tropical cyclone Debbie, which hit the east coast of Australia in March 2017 represents the only emergency event experienced by Seqwater over the current regulatory period. At the time of making its regulatory submission, Seqwater had not finalized its assessment of the additional costs resulting from this event.

9.3 Law or government policy events

Seqwater is not seeking any adjustments arising from a change in law or government policy.

9.4 Feedwater quality events

Seqwater is not seeking a specific end-of-period adjustment arising from a feedwater quality event. Instead, Seqwater has proposed a change in its variable operating expenditure budget. Seqwater note this change would remove minor or seasonal feedwater quality variation as a review event moving forward, while retaining the option for 'major' events only.

KPMG's has therefore assessed Seqwater's proposed change in variable operating expenditure associated with feedwater quality as part of its overall assessment of operating expenditure in Section 0.

9.5 Drought response

At the time of submission, Seqwater had not finalised its assessment of the additional costs incurred by the business resulting from prevailing drought conditions. KPMG understand Seqwater will make a supplementary submission with revised cost estimates. As an interim measure, Seqwater has provided indicative cost estimates. These estimates are in relation to:

1. Operation of the grid under drought-response mode ($400,000); and
2. Carting of water at the Dayboro WTO to stand-alone supply schemes ($100,000):

Drought conditions and lower storage levels in northern SEQ have triggered a change in operations from 'least cost' mode to 'drought' mode by Seqwater. In doing so, Seqwater has sought to provide additional support to the northern region under normal seasonal conditions, including re-commissioning Ewen Maddock to bring it into hot standby mode. Seqwater has also been required to pump water north via the Northern Pipeline Interconnector (NPI). In addition to these measures, Seqwater has been required to cart water from its Dayboro WTP to the Dayboro off grid community.

While KPMG understand the majority of costs resulting from the change in operation mode relate to the re-direction of flows along the NPI, and subsequent change in energy costs (currently included in the breakdown of forecast variable opex), the breakdown of incremental costs associated with this change in operation mode and requirement for carting is unclear.

As Seqwater are yet to finalize their estimate of drought response costs, and are intending to provide a supplementary submission, KPMG therefore recommend these costs not be approved by the Authority until such time as the submission is provided by Seqwater. As part of the supplementary submission, the Authority should request from Seqwater a detailed breakdown of costs relative to the base year expenditure or that expenditure associated with 'least cost' mode of operation.

Appendix A - Seqwater Meetings

Table 90. KPMG meetings with Seqwater staff

Capital Expenditure – 21/22 August 2017 (David Francis, Julian Watts, Lance Brooks)
• Long term planning – Kate Lanskey
• Strategic asset management – Mark Wilson
• Overview of capital planning – Bruce Hutton, Arran Canning
• Renewals program – TBC
• Delivery of program – Kathleen Thatcher
• Benefits realisation – Brett Myatt, Arran Canning
• Project 1: All Pipes – PAA Beaudesert WSZ Upgrade – Mark Smith, Bruce Hutton, Amelia Jewell
• Project 2: Mt Crosby East Bank WTP - PID01566 - TEB: Filtration Upgrade / Improvement – Lee Foster
• Project 3: Mt Crosby East Bank WTP - TEB: Eastbank WTP Sedimentation Upgrade (Resilience) – Lee Foster
Capex - Monday 22 August 2017 (David Francis, Lance Brooks).
• Project 4: North Pine WTP - TNP: Filtration Capacity Upgrade (250 ML/day) - Lee Foster, Amelia Jewell
• Project 5: Ipswich Office - Enterprise Resource Planning Program CAPEX - Murray Heke, Graham Welch, Edwin Sayers
• Project 6: Holts Hill Reservoir - RHH: pH Correction Upgrade – Lee Foster
• Project 7: Somerset Dam - DSO: Dam safety upgrade – Barton Maher
• Project 8: Lake MacDonald Dame - PID01688 - DLM: McDonald Dam Upgrade Stage 2 – Barton Maher
• Project 9: Leslie Harrison Dam - PID01430 - DLH: Leslie Harrison Dam Upgrade Stage 1 – Barton Maher
• Project 10: Administration Indirect Costs - Mobile Plant and Fleet Renewals - Darren Hayman, Karen Jones

Operating expenditure - 24 August 2017 (Mark Fitzgibbon, Lance Brooks)
• Operating Costs Forecast Methodology – Adam Kay-Spratley
• Regulatory model overview – Adam Kay-Spratley
• Base Year 2018-19development – Kimberley Harding,
• Opex governance – Kimberley Harding,
• Escalation / Growth – Adam Kay-Spratley

Operating expenditure - 24 August 2017 (Mark Fitzgibbon, Lance Brooks)
• One off step changes: MWA (Major Contracts, WQ Reporting, Fixed Opex mode-driven) – Mark Cullian
• One off step changes: ICT – Murray Heke, Edwin Sayers
• One off step changes: Water Security Programme, Integrated Master Plan – Kate Lanskey
• One off step changes: Community Engagement and education – Liz Kearins, Sophie Walker
• Overview of Procurement Processes – Michael Harkin

Contact us

Eamonn Corrigan
Director
+ 61 (2) 9335 8555
Ecorrigan1@kpmg.com.au

Mark Fitzgibbon
Associate Director
+ 61 (2) 9335 8555
Ecorrigan1@kpmg.com.au

Julian Watts
Associate Director
+ 61 (2) 9335 8555
Ecorrigan1@kpmg.com.au

Lance Brooks
Associate Director
+ 61 (7) 3233 9333
lbrooks2@kpmg.com.au

kpmg.com.au

David Francis
Director
SIP Advisory Pty Ltd
+61 03 9751 2281
+61 0403 399 419
david.francis@sipadvisory.com