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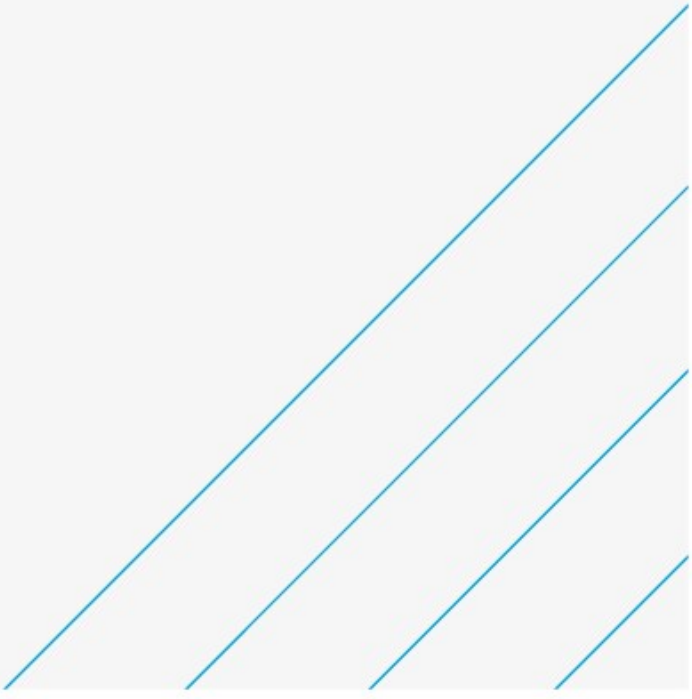
Review of expenditures and demand for the investigation of Seqwater's bulk water prices for 2022–26

Draft Report

Queensland Competition Authority

25 November 2021



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Glossary

Acronym	Definition
AARP	Annual Asset Renewal Program
AAS	Australian Accounting Standards
ACP	Asset Class Plans
AEP	Annual Exceedance Probability
AHD	Australian Height Datum
ANCOLD	Australian National Committee on Large Dams
APMP	Asset Portfolio Master Plan
AS4000	lump sum construction contract
AWTP	Advanced Water Treatment Plants
BAFO	Best and Final Offer
BC	Business Case
BRCFS	Brisbane River Catchment Flood Study
BWSA	Bulk Water Supply Agreements
BWTP	Beaudesert Water Treatment Plant
Capex	Capital expenditure
CEG	Cost Estimation Guidelines
CPGG	Capital Portfolio Governance Group
CPI	Consumer Price Index
DAF	Dissolved Air Flotation
DBC	Detail Business Case
DTI	Digital Technology and Innovation
ECI	Early Contractor Involvement
EEOR	Energy Efficiency Opportunity Register
EFRC	Executive Fiscal Review Committee
ELT	Executive Leadership Team
EMaAP	Energy Modelling and Analytics platform
ERP	Enterprise Resource Platform
FSL	Full Supply Level
FTE	Full Time Equivalent
FY	Financial Year ending
GCDP	Gold Coast Desalination Plant
GHG	Greenhouse Gas
GL	Gigalitres
GST	General Sales Tax
GWh	Gigawatt hours
HV	High Voltage

Acronym	Definition
ICT	Information Communication Technology
IDC	Interest During Construction
IMP	Integrated Master Plan
IT	Information Technology
KBWS	key bulk water storage
KPIs	Key Performance Indicator
kV	Kilovolts
LGA	Local Government Area
LP	Luggage Point
MCS	Monitoring and Control System
MIS	Maintenance Improvement Strategy
Ml/d	Megalitres per day
O&M	Operations and Maintenance
Opex	Operating expenditure
OT	Operational Technology
p.a	per annum
p90	Probability exceedance 90
PAR	Population at Risk
PLC	Programable Logic Controllers
PRA	Portfolio Risk Assessment
PRW	Purified Recycled Water
PV	Photovoltaic
QCA	Queensland Competition Authority
QCA Act	Queensland Competition Authority Act 199
QGSO	Queensland Government Statistician's Office
QLD	Queensland
RAB	Regulated Asset Base
RFI	Request for Information
ROV	Remote Operated Vehicle
RPEQ	Registered Professional Engineer of Queensland
RWPS	Raw Water Pump Station
SaaS	Software as a Service
SCADA	Supervisory control and data acquisition
SEQ	South East Queensland
Seqwater	Queensland Bulk Water Supply Authority
SOA	Standing Offer Arrangement
SRWP	Southern Regional Water Pipeline
SWP	South West Pipeline
ToR	Terms of Reference

Acronym	Definition
UAV	Unmanned Aerial Vehicle
VRM	value and risk matrix
WACC	Weighted Average Cost of Capital
WCRWS	Western Corridor Recycled Water Scheme
WSP	Water Security Plan
WTP	Water Treatment Plant

Executive Summary

Areas where Seqwater does well

We highlight below some of the key areas which impressed us in undertaking the review:

- **Digital, Technology and Information (DTI)** strategy and structure is appropriate and fit for purpose. The digital strategy is aligned with business drivers, weaknesses are recognized, and projects and renewals are focused on improving existing systems and using technology to enhance business operations.
- Seqwater's **asset management processes** have improved notably:
    - Improvements have been made to the quality of condition and criticality data through the ongoing implementation of a new criticality framework and clarified condition assessment criteria.
    - Seqwater has demonstrated readiness and ability to learn the lessons from incidents such as Sparkes Hill Reservoir structural failure and change its practices as a result.
- It has shown that it has good **awareness of areas that it needs to improve on** in capital processes and delivery, this is demonstrated by its priority objectives within the Corporate Strategy and a number of key initiatives have been identified.
- Up until recent years (2019), Seqwater **was successful in keeping opex to efficient levels**, routinely outperforming the Determination.
- We were impressed by the **capability and quality of the individuals** we interacted with, suggesting a high calibre of staff in the organization.
- The organization was very **responsive, open and helpful** in this process.

Potential areas of improvement

As with all organisations there are areas where we believe improvements could be made which would help to improve performance and efficiency. We summarise the most significant potential areas of improvement below.

1. **Spend to save** can help an organization to become more efficient and effective. We saw little to no evidence of consideration of opportunities for operational efficiencies by delivering capital projects. This is most notable for:
    - Energy efficiency projects which are perhaps one of the easiest projects to implement with rapid benefits realisation;
    - On-site PV solar generation projects which should also provide a quick payback period in offsetting expenditure on energy according to Seqwater's own analysis;
    - We saw no DTI spend to save projects, often a key lever for efficiency in other organisations.
2. **Drivers for expenditure** are not well measured or understood:
    - Activity based costing is not fully applied. For example, major projects opex includes over 50% of costs allocated to 'administration' code, giving little visibility of what the time and therefore cost relates to. The full implementation of timesheets and activity-based costing provides greater visibility of costs and identifies potential for efficiency gains.
    - Cost drivers for capital expenditure have not historically been captured for outturn costs, we suggest that clear allocation to cost drivers would give management more information with which to make informed decisions on expenditure. This is also beneficial from a regulatory perspective when reviewing justification for expenditure across various asset types.
    - We also suggest that cost drivers are captured at a more granular level using proportional

allocation where there are multiple drivers within one project, for example. This is particularly relevant for the emerging major projects where a strategic approach to planning ought to be taken.

3. **Opex efficiency and variance**
    - In our experience, well managed utilities have a good understanding of the quantum and causes of both year-on-year variance and performance against the Determination and a plan to mitigate any adverse movements. We saw little evidence of understanding of the variance against Determination or actions taken to mitigate the overspend.
    - A closer variance monitoring process should drive internal focus on priorities and efficiencies.
4. **Risk and performance and link to expenditure**
    - In our experience well run utilities use clear and regular reporting of underlying system and asset risk and performance. We found little evidence of this kind of approach. For example, it was not possible to demonstrate to us, how the organization would know if it was carrying out maintenance efficiently and effectively. This lack of risk and performance indicators then makes it harder to measure asset health and make the case for expenditure or changes in approach.
    - Linked to this, it appears that much of the asset management focus appears to have been on process improvements rather than data and decision-making to drive improved outcomes and efficiency.
5. **Capital expenditure costs and efficiency**
    - No capital efficiencies have been included within the Seqwater pricing proposal. From a capex perspective the projects are a 'lift and shift' from the APMP and there is no evidence of Seqwater reviewing the plan in the round and identifying opportunities for efficiencies. We would expect to see evidence of some form of internal efficiency challenge prior to submitting the pricing submission to Queensland Competition Authority (QCA), this does not appear to have happened.
    - Procurement is an area where Seqwater has opportunities to improve its processes. The majority of projects are procured as a design then construct contracts or combined design and construct contracts. We have seen limited evidence of more sophisticated approaches to procurement such as early contractor involvement, alliancing or risk/reward sharing to deliver more efficient outcomes. This may become more embedded as larger capital projects are developed in the coming years. Seqwater has identified that strategic packaging or bundling of capital projects may help to drive economies of scale and realise efficiencies. We agree and would expect some early efficiencies to be gained through utilizing this approach.
    - Contingency is all held at the project level by project managers and there are no sophisticated approaches employed to cost contingency at a program or portfolio level. Although reasonable justification and approval process is in place there are opportunities to improve this and realise efficiencies.
6. **Integrated strategic planning Drought management**
    - Seqwater has carried out a number of activities in advance of the triggers set out in the Water Security Program. This suggests limited confidence in the robustness of the triggers or a lack of granularity (e.g. sub-actions) in the program. It would be useful to address these issues to ensure that Seqwater can act with confidence in drought conditions.

Recommended expenditure

We have reviewed Seqwater's proposed expenditure and recommend accepting a number of the claims made for increases in the next period. We have recommended applying a continuing efficiency (of 0.5% p.a.) and catch-up efficiencies to both capex and opex.

Operating expenditure

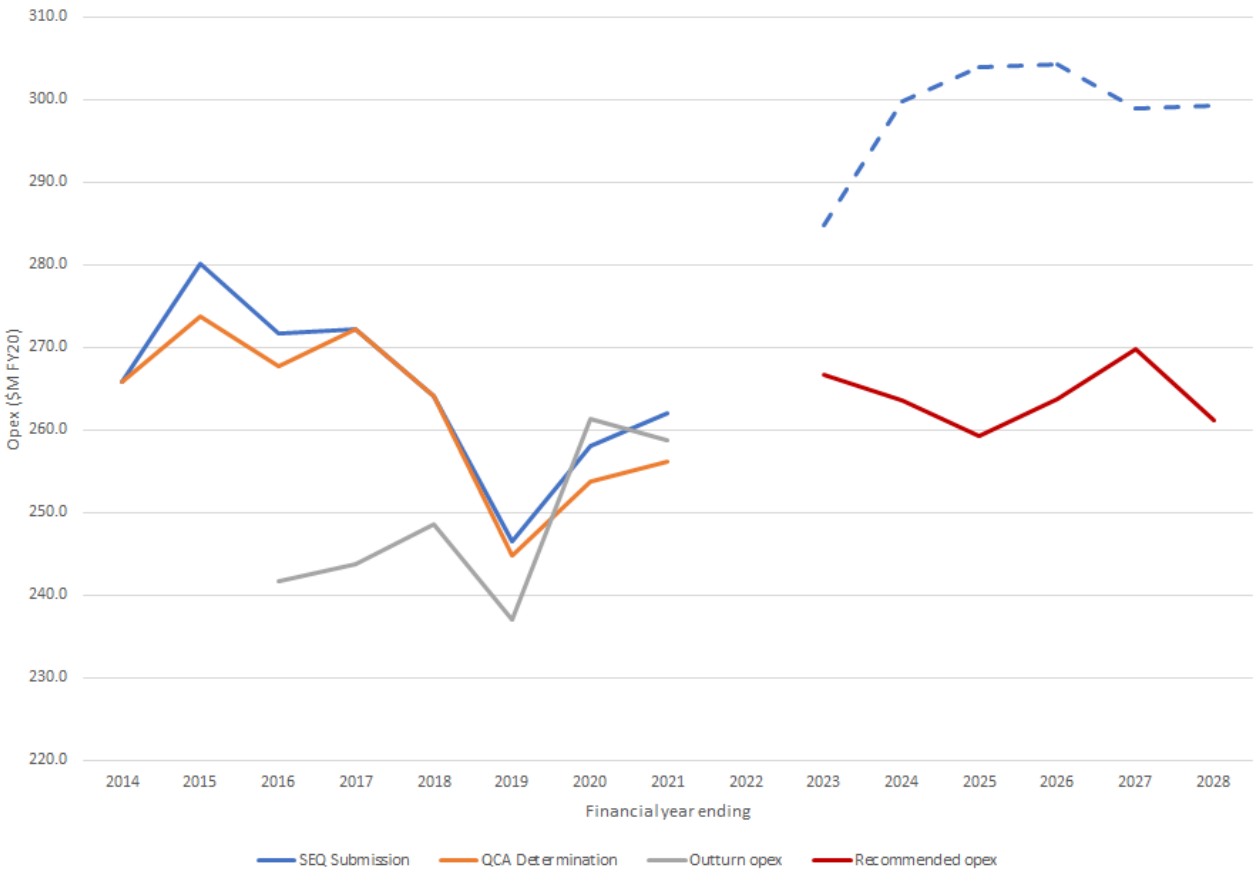
Having previously outperformed the Determination, since 2019, Seqwater's opex has increased significantly and has exceeded the allowance. Seqwater has projected further significant increases, with the most significant driver being the expected costs of planning for major projects.

We have recommended accepting a number of the step changes, including some of the planning and natural assets costs, albeit at a different level or reprofiled.

The efficient level of expenditure is based on the previous Determination projection for FY20, adjusted for reasonable 'exogenous' factors outside of Seqwater's control, such as the industry wide increase in insurance costs and a reasonable proportion of the new major projects division. The inefficient fixed expenditure in 2020 is recovered through a one-off adjustment in 2023 and a glide path or catch-up efficiency to achieve the efficient fixed expenditure by 2025.

The total (fixed and variable) historical and recommended operational expenditure is summarised below. As can be seen, it is a significant increase on current levels of spend, but not as significant as requested by the organisation.

Figure 0-1 - Recommended total (fixed and variable) opex ($M FY20)



Source: Seqwater Document "RFI 62-66 Attachment" and QCA reports March 2015 and March 2018 and "OPEX Forecast Summary as per sub + LP 2021-06-20 sent to QCA"

Note: unadjusted opex

Capital expenditure – current determination period

Capital expenditure reported in the current Determination period includes actuals for 2018, 2019, 2020 and 2021; forecast expenditure is included for 2022. Seqwater is forecasting a $170M underspend against its QCA regulatory allowance with the biggest contributor being the deferral of the Lake MacDonald Dam Safety Upgrade project of $95.6M. We have observed a number of process improvements Seqwater has made within the current determination period. Within the current determination period we recommend three adjustments to arrive at our recommended level of prudent and efficient capital expenditure:

- Reduction of Regulated Asset Base (RAB) for Grid Support costs of $11.8M which are additional variable operating costs, not tangible assets, incurred in managing the grid to deliver bulk water.
- Sparkes Hill Reservoir roof replacement reduction of $1.4M from the RAB for inefficient procurement processes as a result of the reactive nature of the project.
- Increase RAB by $0.36M for the categorisation of some of the drought review event costs that we consider to be capex rather than opex.

Capital expenditure – Future determination period

Seqwater proposes expenditure of $889M capex over the future period to be capitalised or $675M on an as incurred basis. Overall, we are broadly supportive of Seqwater's capital expenditure plans in terms of the prudency of its investment plans in the future period.

We recommend a number of specific scope adjustments to Seqwater's proposed capital program:

i. Wivenhoe Dam Gates project recategorisation from opex to capex, increasing capital expenditure by $5.2M (incurred and capitalised).
ii. Emergent works allowance expenditure has not been justified to recommend additional expenditure, decrease capital expenditure by $17.1M (incurred and capitalised).
iii. Solar PV project capex would be prudent given operational efficiencies that can be realised with a rapid payback period, increase capital expenditure by $11.1M (incurred and capitalised).
iv. Energy Efficiency capex would be prudent given operational efficiencies that can be realised with a rapid payback period, increase capital expenditure by $3.4M (incurred and capitalised).
v. Deferral of the proposed capitalisation of the $140M Lake MacDonald Dam Safety upgrade project from 2025 to 2027 as this project scope is still to be defined and the total estimated expenditure is still to be confirmed.
vi. Netting off of $1.4M of proposed capitalised capex in FY23 for South West Pipeline expenditure for $1.2M capex already capitalised in the current period.

We then recommend adjustments to reflect catch-up and continuing efficiency. Catch-up reflects the efficiency needed to be achieved over time to catch up with a frontier utility. Seqwater has not applied any internal efficiency challenge on any of its capital program, either in the round or at sub-program level. We would expect Seqwater to make efficiency savings considering the improvements that Seqwater continue to make to its capital processes.

We have sought to identify, throughout our review, where there are opportunities to realise achievable efficiencies throughout the future determination period. These primarily relate to initiatives that Seqwater are already undertaking and some further opportunities and recommendations that we have identified throughout the course of our review. We have identified three areas where Seqwater should be able to make material improvement to its processes to move towards the efficiency frontier utility level over time and deliver material efficiencies over the next Determination period. These are:

i. Capital planning and asset management
ii. Contingency management and cost estimation
iii. Bundling or packaging of projects for procurement

Our view of prudent and efficient capital expenditure is summarised in Table 0-1 below.

Table 0-1 - Atkins recommended capitalised capital expenditure in the future period

FY ending ($000k, nominal)	2023	2024	2025	2026	2027	2028
Seqwater proposed capital expenditure (incurred)	179,409	189,522	163,218	142,547	228,881	159,645
Seqwater proposed capital expenditure (capitalised)	298,447	139,172	287,461	164,515	177,108	284,586
Atkins recommended scope adjustments (incurred)						
Wivenhoe Dam Gates from Opex to Capex	513	1,153	2,312	1,203	1,233	1,264
Emergent works allowance not justified	- 3,075	- 3,075	- 3,075	- 3,075	-	-
Solar project capex	-	4,532	3,231	3,311	3,394	-
Energy Efficiency capex	348	502	1,689	844	-	-
LP3 Renewals to drought allowance	- 2,968	- 3,024	- 3,087	- 3,159	- 3,234	- 3,312
Atkins recommended expenditure incurred pre-efficiency	174,226	189,610	164,287	141,671	230,274	157,597
Atkins recommended efficiency adjustments (applied to scope adjusted incurred capex)						
Catch-up efficiency %	1.89%	3.36%	6.32%	6.79%	8.79%	8.79%
Catch-up efficiency $	- 3,301	- 6,370	- 10,391	- 9,619	- 20,240	- 13,852
Continuing efficiency %	0.50%	1.00%	1.49%	1.99%	2.48%	2.96%
Continuing efficiency $	- 855	- 1,828	- 2,297	- 2,621	- 5,199	- 4,259
Total recommended efficiency adjustments	- 4,156	- 8,198	- 12,687	- 12,240	- 25,439	- 18,111
Atkins recommended scope adjustments (capitalised)						
Wivenhoe Dam Gates from Opex to Capex	513	1,153	2,312	1,203	1,233	1,264
Emergent works allowance not justified	-	-	-	- 17,177	-	-
Solar project capex	-	4,532	3,231	3,311	3,394	-
Energy Efficiency capex	348	502	1,689	844	-	-
LP3 Renewals to drought allowance	- 2,968	- 3,024	- 3,087	- 3,159	- 3,234	- 3,312
Lake MacDonald deferral			- 140,097		155,624	
South West Pipeline land costs already capitalised	- 1,425	-	-	-	-	-
Total recommended scope adjustments (capitalised)	- 3,533	3,163	- 135,953	- 14,978	157,017	- 2,048
Atkins recommended efficiency adjustments (capitalised)	**- 4,156**	**- 8,198**	**- 12,687**	**- 12,240**	**- 25,439**	**- 18,111**

Source: Seqwater pricing submission and Atkins analysis

1 Introduction

1.1 Background

The Queensland Competition Authority (QCA) is the independent economic regulator in Queensland and was established under the QCA Act 1997. The QCA acts as the pricing regulator for the Queensland Bulk Water Supply Authority (known as Seqwater).

In August 2021 the QCA appointed Atkins to carry out a detailed review of Seqwater's operating expenditure, capital expenditure and demand forecasts. The purpose of this review is to inform the QCA's Determination on prices for the upcoming price control period which applies from 1 July 2023 to 30 June 2026 and a further two years out to 30 June 2028 as per our Terms of Reference (ToR).

1.2 Terms of reference

This report has been prepared in accordance with the Terms of Reference set out in the contract between Atkins and QCA which commenced on 26 July 2021. These are reproduced in Appendix D.

1.3 Terminology in this report

A number of terms are used within this report which have specific meaning relating to the regulatory process. These terms are detailed in Table 1-1 below.

Table 1-1 - Determination period terminology

Term	Usage
2015 Determination	The determination made by QCA which set prices for Seqwater's bulk water for the period 1 July 2015 to 30 June 2018
2015 Determination period or Previous Determination period	The period from 1 July 2015 to 30 June 2018 which was the subject of the 2015 Determination
2018 Determination	The determination made by QCA which set prices for Seqwater's bulk water for the period 1 July 2018 to 30 June 2021 and then extended to 30 June 2022
2018 Determination period or Current Determination period	The period from 1 July 2018 to 30 June 2022 which was the subject of the 2018 Determination
2022 Determination period or Future Determination period	This period covers either the period from 1 July 2022 up to 30 June 2026
2021 pricing submission or proposal	Seqwater's Bulk Water Price Submission that summarise its expenditure, demand and revenue requirements that it proposes for the 2022 determination period
Pricing or regulatory model	The spreadsheet model submitted by Seqwater to QCA in June 2021 and resubmitted in August 2021 contains the capital expenditure proposals and high level operating expenditure proposals in support of its pricing submission
Drought submission	The submission by Seqwater to QCA in August 2021 specifically in support of it proposed expenditure for the Drought Allowance

1.4 Price base and cost data

The financial and expenditure information for this review is based on Seqwater's pricing submission to QCA on 30 June 2021 and updated pricing model dated 20 August 2021.

Within the pricing model forecast capital expenditure is provided on a nominal basis both on an incurred basis and on an as capitalised basis which includes financing costs. For capital expenditure within this report, we have presented all costs on a nominal basis. Seqwater applied escalation factors for capex earlier in the

process of developing its pricing proposal; the capital expenditure feeder model was not provided as part of the review and we were not provided with a version linked to the pricing model as submitted to the QCA. As we discuss later in the report there is little insight to be gained from normalising the price base for capital expenditure due to the lack of historical comparisons that can be made either by driver or asset type.

For our analysis of operating expenditure, we have sought to present costs on a normalised FY20 price base as this provides better opportunity for comparisons of the underlying trends and drivers for costs by activity over time. To achieve a consistent price base, we have used the inflation indices set out in Table 8.2 of Seqwater's Price Submission for FY18 and FY19. We have then used Seqwater's weighted opex escalation factor from the opex forecast model[1] for future years.

1.5 Report structure

The structure of this report is as follows:

- Section 2 outlines our overall expenditure review methodology
- Section 3 describes the Seqwater business, those elements subject to this regulatory review and the context in which it operates
- Section 4 reviews the strategic direction and asset management processes
- Section 5 reviews and opines on the appropriateness of Seqwater's demand forecasts
- Section 6 reviews and recommends the efficient level of allowed operating expenditure in the current and future determination periods
- Section 7 reviews and recommends the efficient level of allowed capital expenditure in the current and future determination periods.

[1] Seqwater spreadsheet "OPEX Forecast Summary as per sub + LP 2021-06-20 sent to QCA"

2 Review methodology

2.1 Overview

Our methodology for undertaking this review is based on the experience of the Atkins team in undertaking similar expenditure reviews across Australia and internationally.

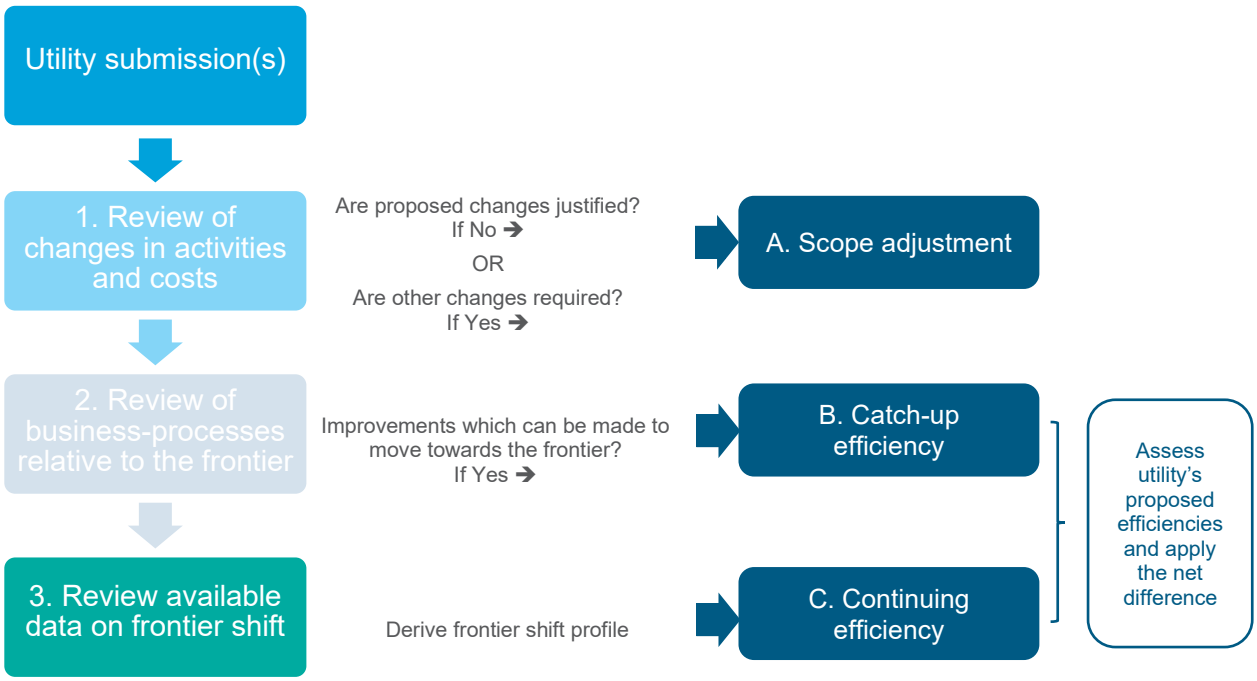
Our review work commenced in August 2021. Our initial task was to review the pricing proposals prepared by Seqwater as well as a small number of reference documents. On this basis and in response to the objectives and brief set by QCA, and an initial review of the submission from Seqwater, we prepared information requests to seek supporting documents and information. We scoped a program of structured interviews following specific agendas for September 2021. These were carried out remotely where we interviewed key subject matter experts and business processes owners responsible for planning and delivery of Seqwater services. The scope included operating and capital expenditure, demand forecast and review events, including drought readiness and response activities and costs. We completed these interviews on 14th September 2021. The interviews identified further documents which we requested through the Request for Information (RFI) data sharing facility. We continued our analysis and prepared this draft report in October 2021.

We are grateful to the staff at Seqwater for preparation work in advance of the interviews, for responding to our questions at interview and providing further documents and answering questions through the RFI process.

2.2 Recommending prudent and efficient expenditure

In arriving at the recommendations in this report, we have applied a three-stage approach to reviewing the efficiency and prudence of expenditure, as summarised in Figure 2-1 below**Error! Reference source not found.**. This methodology is consistent with that applied for other regulatory reviews across Australia.

Figure 2-1 - Approach to assessing efficiency



Stage 1. Review of changes in activities and costs

A particular characteristic of the Queensland regulatory process is the focus on base year fixed expenditure, confirming that it is prudent and efficient and identifying any areas of expenditure considered to be inefficient. Where we found that expenditure is not efficient, we propose to unwind this as a catch-up efficiency to be achieved over time as described in stage 2 below.

For operating expenditure Seqwater has proposed step changes to this base expenditure to capture additional activities and related costs not included in the base year. We review each change to test whether expenditure

is prudent and efficient. We have included those changes which we consider are justified. We have also added a step change or additional expenditure where we consider that Seqwater has under-estimated its needs. Where any proposed step change is not considered as prudent or efficient, we make adjustments to expunge the change, to reduce the level of expenditure proposed or to re-phase the activity to a more likely profile of expenditure. We also take a view as to whether any operational expenditure should be classed as capex or vice versa, and make recommendations to any appropriate re-categorisation.

For capital expenditure we review Seqwater's capital processes including strategic plans and asset management processes. We test these processes through reviewing a sample of capital projects to test whether proposed project costs including estimates and timing of expenditure is prudent and efficient. We also take a view as to whether any operational expenditure should be classed as capex or vice versa, and make recommendations to any appropriate re-categorisation. We make recommendations on scope adjustments to increase or decrease total incurred capital expenditure over the future period.

This step involves identifying inefficiencies within proposed changes to Seqwater's specific programs and does not apply to base expenditure to avoid double counting with stage 2. These adjustments are clearly distinct from the types of efficiencies identified in stage 2 in that they correct for an imprudent or inefficient proposed change to Seqwater's activities (and associated costs) rather than the business processes employed to deliver the services. If Seqwater's proposed changes in activities (and associated costs) are not efficient, a **scope adjustment** is made.

Stage 2. Review of business-processes relative to the frontier

This step identifies the effectiveness of business processes. For example, decision-making and procurement processes, relative to a benchmark frontier company. Where we identify improvements that can be made relative to the benchmark, a **catch-up adjustment** is made. This encourages the utility to move to the efficiency frontier.

We normally recommend a profile or pathway of catch-up efficiency we consider the utility will realistically be able to achieve each year within the next determination period. This is based on experience of how other utilities in a similar position have been able to achieve efficiencies with new business processes, management focus and appropriate incentives. It does not mean that the utility will have arrived at the frontier at the end of the determination period. Using the QCA methodology of base, step and trend for forecasting operating expenditure, we start from a previously determined efficient base, include additional efficient costs from exogenous drivers and identify any inefficient expenditure above the base. This inefficient expenditure is recovered through a short glidepath over two years, and shorter than we would normally apply a catchup efficiency.

Stage 3. Review available data on frontier shift

We consider a number of data points such as the **efficiency gains** of well-performing utilities and broader productivity trends (e.g., multi-factor or total factor productivity). This recognises that in competitive markets firms must innovate to achieve continuing efficiency gains over time.

We compare the total efficiency challenge we derive from steps (2) and (3) with the efficiencies applied by Seqwater in its own submission. We then apply the net difference as an adjustment to the submission.

3 Operating context

3.1 Seqwater business and operating environment

Seqwater is responsible for the provision of bulk water supply across South East Queensland (SEQ). Seqwater's water supply assets include 73,000+ hectares of catchment land, dams and weirs, 36 conventional water treatment plants and climate resilient sources of water through the Gold Coast Desalination Plant (GCDP) and the 3 Advanced Water Treatment Plants (AWTPs) within the Western Corridor Recycled Water Scheme (WCRWS), as well as 28 bulk water reservoirs, 22 pump stations and more than 600 kilometres of bi-directional pipeline network. Seqwater supplies bulk treated drinking water to five retailer customers: Unitywater, Urban Utilities and the water businesses of the Logan, Redland and Gold Coast councils (we refer to these as Retailers in this report). The Retailers in turn deliver drinking water to their customers through their distribution networks. Seqwater also supplies drinking water to 53,000 people living in 16 off-grid communities. The water for these communities is sourced and treated locally, then distributed to households and businesses.

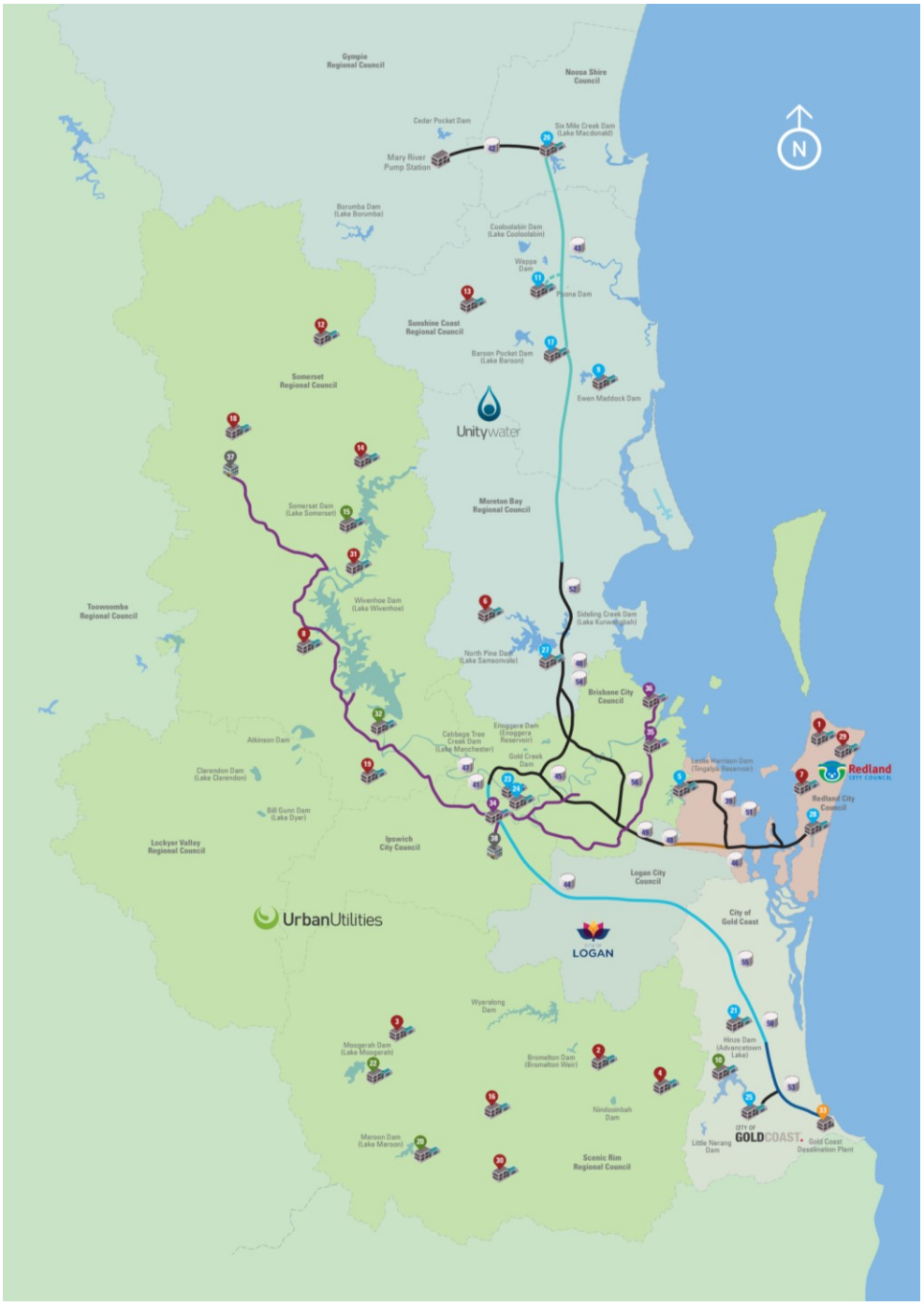
Seqwater's catchment areas cover around 1.2 million hectares of land, of which it owns c65,000 hectares. Seqwater is also responsible for a number of recreational areas on its land and associated with its water storage sites.

Additional, to the urban bulk water supply provision, Seqwater is also responsible for providing irrigation water to around 1,200 farmers as well as water supply to Toowoomba and Gympie regional councils and power stations operated by Stanwell Corporation and CleanCo. The costs involved in these activities are not subject to the bulk water price determination and are excluded from this report.

Seqwater also has installed hydro-electricity generation at Wivenhoe, Somerset and Hinze dams, which are treated as unregulated services and these assets are operated as a separate commercial venture with the costs excluded from bulk water prices.

The Seqwater Water Grid as published on the Seqwater website is reproduced in Figure 3-1 below.

Figure 3-1 - Seqwater water grid



Source: Seqwater website, accessed October 2021

3.2 Legislation

Seqwater is officially the Queensland Government Bulk Water Supply Authority. Seqwater is a wholly government owned statutory authority, it was officially formed in its current form 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.

The Queensland Competition Authority (the QCA) was established under the *Queensland Competition Authority Act 1997 (QCA Act),* with responsibility for conducting investigations into the pricing of government agencies and local government bodies that are monopoly suppliers of goods and or services inside

Queensland. QCA has set prices and determined maximum revenue limits for Seqwater's bulk water services since it was established in its current form in January 2013. This price review represents the third such review with the determination period from 1 July 2022 to 30 June 2026.

Seqwater's Operations are based on a series of separate Water Licences and Resource Operations Licences initiated under the Water Act 2000 for the operating of Weirs and Dams across its operating region.

3.3 Regulatory requirements (referral notice)

Under Section 23(1) of the QCA Act the, on 16 June 2021 the Treasurer and Minister for Investment issued the QCA with a Referral Notice to undertake an investigation into Seqwater's bulk water pricing practices for the period of 1 July 2022 to 30 June 2026, for the eleven local government areas.

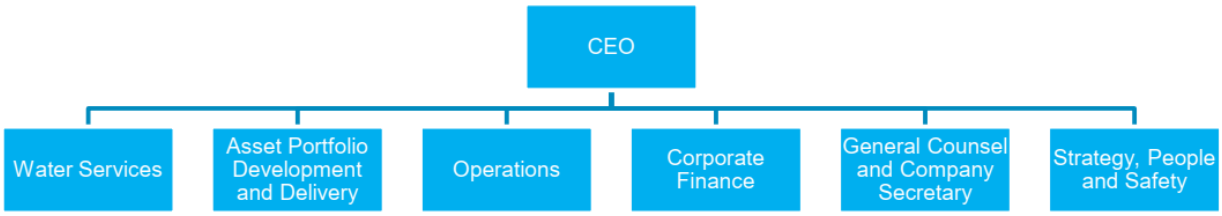
The relevant sections of the Referral Notice pertinent to this report are:

- Assessment of prudency and efficiency of capital and operating expenditure from 1 July 2022 to 30 June 2028
- Assess actual capital expenditure from1July 2017 to 30 June 2022
- Review costs and expenditure for review events make a recommendation on the appropriateness of future review events
- Prudent and efficient costs for a future drought allowance Drought allowance

3.4 Organisation, structure and business functions

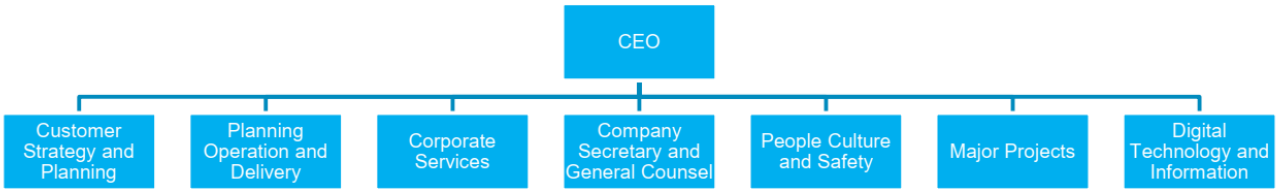
Since the last QCA review, in October 2019 Seqwater underwent a restructure of its business executive directorates, the significant change was to increase the number of directorates from six to seven to include the Major Projects Group. The organisational structures before and after October 2019 are shown in Figure 3-2 and Figure 3-3 below.

Figure 3-2 - Seqwater organisational structure pre-October 2019



Source: Seqwater Connecting the business presentation, 7 September 2021

Figure 3-3 - Seqwater organisational structure post-October 2019



Source: Seqwater Connecting the business presentation, 7 September 2021

4 Strategic and asset management review

Our scope of review is to:

(1) *include a review of Seqwater's governance arrangements, policies and procedures relevant to operating and capital expenditure decisions. Documentation reviewed should include but need not be limited to; asset planning and management policies; risk management approaches; procurement and investment decision-making frameworks. The consultant should form a view as to whether Seqwater's governance, policies and procedures are:*

   i. *consistent with good industry practice*
   ii. *appropriately and consistently applied in developing and delivering its opex and capex programs, and*
   iii. *are likely to result in efficient expenditure and investment decisions.*

(2) *if necessary, recommend potential improvements to governance arrangements, policies and procedures relevant to Seqwater's operating and capital expenditure decisions and quantify potential savings from such improvements, if possible.*

4.1 Summary of findings and recommendations

Seqwater has made a number of improvements across its business processes since the last expenditure review particularly in how it is structured so that its teams are more focused and there is a more consistent approach taken to asset management across its asset classes. We summarise our key findings and recommendations from our strategic and asset management review in the following paragraphs.

Seqwater has made improvements to the quality of condition and criticality data through the ongoing implementation of a new criticality framework and clarified condition assessment criteria. We have seen evidence of these improvements with its Asset Class Plans (ACPs). Seqwater has developed a broad suite of over 100 ACPs and is seeking to obtain ISO55001 certification in the future. We have identified that there is a strong focus on process within the organisation. There appears to be an opportunity to enhance what Seqwater does well by introducing more specific measures of performance and risk within its ACPs. This would provide a clearer line of sight between its corporate risk framework; current asset performance and risk; and future asset performance and risk which is linked to its expenditure proposals, this is particularly relevant for renewals. Improvements in this area should help Seqwater to better scope, optimise and prioritise expenditure.

We consider that there is an opportunity for Seqwater to develop a long-term and fully integrated capital expenditure plan and forecasts over time. We acknowledge that there is work being undertaken to review the Water Security Plan (WSP) to include climate change forecasts as well as incorporating the outputs from the Dam Safety Portfolio Risk Assessment (PRA) 2021 into an update Integrated Master Plan (IMP). We would expect to see clearer linkages between current and future state, the direction of travel, emerging risks and indicative expenditure requirements in a longer term plan at the next expenditure review.

Seqwater's focus of its corporate strategy and objectives is on improving end-to-end capital delivery and its asset management framework. Seqwater has recently undertaken a review of its Capital Investment Lifecycle Framework with a view to improving the Gateway framework, governance process and decision-making requirements, and establishing support tools for consistent application. The improvements Seqwater has identified to make in its Capital Investment Lifecycle Framework should strengthen the process to enable more efficient and optimal outcomes at a program level in the future.

Seqwater does not a place strong focus on efficiency within its organisation and this is highlighted through its pricing proposal. This is particularly evident for procurement where bundling and packaging of projects has been identified as an objective, but the efficiency benefits and savings have not been evaluated or borne out through its expenditure proposals. Additionally, the Digital Technology and Innovation (DTI) team do not have any specific 'spend to save' initiatives identified in the future period either as part of Operational Technology (OT), Information Technology (IT) or Energy workstreams. We consider that there are some specific opportunities for efficiencies through improved focus on strategic spend to save initiatives.

As mentioned, Seqwater's ambition for bundling of projects for procurement and cost efficiencies is not yet borne out through its pricing submission to QCA. So far there does not appear to many (if any) strategic capital

programs where projects are pooled. Seqwater have also acknowledged that it is seeking to make improvements around the way it manages contingency and move towards a more sophisticated approach i.e., managing common risks at a higher program or portfolio level. We have identified that pooling projects into programs could be an area where efficiencies can be realised by reducing total contingency both in estimates and throughout the project lifecycle though reducing or eliminating common risks which are duplicated across multiple smaller projects. Holding contingency at a higher level may also provide opportunity for efficiencies in project outturn costs.

Seqwater does not currently have a unit cost or historical cost database with estimates heavily reliant on external consultants and quantity surveyors, built up on a project by project basis. Employing a historical cost database may be beneficial for Seqwater to help make strategic business decisions, scrutinise project costs and schedules up-front, and reduce reliance on consultants. Utilising a historic unit cost database in conjunction with top down estimates may provide more accurate estimates and more opportunity for Seqwater to challenge external estimates. We would expect to see this type of approach as Seqwater's processes mature.

4.2 Corporate Strategy

Seqwater **has sought to directly address the external drivers and critical issues for its business through its updated Corporate Plan published in September 2020. Seqwater identifies its Strategic Objectives as:**

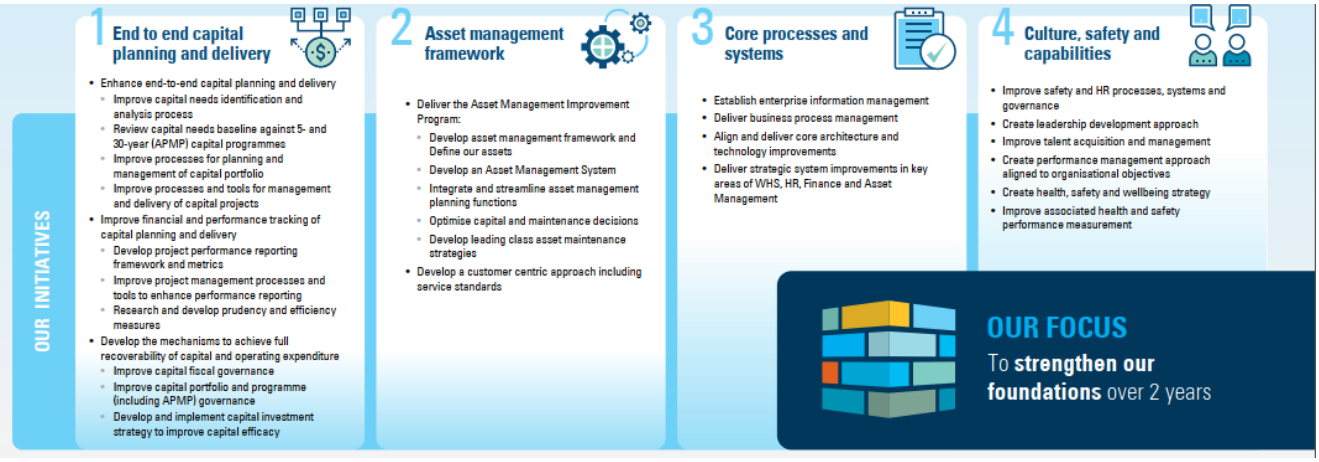
i. Improve safety and organisational culture
ii. Improve processes, systems and planning
iii. Strengthen financial sustainability
iv. Increase water supply certainty; and
v. Increase stakeholder, customer and community satisfaction and support

Figure 4-1 - Seqwater strategic objectives

Source: Seqwater corporate strategy update Feb 2021

Seqwater has more granular measures of success against each of these objectives which provide insight as to where the organisation is compared to its peers and the efficiency Frontier. Seqwater recognises that efficiency is not a key focus for the organisation with other more fundamental initiatives required to reach a baseline level before it can begin to become more efficient. For the period 2020 to 2022 it has set itself four strategic priorities and initiatives to strengthen its foundations over the two year period:

Figure 4-2 - Seqwater 2020 to 2022 strategic priorities



Source: Seqwater corportae strategy presentation, August 2021

Capital planning and delivery is Seqwater's highest priority area of improvement. It is in the process of improving its Asset Management System and Plans discussed in detail in Section 4.5 below.

4.3 Long term investment plan

4.3.1 Asset Portfolio Master Plan

Seqwater's Asset Portfolio Master Plan (APMP) is the key document that drives its capital planning and investment. It is the point of truth for capital expenditure within the 2021 pricing model and includes the vast majority of all capital expenditure proposed in the future period. The APMP Report 2021 is the latest iteration of this, and it covers how the APMP was compiled, the period it covers, who was consulted and on what basis projects have been prioritised. The APMP21 details the capital program for 2021-22 and provides a four year program to 2026 for infrastructure and non-infrastructure capital, including natural, storage, treatment, transport, purified recycled water, fleet, facilities, ICT and recreation infrastructure. It provides the expenditure in each of the regions, in each of the Water Service Provider territories and each of Seqwater's key strategic asset categories.

In preparation of the quantum of annual expenditure in the plan Seqwater takes a top down view to develop target budgets (Table 4-1) which relate to:

i. A percentage of expenditure on difference types of assets
ii. Historical expenditure
iii. Achievable and deliverable expenditure.

The annual budget for expenditure that Seqwater has set itself is $180M per annum over the next five years on an as incurred basis. This marks a significant increase on the approximately $100M per annum it has been able to deliver in recent years, the reasons for this are discussed in more detail in Section 7 review of capital expenditure.

Table 4-1 - Seqwater APMP top down budgeting

Strategic Asset Group	Current Asset Value	% Total asset value (%)	Annual Approx. Budget Band ($M)	5 Year Target ($M)	% of 5 year spend (%)	% of Asset Value (%)
Water Treatment	2.5	15	40-50	240	25	1.95
Water Transport	3.9	24	60-70	350	36	1.80
Water Storage	4.9	30	40-60	250	26	1.02
Manufactured Water	3.9	24	2	20	2	0.10
BAU Business Investments	1.0	6	20	100	10	2.00
Total	**16.1**	**100**	**180**	**960**	**100**	

Source: Seqwater Capital Investment 2018 – 2026 Presentation to $M, August 2021

Seqwater identified the five year program of projects through a risk-based prioritisation and deliverability risk matrix. The risk-based prioritisation score (0-5) for inclusion/exclusion of projects appears to be drawn at a level to fit within the $180M budget envelope. The prioritisation approach appears to be rather arbitrary when considering the many manual adjustments that are applied over the top of the formulaic approach for example where projects have been delayed due to timing or deliverability issues.

Seqwater does not appear to have any wider longer term capital investment plan beyond the APMP although we understand that Seqwater is in the process of revisiting its Integrated Master Plan (discussed below). The four year APMP plan provided appears to sit in isolation from any longer term programme of capital works, particularly with respect to the pipeline of 'major projects'. We requested the longer term view of Seqwater's Major Projects and indicative timings for expenditure related to its gateway process but this does not appear to have been developed at this stage beyond the regulatory target dates for completion.

We have seen elsewhere that the utilities with a longer term horizon and view of forthcoming projects over a 20 to 30 year horizon are able to prioritise and plan for those significant projects more appropriately. We suggest that a long term investment plan is developed for example over a 30 year horizon which also factors in climate risk and adaptation.

4.3.2 Integrated Master Plan

Seqwater's Integrated Master Plan (IMP) is a strategy providing a 30-year horizon planning instrument to deliver a whole of bulk water system strategy for growth and water security encompassing natural and built assets. The IMP guides decision making on proposed capital expenditure and operation for the Water Grid. The IMP was last reviewed in 2018 and is updated on a 5-yearly basis with the next review is due to take place after the publication of the updated Water Security Plan (WSP) (discussed below). Outcomes of the IMP flow into the APMP which as discussed above is used as the basis for the pricing submission. There are some instances where the IMP and APMP plans do not align, for example where further project investigations are required and alternative solutions are identified.

There are some limitations to the IMP in that its focus is on meeting the levels of service within the Water Security Plan however there are other objectives and obligations that Seqwater is required to achieve such as flood mitigation and dam safety requirements. We understand the next iteration of the IMP will include measure and levels of service around water quality and continuity of supply.

4.3.4 Climate Change Adaptation

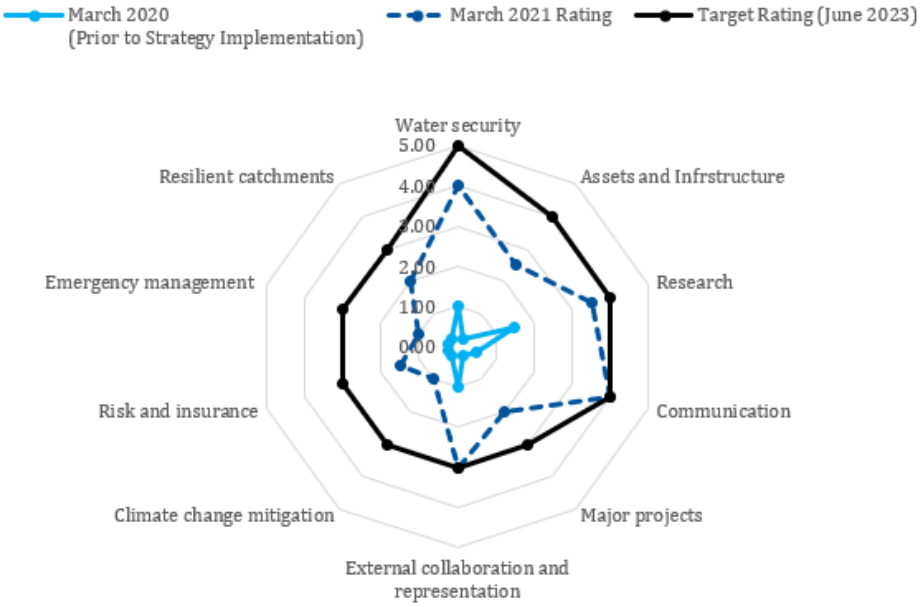
Seqwater's 'Climate Change Adaptation Strategy', signed off in March 2020 is an initial step to identify core areas of Seqwater's operations affected by climate change and preliminary steps to build resilience and adaptive capacity. It identifies the key climate change adaptation activities for the 3 years to June 2023 with assigned manager responsibilities, which are:

i. Water security
ii. Assets and infrastructure
iii. Existing assets
iv. New infrastructure
v. Research
vi. External collaboration
vii. Communication
viii. Climate Change Mitigation
ix. Risk and insurances
x. Emergency management
xi. Resilient catchments

Many of the activities are at an early stage of maturity and we recognise the journey Seqwater is on to embed climate change adaptation into its core decision-making documents and processes.

The first annual update on the progress of the strategy to the Executive Leadership Team (ELT) was provided in April 2021 with a maturity assessment scorecard undertaken for the 9 key activities identified above.

Figure 4-3 - Seqwater Climate Change Adaptation Strategy maturity assessment, April 2021



Level -1	Level 0	Level 1	Level 2	Level 3	Level 4	Level 5
Opposition / Resistance	Acceptance but no action	Ad Hoc	Defined	Managed	Integrated	Sustained

Source: Seqwater's Climate Change Adaptation Strategy Implementation, ELT Meeting Brief, April 2021

Seqwater's 2021 pricing submission to the QCA does not yet appear to reflect any strategic or detailed climate adaptation and mitigation activities and there is a need to develop a more detailed understanding of the financial implications of climate change adaptation for the business. We would expect these activities to be fully embedded with clear linkages to its capital and operational expenditure plans by the time of the next QCA price review.

4.3.5 Energy strategy

Seqwater consumes approximately 140 GWh of energy annually in a normal year (excluding climate-resilient assets) with energy consumption forecast to double by 2030. In addition, the operation of climate resilient assets in a drought situation such as the GCDP and WCRWS will drive Seqwater's energy demands even higher, upwards of 350 GWh.

Seqwater's first Energy Strategy was developed in 2018 with the following objectives:

- Develop a sustainable energy culture
- Use energy more efficiently
- Optimise commercial energy arrangements
- Generate energy to offset current demand as a non-regulated revenue stream

Between January and June 2021 Seqwater completed a review of its Energy Strategy with the objective to align the external environment with its strategic business needs. The key strategic objectives influencing the Energy Strategy Seqwater are:

i. Support the achievement of sustainability targets
ii. Ensure energy security
iii. Use energy more efficiently

The Queensland government target is to have 50% of energy consumption from renewables by 2030 and achieve net zero by 2050 and Seqwater's Energy Strategy appears to be in support of these broader state-wide targets. Seqwater's June 2021 pricing submission to QCA appears to have focused its expenditure

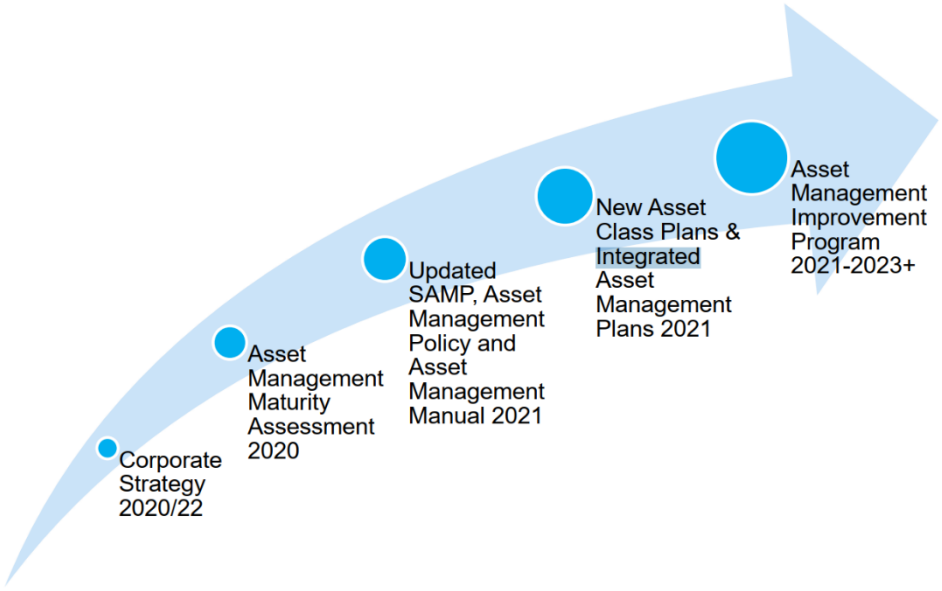
requirements for achieving the objectives in its strategy via procurement of carbon offsets via Large Generation Certifications and Australian Carbon Credits. Seqwater has not proposed any significant capital expenditure within its pricing submission on renewable energy projects which appears to be misaligned with the focus and objectives of its Energy Strategy. At the current time there does not appear to be any long term plan for achieving the objectives, the Energy Strategy focuses on the next three years to 2023/24 with limited specific activities identified. We discuss Seqwater's proposals and our recommendations to its GHG abatement operational expenditure in more detail in Section 6.7.5.6 and our view on prudent capital expenditure on energy and energy efficiency projects in Section 7.5.5.

4.4 Asset management practices and processes

4.4.1 Overview

Seqwater is on a journey to improve its overall Asset Management processes. This is best explained through the diagram in Figure 4-4 below. Seqwater has developed its overall Corporate Strategy (discussed in section 4.2 below) which is the catalyst for the identification and programming of the remaining Asset management improvement initiatives.

Figure 4-4 - Seqwater's current Asset Management improvements



Source: Seqwater capital expenditure processes presentation, August 2021

4.4.1.1 Areas of improvement identified at the last expenditure review

At the previous expenditure review undertaken in 2018 a number of observations were made by the QCA consultants, KPMG in its Final Report[2] around Seqwater's capital planning framework. These were that:

- 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.

[2] KPMG, Seqwater Expenditure Review, Updated Report for QCA, March 2018

- 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 more 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.

For our review we have sought to review the incremental improvements Seqwater has made since the last determination in how it plans capital projects and how its pricing proposal and associated expenditure are linked to these improvements. We have found that Seqwater has made considerable progress to improve its approaches to Asset Management including:

- Bringing together disparate Asset Management functions and systems under one single directorate (Planning, Operation and Delivery) with responsibilities better defined.
- Better alignment of planning for growth, sustaining capital and maintenance which were previously independently run sections of the business. There has been a move towards improved integration of these areas.
- Improvements to the quality of condition and criticality data through the ongoing implementation of a new criticality framework and clarified condition assessment criteria. We have seen evidence of these improvements with its Asset Class Plans although we consider the process could be enhanced through introducing performance measures and metrics where appropriate rather than solely relying on subjective condition assessments.
- Identifying initiatives to improve its Capital Investment Lifecycle Framework, including improving the Gateway framework, governance process and decision-making requirements, and establishing support tools for consistent application.

We discuss these improvements and provided recommendations for future improvements in the following sections.

4.4.2 Asset base and condition

Section (C)(7) of the Referral Notice specifies that the opening Regulated Asset Base (RAB) as of 1 July 2022 is to be established by rolling forward the opening RAB as of 1 July 2017 for the following:

- actual capital expenditure, where available (otherwise forecast capital expenditure), adjusted for any findings from the QCA's prudency and efficiency review;
- depreciation, which is calculated using the straight-line method and applying the remaining lives as used in the 2018- 21 review;
- actual inflation.

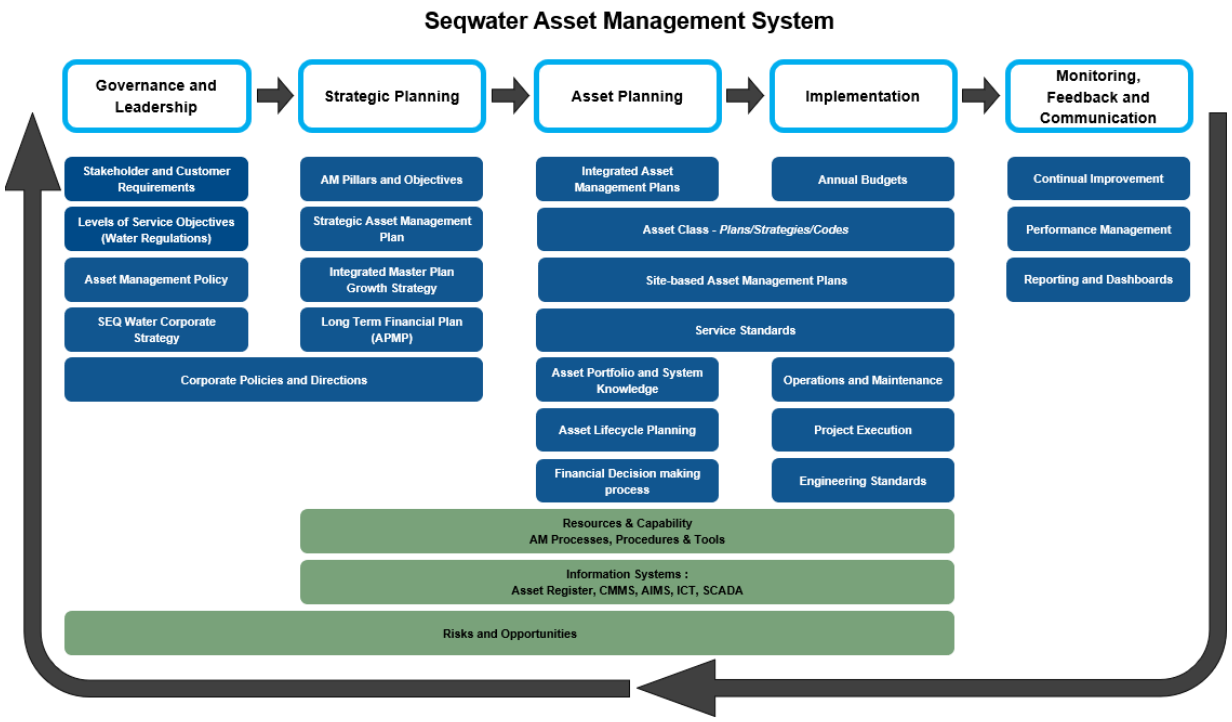
Seqwater's RAB is separated out into Drought and Non-Drought assets; and between Existing RAB items (pre-2013) and capex items added after 2013. Drought assets are those assets which were initiated as a direct response to drought conditions including the WCRWS, associated pipelines, desalination plants and some WTP upgrades. Non-drought assets are those assets that were inherited from previous councils, service growth or other non-drought related compliance and improvement drivers.

4.4.3 Asset management objectives and planning

4.4.3.1 Asset Management System

Seqwater's Asset Management System outlines the methodology for decision-making regarding the lifecycle and financial activities related to the assets used to provide the services of Seqwater. The core of the framework is based on the principles of whole-of-life asset management. The AMS has been incorporated into the Strategic Asset Management Plan with a separate Asset Management Manual in development. Although Seqwater is not yet ISO55001 certified it is making progress to better align its systems with the standard with a view to potentially seeking accreditation in the future.

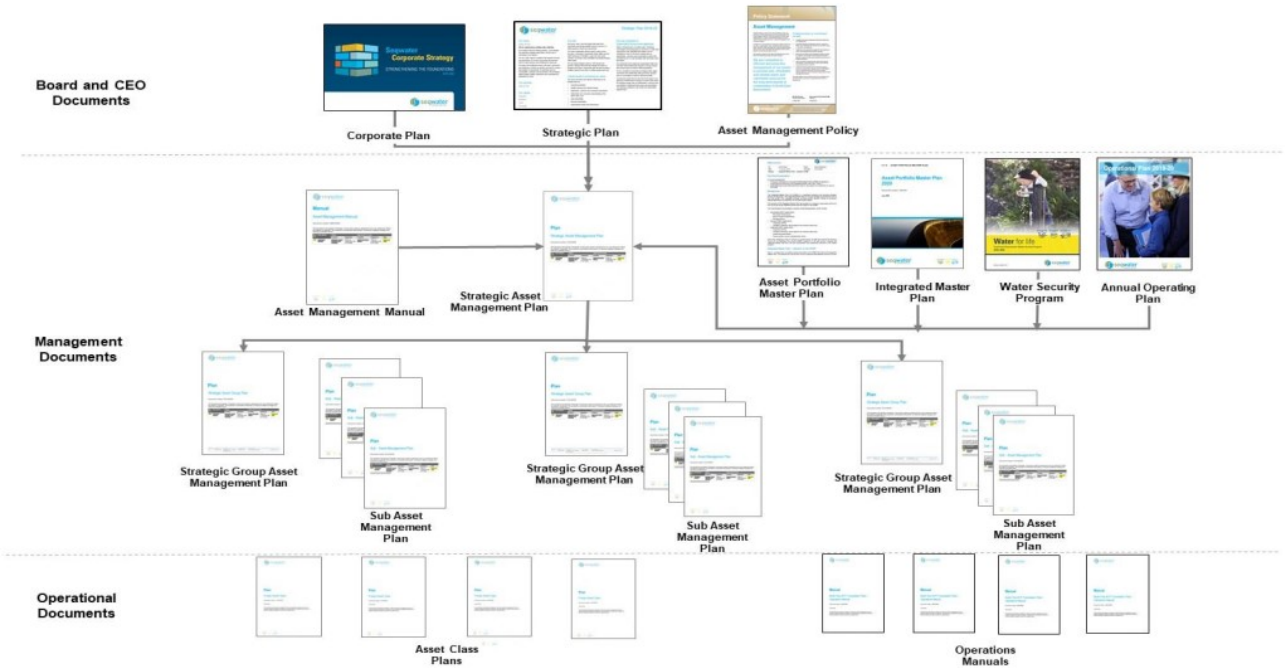
Figure 4-5 - Seqwater's Asset Management System



Source: Seqwater Strategic Asset Management Plan v13

Seqwater's Asset Management System is best viewed through looking at the hierarchy of documents driven from the Corporate and Strategic Plan via Management documents to its Asset Class Plans and Operation Manuals. This is shown in Figure 4-6 below.

Figure 4-6 - Asset Management System document hierarchy



Source: Seqwater capital expenditure processes presentation, August 2020

4.4.3.2 Strategic Asset Management Plan

Seqwater's Strategic Asset Management Plan (SAMP) was last published in 2016 and is in the process of being reviewed and updated to realign with the corporate strategy. The SAMP aims to provide the link between the organisational strategic objectives of Seqwater and the asset management objectives including the portfolio wide asset planning and investment process that considers performance, risk, and cost.

Seqwater is in the process of implementing an asset management improvement program, the aim of which is a maturity uplift in asset management to align with industry best practice and move towards and ultimately achieve ISO 55001:2014 Asset Management – Management systems – Requirements.

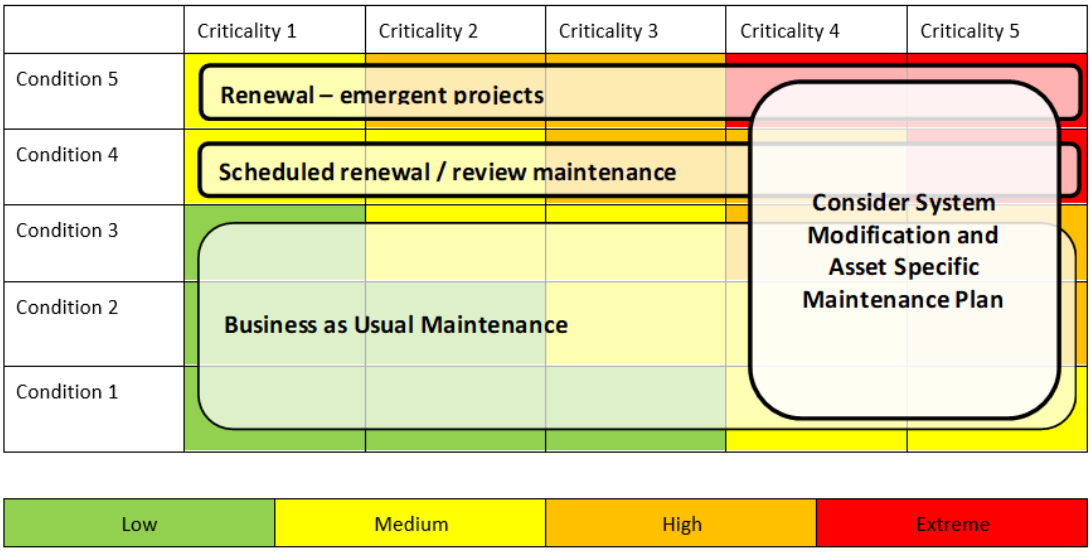
4.4.3.3 Asset Class Plans

Seqwater have developed over 120 documents that support its Asset Class Plans (ACP). It has provided some examples of Asset Class Plans for valves, reservoirs, pipelines and pumps. The Asset Class Plans provide the maintenance standards and procedures for the various asset classes. In terms of implementation, these plans provide specific details on:

- Condition assessment and monitoring timing
- Regulatory inspections (where applicable)
- Cyclic maintenance activities to be undertaken

The Asset Class Plans aim to optimise the operating, inspection and maintenance strategies to enable efficient asset management (balancing cost, risk, and performance). The plans provide a standard maintenance regime for a considerable number of the assets owned by Seqwater, which aims to ensure a consistent approach across the portfolio.

Renewals needs are identified using the condition assessment criteria outlined for specific asset classes in the Asset Class Plans. The table below summarises guidelines for how the interventions are planned based on Seqwater's risk framework and the strategies outlined in the ACPs.



Source: Seqwater capital expenditure processes presentation, August 2020

More detail on the expected interventions for each asset class are set out in the individual ACPs. This criticality and condition framework aligns with the Seqwater Risk Management Framework, criticality is a proxy for consequence and condition is a proxy for likelihood.

Engineering judgement is required. In many situations, renewals are planned based on predictions / expectations that the condition will deteriorate to condition 4 or 5 within the planning horizon. This is especially true of short lifecycle assets. We consider that there could be an increased focus on asset performance measures where applicable so that outcomes and linkages between condition, expenditure and performance can be better established. This can then be used for longer term planning, prioritisation and delivery. At the current time the Asset Class Plans appear to be discreet and separate from its expenditure proposals rather

than being a critical input to its submission. A comprehensive list of Seqwater's Asset Class Plans can be found in Appendix B. Asset Class Plans

There appears to be a focus within Seqwater on achieving ISO55001 certification and developing Asset Management processes without first asking why and what the ultimate objective is. There is an opportunity to develop a suite of performance measure for its assets classes to measure and then make more informed decisions about where and how it directs its expenditure.

4.4.4 Performance

Seqwater's focus of its Asset Class Plans is on asset condition. Service levels and performance of assets and operations do not appear to be key drivers of expenditure decision making and these have not been utilised by Seqwater in the development of its expenditure and pricing proposal.

We understand that Seqwater has plans to develop more robust quality service standards going forward for continuity of supply and asset resilience, but this is in the early stages of development. Seqwater is in the process of establishing an enhanced Water Quality Standard for inclusion within its Bulk Water Supply Agreements (BWSA) with its retailer customers. It is working collaboratively with UnityWater to develop this standard and identify additional desired quality parameters.

Given the lack of focus and reporting on asset performance by Seqwater, we have been provided very little evidence of any asset performance as part of this review. Indeed, at the current time Seqwater does not appear to link any performance measures to customer expectations and/or its pricing and expenditure proposals. We consider this to be a specific area of improvement for Seqwater to develop going forward. Enhancing links between Seqwater's asset performance and its expenditure proposals would likely improve how Seqwater effectively directs and targets its investment and expenditure. From a regulatory and pricing perspective it would provide additional justification for any step changes in expenditure between periods and provide additional clarity on the need for expenditure which is currently lacking.

4.4.5 Risk management and asset management decision making

Seqwater maintains a suite of risk management documents:

- Corporate – Risk Management Policy Statement (POL-00013)
- Corporate – Enterprise Risk Management Framework (FRA-00014)
- Corporate – Seqwater Risk Appetite Statement (POL-00098)

Seqwater's risk appetite statement was last updated in 2018 and provides its risk tolerances and appetites under risk categories of:

- Health, Safety and Capability
- Environment
- Legal, Regulatory, Ethics
- Reputation, Social and Community
- Financial
- Water Quality and Supply; and
- Dam Safety

We observed that whilst the risk policies and risk tolerances are set there does not appear to be a clear line of sight from Seqwater's corporate risk management objectives and framework and the ACPs it has developed. We consider this would be an area for improvement for Seqwater.

We understand Seqwater is undertaking a review of its risk management framework which is targeted for completion by end of Q2 2021-22. We would expect an outcome of this would be to better link corporate risk objectives to physical infrastructure risks. The review will involve a series of consultations with internal stakeholders including Seqwater's Board.

4.4.6 Capital delivery and governance

Seqwater maintains a Capital Investment Lifecycle Framework which defines and documents the process and Gates applicable for the management of Seqwater's capital investment program. The framework formalises the

governance and controls required as part of the decision to accept (or reject) a capital project as it progresses through each Gate. There are specific procedures, that sit under this framework to guide the project planning, delivery and review phases.

Seqwater has a Capital Portfolio Governance Group (CPGG) whose primary functions are to:

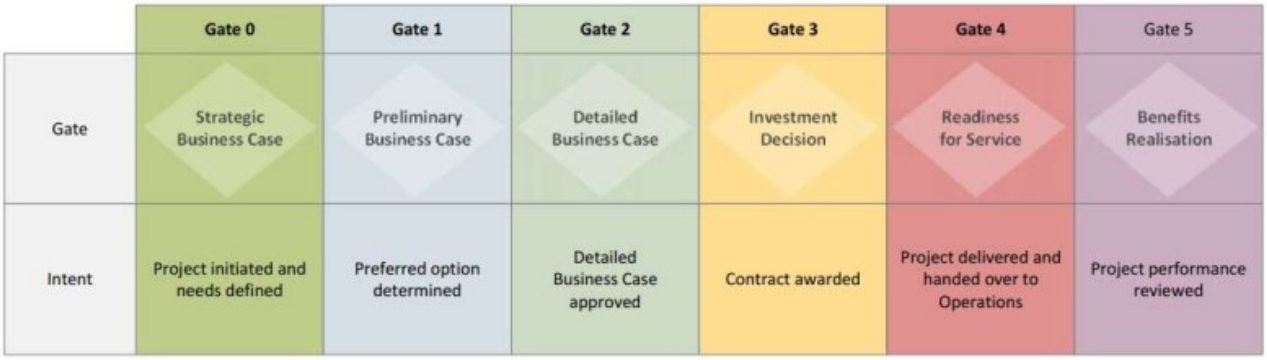
- monitoring the overall direction and execution of the capital portfolio; and
- identify risks to achievement of Seqwater's organisational objectives as they relate to the capital portfolio and progressing mitigative actions.

Seqwater has two key capital expenditure workstreams:

i. Sustaining Capital; and
ii. Major Projects (>$40m capex or high risk)

Both programmes follow similar structured Investment Governance processes which are based on a gateway process. These are aligned to the Queensland Treasury Gateway Project Assessment Framework[3]. The six-stage process is shown in Figure 4-7.

Figure 4-7 - Seqwater capital investment gateway process



Source: Seqwater Gateway Process, captial process presentation August 2021

Fiscal governance is overseen by the Executive Fiscal Review Committee (EFRC) and is a core Standing Committee of the Executive Leadership Team (ELT). EFRC has the primary role of considering matters which may have financial or budgetary implications for Seqwater including the review and endorsement of initiatives or proposals that cannot be accommodated within existing budgets.

Seqwater has recently undertaken a review of its Capital Investment Lifecycle Framework with a view to improving the Gateway framework, governance process and decision-making requirements, and establishing support tools for consistent application.

Our review found Seqwater's capital governance processes to be appropriate in the context of the volume of capital projects and expenditure it has been able to deliver (discussed in Section 7.4). Due to the lower-than-expected volume of capital projects delivered in the current period it is likely that these processes have not been stress tested as they may be going forwards when there are increasing competing demands on resources to deliver bigger projects in the coming years. The improvements Seqwater has identified to make in the Capital Investment Lifecycle Framework should strengthen the process to enable more efficient and optimal outcomes at a program level in the future.

Seqwater's *Non-current assets policy* is discussed in Section 4.5.9 below. Seqwater's approach to capitalisation is that project costs are only classed as capex after a preferred option has been identified, this is generally always within Gateway 2 during the development of the detailed business case. This is a different approach to other utilities we have reviewed where costs are capitalised earlier in the project planning process. What this means is that for Seqwater for any significant capital projects requiring significant up-front planning that these planning costs will all land on opex rather than absorbed into the RAB and recovered over a longer

[3] Gateway reviews (assurance) - Queensland Treasury

period of time. We comment further on the quantum of operating expenditure on 'planning costs' within the Major Projects Group that Seqwater has proposed to recover in the future period in Section 6.7.5.9.

4.4.7 Cost estimation and contingency

Seqwater has made a number of changes and improvements to its cost estimation and approach to contingency since the last expenditure review. Seqwater has attempted to ensure all projects at Gateway 2 (discussed in 4.4.8) have appropriate contingency allowances. Seqwater have established approaches for cost estimates where projects are classed 1-5 depending on:

- the project's cost category: the three main categories are 'Minor', 'Medium' and 'Major', which is determined by an assessment of the project's value, complexity and risk profile;
- the Gateway stage: as would be expected, certainty increases as projects progress through each Gateway; and
- the purpose for which the estimate is being prepared: for example, Options Analysis, Business Case (recommended option), Readiness for Market

Table 4-2 - Seqwater contingencies for cost estimates

Estimate Class	Project Category		
	Minor (%)	**Medium (%)**	**Major (%)**
Class 5	**70 - 100**	**30 - 70**	**30 - 70**
Class 4	**20 - 30**	**20 - 30**	**Probabilistic estimation**
Class 3	**10 - 20**	**10 - 20**	
Class 2	**10 - 15**	**10 - 15**	
Class 1			

Source: Seqwater June 2021 pricing submission

Where probabilistic estimates are used for projects classed as 'Major' in Table 4-2, these are required to be estimated to a minimum P80 level or above which is fed into the Business Case approval process. Overall, we consider this to be a reasonable approach to managing risk and contingency at a project level. However, we consider that there is an opportunity to optimise the contingency and risk profile across the capital program at a portfolio level which we do not see any evidence of Seqwater doing at the current time.

In its submission to QCA Seqwater identified that for projects that reached Practical Completion (PC) in FY19 and FY20 it spent 11% and 7% more respectively than was identified within its business cases. In FY21 this was 15% less than the business case values. We suggest it would be helpful for Seqwater to analyse this in more detail for example by asset or project type to provide a better understanding of whether or not specific types of projects are overspending or underspending regularly and why. As we discussed below a more historic cost database would be a useful tool to interrogate this in more detail and track cost types over time.

Project cost contingency is all held at the project level by project managers and there are no sophisticated approaches employed to managing costs contingency at a program or portfolio level. We note that Seqwater Project Managers are required to undertake a staged approval process to release contingency into the project. We have not tested the robustness of this process although it appears reasonable. A single project may have multiple contracts, and contingencies may be held for each contract, as well as an overall contingency for the project. Managing risk and holding contingency at the portfolio level can be more efficient than providing each project with contingency to cover common risks[4]. As we do not currently see Seqwater undertaking much pooling of projects there may be common risks which are duplicated across multiple smaller projects. Identifying these risk and associated cost contingencies at an earlier stage may reduce initial project budgets

[4] Managing Cost Risk & Uncertainty In Infrastructure Projects, Leading Practice and Improvement: Report from the Infrastructure Risk Group 2013

particularly when basing contingencies on a risk management approach rather than for example uplifts based solely on optimism bias.

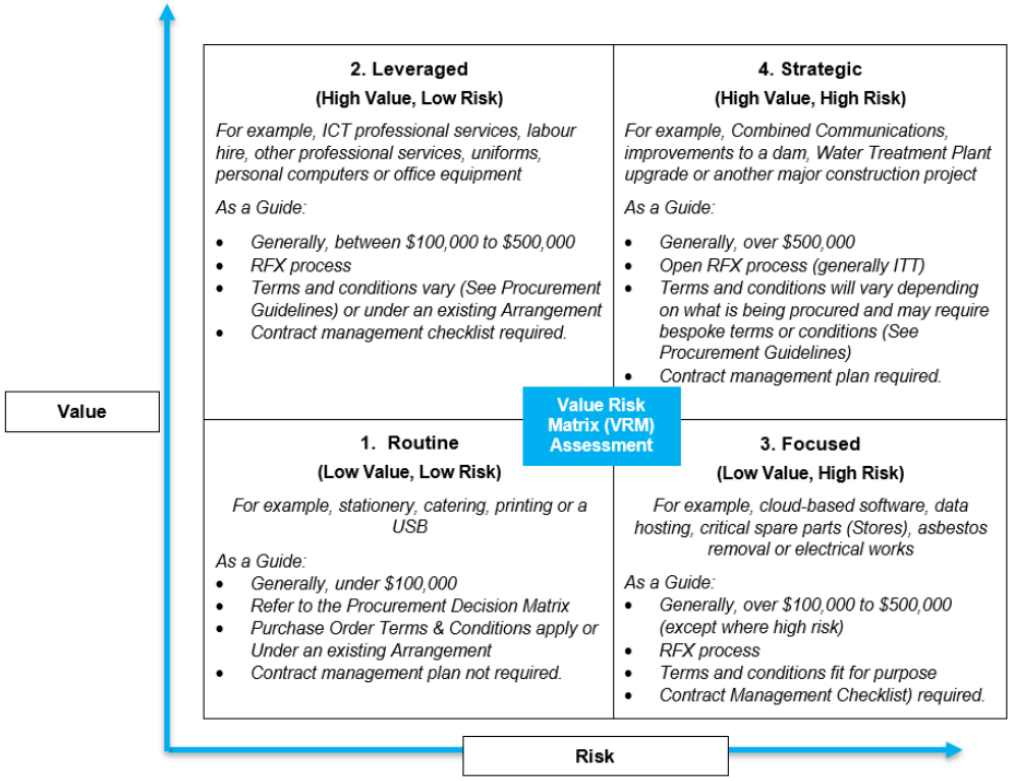
Seqwater does not currently have a unit cost or historical cost database. Seqwater is looking to develop a cost estimation tool in the future period. Cost estimation currently relies heavily on external consultants and quantity surveyors and estimates are built up on a 'project by project' basis. Employing a historical cost database may be beneficial for Seqwater to help make strategic business decisions, scrutinise project costs and schedules up-front, and reduce reliance on consultants. Utilising a historic unit cost database in conjunction with top-down estimates may provide more accurate estimates and more opportunity for Seqwater to challenge external estimates. We would expect to see this type of approach as Seqwater's processes mature.

Seqwater maintains a Cost Estimation Guidelines (CEG) document, last updated in 2019 which provides its staff, contractors and external consultants a structured guidance for developing cost estimates for Seqwater projects of all values and levels of complexity at all stages of project development. These appear appropriate and provide a consistent basis by which cost estimates are developed.

4.4.8 Procurement and delivery

Seqwater's capital procurement policy is aligned to the QLD government procurement policy. Procurement is led and governed by the Commercial services team. Seqwater has an established Value and Risk Matrix (VRM) for identifying the type of procurement that is most appropriate on a 'project by project' basis. This is shown in Figure 4-8 below.

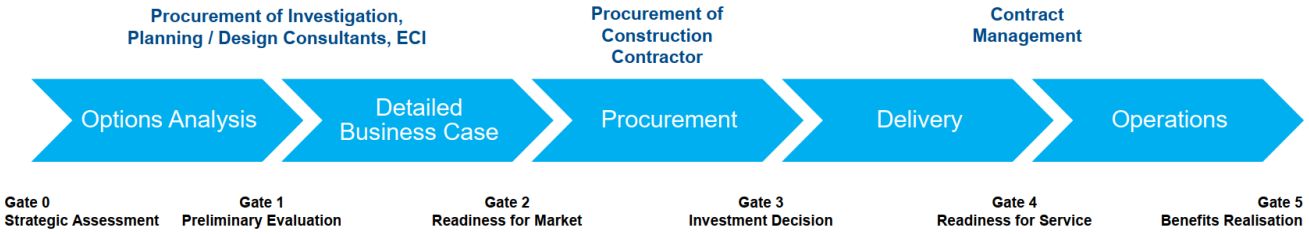
Figure 4-8 - Seqwater capital procurement value/risk matrix



Source: Seqwater capital processes presentation, August 2021

The vast majority of capital works are outsourced, and the proposed delivery model is critical to the procurement options chosen. Seqwater's approach to procurement views each project on a project-by-project basis with the contracting arrangements chosen at each stage of the capital project lifecycle. Seqwater tends to opt for staged approaches to procurement which map to its capital gateway process as shown in Figure 4-9.

Figure 4-9 - Seqwater's procurement through the life of a capital project mapped project gateways.



Source: Seqwater capital processes presentation, August 2021

Planning and design contracts are procured through Seqwater's Planning and Design Service Standing Offer Arrangements (SOA). Likewise, construction contracts are either procured through the Works and Services SOA or via AS4000 lump sum contracts. Traditionally Seqwater has not utilised much early contractor involvement or more innovative procurement models such as alliancing, this is primarily due to the relatively lower value capital projects it has overseen since its founding. There is an opportunity with the significant major projects that it has in the pipeline to reconsider its approaches to procurement. We note that Seqwater often refers to how its processes are prudent and efficient, but this is not obvious when reviewing its capital expenditure proposals. Seqwater has not challenged itself as to what it can do differently in the procurement space to realise efficiencies. For example, Seqwater identifies project bundling or packaging of projects as something that it aspires to do more of to realise greater efficiency, particularly in the sustaining capital space but this has not been reflected in its pricing submission.

4.4.9 Capitalisation

Seqwater maintains a Non-Current Asset Policy which summarises the key obligations and where there is alignment or otherwise from the "*Non-current asset policies for the Queensland Public Sector"* Treasury Department document of which Seqwater is required to comply.

The Non-Current Asset provides Seqwater's asset classes and asset recognition thresholds, reproduced in Table 4-3 below.

Table 4-3 - Seqwater asset class and asset recognition threshold

	Asset Classes	Examples of assets forming the asset class	Asset Recognition Threshold ($)
Property, Plant and Equipment	Land	Freehold land	1
	Buildings*	Buildings, Building Fit Outs, Houses	10,000
	Infrastructure*		10,000
	Dams and Weirs	Dams and Weirs	
	Water Treatment Plants (WTPs)	WTPs, Desalination Plants, Purified Recycled Water Treatment Plants, Water Pump Stations,Sewage Treatment Plants (STP minor assets by value)	
	Pipelines and others	Pipeline, Channel, Irrigation Scheme assets	
	Recreation facilities	Amenities, picnic facilities, ground assets, playgrounds, services and structures.	10,000

	Asset Classes	Examples of assets forming the asset class	Asset Recognition Threshold ($)
	Plant and Equipment	Fixtures and Fittings, Furniture, Motor Vehicles, Computer Equipment, Office Equipment, Boats, Laboratory Equipment and other items	5,000
	Work in Progress (WIP)	Held in a WIP account until assets are ready for use at which point they are capitalised	N/A
Intangible	Land Easement		1
	Software Purchased		100,000
	Other intangibles	Water Rights, Agreements	100,000

**Land Improvements are to be included in the class Building or Infrastructure based on their proximity to the asset to which they relate*

Source: Seqwater non-current asset policy

Seqwater's approach to capitalisation of project costs is a little different to other organisations we have reviewed.

Seqwater's capitalisation policy assumes that initial project costs for planning and preparation are considered as operational expenditure. Project costs are only capitalised after a preferred option has been identified on approval in Gateway 2 of its capital governance process. This is consistent with what has been applied in past Seqwater reviews. The project costs, internal and external, are recorded against cost codes in the general ledger.

Capital projects are included in the RAB when the project received a Practical Completion (PC) status. Seqwater's finance team undertakes a validation on project costs recorded in the general ledger and allocates the costs to the assets as per the approved business case or details from the vendor invoices. Finance costs are included. Post PC, the finance team continues to capitalise the project costs as paid on a regular basis until the project reaches the financial completion status. Typically for ongoing and minor renewals projects expenditure is capitalised in the year in which the costs are incurred. Where costs are capitalised and incurred within the same fiscal year there are no additional financing costs incurred.

As discussed in more detail in Section 6.7.5.9, Seqwater's approach to capitalising costs after Gateway 2 combined with the increasing pipeline of Major Projects is driving a step-change in Seqwater's proposed operating expenditure costs in the future period.

5 Demand forecast review

Our Terms of Reference indicates:

> *To assist the QCA in its assessment, the consultant will undertake a desktop review of Seqwater's proposed demand forecasts and form a view on whether they are appropriate. In doing so, the consultant should consider the appropriateness of the proposed forecasting methodology, data sources and assumptions.*
>
> *If the consultant considers that Seqwater's proposed demand forecasts are not appropriate, the consultant must:*
>
> *• clearly explain why it considers the forecast inappropriate*
>
> *• recommend an alternative forecast that it considers is appropriate, within the parameters prescribed in the referral notice.*

5.1 Background

The demand forecast is a key factor as both the denominator for volumetric charges and driver for costs such as variable opex.

QCA has been asked to assess the appropriateness of Seqwater's demand forecasts and to ensure any adjusted forecast remains within the range published in Seqwater's Water Security Program.

The third version of the Water Security Program (WSP2022) is expected to be finalised in March 2022, so was not available at the time of the Price Submission. However, the demand forecast proposed by Seqwater under normal operating conditions is based on the medium demand profile in its 2019 Demand Forecast Assessment which Seqwater expected to be the demand forecast that will be contained in WSP2022.

The drought demand projection was submitted as part of a later, separate, drought submission.

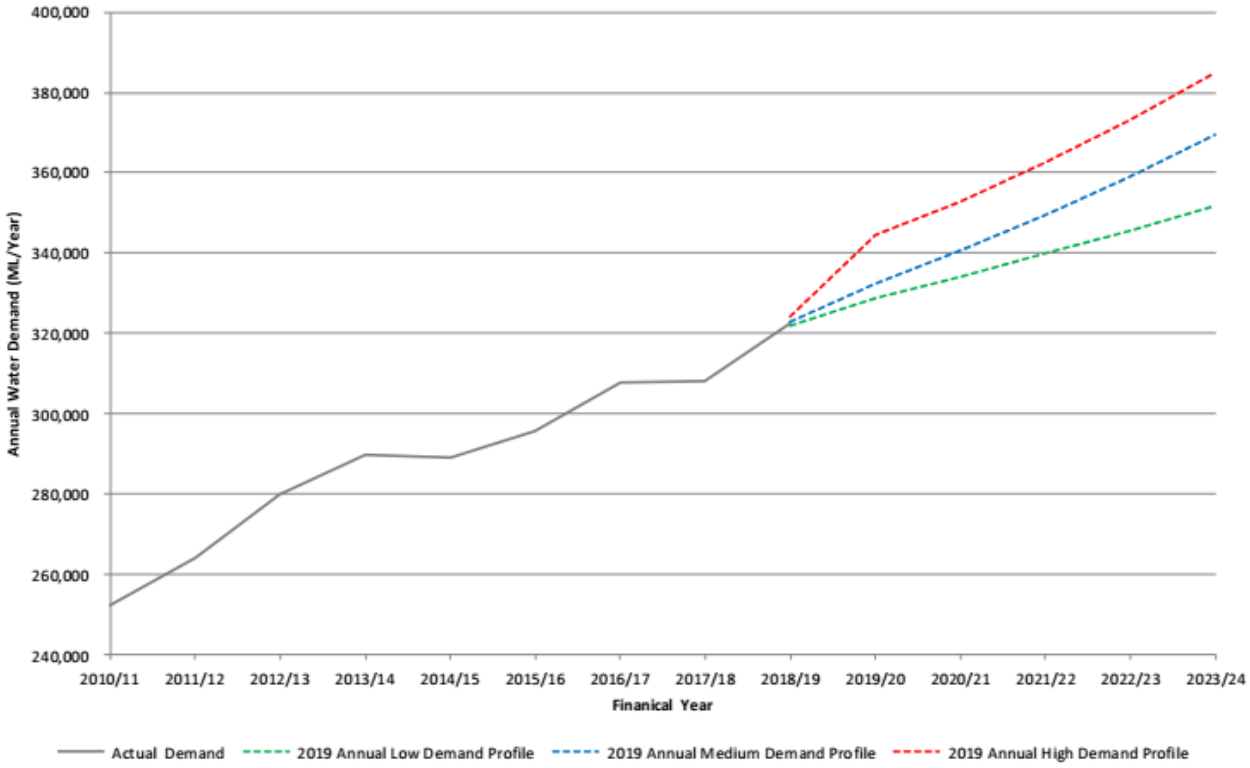
5.2 Normal operating conditions

The 2019 Demand Forecast Assessment involved a number of key activities including revised demand model input factors at the Local Government Area (LGA) residential and non-residential level (based on updated production and consumption) and review of drivers such as population projection, per capita usage and future consumption growth[5]. For example, the model used the QGSO 2018 Edition Medium Series population projection.

It employs three scenarios: the medium (most likely), low and high scenarios. The resulting forecasts were as follows:

[5] Source: Seqwater 2019 Annual Demand Forecast Assessment Report, October 2019

Figure 5-1 - Demand forecast scenarios and recent actuals



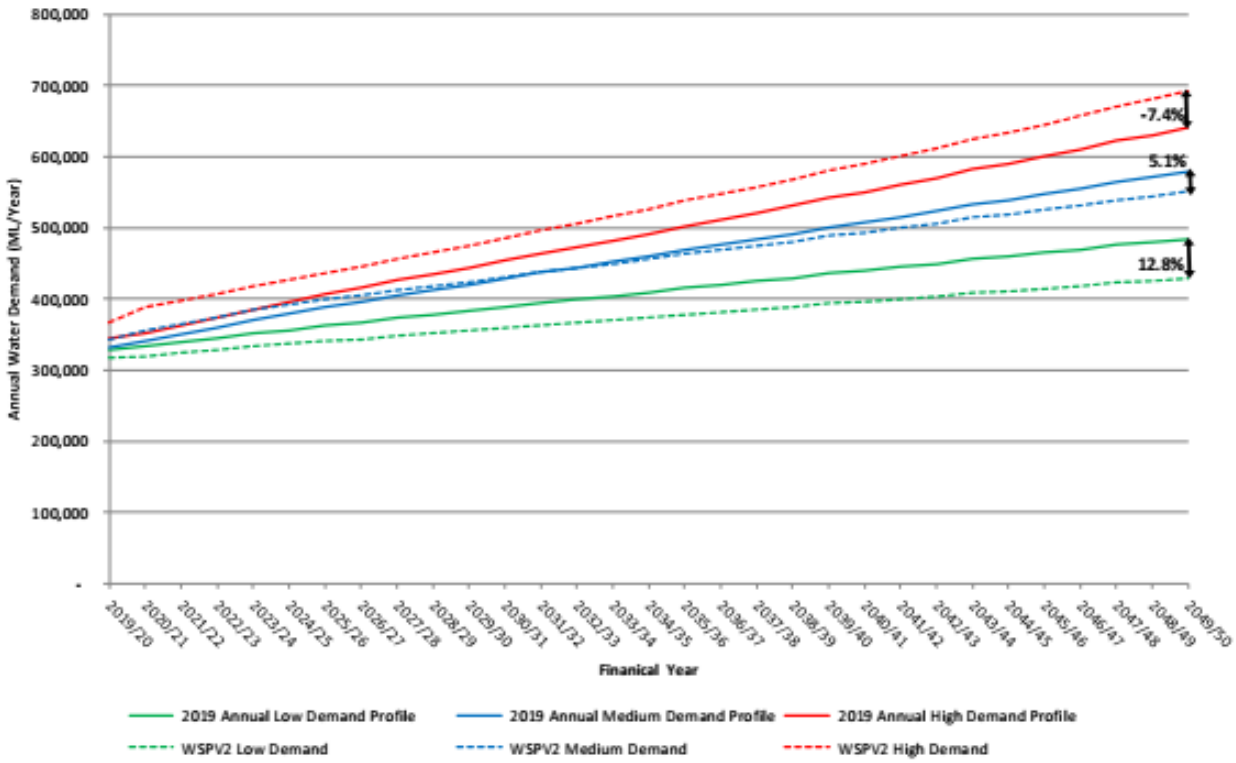
Source: Seqwater 2019 Annual Demand Forecast report

Compared to the demand forecast in the previous WSP, the revised demand forecast led to:

- Medium demand scenario (used for the Pricing Submission): lower initial demand until the 2030s when the revised forecast is higher.
- Low demand scenario: consistently higher than the previous WSP.
- High demand scenario: consistently significantly lower demand than the previous WSP.

This is summarised graphically below.

Figure 5-2 - Comparison of revised demand forecast with the previous Water Security Program



Source: Seqwater 2019 Annual Demand Forecast report

There is always uncertainty in demand forecasts as they are based on inherently uncertain future states such as population, economic activity, weather, policy and links to other factors such as the energy sector.

We have a number of observations about the normal operating condition demand forecasts:

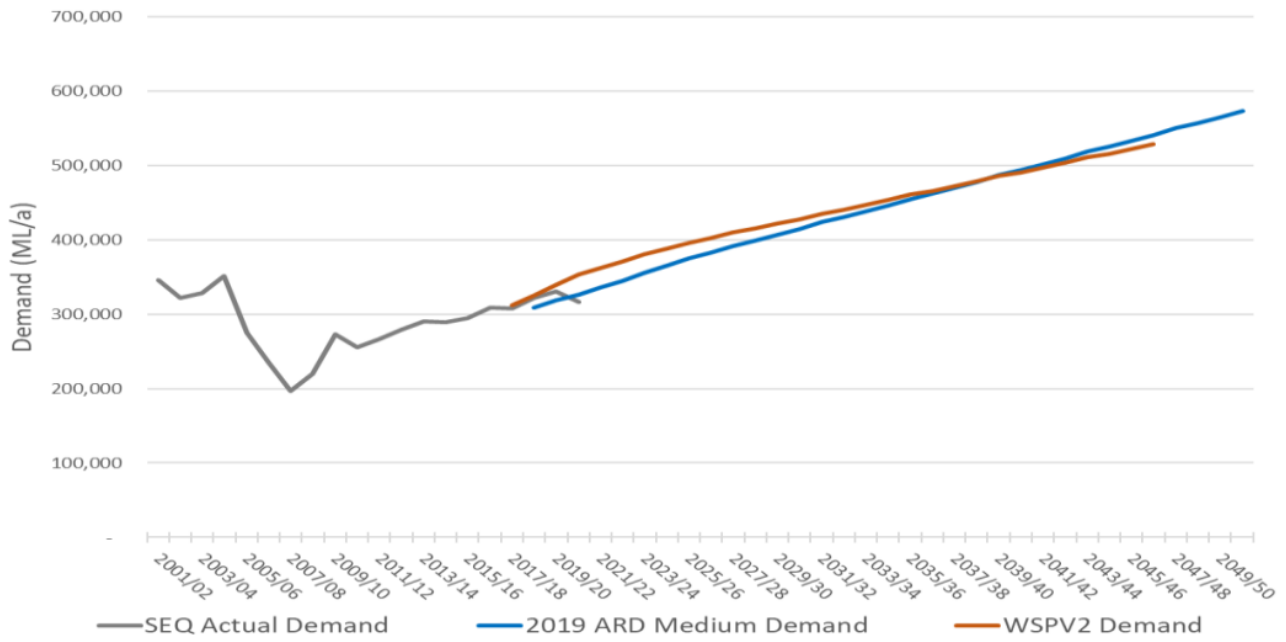
- Seqwater's definition of what constitutes "normal operating conditions" is not clear. Demand can vary significantly due to weather and atypical occurrences. It is therefore good practice to adopt a definition of "normal operating conditions" (e.g. a representative annual "average" weather year adjusted for any atypical events), then assess, and if necessary, adjust, historical data to meet this definition, before using these data as the basis of a projection.
- Linked to this, the forecasts take no account of climate change, either historical or future. Seqwater recognises this and intends to investigate it. We consider it is worthy of investigation for longer term planning and for consideration of how historical data are used and/or adjusted to current and future conditions.
- To assist with the first two points, it would be beneficial to have a robust understanding of the interaction between weather and demand. An example of how this could be carried out, is by collaboration with the retailers to build spatially disaggregated weather-demand models which can be used for predictive purposes.
- Being carried out in 2019, the forecasts take no account any potential lasting effects of Covid. In our discussions in September 2021, we were told that Seqwater had not yet had conversations with retailers about the potential persistent effects.
- The demand forecast is developed with very limited (or no) engagement with end customers. For example, Seqwater told us it had not discussed with heavy industry customers (of which there are approximately seven, with high average use) what their plans are, so would not be able to take account of their plans to either shutdown or double potable water use, for example.
- The demand forecast has limited consideration of current levels or changes in losses/leakage (Seqwater's or retailers) over time simply stating that *"It is understood that each of the SEQ Service Providers continues to invest in pressure and leakage management programs which reduce unaccounted water. It is assumed*

that the outcomes of these programs have been included in the Service Providers' demand forecasts submitted to Seqwater".

Overall, we consider that Seqwater's demand forecasts are not unreasonable, following broadly on historical trends, as can be seen (for medium demand excluding power stations) below.

The projections provided in the justification for variable costs (see Table 6-16) and Seqwater's "fairweather demand" figures in the Drought Calculations[6] appear to be between the medium and low 2019 demand forecast scenarios. We think this is not unrealistic given the impacts of Covid on demand for example.

Figure 5-3 - Comparison of actual and projected demands (excluding power stations)



Source: Seqwater 2019 Annual Demand Forecast report

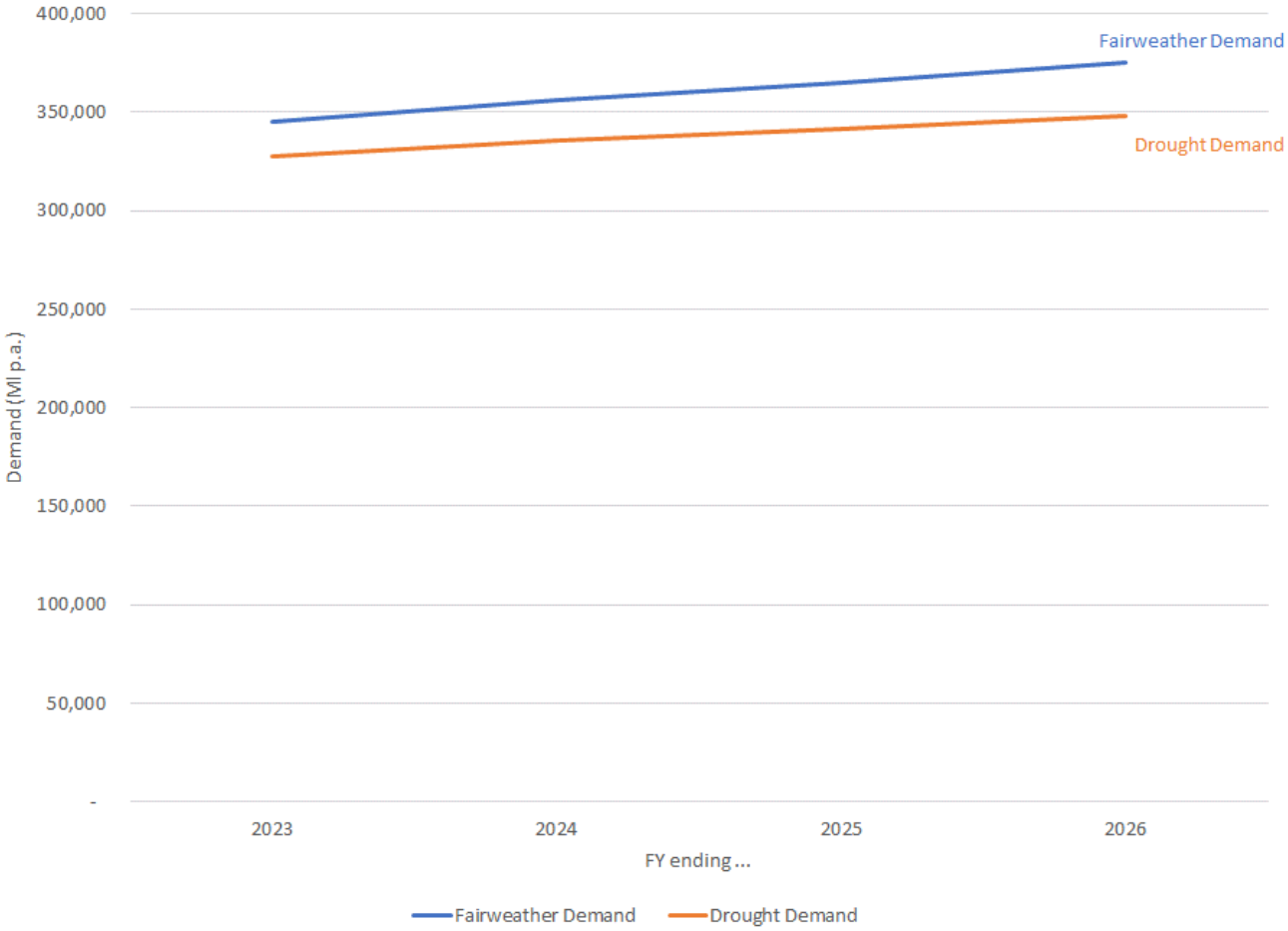
We have therefore recommended accepting Seqwater's forecasts but also ensuring that the observations set out above are considered in future demand forecasts.

5.3 Drought demand

Seqwater has projected a 'drought demand' which is 5.0% lower than the "fairweather demand" each year from FY23 to FY26. The resulting demand profile is shown below.

[6] Source: Seqwater spreadsheet Submission Drought Calculations 2021-08-20 sent to QCA

Figure 5-4 - Seqwater's projected drought demand



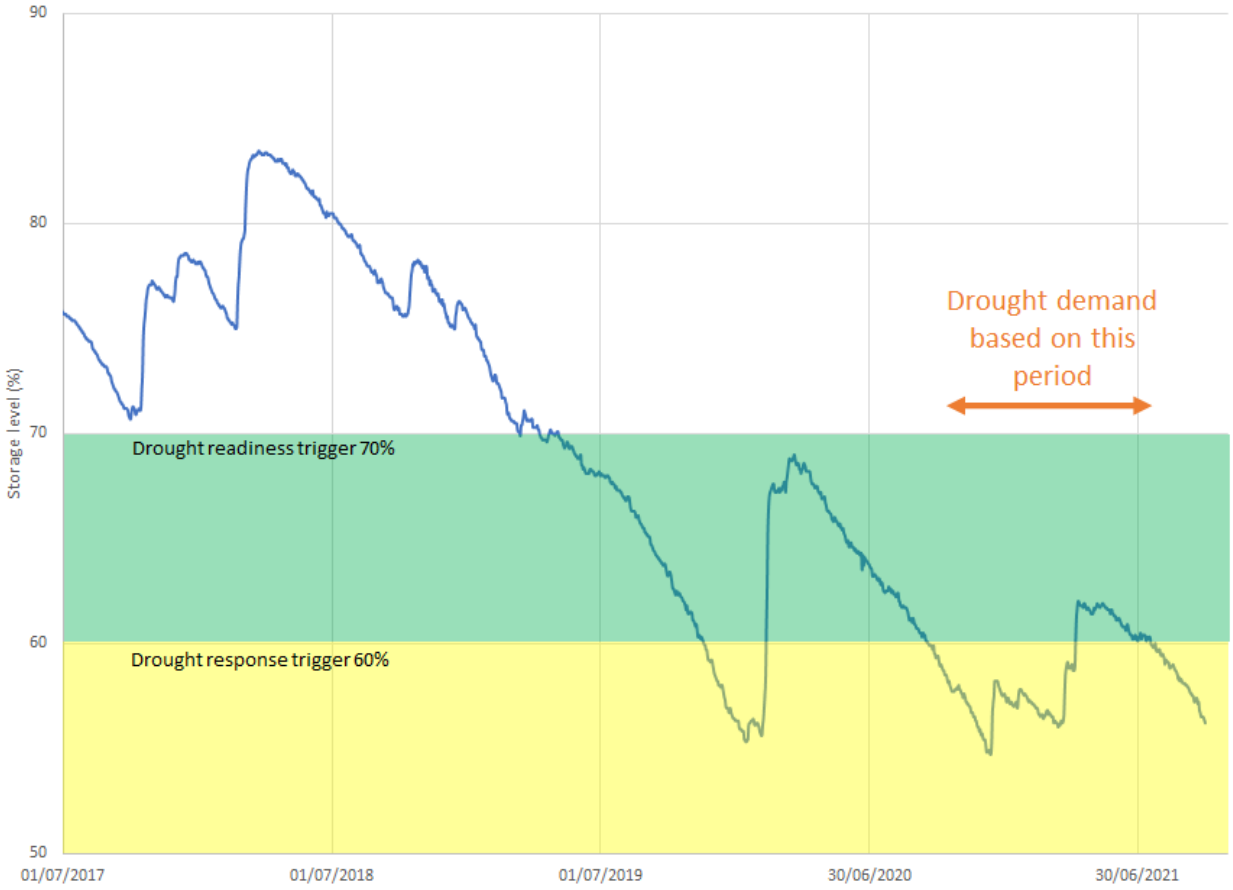
Source: "Submission Drought Calculations 2021-08-20 sent to QCA"

Seqwater has explained that it has prepared the drought demand forecast using a drought "total consumption rate" of 249 l/p/day inclusive of system losses, based on demand in the period from Sep 2020 to July 2021[7]. This period was chosen as the drought period because "water saving" messaging was being delivered over this period. It was considered a recent indication of consumption behaviour under drought conditions with some minor demand management measures being active. It results in demands which are 5% lower than Seqwater's "fairweather demand" projection in FY23 widening to 7% lower by FY26.

This period can be seen in the context of storage levels and drought status as below. As can be seen water levels moved between drought response and readiness and back to response again in this period.

[7] Source: Seqwater demand presentation, 14 September 2021

Figure 5-5 - Storage levels in the period used for deriving drought demand



Source: Atkins analysis of Seqwater spreadsheet "SEQ Water Grid Storage"

The outturn level of demand during drought will be greatly affected by many factors. Experience elsewhere suggests that media coverage of the drought and water conservation measures play a large role in it as does the current water use mix, housing mix and industry types.

We note also that the WSP requires a step up in water conservation messaging and "medium level restrictions" when storage levels reach 50%, a point which was not reached during the period. Other water suppliers in Australia have recently projected larger reductions in demand during drought[8].

We consider that Seqwater's proposed drought demand is not unrealistic if the drought remains broadly stable with storage levels roughly in the 55% to 65% range. However, we would expect demand to reduce further if storage levels reduce, especially if they go below 50% and the next stage of water conservation measures is triggered. Reductions of 10 to 20%[9] are easily foreseeable in such a scenario, with larger increases possible if storage levels fall further and public concern rises.

We would note that, whilst we acknowledge significant uncertainties, the approach taken to deriving this demand is rather simplistic. For future drought demand forecasts, we consider it would be good practice to examine (and potentially adjust for representativeness of) weather in the drought period, carry out more sophisticated analysis such as examining component level potential responses to restrictions and learn from the experience of restrictions elsewhere. We would also consider it good practice to examine the potential for leakage reduction measures.

[8] For example Sydney Water targeted 13.7% reduction from Level 2 water restrictions in 2020, see https://www.ipart.nsw.gov.au/sites/default/files/documents/consultant-report-by-atkins-cardno-sydney-water-expenditure-and-demand-forecast-review-19-march-2020.pdf

[9] Based roughly on the 140 lpd residential demand target (at 50% storage) compared to the current consumption with a range around it taking account of industrial and non-revenue water.

6 Operating expenditure

Our Terms of Reference indicates that we form a view on:

(a) the reasonableness of Seqwater's proposed base year for establishing an efficient level of recurring opex and, if not reasonable, an alternative base year

(b) the prudence and efficiency of proposed base-year opex, including any adjustments required to account for non-recurrent costs and identified efficiencies. The consultant should recommend an estimate of the base-year expenditure that reflects efficient recurrent ongoing costs

(c) the prudence and efficiency of any proposed incremental step changes to base-year opex, including whether the drivers of those step changes are reasonable

(d) the reasonableness of Seqwater's methods of allocating shared costs, where relevant

6.1 Summary

Seqwater's total opex was broadly stable from 2016 to 2019. This led Seqwater to consistently outperform the 2015 and 2018 Determinations in this period. However, the situation changed in 2020 with a significant increase in "fixed" opex, increasing both fixed and total opex above the 2018 Determination assumptions in 2020 and 2021. Seqwater expects this increase to be maintained and grow in the next period.

Seqwater explained to us that it seeks to operate within the previously approved efficient level of expenditure, yet it has exceeded this funding envelope. There is little evidence that the business monitors expenditure against the determination expenditure and takes action to control costs within the envelope.

Fixed expenditure

Fixed expenditure, after adjustment for atypical expenditure, has increased by $17.6M (nominal) over the period. The FY20 base year expenditure is $13.2M above the previously approved efficient level; Seqwater has explained $2.5M being driven by external factors which we have accepted. While Seqwater provided explanations for these additional costs, it was not able to demonstrate that these costs are efficient or that other activities and related costs were deferred to include these additional costs within in the envelope. **We conclude that the remaining $10.7M has not been demonstrated as being efficient.** We propose that fixed expenditure in 2023 is reduced by $4.2m and a glide path reduction to the efficient base year in 2025 reflecting a catch-up efficiency over the period. We consider this is reasonable to allow Seqwater to improve systems and processes including more effective activity-based costing.

Variable expenditure

Variable expenditure, comprising mainly chemical and power costs, shows a negative variance of $17.0M against the QCA determination over the current period. This is mainly due to power cost savings driven by the supply contract negotiated by the Queensland government. In the base year, the variance is $5M. We conclude that the variable base year expenditure is efficient and can be used as the basis for forecast expenditure. The expenditure forecasts were based on optimum operation of the network with no outages of feedwater events. We consider that Seqwater should make reasonable allowance for these events rather than itemise as additional expenditure. For example, including feedwater events and grid support costs within this analysis would reduce the variance to $1M.

Step changes

We have reviewed the prudence and efficiency of the step changes proposed by Seqwater in Table 6.15 of its submission, as follows:

- Luggage point AWTP operation and proactive drought management –considered as part of Drought Opex.
- Insurance premium changes – initial uplift accepted, but not the case for ongoing real terms increases.
- Natural assets – accepted as operating expenditure but increase above the 2020 base expenditure not accepted.
- Residual disposal costs – accepted as prudent but costs not efficient.
- GHG emissions abatement – not accepted; allowance in capex for electricity efficiency initiatives and advancing solar power generation.
- Wivenhoe gates – moved to capex.

- Options analysis and planning costs and delivery of large infrastructure projects – partially accepted.
- Negotiation of employee agreements and Water for SEQ planning – not accepted as these 'business as usual' activities.
- QCA regulatory fees – accepted.
- DTI expenditure – an additional step change recommended by Atkins for increasing external costs

The impact of these changes is to reduce expenditure to the values shown in Table 6-1 below.

Forecast variable expenditure

Seqwater has forecast variable expenditure from the unit costs of production for the FY20 base assuming optimum operation of the grid. We have proposed some modest additions to take into account annual changes in raw water quality and possible outages which drive sub-optimal use of the grid, based on Seqwater's data. We have identified potential savings from residuals disposal and reuse. The benefits from the Seqwater energy efficiency proposals and the advancement of solar energy implementation should deliver significant power cost savings in later years of the future determination period.

Review events – feedwater quality

Feedwater events, where high turbidity in the raw water drove a higher use of chemicals, are currently excluded from base expenditure. We confirm that the feedwater events in the current period are reasonable and efficient.

However, we also note that these events have occurred in every one of the last four financial years, a situation which may be worsened by climate change, and that Seqwater states that there are known gaps in the treatment process to address some of the issues. We therefore also recommend that consideration be given to ensuring that the best long-term solutions are put in place for managing this issue as efficiently as possible.

One way to help to achieve this and provide incentives to Seqwater to manage feedwater quality events as efficiently as possible would be to remove the review event mechanism and incorporate the average review event cost in FY19 to FY21 ($0.5M p.a.) in the expenditure allowance for the next period. For consistency with the position taken in the current period, we have provided two estimates of future variable expenditure: one including this expenditure and one without.

Review events - drought

Seqwater has made the case for a review event totalling $72.3M of operating expenditure (sum of nominal expenditure). Seqwater carried out a number of activities in advance of the triggers set out in the Water Security Program. In general, we have adopted the follow principles:

- Where costs would have been incurred anyway, simply at a later date, we have recommended including them in the drought review event. This is because they have proven to be required, and we would have supported them at the later date. However, we would draw attention to the fact that, this should not be interpreted as support for the prudency of carrying out activities ahead of the WSP triggers. Had the drought broken and/or the trigger for the activity not subsequently been met, we would not have recommended allowing this expenditure in the drought review event.
- Where carrying out an activity in advance of the WSP trigger, which means that opex has been incurred for longer (e.g., earlier operation of the Western Corridor Recycled Water Scheme (WCRWS)), we have only recommended allowing the additional opex from the period when the trigger was first met.
- Where we have recommended allowing the higher costs of producing water from WCRWS and/or Gold Coast Desalination Plant (GCDP), this reduces the volume of water produced from conventional sources. We have therefore recommended "netting off" the saved cost of producing water from conventional sources.

We have reviewed Seqwater's claim by cost line and financial year and recommend allowing $54.4M from FY18 to FY22. We note, however, that the projected expenditure for FY22 is based on Seqwater's projections and includes GCDP opex to end of October 2021. Depending on the evolution of the drought, outturn expenditure in FY22 may therefore vary significantly from these assumptions.

Efficiency

As set out above, we have applied a catch-up efficiency to the FY20 base year expenditure as we found some activities should be managed within the efficient expenditure set at the 2018 determination. We identified the need to improve processes and activity-based costing and to give greater focus on monitoring expenditure over the determination period. We have proposed a step reduction in the 2023 fixed costs and a glide path or catch-

up efficiency to achieve a prudent and efficient level of expenditure by 2025. We consider this is a reasonable approach allowing the full implementation of cost management processes.

We have also proposed a continuing efficiency of 0.5% p.a. cumulative through to 2028. After taking into account the efficiencies proposed by Seqwater this reduces to 0.3% p.a. cumulative through to 2028.

Escalation

We have accepted the Seqwater proposed escalation factors. The Seqwater proposals are generally consistent with the methodology used in the Referral Notice.

Efficient expenditure

Our recommended efficient fixed and variable expenditure are summarised in Table 6-1 and Table 6-2 respectively.

Table 6-1 - Atkins proposed fixed expenditure ($M FY20)

FY ending June	2023	2024	2025	2026	2027	2028
Recommended Expenditure ($FY20)	231.7	228.1	225.2	229.7	235.3	226.2
Recommended Expenditure (nominal)	250.1	251.6	254.5	265.9	279.2	275.1

Source: Seqwater proposal and Atkins analysis

Table 6-2 - Atkins proposed variable expenditure ($M FY20)

FY Ending June	2023	2024	2025	2026	2027	2028
Recommendation if feedwater quality review mechanism remains in place						
Recommended expenditure ($M FY20)	35.1	35.4	34.1	34.2	34.5	35.0
Recommended expenditure ($M Nominal)	37.7	38.9	38.1	39.1	40.3	41.7
Recommendation if feedwater quality review mechanism is not applied						
Recommended expenditure ($M FY20)	35.6	35.9	34.5	34.6	35.0	35.5
Recommended expenditure ($M Nominal)	38.2	39.4	38.7	39.6	40.8	42.3

Source: Seqwater proposal and Atkins analysis

6.2 Methodology

Our overall methodology is explained in Section 2. In this section we examine the key drivers for variance in outturn expenditure and for the changes in forecast expenditure.

Seqwater's original Pricing Proposal submitted in June 2021 outlined proposed expenditure requirements for its non-drought activities, in August 2021 Seqwater made a further submission to the QCA for a review item for drought related capital and operating expenditure including expenditure on the WCRWS. We have based our assessment on this updated total expenditure including both the original, June 2021 submission and August 2021 drought submission.

We make an assessment of an efficient level of expenditure for the period 2022 to 2026 and out to 2028 taking into account our discussions with Seqwater, documents presented and provided and subsequent answers to questions we raised in a formal Request for Information (RFI) process. Our focus is on a material level of expenditure. This included a review of

i. Variance analysis of fixed and variable operating expenditure in the current determination period and reasons for this.
ii. Efficient base year fixed expenditure and proposed adjustments.
iii. Proposed step changes to the base year.
iv. Forecast variable operating expenditure and links to the demand forecast.
v. The prudence and efficiency of review items including drought-related costs.

We have made scope adjustments where appropriate and have applied catchup and continuing efficiencies to derive an efficient level of expenditure for the period FY23 to FY26. Escalation factors have been applied to FY20 costs to derive nominal expenditure for each year of the determination period.

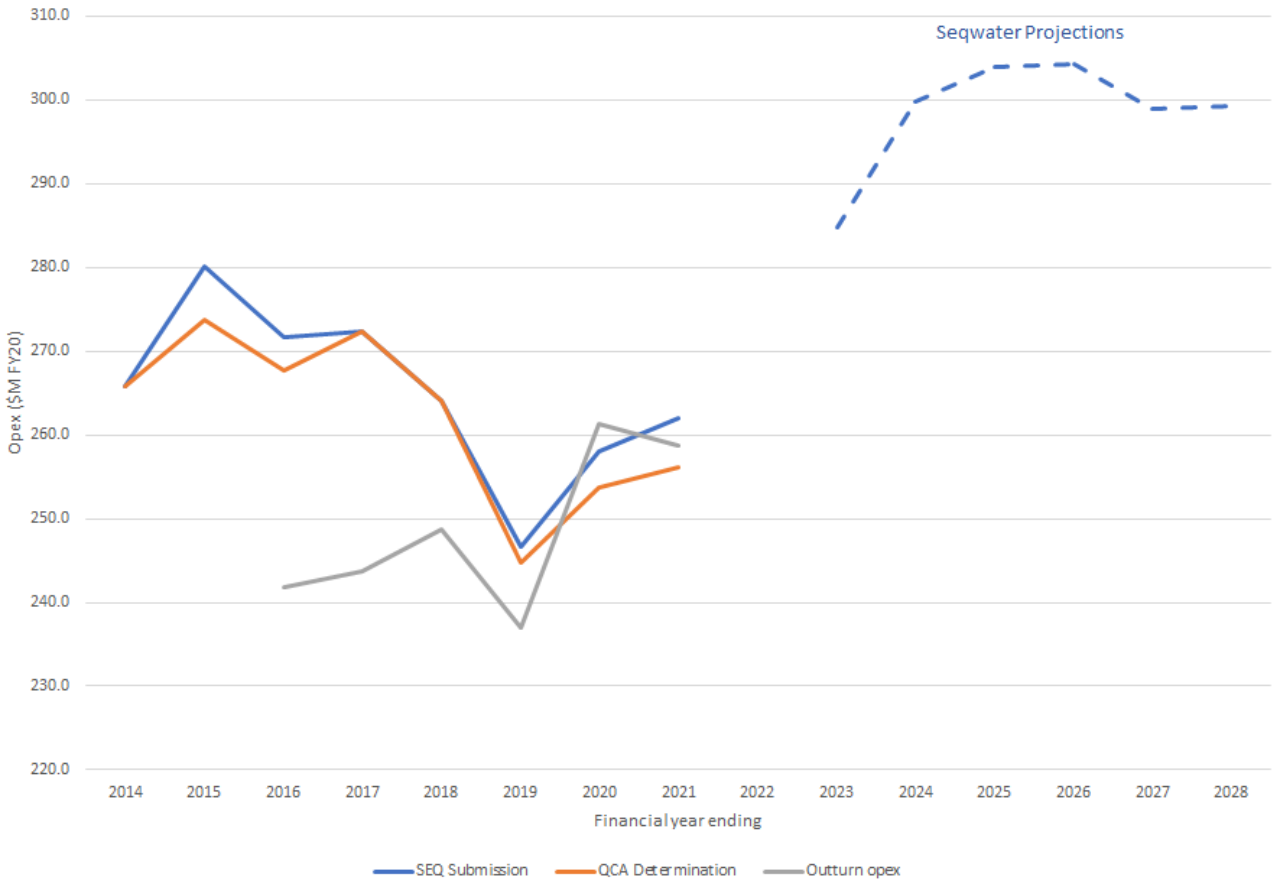
6.3 Overview

The Queensland Bulk Water Transport Authority (Linkwater) was merged into Seqwater in December 2012. In March 2015, QCA published its report into SEQ Bulk Water Price Path 2015-18, recommending operating expenditure for the merged entity. This was followed in March 2018 by the assessment of prudent and efficient expenditure for the 2018 to 2028 period, which was used to set prices for FY18 to FY21.

Seqwater's total opex was broadly stable from 2016 to 2019. This led Seqwater to consistently outperform the 2015 and 2018 Determinations in this period. However, the situation changed in 2020 with a significant increase in "fixed" opex, increasing both fixed and total opex above the 2018 Determination assumptions in 2020 and 2021.

Seqwater expects this increase to be maintained and grow in the next period as can be seen below.

Figure 6-1 - Historical total opex trends ($FY20)



Source: Seqwater Document "RFI 62-66 Attachment" and QCA reports March 2015 and March 2018[10]

Note: unadjusted opex.

[10] *Note prices converted to $FY20 in this and other figures using Brisbane financial year CPI (years 2014 to 2017), Table 8.2 of Seqwater submission (2018 to 2022) and Seqwater Opex forecast model received 24 August 2021 (2023 to 2028).*

Figure 6-2 - Historical fixed opex trends ($FY20)

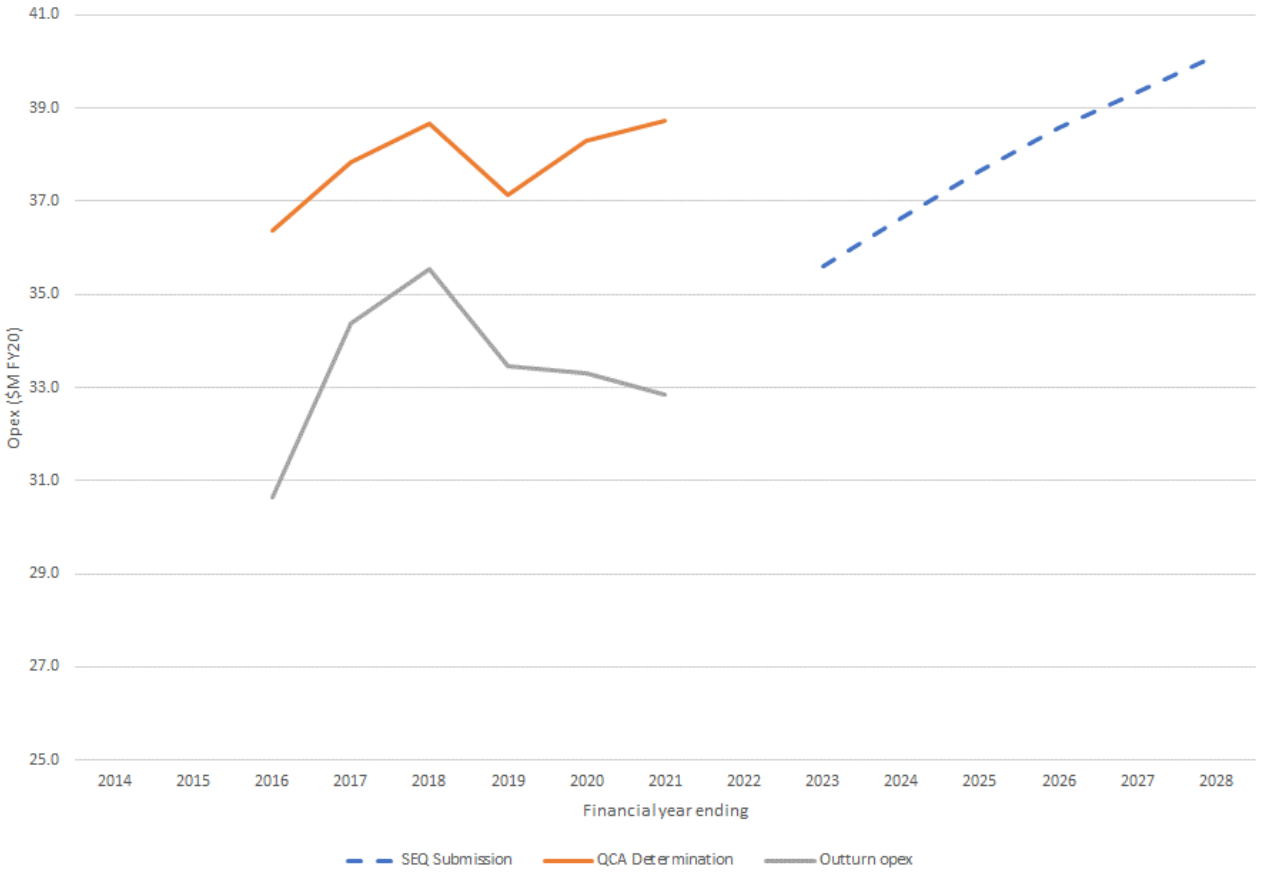
Source: Seqwater Document "RFI 62-66 Attachment" and QCA reports March 2015 and March 2018[11]

Note: unadjusted opex

Some of the increase is offset by underspend against the variable opex determination. However, having outperformed in this period, Seqwater is projecting an increase in variable opex in the next period as can be seen below.

[11] Note prices converted to $FY20 in this and other figures using Brisbane financial year CPI (years 2014 to 2017), Table 8.2 of Seqwater submission (2018 to 2022) and Seqwater Opex forecast model received 24 August 2021 (2023 to 2028).

Figure 6-3 - Historical variable opex trends ($FY20)



Source: Seqwater Document "RFI 62-66 Attachment" and QCA reports March 2015 and March 2018[12]

Note: unadjusted opex

We examine in further detail below the reasons for the variance in the 2018 determination period and the adjustments that Seqwater has applied in deriving its proposed base year opex. We also examine the proposed changes in forecast opex.

6.4 Operating expenditure in the 2018 determination period

In the 2008 determination[13] for Seqwater, QCA set an efficient level of base year expenditure for FY19 to FY21 including inflation, step changes and an adjustment for efficiency. Table 6-3 shows the variance in fixed, variable and total expenditure for FY19 to FY21. The analysis shows gross expenditure with adjustments for review items – drought and feedwater – and atypical expenditure which Seqwater has removed from the base. The actual (net) expenditure is then compared with the allowed expenditure in the QCA determination.

[12] Note prices converted to $FY20 in this and other figures using Brisbane financial year CPI (years 2014 to 2017), Table 8.2 of Seqwater submission (2018 to 2022) and Seqwater Opex forecast model received 24 August 2021 (2023 to 2028).
[13] South East Queensland Bulk Water Price Review 2018/21, QCA March 2018

Table 6-3 - Variance in the current period total fixed and variable operating expenditure ($M nominal)

$m nominal year ending June		2019	2020	2021	Total
Fixed opex	Actual (gross)	227.0	258.4	265.1	750.6
	Remove from base (atypical)	-21.4	-29.8*	-33.6	-84.9
	Actual (net)	205.6	228.6	231.5	665.7
	QCA determination	209.8	215.4	222.9	648.1
	Variance on QCA	-4.2	13.2	8.6	17.6
Variable opex	Actual (gross)	34.1	35.2	34.5	103.7
	Feedwater Review item	-0.2	-1.0	-0.3	-1.5
	Grid support variable costs	-0.1	-0.9	-0.5	-1.4
	Actual (net)	33.8	33.3	33.7	100.8
	QCA determination	37.5	38.3	39.7	115.5
	Variance on QCA	-3.7	-5.0	-6.0	-14.7
Total opex	Actual fixed and variable	239.4	261.9	265.2	766.5
	QCA determination	247.3	253.7	262.6	763.6
	Variance on QCA	-7.9	8.2	2.6	2.9

Source: Seqwater presentation 6 September, QCA report 2018 and Atkins analysis

** note this figure includes a confidential corporate adjustment not described in this report*

Fixed operating expenditure

The total variance over the three-year period is $17.6M, an average of $5.9M p.a., with the greater variance in FY20 after taking into account of atypical expenditure identified by Seqwater. With the atypical expenditure set aside in 2020, the data suggest that taking an average of the three years expenditure would provide a more representative value for a base year. However, because of significant changes to actual expenditure in 2020 with the implementation of the major projects group, this would not be representative. We comment on this expenditure for the FY20 base year in Section 6.5. We also comment on the drought review expenditure in Section 6.6.

Variable costs

Variable costs are the direct costs of producing water including power, chemicals, and 'other' costs including sludge treatment and disposal. These 'other' costs comprise, on average, 8% of total annual variable costs. Total costs were estimated from the demand forecast and the unit cost of water produced for a 'normalised' year. QCA assumed that FY19 was a normal year.

Table 6-1 summarises actual variable operating expenditure as $100.8M compared with the QCA efficient expenditure of $115.5M including input costs and growth escalation and continuing efficiency. This results in a variance of $14.7M [OBJ]below the QCA efficient operating costs over the period, equivalent to 13% of the QCA allowance. We noted that for the period FY15 to FY18 that actual expenditure was 11% below the QCA determination.

A significant element of this saving is attributed to lower electricity costs following a re-negotiation of tariffs by the Queensland Government. These lower electricity costs did not arise from the direct management actions of Seqwater and could be considered as a windfall gain where customers would expect to benefit.

Seqwater has identified increases for atypical expenditure comprising grid support costs and feedwater events which it has have been excluded from the variance analysis. There were three feedwater quality events over the last three years, FY19 to FY21, at a reported cost of $1.5M or 1.3% of the total QCA allowance for the

period. Grid support costs due to planned outages at water treatment plants and relate mainly to electricity and chemical costs at the Gold Coast Desalination Plant (GCDP).

We conclude in our comments in Section 60 that grid support costs are variable costs, not tangible assets. Taking the $1.4M grid support variable cost with the $1.5M feedwater quality events, the variance above the QCA determination is -$14.7M. We discuss grid support costs and feedwater quality events in Section 6.5.2.

6.5 Base year 2020

6.5.1 Reconciliation of actual expenditure with the QCA determination

The base year FY20 variances for fixed and variable expenditure are shown in Table 6-4.

Table 6-4 - Operating expenditure variance in the FY20 base year ($M FY20)

$m nominal	Actual expenditure	QCA determination	Variance on the QCA determination
Base year fixed opex	228.6	215.4	13.2
Variable opex	33.3	38.3	-5.0
Total	261.9	253.7	8.2

Source: QCA Final Report 2018, Seqwater pricing submission 2021 and Atkins analysis

Note that fixed and variable opex is after adjustments for atypical expenditures

Seqwater sought to provide a reconciliation [14] for the $13.2M variance above the QCA determination which we have summarised in Table 6-5 and discuss below.

Table 6-5 - Seqwater explanation of variance to the base year fixed opex

Function	Variance $M FY20	Reasons for variance
Asset maintenance	5.0	Maintenance improvement strategy Ladders and platforms Delivery review HV inspections and pole audit Reactive mains Network value inspection program
Asset management	2.6	Asset management planning costs
Operations	2.9	Control System Management functions
Major projects	2.2	Major projects creation
Insurance premiums	1.0	Increase in premium
Other fixed	(0.5)	
Total variance	13.2	

Source: 'reconciliation' slide, presentation 15th September

The $13.2M variance is a significant change compared with the -$4.2M variance against the previously approved efficient expenditure for 2019. Seqwater explained the reasons for the year 2020 variance in Table 6-5 above although could not explain this year-on-year variance.

[14] Seqwater document 'reconciliation' in 13 September presentation

The QCA set an efficient level of fixed expenditure for FY20 based on its review of expenditure in 2018. This total expenditure allows Seqwater to manage its assets and deliver bulk water within this funding envelope, prioritising expenditures based on its own management decisions. Our approach to these expenditures above the efficient level is to understand the cost drivers and whether they are endogenous or exogenous. Exogenous factors include additional insurance costs and the need to deliver major projects in future periods. We test whether these costs are prudent and efficient. Endogenous costs should be controlled by management through prioritising activities and work within the efficient costs determined by QCA in 2018; by definition, these endogenous costs above this cost envelope are not efficient unless there are clear explanations to the contrary.

We asked Seqwater several times to provide an explanation for these variances for each function listed in Table 6-5. We discuss this information, subsequently received, in the following sections. These set out the activities and related costs but do not explain why they could not be efficiently managed within the allowed funding envelope.

6.5.2 Operations and maintenance

Asset maintenance

Additional asset maintenance expenditure relates to the Maintenance Improvement Strategy (MIS), ladders and platforms, delivery review, HV inspections and pole audit, reactive mains and network valve inspection program. These activities were detailed in the maintenance expenditure presentation[15]. Seqwater attributes these variances to increased operational risk and reactive mains repairs, and a change in cost culture with a transition to condition-based maintenance. An additional expenditure of $5M is reported for these activities.

Seqwater provided information on maintenance performance[16] and a typical monthly report. The measures relate to the performance of the maintenance teams rather than the performance of the assets; the one exception was the impact of maintenance on availability which shows a high and stable performance. In discussions with Seqwater it stated that the assets were in a stable condition. We have not seen any specific outcome measures or other metrics where Seqwater could explain trends in maintenance work and demonstrate whether assets are stable or deteriorating. This is important in justifying any changes to maintenance expenditure. We have assumed that assets are stable and there are no exogenous factors which impact on a change in maintenance activity.

We recommend that Seqwater develops specific outcome measures, using their asset plans and other data, to provide a clear view of asset performance and to identify any change in serviceability.

Asset management

Seqwater explained that additional costs were due to changes in the gates for capitalisation. However, following discussions on 13 September, we understand that it is due to greater activity levels on projects which are in the earlier gate stages and the process of capitalising project costs after the Gate 2 approval has been unchanged over the current determination period.[17]

Operations

Seqwater explained that these additional costs related to increased manning requirements as a result of the Control System Management (CSM) system implementation. Restoration work was carried out in response to the Wivenhoe bush fires.

Findings on Maintenance, Asset Management and Operations expenditure

Our view is that the factors driving significant change in costs are endogenous within the overall business to deliver bulk water and manage assets. There is no clear evidence of any changes to external factors which are driving these activities. There are also no measures showing any deterioration in asset performance.

These expenditures have been incurred but do not demonstrate the need to increase the base year efficient expenditure.

We found that while these activities are prudent to undertake and costs are reasonable, they should be managed by the business within the efficient funding envelope by prioritising all activities and related costs. We asked Seqwater to justify the variance relates to additional efficient expenditure; however, it has not demonstrated the need to increase the efficient expenditure element set in the 2018 determination.

[15] Maintenance Expenditure presentation, 6th September 2021
[16] RFI144 Maintenance team performance and sample monthly report, Jun 21
[17] Seqwater reconciliation presentation, 13 September 2021

6.5.3 Major projects

Major Projects

Seqwater recognised in 2018[18] that it needed to enhance its project delivery function to manage a significant increase in its capital program as a result of large projects related to dam safety compliance, flood resilience and the south west pipeline. A separate group was set up within the business drawing on some existing staff and external recruitment. The group now manages all projects with a value greater than $40M and other specialist projects. The board paper stated that the cost of this major projects group '*will be funded from the infrastructure program capital budget with individual project costs allocated to those projects'*. The Board approved an additional 30.5 FTEs including consultants on short term inputs.

The group was substantially established in FY20 although the full year effect of increasing costs is not reflected in the costs presented. Seqwater recruited a further 35 FTE's[19] during FY20 where the full year impact was not shown in operating expenditure for the year. Seqwater explained that the additional staff were approved by the Executive and there was no specific Board Paper. A separate step change is proposed by Seqwater to cover these costs which we discuss in Section 6.7.5.

An activity-based costing process is used to allocate costs to projects, support functions and administration. When projects achieve Gate 2 approval, subsequent costs are capitalised. In FY20, 78% of hours were allocated directly to project timesheet codes for capitalisation and 22% to operational timesheet codes[20]. The $2.2M in Table 6-2 relates to operating costs for various support activities; Seqwater reported that $1.2M relates to administration support[21]. Whether this is due to insufficient disaggregation of coding for activity-based costing, or a real but high level of administration support is unclear. We are also concerned that there may be some duplication of support services from the core business and within the major projects team.

We accept that some support may be needed for staff training for both capitalised and operational teams, however we would not expect this to be greater than 5% of total staff costs and not to the level implied by the reported administration costs. This 5% is based on an efficient engineering consultancy which is akin to the major projects' division.

This is the first full year of operation for the group, and it will take some time to reach an efficient level of working applied by a frontier company as work practices bed down and efficiencies are driven through the division.

We recommend that full implementation of activity-based costing is necessary to explain both internally and externally where costs are being incurred. We find from other utilities that a rigorous implementation of activity-based costing and cost control that efficiencies can be found. This applies across the whole business, not just the Major Projects group.

We can support an efficient expenditure of $1.5M comprising defined activities and a proportion of administration costs but from the details we have seen, we are not able to conclude that the $1.2M level of administration support expenditure is prudent or efficient. We conclude an efficient expenditure of $1.5M for 2020 comprising $0.5M support costs (5% of the total $10M operating and capital expenditure for administration) plus $1.0M for costs allocated to defined activities. We propose that the remaining $0.7M inefficient expenditure should be recovered through a 'glide path' or catch-up efficiency applied to major projects support expenditure over the first two years of the future determination period.

6.5.4 Insurance cost variance

This increase is as a result of the external insurance market. Seqwater has demonstrated that it has taken a reasonable approach in managing insurance costs in the base year. We have recommended accepting this increase.

6.5.5 Base year atypical operating expenditure

Seqwater has applied adjustments to gross operating expenditure in FY20 to derive an efficient base year expenditure. These adjustments are shown in Table 6-6 below and discussed in subsequent sections.

[18] RFI 119 Board Paper, Seqwater July 2018
[19] RFI 125
[20] Seqwater RFI87
[21] RFI 148

Table 6-6 - Proposed adjustment to base year total operating expenditure ($M FY20)

Item of expenditure	FY20 $M	Reasons for adjustment	Atkins comment
Toowoomba to Warwick Pipeline Feasibility Report	1.2	Externally funded	Not within the regulated business
Natural Assets	5.8	Assumed to be expensed in future period	
Grid Support	2.9	Assumed to be capitalised	Include as variable costs to support the grid
'Connect the Dots' project	4.3	One-off expenditure	
Water Futures program	1.1	One-off expenditure	
Net impact of COVID-19	(0.9)	One-off saving	
Connecting our business	0.7	One-off expenditure	
Drought Readiness	5.3	Review event	Discussed in Section 6.6
Drought Response	8.0	Review event	Discussed in Section 6.6
Feedwater quality	1.0	Review event	Discussed in Section 6.6
Total adjustments	29.4		Note minor difference with Table 6.3 due to rounding

Source: Seqwater submission Table 6.2 and Atkins comments

We comment below on each of the adjustments. Review events are discussed in Section 6.6.

Toowoomba to Warwick Pipeline Feasibility Report

This report was externally funded and does not form part of the regulated business.

Natural Assets

Expenditure relates to catchment management activities mainly on third party land to reduce the risk of pollution impacting on the Seqwater assets and abstraction for treatment. Reported expenditure includes environmental offsets. Expenditure in the current period was reported within gross operating expenditure and subsequently capitalised. Seqwater has reviewed its capitalisation policy, and, for the future determination period, some previously capitalised natural asset costs will be expensed. This is because much of the work is carried out on third party land where Seqwater has no future economic benefit in the expenditure. We accept this approach.

Grid Support

Seqwater comments that these costs relate to maintaining the bulk water supply in the grid when a planned outage occurred as part of the Crosby East Bank treatment plant upgrading project. Seqwater makes the case that the costs were incurred as part of the project delivery, to make up for the output lost from the treatment plant outage. The additional costs relate to operating of the Gold Coast Desalination Plant (GCDP) and the Southern Regional Water Pipeline (SRWP) in a northerly direction. Seqwater explains that the costs are not able to be capitalised under its capitalisation policy. Seqwater is seeking to recover the costs through the RAB, thereby spreading the cost across existing and future customers.

We note that these costs cannot be capitalised under the Seqwater capitalisation policy. These are additional variable costs, not tangible assets, incurred in managing the grid to deliver bulk water. The benefits of a grid supply system are that it allows flexibility in operation, to allow for varying treatment works outputs for any reason against the requirement to deliver varying demand requirements in the network. This is business as usual as the grid responds to varying inputs and outputs. It is for Seqwater to manage the risks of plant outages, whether planned or unplanned.

We reviewed the business case for the Mount Crosby East bank WTP upgrade where we did not find any mention of the need for grid support as part of project implementation. We noted that the capacity of the treatment plant will be increased by 20% when work is completed which should provide greater flexibility in operating the grid in the future with less reliance on GCDP.

We concluded that these are atypical variable costs, not tangible assets, in response to a planned outage in the bulk supply network. There is no justification to consider these costs as additional and capitalise them. These costs should be considered with other cost variances when comparing actual variable costs with the QCA allowance over the determination period.

The same finding applies to the total $11.8M grid support expenditure in the current determination period. These should be considered as additional variable costs in the period to manage outages in the grid system. These costs should be considered within the analysis for variable expenditure, reducing the variance from $17.0M to $5.2M.

'Connect the dots' project

Seqwater advised us that this was a 'one-off' expenditure related to

> *A large business process change project managed by IT. A significant change of scope has meant that the expenditure on research and options analysis no longer qualifies as capital in nature. Costs were written back to operating expense.*

We accept this as an atypical expenditure.

Water Futures program

This expenditure relates to a community engagement project for purified recycled water that was funded as a step change in the previous regulatory period for a fixed 3-year term. We accept this adjustment as a 'one-off' expenditure.

Net impact of COVID-19

Seqwater proposes a 'one-off' saving of $0.9M as a result of cancelled bonuses and lower training costs offset in part by additional operating costs and increased labour costs when staff did not take leave. The main area of saving was the non-payment of annual bonuses for FY20. We consider this to be business as usual and with no adjustment to the base.

Connecting our business

These costs relate to the recruitment of seven new executive roles and related redundancies. We consider this expenditure to be business as usual.

Summary

Our findings on the atypical adjustments to the base year expenditure are summarised in Table 6-7.

Table 6-7 - Atkins efficient atypical adjustments to base year operating expenditure

Item of expenditure	FY20 $M	Reasons for adjustment	Atkins comment
Toowoomba to Warwick Pipeline Feasibility Report	1.2	Externally funded	Accepted as atypical expenditure
Natural Assets	5.8	Assumed to be expensed in future period	Accepted
Grid Support	2.9	Assumed to be capitalised	Part Variable cost
'Connect the Dots' project	4.3	One-off expenditure	Accepted
Water Futures program	1.1	One-off expenditure	Accepted
Net impact of COVID-19	0	One-off saving	Business as usual
Connecting our business	0	One-off expenditure	Business as usual

Item of expenditure	FY20 $M	Reasons for adjustment	Atkins comment
Drought Readiness	5.3	Review event	Accepted as atypical. See comments in Section 6.6.1 and 6.6.2
Drought Response	8.0	Review event	
Feedwater quality	1.0	Review event	
Total adjustments to base	29.6		
Adjustment to base fixed costs	26.7		
Adjustment to base variable costs	2.9		

Source: Seqwater submission Table 6.2 and Atkins comments

We concluded that only two of these items relate to business as usual but have no material impact on the base year expenditure. Atypical items are accepted; we comment further on Review Events in Section 6.6 and variable costs in Section 6.7.

6.5.6 Base year fixed operating expenditure

We are required to comment on the reasonableness of Seqwater's proposed base year expenditure for establishing an efficient level of recurring opex and, if not reasonable, an alternative base year.

We found it is reasonable to use the FY20 year as the base for future expenditure with additions for insurance and an element of major projects expenditure as shown in Table 6-8.

We do not accept an increase in the 2020 base year of $10.7M as being efficient. The $10.0M expenditure for operations, maintenance and asset management expenditure form endogenous activities within the overall business to deliver bulk water and manage assets. We asked Seqwater to provide to explain the reasons for expenditure above the funding envelope. We found that there is no clear evidence of any changes to external factors which are driving these activities. In addition, there are also no measures showing any deterioration in asset performance. While the activities themselves may be prudent, it is for management to prioritise within the overall efficient funding level. We recommend that a range of outcome measures are developed to demonstrate the performance of assets in delivering service to customers so that any improvement or deterioration in outcomes can be clearly shown.

Seqwater was not able to demonstrate that all the expenditure for major projects was efficient. Over half the $2.2M expenditure was coded to 'administration'. We also consider there is some duplication of functions within the business. We concluded that it was reasonable to include $1.5M of the total $2.2M major projects expenditure as being efficient. The remaining $0.7M could not be justified.

We recommend that activity-based costing is fully applied across the business; in parallel, all staff should be required to complete timesheets.

Table 6-8 - Efficient expenditure for the FY20 base year ($M FY20)

	Expenditure $M	Atkins comment
QCA Efficient base year fixed opex	215.4	QCA March 2018
Insurance	1.0	Accepted
Major projects	1.5	A reasonable proportion accepted as efficient
Atkins efficient level of expenditure	217.9	
Major project inefficient expenditure	0.7	Not demonstrated as efficient
Additional asset maintenance, asset management and operations expenditure	10.0	Not demonstrated as efficient
Total expenditure not efficient	10.7	Not demonstrated as efficient

Source: Atkins analysis

Note that fixed opex is after adjustments for atypical expenditures

We have not removed inefficient expenditure in full, from the start of the period but have applied a glide path of catch-up efficiency over the first two years of the future determination period to give the organisation time to make the changes required to return expenditure to an efficient level by 2024. It also focuses the business on driving efficiency across all areas of the business. The impact of the efficiency adjustments is shown in Table 6-9 below.

Table 6-9 - Efficient fixed expenditure for the future determination period ($M FY20)

FYr ending June	2020	2023	2024	2025	2026
Base year fixed opex	228.6	228.6	228.6	228.6	228.6
Catch-up efficiency		-4.2	-8.3	-10.7	-10.7
Efficient fixed expenditure	228.6	224.4	220.3	217.9	217.9

Source: Atkins analysis

The glide path of catch-up efficiency reflects the positive variance in 2019 and a reasonable timescale for Seqwater to implement full activity-based costing and drive efficiencies in the business. We discuss catch-up efficiency in Section 6.7.7.

6.5.7 Variable expenditure in the current period

Variable costs are the direct costs of producing water including power, chemicals, and other costs including sludge treatment and disposal. These other costs comprise, on average, 8% of total annual variable costs. We have disaggregated the main components over the current period to understand the reasons for variance against the QCA determination. This analysis is shown in Table 6-10. The costs are before any 'true up' for demand variances between actual and the QCA determination.

Table 6-10 - Variable costs in the current period ($M nominal)

Item of expenditure FY ending June	2018	2019	2020	2021	Totals FY19 to 21
Chemicals	14.5	15.7	17.7	18.1	51.5
Energy	18.5	15.7	13.1	13.1	41.9
Other	2.2	2.4	2.5	2.5	7.4
Total Actual	35.2	33.8	33.3	33.7	100.8
QCA determination		37.5	38.3	39.7	115.5
Variance against the determination		-3.7	-5.0	-6.0	-14.7
Chemical cost $ per Ml	47.1	48.8	55.8	58.9	
Energy cost $ per Ml	60.0	48.7	41.4	42.6	
Water delivered (Gl/a)	308.2	322.4	317.4	307.3	

Source: Seqwater RFI 62-66 Variable costs and demand projections; Atkins analysis

Note that we have taken the actual reported costs for FY21 from the 6th September presentation which differs from the 'variable forecast' worksheet in the 'Opex Forecast summary' spreadsheet which shows $31.4M after reductions for assumed feedwater and energy costs which may have outturned lower than assumed.

These costs exclude feedwater events and manufactured water; the latter relates to a 13,308 Ml (37.8 Ml/d average) supply from the GCDP. Over the period, there is a $14.7M variance below the QCA determination.

Chemical costs have increased over the period with unit costs increasing by about 10% in real terms. Seqwater provided a list of chemical contracts, and it is unclear what the main drivers are for these increased costs.

Conversely there has been a 65% reduction in energy costs. This is mainly as a result of lower energy prices at the large contestable electricity sites, levering the Queensland Government arrangements for the supply of power on a ten-year contract expiring in December 2028.

Variable expenditure in the base year

Seqwater proposed two adjustments to base year fixed operating expenditure related to capitalised grid support and feedwater quality. We discuss grid support costs in Section 6.4 above where we concluded that this is a variable cost related to operating the grid during outages. Similarly, feedwater quality costs discussed in Section 6.6.1.is a variable cost and should be considered within the variable cost variance analysis. We summarise the FY20 base year expenditure in Table 6-11. The costs are before any 'true up' for demand variances between actual and the QCA determination.

Table 6-11 - Base year variable cost variance analysis ($M FY20)

Item of expenditure	Base year $M	Comment
Actual	33.3	
Grid support costs	0.9	Driven by planned outage at Mt Crosby East
Feedwater additional costs	1.0	Review event
Total actual expenditure	35.2	
QCA determination	38.3	
Variance	3.1	

Source: Atkins analysis

The QCA allowed variable expenditure included a continuing efficiency target of $.03M over the three-year period which has been achieved. The analysis results in an overall net variance of $3.1M.

The QCA allowable expenditure assumed that there were no planned or unplanned outages to the grid or feedwater with high turbidity resulting in additional chemicals; separate cost claims were submitted for these items. This regulatory framework does not encourage flexibility in the use of the grid to manage outages and varying demand patterns or efficient treatment practices to manage varying raw water quality. We believe that the risk of such events is, part of business as usual – feedwater quality events happen regularly – and should be managed by Seqwater rather than the risks passed directly to customers. We consider that this would encourage efficiencies in the way such outages and raw water quality events are managed. It would therefore be reasonable to include allowances for these events and remove any ex-post adjustments.

Under the current regulatory rules, the feedwater costs are an additional cost to the business, this should be considered in the variable cost variance analysis where net savings have been made. Similarly, where additional grid support costs have been incurred, these should be included in the variance analysis.

Base year variable costs are summarised by works or groups of works in Table 6-12.

Table 6-12 - Base year variable cost analysis ($M FY20)

Item of expenditure All $M	Chemicals	Power	Other	Total cost	Output (Ml/d)	Chemicals $/ Ml	Power $/ Ml	Other $/ Ml
Grid (excluding Mt Crosby)	9.1	6.1	2.2	17.3	402.7	61.9	41.5	15.0
Mt Crosby	7.9	6.2	0.2	14.3	444.0	48.7	38.3	1.2
Off grid	0.7	0.8	0.1	1.6	23.0	83.4	95.3	11.9
Other	0.0	0.0	0.0	0.1	-	-	-	-
Total	17.7	13.1	2.5	33.3	869.7	55.8	41.2	7.9

Source: Seqwater Opex forecast summary and Atkins analysis

These costs exclude manufactured water from the GCDP of 13,308 Ml (37.8 Ml/d average) supply. This supply equates to chemical and energy costs of $152/Ml and $395/Ml respectively.

We note that the Mt Crosby treatment works costs are lower than other grid sources possibly due to economies of scale, although the river source is likely to need more chemicals than a direct supply from a reservoir. There is scope for further efficiencies at the works with the completion of filter refurbishment work and the planned increase in capacity. there appears to be future efficiency benefits with greater use of the plant.

Interim pumping and chemical dosing costs are included within grid costs.

We conclude that the variable base year expenditure is efficient and can be used as the basis for forecast expenditure. We discuss future variable costs and scope adjustments in Section 6.7.3.

6.6 Review events

In its 2018 report, QCA set out a review events framework for two types of event:

- Feedwater quality events
- Drought response events

In its submission Seqwater has made the case that it should be able to recover expenditure for both types of review event. We discuss them in turn below.

6.6.1 Feedwater quality events

The cost of treating water can increase in response to changes in the quality of feedwater due to events such as heavy rainfall.

In its submission for the 2018 review Seqwater included a contingency of $1.2M p.a. (or 8 per cent of variable chemical costs) for the 2019 variable opex base year to account for minor variations in feedwater quality. QCA

removed the proposed contingency from its recommended expenditure and recommended maintaining the 2015 definition for a feedwater quality event; that is:

Where Seqwater can demonstrate that it is unable to manage the impact of feedwater quality which causes a change in revenue, or prudent and efficient costs:

i. A material change be eligible for a mid-price path review.

ii. Where not subject to a mid-price path review, the change be recouped by an end-of-period. adjustment.

Seqwater is seeking to recover the costs totalling $2.0M for four feedwater quality events during the current period, one event in each of FY18, FY19, FY20 and FY21.

It states that each event was associated with a period of intense rainfall with the cause being outside of its control and unforeseeable. The additional costs claimed relate to chemical use at East Bank and West Bank WTP.

The review event claims, and total variable chemical costs are compared below. We note that expenditure on variable chemical use has exceeded Seqwater's prior expectations.

Table 6-13 - Review event claims and total variable chemical costs ($M nominal)

FY ending June	2018	2019	2020	2021
Review event claim	0.5	0.2	1.0	0.3
Variable chemical costs	14.5	15.7	17.7	17.0
Seqwater proposal for 2018 review		15.4	16	16.6
Outturn expenditure	14.5	15.7	17.7	

Source: QCA 2018 Final Report, Seqwater document RFI 62-66 Attachment

Based on the evidence presented to us, we are satisfied that the costs meet the definitions set out for feedwater quality events in 2018. We recommend that the claimed review event expenditure be accepted as prudent and efficient.

However, we also note that these events have occurred in every one of the last four financial years, a situation which may be worsened by climate change, and that Seqwater states that there are known gaps in the treatment process to address some of the issues[22]. We understand that Review Events relate to exceptional events having a significant impact on expenditure.

We therefore also recommend that consideration be given to ensuring that the best long-term solutions are put in place for managing this issue as efficiently as possible. This could be achieved by Seqwater by reallocating some of the risks of these events from customers to Seqwater to provide greater incentives for mitigation measures.

One way to help to achieve this and provide incentives to Seqwater management feedwater quality events as efficiently as possible would be to remove the review event mechanism and incorporate the average review event cost in FY19 to FY21 ($0.5M p.a.) in the expenditure allowance for the next period. For consistency with the position taken in the current period, we have provided two estimates of future variable expenditure: one including this expenditure and one without.

6.6.2 Drought response events

At the time of writing this document, Seqwater finds itself in a period of drought response, with key bulk water storage (KBWS) between 50% and 60%.

Water Security Program

The Water Security Program 2016-2046 sets out a series of triggers for actions which should be taken at different levels of storage of KBWS capacities. The document specifies that the approach is adaptive i.e.:

> *"Our drought response approach is adaptive to allow actions and triggers to adjust to demand, climate, severity of drought and other external factors. This flexibility is critical to a resilient region. Nevertheless, triggers should not be significantly delayed, or the benefit of the actions will be diminished. In a severe*

[22] Ref Seqwater document: "Mt Crosby WTP Rainfall Events 2020-21.pdf"

drought, delays could result in a serious risk to water security. Some actions may be brought forward if the drought is more severe than the supporting modelling has anticipated."

However, it also highlights that the triggers are the result of extensive modelling and gives a list of "actions that will be taken at each KWBS trigger level" indicating confidence in the appropriateness of the trigger levels.

Figure 6-4 - Water Security Program Drought Response Triggers

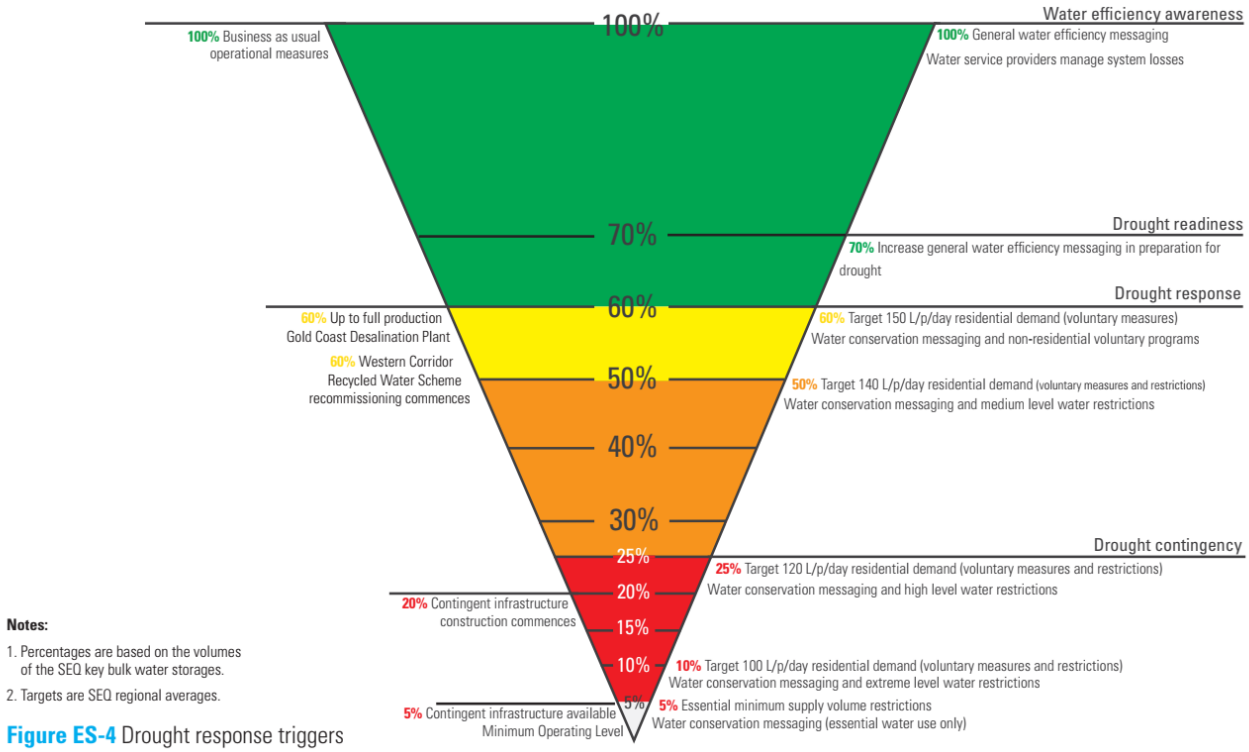


Figure ES-4 Drought response triggers

Source: South East Queensland's Water Security Program 2016-2046

We note that the Water Security Program envisages that recommissioning of WCRWS should start at 60% storage in order to be fully operational by the time 40% KBWS storage is reached[23] allowing for a recommissioning timeframe of 24 months. This target was chosen "because it was found to be high enough to provide sufficient water supply security".

This differs to the drought response for GCDP which envisages full production starting at 60% KBWS storage.

Review event definition

Droughts are not readily predictable and therefore prudent and efficient drought response costs in a pricing period are inherently difficult to determine in advance. Recognising this, in its 2018 report, QCA recommended that:

Where Seqwater can demonstrate a change in prudent and efficient costs as a result of taking drought response measures in accordance with the Water Security Program, Seqwater should be able to recover these drought response costs as follows:

(a) Where the impact is material, drought response costs should be recouped through a price adjustment during the three-year regulatory period.

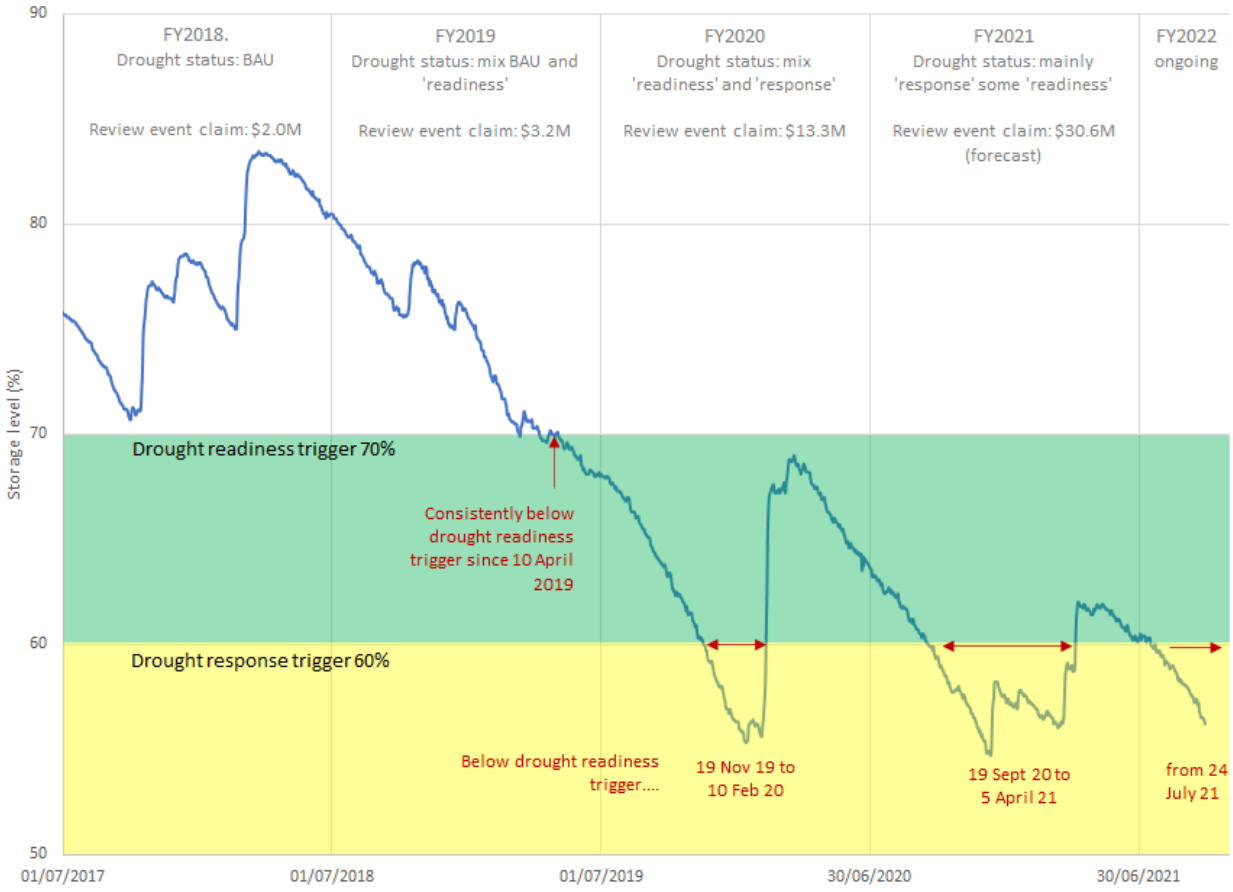
(b) Where the impact is not material, drought response costs should be recouped through an end-of-period adjustment

[23] "For modelling purposes, the operational target for WCRWS remained at 40% KBWS" page 181

The recent drought

Dam storage levels started to drop reasonably consistently in early 2018 until early 2020, reaching the drought readiness trigger in April 2019 and initially reaching the drought response trigger in November 2019. Levels have since fluctuated between the drought readiness and response zones following rainfall in February 2020 and April 2021.

Figure 6-5 - Dam storage levels since 2017



Source: Atkins analysis of Seqwater's historical dam storage data (downloaded from https://www.seqwater.com.au/historic-dam-levels on 29 September 2021)

Seqwater's review event claim

Seqwater has made the case for a review event totalling $72.3M of operating expenditure (sum of nominal expenditure). Seqwater carried out a number of activities in advance of the triggers set out in the Water Security Program. In general, we have adopted the follow principles:

- Where costs would have been incurred anyway, simply at a later date, **we have recommended including them in the drought review event**. This is because they have proven to be required, and we would have supported them at the later date. We have made adjustments to shift this expenditure to the financial year in which we consider it should have been incurred. We would also draw attention to the fact that, this should not be interpreted as support for the prudency of carrying out activities ahead of the WSP triggers. Had the drought broken and/or the trigger for the activity not subsequently been met, we would not have recommended allowing this expenditure in the drought review event.
- Where carrying out an activity in advance of the WSP trigger means that opex has been incurred for longer (e.g. earlier operation of the WCRWS) **we have only recommended allowing the additional opex from the period when the trigger was first met.**
- Where we have recommended allowing the higher costs of producing water from WCRWS and/or GCDP, we have considered if it has led to a reduction in the output from conventional sources with associated cost

savings. Based on information provided by Seqwater[24], we understand that water produced by GCDP reduced output from conventional sources, but that up to 30 June 2021, the WCRWS substituted raw water use by power stations so did not reduce output from conventional sources until that date. We have therefore **recommended "netting off" the saved cost of producing water from conventional sources for all drought response GCDP production and for WCRWS drought response production from FY22 onwards**[25]. We have incorporated these savings in our recommended review event expenditure in Table 6-14 below.

We have reviewed Seqwater's claim by cost line and financial year in Appendix C. We summarise below our view of the drought review expenditure.

We have considered the extent to which these costs should be considered prudent and efficient. The adjustments we have made reflect our view of the alignment with the WSP as well as the prudence of the actions taken.

Based on the information provided to us, it is not possible to conclude with confidence that any of the costs are inefficient. However, we consider that there is a risk of potential inefficiency, especially in regard to the negotiations with the single supplier for maintenance and operation of the manufactured water assets for both GCDP and WCRWS. To mitigate this risk, in future, we recommend that Seqwater carry out actions ranging from benchmarking for smaller costs to market testing for significant expenditures. Future costs are discussed in more detail in Section 6.7.8.

Table 6-14 - Drought Response Review Event Recommendations ($M nominal)

FY ending June	2018	2019	2020	2021	2022
Seqwater request ($)	1.9	3.2	13.6	30.5	23.0
Atkins view					
Examples of types of costs not recommended	Water efficiency and readiness resourcing and non-WSP aligned studies	Opex for early start of WCRWS, readiness resourcing.	Opex for early start of WCRWS, non-WSP aligned demand management	Opex for early start of WCRWS, some minor non-WSP aligned activities	No significant exclusions
Recommended Review Event Expenditure		0.2	9.2	29.0	23.0
Offsetting cost savings	-	-	-0.8	-1.4	-4.5
Atkins recommended NET Drought Response Review Event	**0.0**	**0.2**	**8.5**	**27.7**	**18.5**

Seqwater document "QCA 2021 Drought Timeline Revised_v2"

Note: recommended expenditure incorporates adjustments to shift expenditure to the financial year in which we consider it should have been incurred.

Note 2: we note that Seqwater has made a $13.3M adjustment for drought costs in FY20 rather than the $13.6M noted in the spreadsheet used for this analysis. This difference has no material impact as we have recommended a lower level of drought response review event expenditure than $13.3M.

[24] Seqwater document "QCA RFI 206"
[25] Savings from reduced conventional production have been estimated based on an average variable cost of $105/Ml (taken from Seqwater document "OPEX Forecast Summary as per sub + LP 2021-06-20 sent to QCA.xlsx"). This has been applied to GCDP and WCRWS production volumes based on Seqwater document "Production and Distribution Reporting - 20210917 – 20180702" except FY22 where we have assumed full production for GCDP and WCRW production pro-rated from FY21 figures based on Review Event PRW supply costs.

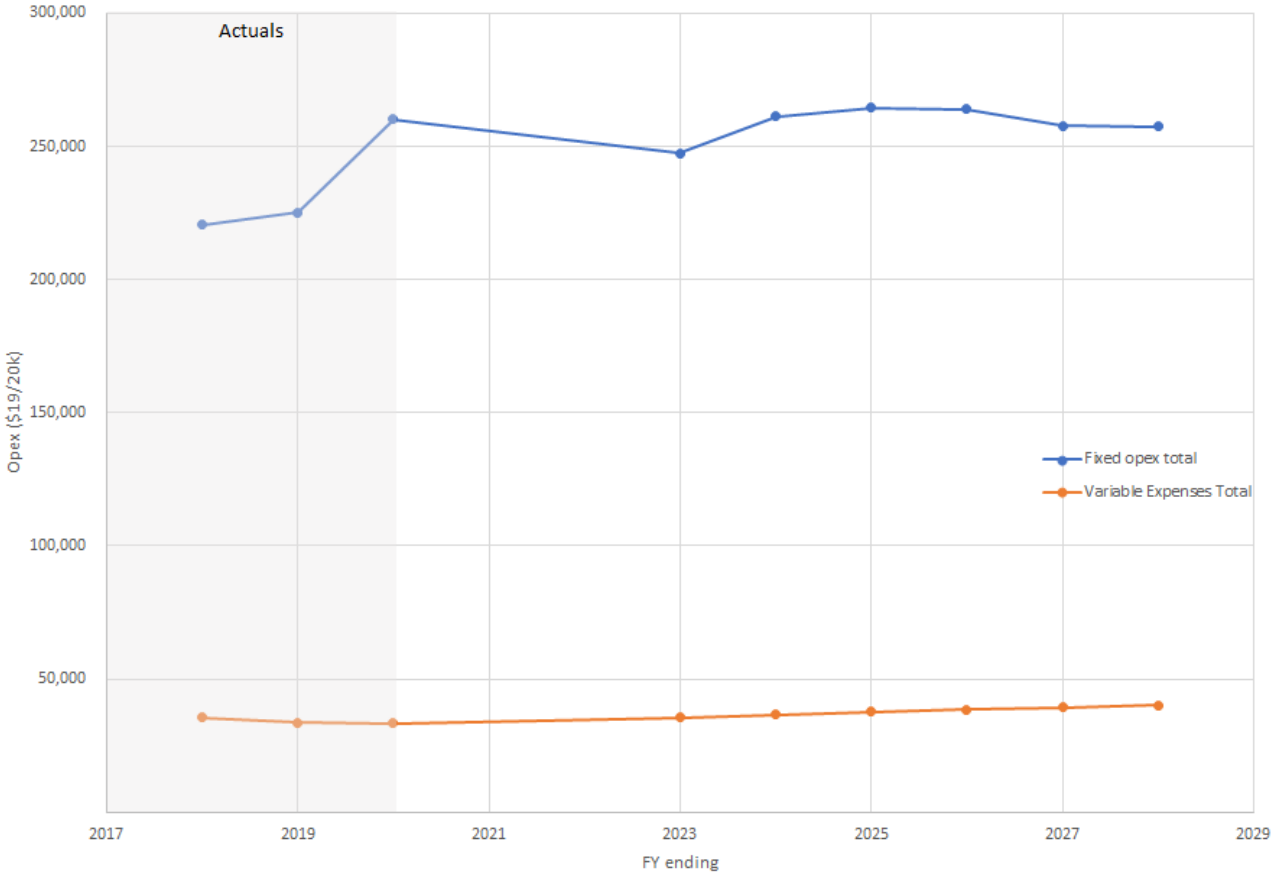
We note that the expenditure in FY22 is based on Seqwater's projections and includes GCDP opex to end of October 2021[26]. Depending on the evolution of the drought, outturn expenditure in FY22 may therefore vary from these assumptions.

6.7 Forecast expenditure

6.7.1 Forecast overview

Both fixed and variable opex are projected to increase in the FY23 to FY28 period compared to average actuals in FY18 to FY20. Variable costs are projected to increase by 12% or $3.9M p.a. in real terms compared to FY18 to FY20 actuals. Fixed opex is projected to increase by slightly less in percentage terms at 10%, equal to an increase of $23.4M p.a. in real FY20 terms.

Figure 6-6 - Historical and projected fixed and variable opex ($k FY20)



Source: Seqwater Document "RFI 62-66 Attachment"

Note: unadjusted opex

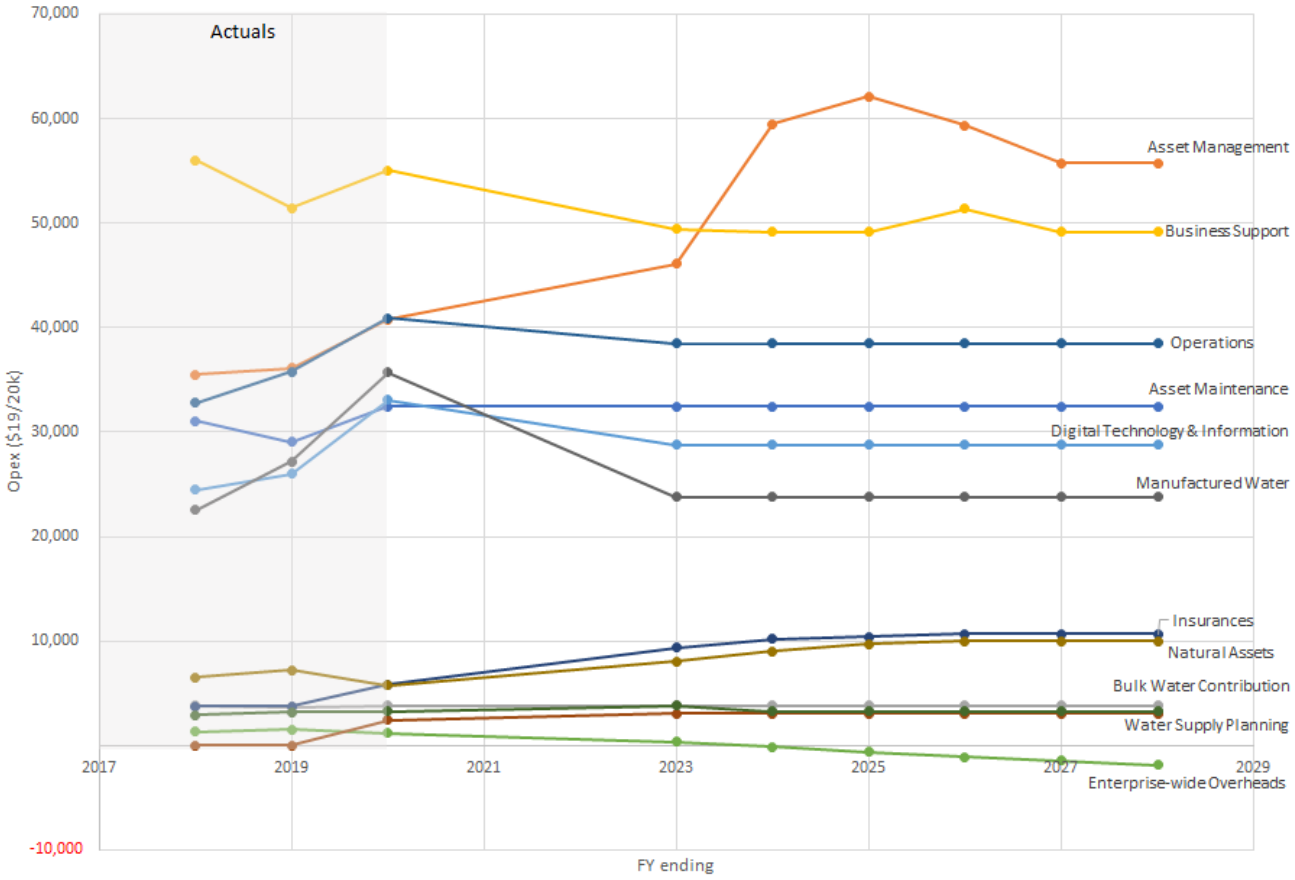
We provide an overview of fixed opex, as it is the largest component, in this section. Variable costs are examined in Section 6.7.3 below.

Fixed opex by function

The projected increase in fixed opex relative to FY18 to FY20 actuals is driven by growth in asset management, insurance and natural assets, partially offset by reductions in costs categorised as "business support" and manufactured water. The asset management function here is understood to include opex planning costs, one of the key step changes requested by Seqwater, as discussed below.

[26] Seqwater email received 12 October 2021

Figure 6-7 - Projected fixed opex by function ($k FY20)



Source: Seqwater Document "RFI 62-66 Attachment"

Note: unadjusted opex

Table 6-15 - Change in fixed opex by function ($M FY20)

Function	Average of actuals (FY18 to FY20)	Average of projected expenditure (FY23 to FY28)	Change ($M)	Change %
Asset Management	37.5	56.4	19.0	51%
Insurances	4.5	10.3	5.9	132%
Natural Assets	6.5	9.5	3.0	46%
Major Projects	0.8	3.1	2.3	281%
Operations	36.5	38.5	2.0	5%
Asset Maintenance	30.9	32.4	1.6	5%
Digital Technology & Information	27.9	28.8	0.9	3%
Water Supply Planning	3.1	3.4	0.2	7%
Bulk Water Contribution	3.8	3.8	0.0	0%
Enterprise-wide Overheads	1.3	-0.8	-2.1	-160%
Business Support	54.2	49.6	-4.6	-8%
Manufactured Water	28.5	23.8	-4.7	-17%
Total	235.4	258.8	23.4	10%

Source : Seqwater Document "RFI 62-66 Attachment"

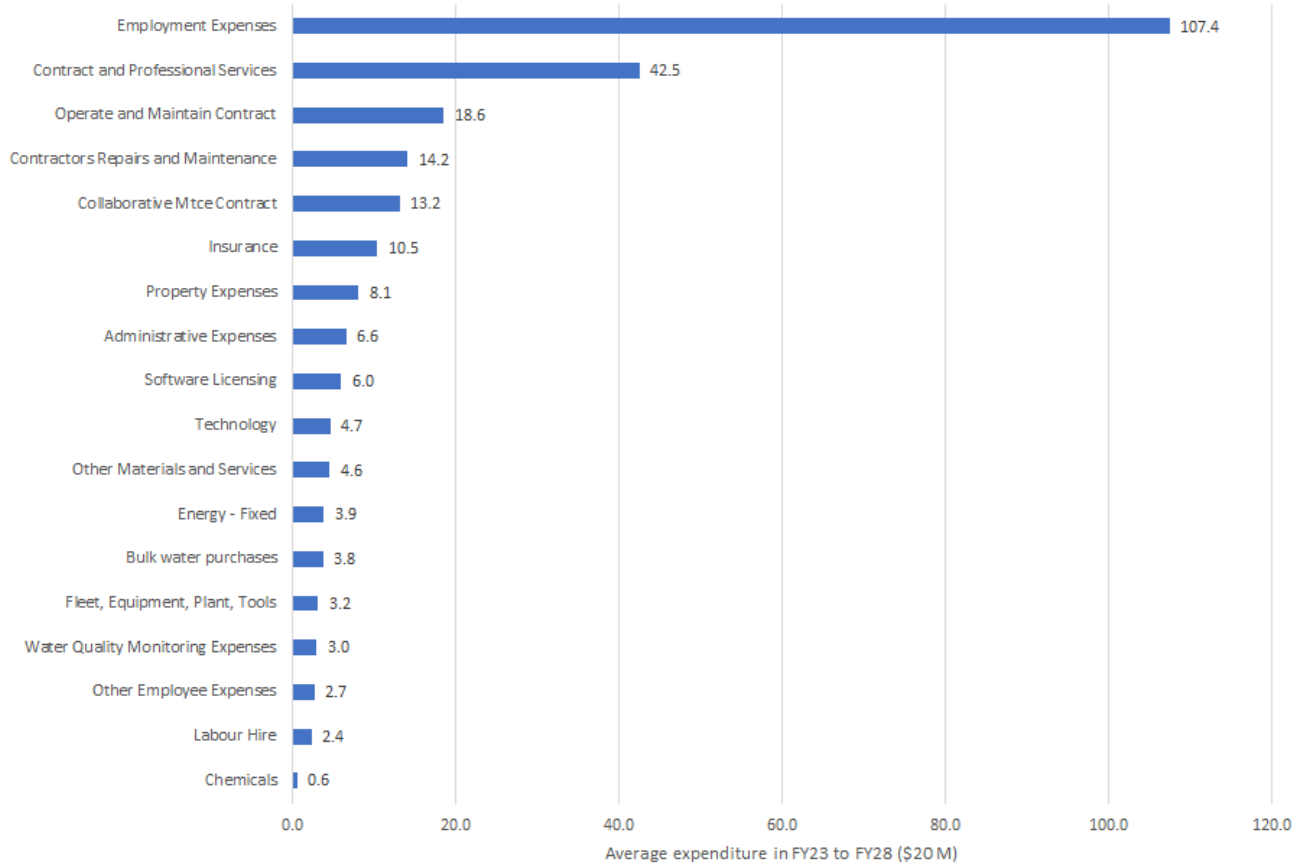
Note 1: unadjusted opex

Note 2: "business as usual" opex includes costs removed from base by Seqwater

Fixed opex by expense code

Labour costs make up the largest component of projected fixed opex at approximately 42%. These are followed by contract and professional services and the manufactured water operate and maintain contract charges.

Figure 6-8 - Future fixed opex by expense code ($M FY20)



Source : Seqwater Document "RFI 62-66 Attachment"

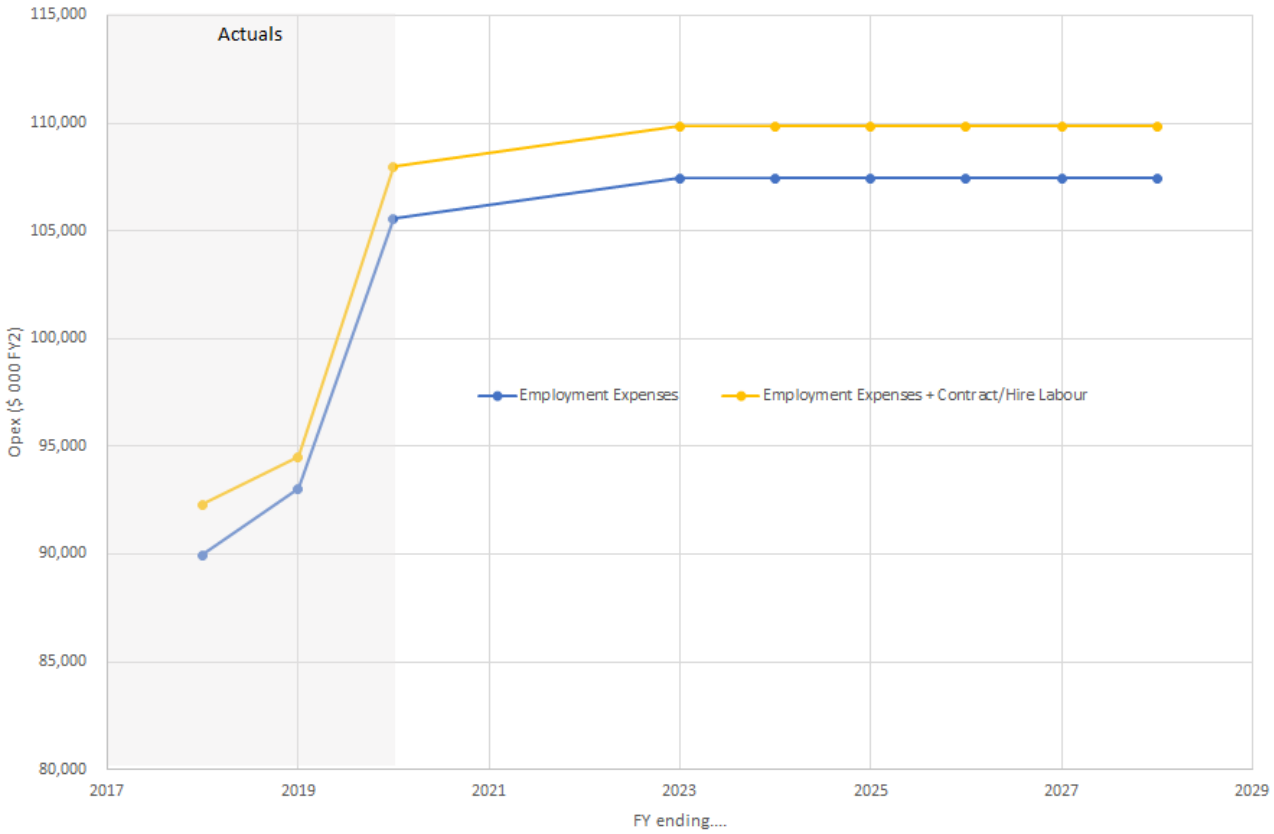
Note: includes fixed opex elements of manufactured water

Labour costs are discussed in further detail in the next section. Contract and professional services make up one of the largest elements of opex planning. Manufactured water is discussed in the Drought Review Event above and also in the discussion of the drought allowance in Section 6.7.8.2.

6.7.2 Labour

Seqwater has seen a significant step up in labour costs in the period from FY18 to FY20, with a real term $15.6M p.a. or 17% increase over two years. Seqwater projects a subsequent increase of $1.9M p.a. or 2% from FY20 to FY23 and flat expenditure after that.

Figure 6-9 - Labour fixed opex costs ($k FY20)



Source: Seqwater Document "RFI 62-66 Attachment"

Note: truncated y-axis

Of the $1.9M p.a. increase from the base year, $0.9M p.a. relates to the major project team and $0.7M p.a. relates to proactive drought management (discussed in the step changes section below). This leaves approximately $0.3M p.a. of 'other' increase which we consider likely to be the net effect of minor effects including higher escalation assumed for employment costs.

6.7.3 Variable costs

Seqwater has forecast expenditure for the future determination period and beyond based on the [medium?] demand forecast and the unit cost of water production at FY20 as shown in Table 6-16.

Table 6-16 - Forecast Variable Costs for the year 2020 and period 2023 to 2028 ($M FY20)

FY Ending June	2020	2023	2024	2025	2026	2027	2028
Demand Forecast (Gl/a)	317.50	345.20	355.80	365.00	375.20	383.00	391.90
Total expenditure ($M)	33.32	35.89	36.94	38.03	38.97	39.80	40.66
Unit cost $/Ml	104.90	104.00	103.80	104.20	103.90	103.90	103.80

Source: Seqwater submission tables 6.17 and 6.18; opex summary spreadsheet

Seqwater has taken the average cost of water production in year 2020 and applied this to the demand forecast. Our view is that the average unit cost over the last three years would be more representative of base cost on

which to make projections. We noted that the average cost of water over the period 2019 to 2021 was $104.9 per Ml.

Expenditure excludes manufactured water. While the 13.8 Ml supply from the GCDP in FY20 is included in the demand forecast, the base and future years costs are excluded from this analysis. The forecast also assumes no feedwater review events but has added the impact of beneficial re-use of treatment works residuals from FY23.

Expenditure by input costs

We reviewed input costs for chemicals and power. From the methodology to forecast expenditure, there is no changes to input costs.

Table 6-17 - Forecast Variable Costs for the year 2020 and period 2023 to 2028 ($M FY20)

FY Ending June	2020		2023	2024	2025	2026	2027	2028
Chemicals	17.70		19.18	19.73	20.27	20.80	21.25	21.73
Power	13.13		13.63	14.15	14.48	14.91	15.27	15.66
Other	2.49		3.09	3.06	3.28	3.29	3.28	3.28
Total	33.32		35.9	36.94	38.03	39.00	39.80	40.67
Chemical cost $ per Ml	55.75		55.56	55.45	55.53	55.44	55.48	55.45
Power cost $ per Ml	41.35		39.48	39.77	39.67	39.74	39.87	39.96

Source: Seqwater submission tables 6.17 and 6.18; opex summary spreadsheet

We noted an increase in chemical costs from the 2020 base year although these are driven by an increase in demand with no change from the 2020 base year unit costs. The main chemicals used for treatment include alum, lime and sodium hydroxide. Potential cost increases are proposed through the application of cost escalation factors to derive annual costs over the period. The factors were reviewed by Frontier Economics[27] who recommended continuing the use of CPI inflation to escalate chemical costs.

Seqwater's electricity demand is currently about 140 GWh increasing to 160 GWh by 2027. In normal operation, this is used mainly in conventional treatment plants and pumping. There is an increase in variable electricity costs over the future determination period driven by increasing plant output. Unit costs are driven by existing supply contacts.

The variation in unit costs across the treatment plants is shown in Figure 6-10. The My Crosby East works supplies on average 31% of the total production with 10% from Mt Crosby West and 11% from the North Pine plant. The analysis is based on gross costs before deduction of feedwater review costs, additional pumping for drought and residuals beneficial use costs.

The treatment plants at Mt Crosby, east and west, form 47% of total treated water with North Pine contributing a further 11%.

[27] Cost escalation factors, Frontier Economics, June 2021

Table 6-18 - Forecast expenditure by treatment works for the year 2020 and period 2023 to 2028 ($M FY20)

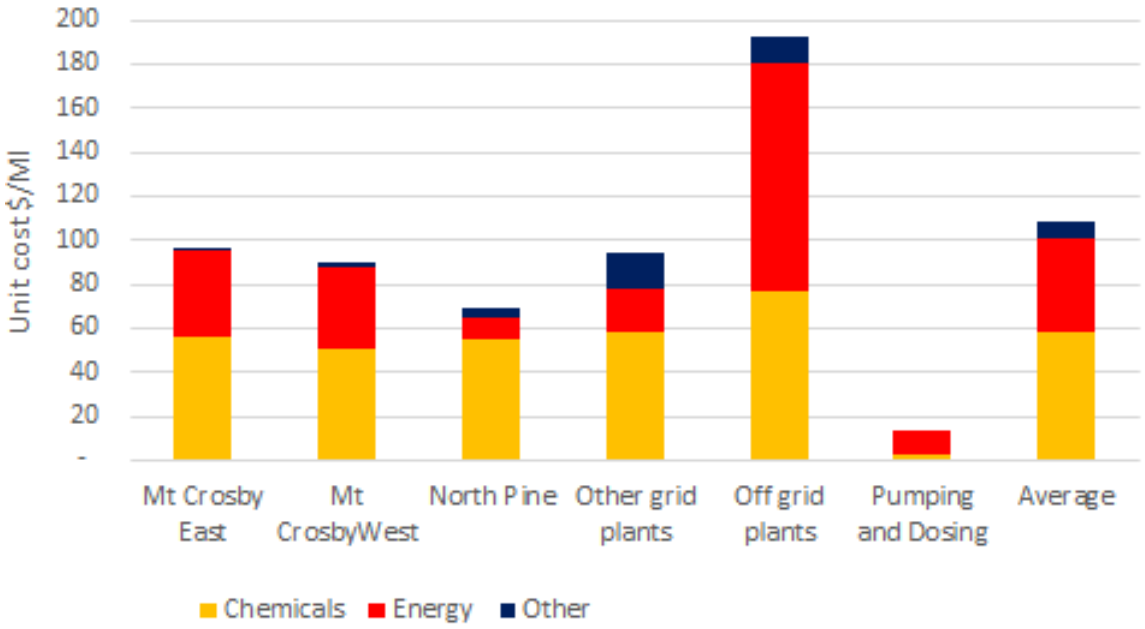
FY Ending June	2020		2023	2024	2025	2026	2027	2028
Mt Crosby East	12.0		13.7	14.6	14.6	15.1	15.7	16.3
Mt Crosby West	3.3		3.0	3.2	3.2	3.3	3.5	3.8
North Pine	2.3		2.5	2.6	2.6	2.8	3.0	3.1
Other grid plants	11.4		11.4	11.3	12.3	12.2	12.0	11.8
Off grid plants	1.6		1.7	1.5	1.6	1.6	1.6	1.6
Pumping and dosing	4.7		4.7	5.0	5.0	5.3	5.3	5.4
Adjustments	-1.8		-1.3	-1.3	-1.3	-1.3	-1.3	-1.3
Total	33.3		35.9	36.9	38.0	39.0	39.8	40.7

Source: Seqwater Opex forecast - variable

The adjustments relate to feedwater quality costs, additional grid pumping offset in part by residual disposal costs as a step change.

The Mount Crosby East plant is the largest plant which, when refurbishment has been completed, will increase its capacity from 420 Ml/d to 505 Ml/d.

Figure 6-10 - Unit costs of water production plants 2020 ($M FY20)



Source: Seqwater *Opex Forecast Summary and Atkins analysis*

The unit cost of chemicals averages around $60/Ml except for the higher values for off-grid plants. This does not appear to vary because of the source water quality. While we have not looked into the detail of chemical dosing rates for differing sources, we suggest this is reviewed to assess whether dosing is optimised because there is potential for savings in future years. Electricity costs are a function of the extent of pumping with relatively high costs for Crosby East and West with river abstractions and lower for the North Pine plant and other grid sources.

The variable expenditure does not take into account the electricity efficiency program proposed in the Energy Efficiency Optimisation Program[28]. While the program identifies a range of projects with varying savings and capital costs, we have identified the top seven initiatives delivering the greatest benefits. Projects identified include

- Mt Crosby East Bank and Eastbank production optimization.
- Mt Crosby Eastbank WTP optimize use of pumps.
- Mt Crosby Westbank WTP optimized Dissolved Air Flotation (DAF) usage.
- North Pine WTP treatment water pump replacement.
- Bundamba Pumping Station – new pumping strategy.

These projects provide savings of up to $1M p.a., a reduction of 12 GWh and GHG savings for a $1.5M capital expenditure. A further tranche of smaller efficiency schemes should deliver a further $0.5M p.a. and 4 GWh saving.

There are also potential savings from earlier implementation of the solar energy projects than proposed by Seqwater. We discuss this program in Section 7.5.5. We assume that savings will start in year 2024 with incremental increases to $1M in 2028. We believe this target to be modest and presents an opportunity for Seqwater to outperform.

Scope adjustments

We noted that the high 'other' costs for other grid plants was influenced by a $0.80M cost allocated to the Molendinar treatment plant and $0.83M to the Mudgeeraba plant. Seqwater explained that both these plants are located in the Gold Coast council area and, because of legacy arrangements discharge thickened sludge to sewer for treatment at two of the Gold Coast's sewage treatment works. Unit costs are $22/Ml and $35/Ml respectively compared with North Pine plant at $5/Ml and Mt Crosby $1.4/Ml. A study carried out in 2017 found that there was no material difference in the cost of sludge disposal to sewer compared with landfill. The Molendinar treatment plant produces on average 1.6 dry tonnes/day and the Mudgeeraba plant 0.9 dry tonnes/day. This arrangement may have worked over several years with payments to Gold Coast council for access and volume charges, but the level of cost appears excessive and suggests that the costs are not efficient. Given the move to beneficial use of re-use of treatment plant residuals there should be more innovative ways for thickening and re-use available. We have assumed that reuse costs should reduce to the average of the North Pine and Landers Shute treatment plants by 2025.

Seqwater has made some adjustments to the gross production costs. It has deducted $0.51M for drought pumping costs and $0.35M for north grid support in 2020 and applied the same assumption for all years to 2028. This assumes a normal operating strategy with no plant outages which may impact on the supply strategy driving changes to costs. We recognise that outages at treatment works may require changes to optimal operation and pumping costs. However, these costs should be managed by Seqwater through efficient operations and not considered as an additional cost in any future reconciliation.

It is normal practice in resource and treatment output planning to make a reasonable and prudent allowance for the outage of plant. With Seqwater's grid supply, which is designed for flexible operation, this outage allowance is relatively modest. Nevertheless, the approach places the operational risk on Seqwater rather than pass on this risk and potential additional costs to customers in a future review. With major reconstruction works at the largest water treatment plant, the Mt Crosby East plant, an outage allowance is likely to be lower than recent grid support costs. We have made a reasonable allowance of $0.4M/a which is about half of the FY20 variable grid support costs reported.

Seqwater has then applied a reduction of $0.96M for additional chemicals used in the current period feedwater event. This assumes that water quality is within normal acceptable limits and not driving any feedwater review costs. This then derives a unit cost of water production assuming no feedwater events in future years. In the current period these feedwater events are an annual occurrence. As such the costs of these events should be included in the base variable costs. We consider the Review item should relate to exceptional events having a material impact on costs, these recent events do not meet this criterion. We have recommended future efficient expenditure in Table 6-19 with either the feedwater quality review item in place or not applied. Our recommendation is that as the frequency of these events is not exceptional, these should not be considered as a Review Item. It is up to Seqwater to manage these events through efficient operational practice rather than a log-up of costs.

[28] Seqwater document 173

An addition $0.49M p.a. has been added to the 'other' category being the cost of beneficial use of residuals. This has been proposed as a step change on which we comment in Section 6.7.5.5. We do not support this proposed step change. While the change to residuals beneficial use is prudent, there is a lack of clarity of the costs driven by this change.

Efficiency adjustments

The Mt Crosby East works is being upgraded to meet water quality and capital maintenance drivers. Seqwater has not assumed any cost savings from the commissioning of this work although the maximum output of the works will increase from 420Ml/d to 505Ml/d. The new filters should allow longer runs between backwashing to deliver this increasing output. The upgraded works should provide the opportunity to deliver efficiencies in operations and variable costs. We have assumed these savings will form part of the continuing efficiency target and have not made any specific scope change.

As discussed in our assessment of efficiency later in this chapter, we have assumed a 0.5% p.a. cumulative continuing efficiency through the future determination period starting from 2020.

Escalation to nominal expenditure

For chemicals, we agree with Frontier Economics that a benchmark should be set rather than reflecting actual expenses as this retains an incentive for Seqwater to outperform the allowable expenditures. Chemical costs form 6% of total operating expenditure hence adopting a change in method or data has no material impact on overall costs. We therefore agree that there is no strong rationale to change the approach.

6.7.4 Efficient variable expenditure

We summarise our findings on efficient variable expenditure in Table 6-19 below. The changes in scope reflect the discussion in Section 6.7.3. An adjustment for continuing efficiency has been applied.

Table 6-19 - Efficient variable expenditure ($M FY20)

FY Ending June	2023	2024	2025	2026	2027	2028	Comments
Treatment plant production (Gl)	344.2	355.4	364.1	373.7	382.1	390.8	GCDP output excluded
Variable costs ($M)	35.9	36.9	38.0	39.0	39.8	40.7	
Scope Adjustment							
Adjust for residuals beneficial use	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	Additional costs not justified
Molendinar and Mudgeeraba residuals efficient use	0.0	0.0	-1.5	-1.5	-1.5	-1.5	efficient sludge disposal/ re-use
Allowance for treatment plant outage	0.4	0.4	0.4	0.4	0.4	0.4	
Energy efficiency savings	0.0	-0.5	-1	-1.5	-1.5	-1.5	Energy efficiency program
Solar energy savings	0.0	0.0	-0.3	-0.5	-0.8	-1.0	Reprofiled Solar capex projects
Total scope changes	-0.1	-0.6	-2.9	-3.6	-3.9	-4.1	
Recommendation if feedwater quality review mechanism remains in place							
Continuing efficiency	-0.7	-0.9	-1.1	-1.2	-1.4	-1.6	cumulative
Recommended expenditure ($M FY20)	35.1	35.4	34.1	34.2	34.5	35.0	
Recommended expenditure ($M Nominal)	37.7	38.9	38.1	39.1	40.3	41.7	
Recommendation if feedwater quality review mechanism is not applied							
Allowance for feedwater quality	0.5	0.5	0.5	0.5	0.5	0.5	Remove from Review Item
Continuing efficiency	-0.7	-0.9	-1.1	-1.2	-1.4	-1.6	cumulative

FY Ending June	2023	2024	2025	2026	2027	2028	Comments
Recommended expenditure ($M FY20)	35.6	35.9	34.5	34.6	35.0	35.5	
Recommended expenditure ($M Nominal)	38.2	39.4	38.7	39.6	40.8	42.3	

Source: Seqwater opex forecast summary and Atkins analysis

6.7.5 Proposed step changes

We are required to assess the prudence and efficiency of any proposed incremental step change to base year opex, including whether the drivers of the step change are reasonable.

Seqwater has proposed Step Changes in expenditure where it considers activities and costs to be additional to the base year expenditure.

Table 6-20 - Seqwater proposed Step Changes in expenditure ($M FY20)

FY Ending June	2023	2024	2025	2026	2027	2028
Luggage Point	7.2	7.2	7.2	7.2	7.2	7.2
Proactive drought management	0.7	0.7	0.7	0.7	0.7	0.7
Insurance premium changes	3.7	4.5	4.7	5.0	5.0	5.0
Natural assets	8.1	9.0	9.7	10.0	10.0	10.0
Residual disposal costs (variable)	0.5	0.5	0.5	0.5	0.5	0.5
GHG Emissions	0.9	0.9	0.9	0.9	0.9	0.9
Wivenhoe Gates	1.2	2.9	1.2	1.2	-	-
Delivery of large infrastructure projects	0.9	0.9	0.9	0.9	0.9	0.9
Options analysis and planning costs	4.1	15.8	20.2	17.4	15.0	15.0
Negotiation of employee agreements	0.3	-	-	0.3	-	-
Water for SEQ planning	0.5	-	-	-	-	-
QCA Regulatory fees	-	-	-	1.9	-	-
Total	28.0	42.4	46.0	45.9	40.1	40.1

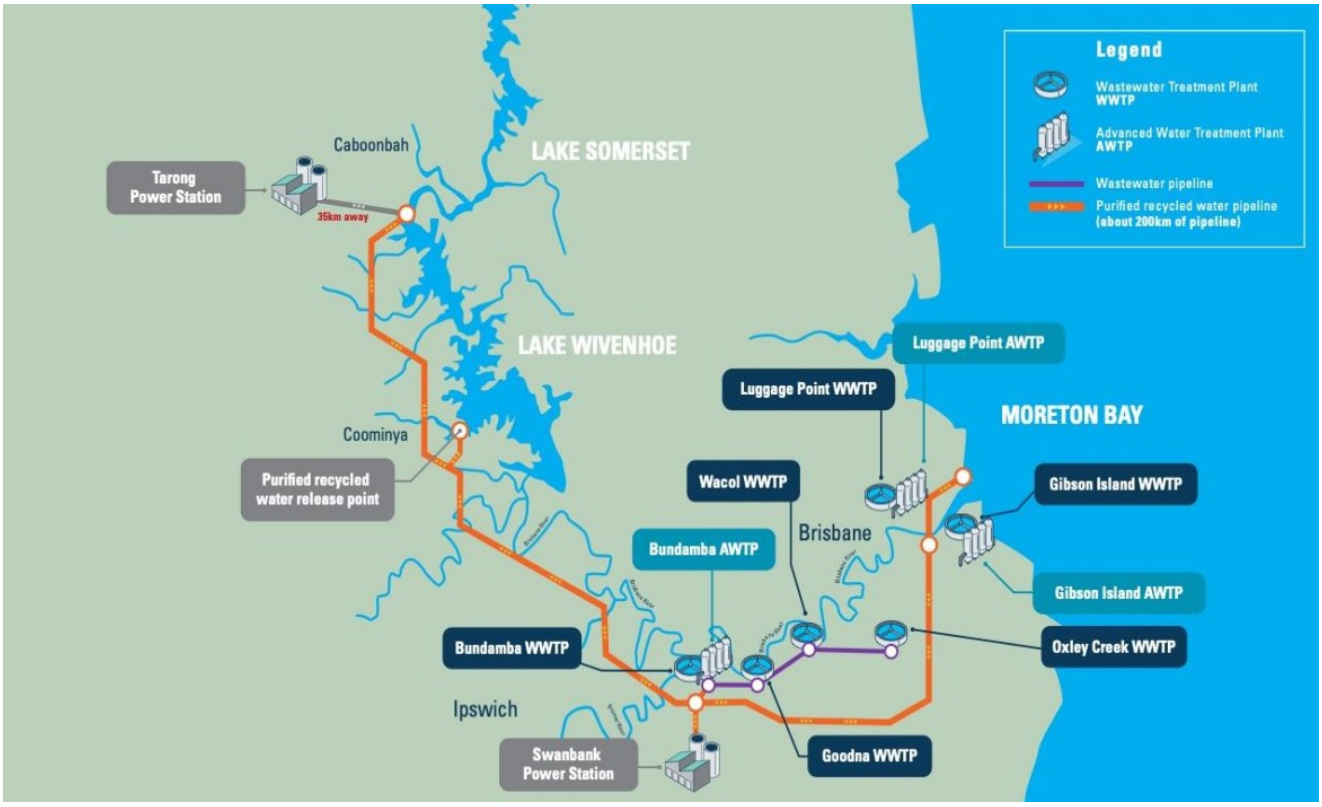
Source: Seqwater spreadsheet "OPEX Forecast Summary as per sub + LP 2021-06-20 sent to QCA"

We discuss these step changes in the following sections.

6.7.5.1 Luggage Point

Luggage Point is one of three Advanced Water Treatment Plants (AWTPs) forming part of the WCRWS. The WCRWS was initially designed to supply up to 232 Ml/day of purified recycled water (PRW) as an indirect potable reuse scheme to augment Lake Wivenhoe and to supply to power stations at Tarong and Swanbank.

Figure 6-11 - Western Corridor Recycled Water Scheme



Source: Seqwater Presentation 9 September 2021

We understand that one train has been fully remobilised at Luggage Point to enable it to produce up to 23Ml/d. As the drought persisted, and with KBWS storage levels below 60% for most of FY21, Seqwater decided in March 2021 to restart two additional trains at Luggage Point. The purpose of the two additional trains is to increase the capacity to supply PRW to industry, reducing the demand on the grid. Seqwater estimates that the two additional trains will provide up to 46 Ml/d to power stations[29].

In its Supplementary Submission, Seqwater proposes that, once the region is no longer in drought, rather than returning the WCRWS to its previously dormant state:

> *future normal operating conditions of the WCRWS (i.e. when the Water Grid storage levels are above 60%) includes producing up to 6ML a day of PRW to supply to industry.*

This step change relates to the additional costs of moving from the dormant maintenance costs to the "future normal operating conditions" described above.

Seqwater has projected expenditure under the future normal conditions of $18.2M p.a. from FY23 to FY28, a step change of $7.2M p.a. in real terms relative to the assumed costs of $11.0M in FY20 for WCRWS maintenance costs while dormant[30].

Seqwater explains its reasons for proposing a change to future normal operating conditions:

> *to continue to build confidence and assist in timely regulatory approval, reducing the timeframe needed for a potential full recommissioning… allow us to respond in a more agile fashion to future drought conditions as they arise (as new membranes do not need to be manufactured and imported from overseas). It assists us to maintain customer relationships and operational understanding, that facilitates drought responses when required, assisting in future water security*

[29] Seqwater document "QCA RFI 4.29 - Documents - Luggage Point AWTP - Business case for Luggage Point AWTP Operation Step Change"
[30] Costs taken from Seqwater document "OPEX Forecast Summary as per sub + LP 2021-06-20 sent to QCA". Basis of costs from document "Bulk Water Price Review Supplementary Submission 2023-26". All figures in $FY20

Our view is that Seqwater has not justified a $7.2M p.a. increase in expenditure, as:

- It is significantly more expensive than producing the water from conventional sources ($7.2M p.a. compared to $0.2M p.a.). These additional costs are likely to significantly exceed the recommissioning costs on an "expected value" basis (i.e. taking into account the frequency of recommissioning).
- It does not align with the WSP, which envisages that recommissioning should start at 60% storage in order to be fully operational by the time 40% KBWS storage is reached
- The agility and customer relationships may be achieved at lower cost by pre-agreement of drought supply contracts.

We have therefore not recommended allowing this step change in base operating costs.

6.7.5.2 Drought costs proactive management

Seqwater has requested additional expenditure of $0.7M p.a. for proactive drought management. It considers that it would be more prudent and efficient to have some permanent staff with relevant technical expertise rather than relying on short term resources to plan for and respond to drought conditions, saying that:

> *This resourcing approach is considered more cost efficient and facilitates a more collaborative approach to drought management with our Retailer Customers. It is also considered necessary to support an enhanced focus on adaptive drought management, financial transparency and cost efficiency*[31]

It has proposed 3.5 additional FTEs: one manager, one program manager, one asset readiness engineer and 0.5 FTE for a water sustainability project manager.

We note that Seqwater has been preparing a revised Water Security Program in the current period and as such some general activities related to optimisation of drought management are already incorporated in the base year.

Our view of the proposed step change is that:

- It is not clear that they would be requested if storage levels were not low at the time of the price submission. It would seem unlikely that Seqwater would be asking for them if storage levels were at 95% for example. As such, it seems that they are associated with being in a drought.
- We have recommended a drought allowance opex line which includes the base year drought management costs. This would appear to be the appropriate place for these costs. We have not therefore recommended incorporating them into the 'base' opex for the next price period.

6.7.5.3 Insurance

Seqwater has explained that the cost of insurance has increased in recent years due to a tightening in the insurance market.

Insurance costs have increased by $2.1M p.a. (or 53%) in real terms between FY19 and FY20 and Seqwater expects them to increase in real terms even further with a $3.5M p.a. (60%) increase from FY20 to FY23.

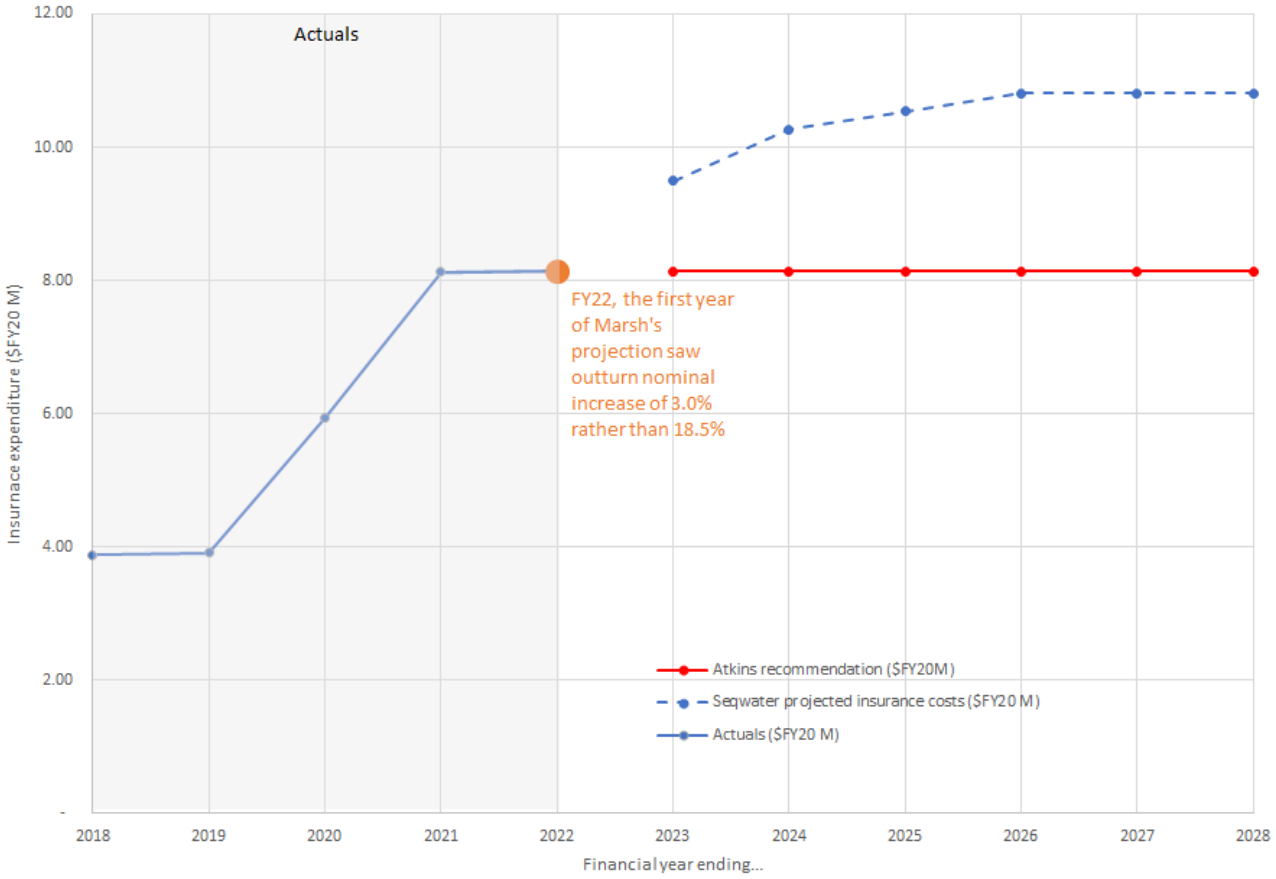
The increase in FY20 was mainly driven by "Industrial Special risks" insurance which more than doubled relative to the prior year, with the 'long term' policy which had been in place expiring in September 2019.

The future expenditure in the submission is based on "indicative" projections provided by Marsh and result in increases of 18.5% from FY21 to FY22, 15.5% from FY22 to FY23, 9.9% from FY23 to FY24 and 5.2% from FY24 to FY25.

We have considered whether the projections had been validated by recent outturn figures for FY22. Subject to placement, insurance costs for FY22 were estimated in September 2021 to be $8.58M compared to FY21 costs of $8.33M[32] i.e. a year on year nominal cost increase of 3.0% rather than the 18.5% projected increase.

[31] Page 97 Seqwater Bulk Water Price Submission
[32] Source: Seqwater presentation 8 September 2021

Figure 6-12 - Projected insurance costs ($M FY20)



Source: analysis of Seqwater document "RFI 62-66 Attachment Analysis"

We recognise that whilst Seqwater's decisions (e.g. level of deductibles) affect the cost of insurance, many drivers of insurance costs are not under Seqwater's control, especially market conditions. However, our view is that Seqwater has not made a robust case for continued real terms increases, with the projections being indicative and not aligned with the actual increases seen between FY21 and FY22.

Instead, we have recommended that the FY22 cost is maintained in real terms, i.e. an increase of $2.2M p.a. relative to FY20 followed by no further real terms escalation after FY22.

6.7.5.4 Natural assets

Expenditure relates to catchment management activities mainly on third party land to reduce the risk of pollution impacting on the Seqwater assets and abstraction for treatment. Reported expenditure includes environmental offsets. Seqwater has reviewed its capitalisation policy, and for the future determination period, a proportion of natural asset costs will be assumed as operating expenditure. This is because much of the work is carried out on third party land where Seqwater has no future economic benefit in the expenditure. We accept this approach in principle and our review has focused on prudent and efficient costs over the future determination period. Table 6-21 shows actual and forecast expenditure in nominal terms.

Table 6-21 - Natural asset expenditure

FY ending June	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
	Actual			Estimate		Forecast					
	Capital expenditure ($M nominal)					Operating expenditure ($M FY20)					
Natural Assets	6.5	6.5	5.2	5.3	5.3	6.7	7.9	8.4	8.6	8.6	8.6
Vegetation offsets		0.8	0.5	0.7	0.7	1.4	1.1	1.3	1.4	1.4	1.4
Total		7.3	5.7	6.0	6.0	8.1	9.0	9.7	10.0	10.0	10.0

Source: Seqwater RFI 62-66, submission table 6.6 and RFI 129

Note 1: no data for 2022 so assumed unchanged from 2021.

Note 2: this table excludes the continuing capital expenditure not subject to the change in accounting treatment.

The future period expenditure from FY22 to FY26 are set out in a Board Paper[33]. Work is planned mainly on third party land in 14 catchments. The scope of work includes agricultural practice improvements (44% of total operating expenditure), weed control (34%), source pollution (9%) and wastewater treatment (3%).

The objective of the natural assets program is protection of source waters and vegetation offsets to meet environmental obligations. Seqwater states that it

> *… depends on 'open' catchments for its raw water supply, where various forms of land uses can pose significant risks to the quality of water entering our water treatment plants. As Seqwater owns less than 5% of the source water catchments, the business invests in undertaking catchment works on private landholdings through its source protection partnership program as its primary mechanism for protecting source waters. This is particularly important as Seqwater does not currently have referral or concurrence powers to influence land use planning decisions in the catchment.*

We agree that a program of catchment management activities and source protection works is an important element in reducing the risks of high sediment and pathogen loads entering treatment plants. This should reduce treatment works costs and minimise the risk of drinking water contamination arising from any failure of treatment barriers. We therefore support a continuing level of catchment management activities which focus on high-risk areas.

In the current determination period, Seqwater developed a long-term plan for source water catchments using a risk-based approach and modelling and doing nothing would see a decline in catchment condition which would impact on treatment and a safe and reliable water supply to customers. From risk assessment and modelling, it estimated an expenditure of $35M over the period FY18 to FY21 although due to fiscal constraints this was reduced to $26M.

For the future determination period, Seqwater has changed its approach using a catchment investment decision support system which identifies priority areas for catchment works to provide the greatest water quality improvement for a given budget; and assess the relative risk of each hazard to the raw water quality received at the WTP.

This new system has forecast a projected expenditure of $10M to $13M annually to gain a suitable risk reduction at treatment works.

We asked Seqwater to demonstrate the benefits of historic and future expenditure proposals in terms of improvements to water quality as measured at treatment works, such as turbidity, colour and biological indicators. We were advised that there are no specific measures in place to demonstrate the effectiveness of historic investment or target measures for future projects.

We noted that future expenditure shown in Table 6-21 above shows a significant increase on the base year 2020. Increasing by 60% from 2025. From the Board paper, the greater part of proposed expenditure is planned for agricultural practice improvements and weed control with source pollution and wastewater

[33] Board paper Seqwater Source Protection Investment Strategy, August 2021

treatment forming small elements of expenditure. Some 55% of proposed expenditure in the future determination period had no business case prepared and 33% had draft business cases.

We conclude that Seqwater has not demonstrated that the proposed step increase in expenditure from FY23 is prudent or efficient. This is because the benefits of the expenditure are not justified, and the timing of interventions is not demonstrated. We propose that the level of expenditure as incurred in the average of the FY18 to FY21 expenditure, $5.9M p.a. is continued through the future determination period. As this is a movement from capital to operating expenditure, the step change is $5.9M p.a. for FY23 to FY26.

We recommend that Seqwater uses the raw water quality monitoring data at treatment works and other locations within the catchment to demonstrate benefits from completed work and use these data to calibrate modelling work.

Vegetation offsets

Expenditure in the current period is an average $0.7M p.a.[34] to deliver vegetation offsets. Seqwater proposes to increase this to $1.4M in 2023 and following a similar level in future years. This is an increase of 0.7M p.a. over the future period. As these costs are not capitalised over the future period, the step change varies from $1.1M to $1.4M.

Seqwater explained that

> *Environmental offsets (also referred to as Vegetation Offsets) are legislative and statutory requirements that are put in place to offset environmental impacts resulting from developments Seqwater undertakes on its own land, specifically the clearing of vegetation*.
>
> *As part of implementing our Capital Works Program, Seqwater has a number of offsets that have resulted from activities where clearing of vegetation has occurred.*

The number and scope of offsets is determined by the extent of capital works. Table 6-22 show the drivers for future expenditure related to specific projects. These are detailed in the response to RFI 150.

Table 6-22 - Vegetation offsets ($M FY20)

FY Ending June	2023	2024	2025	2026	2027
Hinze dam	0.6	0.6	0.4	0.5	0.6
Wyaralong dam	0.5	0.5	0.5	0.6	0.5
Visini Rd	0.2	0.2	0.2	0.1	0.1
Other defined projects	0.1	0.1	0.0	0.1	0.2
Total	1.4	1.4	1.1	1.3	1.4

Source: Seqwater RFI 150, submission table 6.6 and RFI 129

We confirmed that the costs are prudent, as they relate to statutory requirements and the activities relate to the capital projects identified.

Findings on the Step Change

Our findings are summarised on Table 6-23.

Table 6-23 - Natural Assets Step Change Expenditure ($M FY20)

FY Ending June	2023	2024	2025	2026
Natural Assets	5.9	5.9	5.9	5.9
Vegetation offsets	1.4	1.1	1.3	1.4
Total Step Change	7.3	7.0	7.2	7.3

Source: Seqwater RFI 150, submission table 6.6 and RFI 129

[34] RFI 150 Natural Assets presentation, Seqwater September 2021

Capital expenditure

In addition, Seqwater is proposing an annual capital expenditure program of $3M p.a. on bank stabilisation and land rehabilitation.

6.7.5.5 Residual disposal costs (variable)

Seqwater is proposing a $0.5M p.a. step change in expenditure for water treatment residual disposal at the North Pine and North Crosby treatment works. Historically, these residuals have been stored, hauled and disposed to landfill. Following a pilot project to implement beneficial reuse of treatment residuals, a new contract for the transport and has been negotiated. A business case was provided[35]. The primary objective was to move from landfill to beneficial reuse of WTP residuals with the benefits of

i. reduced operating expenditure by transporting materials for beneficial use rather than landfill.
ii. reduced capital expenditure, some $11M over the period 2021 to 2038 associated with upgrading existing facilities and reducing storage needs.
iii. avoidance of exposure to a potential future Landfill Levy.

The expected operating expenditure savings costs in (i) above have not materialised and the estimated additional costs from the first three months of the new contract indicates a full year increase of $0.5M.

Additional costs have arisen from the new contract with a different residuals measurement system. Previously the residuals management contract was based on the number of loads or bins hauled from the treatment plants. The new contract moves to weight rather than volume measurement. For some sites, the average density of residuals was found to be much greater than expected.

The primary objective of re-use of treatment plant residuals is welcomed and a prudent decision given the environmental benefits and potential landfill levy. However, the basis of the costs, whether savings or increased costs is uncertain. It appears that Seqwater has limited visibility of the costs of residual management and is not able to demonstrate that the proposed increase in expenditure is efficient.

We recommend that Seqwater seeks a detailed understanding of costs using appropriate activity-based cost codes to demonstrate the efficient costs of residuals beneficial use compared with landfill costs. The move from volume- to weight- based contract is a matter for management to resolve.

These are variable costs which should fall within the 'other' cost category.

In summary we do not support this proposed step change. While the change to residuals beneficial use is prudent, there is a lack of clarity of the costs driven by this change.

6.7.5.6 GHG abatement

In the Queensland Climate Transition Strategy, the Queensland Government set out three key climate change commitments:

- Powering Queensland with 50% renewable energy by 2030.
- Achieving zero net emissions by 2050.
- An interim emissions reductions target of at least 30% below 2005 levels by 2030.

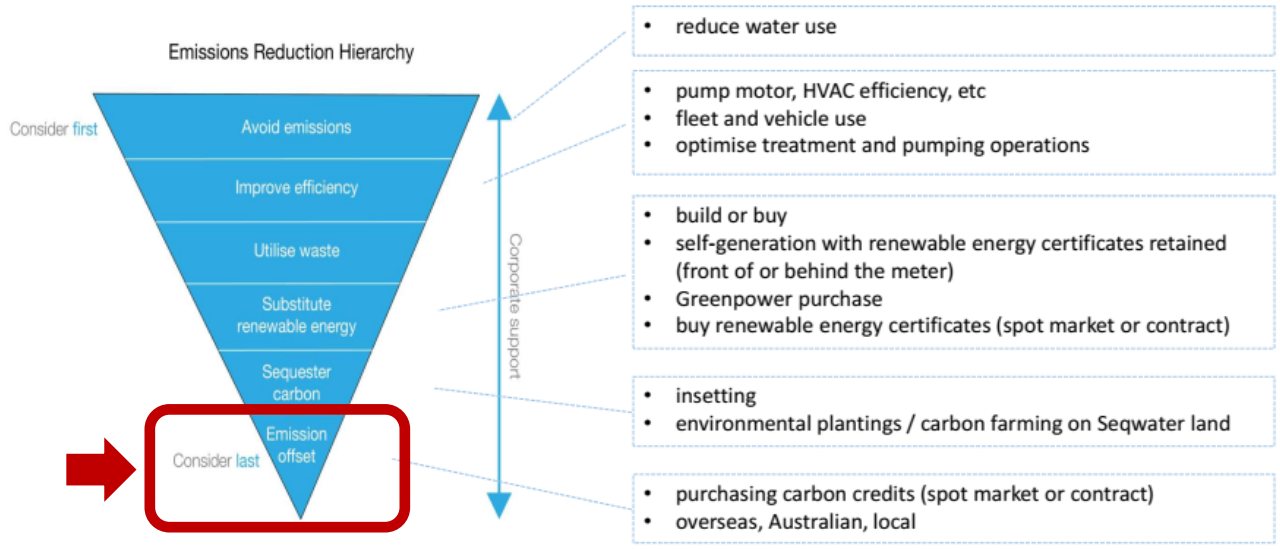
In line with this, Seqwater has adopted a corporate greenhouse gas emissions target of net zero emissions by 2050.

In its submission Seqwater proposed an increase in opex of $0.9 M p.a. from July 2022, "that may include the purchase of carbon offsets (e.g. Large Generation Certificates, Australian Carbon Credit Units) and /or other abatement options."

Seqwater's high level emissions reduction hierarchy makes it clear that avoidance, efficiency and renewable energy should take precedence over emission offsets. This aligns with international best practice such as the IEMA GHG Management Hierarchy.

[35] EFRC submission Beneficial Reuse of WTP residuals, Seqwater, March 2021

Figure 6-13 - Seqwater emissions reduction hierarchy



Source: Seqwater Presentation 8 September 2021 and Atkins annotation

We are not able to recommend this additional expenditure. It is not clear to us that the proposed additional expenditure, focussed on offsets, is consistent with Seqwater's own emissions reduction hierarchy. Seqwater has not proposed significant investment in avoidance measures (e.g. leakage reduction), energy efficiency or own renewable generation capacity. As such, we do not consider the proposed expenditure to be the most effective use of finite resources or of achieving emissions reductions.

6.7.5.7 Wivenhoe gates

Subsequent to the submission, Seqwater has clarified that this expenditure should be classified as capex. As such, we have removed this step change and have addressed it as part of proposed capex.

6.7.5.8 Major Projects team

This expenditure represents the full year impact of establishing the major projects team in FY20 as some staff were only in post for part of that financial year. We comment on the cost of establishing the Major Projects group in Section 6.5.3. We commented that in FY20, 78% of hours were allocated directly to project timesheet codes for capitalisation and 22% to operational timesheet codes. Nearly half the operating costs are allocated to administration support. Whether this is due to insufficient disaggregation of coding for activity-based costing, or a real but high level of administration support is unclear. We are also concerned that there may be some duplication of support services from the core business and within the major projects team.

We noted that the response to RFI 125 that the major projects establishment comprised 27 FTEs in the program and project development and delivery team, and 26 FTEs in the project support team. We note that the Seqwater organogram shows 72 FTEs in the Major Projects division which leaves 19 FTEs unaccounted for.

We are not able to confirm that the value of this step change expenditure is efficient. Given that this activity is to support the project planning and delivery costs in the future period, we have proportioned these costs to the operating expenditure proposed for future projects. In the planning costs discussed in Section 6.7.5.9, we propose that the level of operating expenditure for projects up to Gate 2 is lower than the Seqwater proposals. We have factored this expenditure in the same proportion of our estimate of direct opex for project planning compared with the Seqwater proposal smoothed over the future determination period. This results in an efficient expenditure about half of that proposed. The adjustment is shown in Table 6-24 below.

Table 6-24 - Major projects step change expenditure ($M FY20)

FY Ending June:	2020		2023	2024	2025	2026	2027
Seqwater proposal	0.86		0.86	0.86	0.86	0.86	0.86
Prudency adjustment	-0.44		-0.44	-0.44	-0.44	-0.44	-0.44
Atkins recommended	0.42		0.42	0.42	0.42	0.42	0.42

Source: Seqwater submission table 6.11 and Atkins analysis

6.7.5.9 Opex planning

Seqwater has requested $85.5M[36] of additional opex between FY23 and FY28 related to "opex planning" i.e. expenditure for planning for capital projects.

The largest components of this step change are:

- $33.4M related to dam safety upgrades.
- $23.9M for "future projects beyond the approved program".
- $9.8M for the next major bulk augmentation.
- $18.4M for three other projects (Wyaralong WTP First Stage, Camerons Hill Reservoir Storage Upgrade and Upgrade Image Flat WTP to 50ML/d).

We would note here that the classification of these costs as opex rather capex has not been challenged here. We examine each of these below.

Dam Safety

These costs relate to planning for four schemes:

- Wivenhoe Dam Stage 2 Dam Safety Upgrade, expected capex $1.2 billion.
- North Pine Dam Upgrade, expected capex $400 million.
- Borumba Dam Safety Upgrade, expected capex unknown.
- Atkinson Dam Safety Upgrade, expected capex unknown.

The costs include activities such as detailed risk and consequence assessments, options analysis, seismic, hydrology, hydraulics, geotechnical investigation, geology, physical and numerical modelling.

Our starting position is that we are supportive of schemes to achieve levels of dam safety as required by regulations or similar. However, the scale of investment being proposed is so significant that it raises broader questions.

We consider that Seqwater has not demonstrated that proceeding with the schemes, as currently outlined, is optimal. In particular, we consider that spending significant sums on planning for schemes costing significantly more than $1.6 billion should only be carried out once, and if, it has been established that dam raising is the best solution compared to alternatives such as combining alternative operating rules (e.g. lower full supply levels, with likely lower yields) with strategic supply-demand balance interventions (e.g. new supplies and/or demand management).

We have therefore recommended a different approach which involves:

- Firstly, development of an integrated strategic dam safety and supply-demand plan which examines the trade-offs of changes to operating rules for the dams and other sources such as GCDP/ WCRWS and potential future strategic supply-demand interventions such as augmentation, demand and/or leakage management.
- We have then assumed that planning for two schemes will start in FY25. We have based the expenditure profile on Seqwater's proposed Wivenhoe and North Pine dam safety upgrade expenditure.

[36] In $FY20

Future projects beyond the approved program

We cannot support $23.9M additional planning expenditure with no details or justification. We have therefore recommended not allowing this expenditure.

Next major bulk augmentation

We recommend accepting the case made for commencing planning for the next major bulk augmentation and agree that it is likely to be additional to current levels of expenditure.

However, we have recommended moving the expenditure to later in the period to allow time for the project identification to be finalised.

Other projects

The proposed Wyaralong WTP scheme is consistent with the Water Security Program and we recommend supporting it as additional activity and expenditure.

However, we do not recommend supporting Camerons Hill Reservoir Storage Upgrade and Image Flat WTP Upgrade as additional expenditure, as (1) it is likely that similar scale planning activity is business as usual and (2) we understand Image Flat Upgrade is not due for completion in any case before FY38 according to RFI101.

The recommended opex planning step change expenditure is summarised below.

Table 6-25 - Recommended opex planning step change ($M FY20)

FY ending June Item of Expenditure	2023	2024	2025	2026	2027	2028	
Integrated strategic dam safety and supply-demand balance plan	1.5	1.5					
Next Major Bulk Augmentation				2.0	6.3	1.5	
Dam Safety Upgrade no 1 TBC			0.9	3.9	8.3	2.4	
Dam Safety Upgrade no 2 TBC			0.0	0.8	2.0	4.4	
Wyaralong WTP First Stage		2.0	3.0	1.0	0.0	0.0	
Total	1.5	3.5	3.9	7.6	16.6	8.3	

Source: Atkins analysis

6.7.5.10 Negotiations

Seqwater has proposed $0.25M in FY23 and FY26 for negotiating Employee Agreements. We consider this to be a business-as-usual activity and not a step change. We have not therefore recommended accepting this additional expenditure.

6.7.5.11 Water for SEQ Planning Project

Seqwater is launching a number of Key Possible Projects, one of which is the “Water for SEQ Plan”. As set out in its Price Submission:

> *The Water for SEQ Plan aims to be a key pillar of future regional plans to support projected population growth through the provision of sustainable, adaptable and integrated water and sewerage services that meet community needs. It will also be another important input into our asset management framework and investment decision-making*

Seqwater has requested an additional $0.5 M in FY23 to cover the costs of plan.

Our view is that Seqwater routinely carries out a number of comparable engagement and planning exercises (e.g. the Water Security Plan update) as part of its business as usual activities and that this does not represent a significant or material new obligation or step change. We have not therefore recommended accepting this additional expenditure.

6.7.5.12 QCA reg costs

Seqwater has proposed the inclusion of $1.92 M in FY26 for QCA fees (in $FY20). The QCA has confirmed that this expenditure is not included in the base year and the costs are reasonable. We have therefore recommended accepting this step change.

6.7.5.13 Digital technology and information expenditure

We comment in Section 7.5.7 on Seqwater's expenditure on ERP systems. It explained that current the on-premise ERP operating costs are ~$1M p.a. opex nearly all driven by vendor support and maintenance. Under the new SAAS arrangement this is forecast to increase to ~$1.5M opex per annum. No changes to internal resources are expected. The increase in opex costs will take effect from FY23. We found that this increase in expenditure is reasonable and efficient and should be included as a step change.

6.7.5.14 Summary of recommended Step Changes

Table 6-26 - Atkins proposed Step Changes in expenditure ($M FY20)

FY Ending June:	2023	2024	2025	2026	2027	2028	Comment
Luggage Point	0.0	0.0	0.0	0.0	0.0	0.0	Not supported
Proactive drought management	0.0	0.0	0.0	0.0	0.0	0.0	Included in drought allowance opex as it is driven by drought
Insurance premium changes	2.2	2.2	2.2	2.2	2.2	2.2	Lacking robust case for ongoing real cost increases
Natural assets	7.3	7.0	7.2	7.3	7.3	7.3	Reprofiled
Residual disposal costs (variable)	0.0	0.0	0.0	0.0	0.0	0.0	Prudent; costs not demonstrated
GHG Emissions Abatement	0.0	0.0	0.0	0.0	0.0	0.0	Not supported
Wivenhoe Gates	0.0	0.0	0.0	0.0	0.0	0.0	Capitalised
Delivery of large infrastructure projects	0.4	0.4	0.4	0.4	0.4	0.4	Adjusted to reflect options analysis and planning costs
Options analysis and planning costs	1.5	3.5	3.9	7.6	16.6	8.3	Partial acceptance, see above for details.
Negotiation of employee agreements	0.0	0.0	0.0	0.0	0.0	0.0	Business as usual costs
Water for SEQ planning	0.0	0.0	0.0	0.0	0.0	0.0	Business as usual costs
QCA Regulatory fees	0.0	0.0	0.0	1.9	0.0	0.0	Accepted
Digital technology and information	0.5	0.5	0.5	0.5	0.5	0.5	Step change recommended by Atkins
Total (pre-efficiency adjustment)	11.9	13.6	14.2	20.0	27.0	18.7	

Source: Atkins analysis

6.7.6 Escalation factors

Seqwater has applied escalation factors proposed by Frontier Economics[37] to areas of expenditure to derive nominal expenditure for input to the opex model. For most of the escalators, Frontier economics recommends continuing with the current approach adopted by the QCA. There is no compelling reason to change the current approach except for one change. Frontier Economics comments that in a low inflation environment, the QCA approach to revert to a 2.5% p.a. value after two years and continuing at that level is likely to over-estimate the escalation factor. It has proposed a market-based forecast which results in lower escalation rates in the long run. Frontier Economics comments that this approach is consistent with the Referral Note. We agree with this approach.

Escalation rates are common across all expense areas except for labour and the labour component of service delivery contractors. These are based on the current Enterprise Agreement and growth in allowance costs up to the end of FY23. Thereafter the trend follow the Queensland Treasury estimates for FY24 and the ten-year historic average of ABS WPI for Queensland.

An adjustment post the Frontier Economics report has been made for electricity based on existing contract arrangements which continue through the future determination period. For variable opex we have applied a weighted escalation factor using the chemicals and electricity indices.

We noted a transcription error for employee and contract costs for FY23 when a 4.42% factor was applied compared with 3% in the report; we have adjusted this value.

6.7.7 Assessment of efficiency

6.7.7.1 Continuing efficiency

We recommend applying a continuing efficiency adjustment, also known as Frontier Shift, to take account of the ongoing improvements that utilities at the frontier should be able to make over time, as more productive ways of working emerge. For operating expenditure Seqwater proposed a continuing efficiency of 0.2% per annum.

We consider that there are Frontier Shift productivity gains to be realised within operating expenditure. Seqwater submitted a report from Frontier Economics which proposed a range of continuing efficiency from 0.2% to 1.0% per annum with a recommendation of 0.2% per annum taking into account Seqwater's historic productivity rate and estimates of historic productivity growth of the Australian water businesses of similar scale to Seqwater.

We have sought to compare efficiencies set and achieved by Australian water business and comparators from the recent UK Competition and Markets Authority findings on four UK water companies. We have not sought to repeat the analysis carried out by Frontier Economics.

Frontier Economics identifies ten water utilities with recent determinations of continuing efficiency varying from 0.2% to 2.0% per annum. We agree that some of this data include outliers which reduces the upper limit to 1% per annum although this upper value applies to smaller utilities.

The effective comparators relate to

- Water corporation (2017) – 0.75% p.a.
- SA Water (2020) – 0.5% p.a.
- Sydney Water (2020) – 0.8% p.a.
- Water NSW (2020) – 0.8% and (2021) – 0.7% p.a.
- Sun Water (2020) – 0.2% p.a.
- Sydney desalination plant (2016) - 0.75% p.a.

The 0.8% per annum continuing efficiency set for Sydney Water was similar to that proposed by the utility.

One factor in the Frontier Economics analysis was the short timescale taken for productivity performance. In previous reviews we have looked at data from the productivity commission for a period from the 1970's to current year. The analysis is sensitive to the time periods taken; using a longer period helps to smooth any 'short term' movements.

[37] Cost escalation Factors, Frontier Economics, June 2021

Seqwater has included in its forecast expenditure a 0.44% efficiency to the whole program but this does not cumulate over the period. This is equivalent to the 0.2% p.a. efficiency set in the 2018 determination and proposed by Frontier Economics.

A recent report from the UK Competition and Markets Authority[38] (CMA) concluded that

> '*companies in competitive sectors with similar activities to the water companies achieved between 0.3% and 1.2% average annual TFP growth per year, with an average across relevant sectors of 0.7% per year, based on the gross output measure*'.

The CMA added that

> '*the 0.7% average comparator estimate did not fully capture productivity growth driven by embodied technical change (input quality improvements)*'

and increased the frontier shift to 1% per annum.

On the basis of our understanding of the business through structured interviews and document review, our analysis of other water entities in New South Wales, South Australia and West Australia and recent published analysis from the UK CMA we have formed the view that the 0.2% p.a. efficiency proposed by Seqwater understates its ability for frontier shift.

While we have not carried out further analysis to confirm similar levels of continuing efficiency as applied to the water utilities listed above, a reasonable value of 0.5% p.a. should be applied. This is the midpoint of the range from 0.2% to 0.8%. This is 0.3% p.a. higher than Seqwater opex efficiency proposal. However, the 0.5% p.a. applies to capital expenditure as no efficiencies have been applied. We consider that the application of 0.5% p.a. gives Seqwater the opportunity to outperform this value over the future determination period. These efficiencies are applied geometrically.

We have recommended applying this efficiency from FY20 onwards and to all expenditure (including step changes).

6.7.7.2 Catch-up efficiency

'Catch-up' efficiency refers to the fact that, because water utilities are not operating in a competitive market, they are not compelled, through competitive forces, to be efficient. As such, they may be operating 'behind' the efficiency frontier, either carrying higher costs and/or delivering worse outcomes or performance than would arise in a competitive market.

Our approach to Seqwater catch-up efficiencies takes a high-level view rather than a detailed assessment of the main elements of operating expenditure, management structures and work processes. The methodology builds from the current period base expenditure efficiency for year 2020 set by the QCA in its 2018 determination. Our variance analysis identifies expenditure above this efficient level. We have then accepted any additional costs driven by exogenous factors such as insurance or elements of the major projects work driven by new large schemes. Other expenditure above the efficient base year is driven by endogenous factors which we Seqwater has not demonstrated t to be efficient. We have therefore made a one-off reduction in fixed operating expenditure in year 2024. This is followed by a glide path or catch-up efficiency to achieve the efficient fixed expenditure value to 2025. We consider this is a reasonable approach which allows Seqwater to achieve the efficient level of fixed expenditure through enhanced management processes.

This glide path or 'catch-up' is a realistic value which other utilities have achieved over previous years and still gives the utility an opportunity to outperform. Further analysis is shown in Section6.7.8.

This analysis does not mean that Seqwater will have reached the frontier by 2025 but it is a big step towards this.

6.7.8 Recommended efficient expenditure

6.7.8.1 Normal operating conditions

We summarise below our recommended fixed and variable opex under normal operating conditions i.e. excluding drought response expenditure.

[38] Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations, Final Report, Competition and Markets Authority (UK), March 2021)

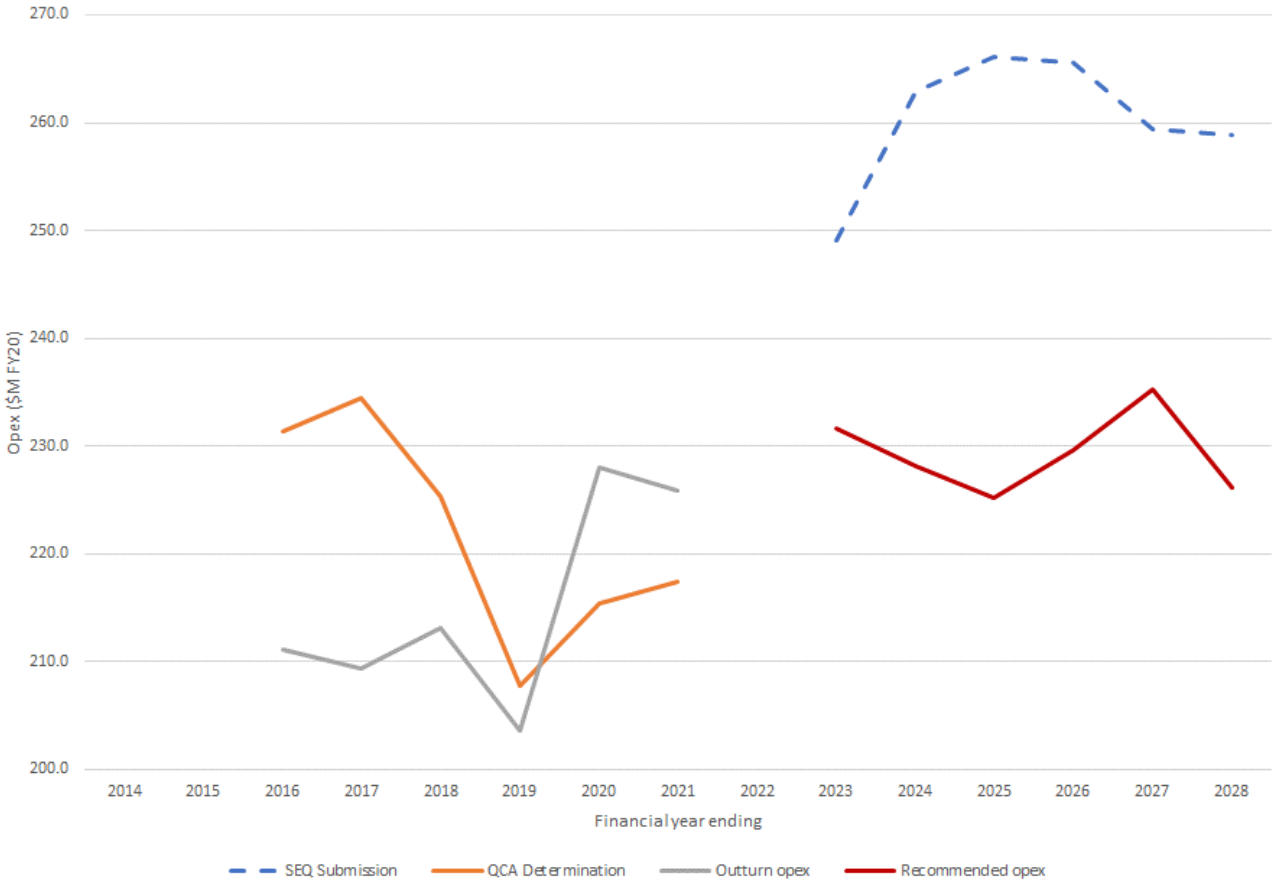
Table 6-27 - Recommended fixed opex ($M)

FY ending June	2023	2024	2025	2026	2027	2028	Price base
Seqwater Proposal							
Base Year Opex	228.6	228.6	228.6	228.6	228.6	228.6	$FY20
Step Changes	27.5	41.9	45.5	45.4	39.6	39.6	$FY20
Pre-Efficiency Opex	256.1	270.5	274.1	274.0	268.2	268.2	$FY20
Efficiency	-1.2	-1.8	-2.3	-2.7	-3.1	-3.5	$FY20
Post-Efficiency Opex	254.9	268.7	271.8	271.3	265.1	264.7	$FY20
Atkins Recommendation							
Base Year Opex	228.6	228.6	228.6	228.6	228.6	228.6	$FY20
Step Changes	11.9	13.6	14.2	20.0	27.0	18.7	$FY20
Pre-Efficiency Opex	240.5	242.2	242.8	248.6	255.6	247.3	$FY20
Catch-Up Efficiency	-4.2	-8.3	-10.7	-10.7	-10.7	-10.7	$FY20
Continuing Efficiency	-4.7	-5.8	-6.9	-8.2	-9.6	-10.4	$FY20
Recommended Expenditure ($FY20)	**231.7**	**228.1**	**225.2**	**229.7**	**235.3**	**226.2**	**$FY20**
Recommended Expenditure (nominal)	**250.1**	**251.6**	**254.5**	**265.9**	**279.2**	**275.1**	**nominal**

Source: *Atkins analysis and Seqwater document "OPEX Forecast Summary as per sub + LP 2021-06-20 sent to QCA"*

Note: nominal opex converted using Seqwater escalators in "OPEX Forecast Summary as per sub + LP 2021-06-20 sent to QCA" adjusted in FY23 for discrepancy from Frontier Economics Report

Figure 6-14 - Recommended fixed opex ($M FY20)



Source: Seqwater Document "RFI 62-66 Attachment" and QCA reports March 2015 and March 2018 and "OPEX Forecast Summary as per sub + LP 2021-06-20 sent to QCA"

Note: unadjusted opex

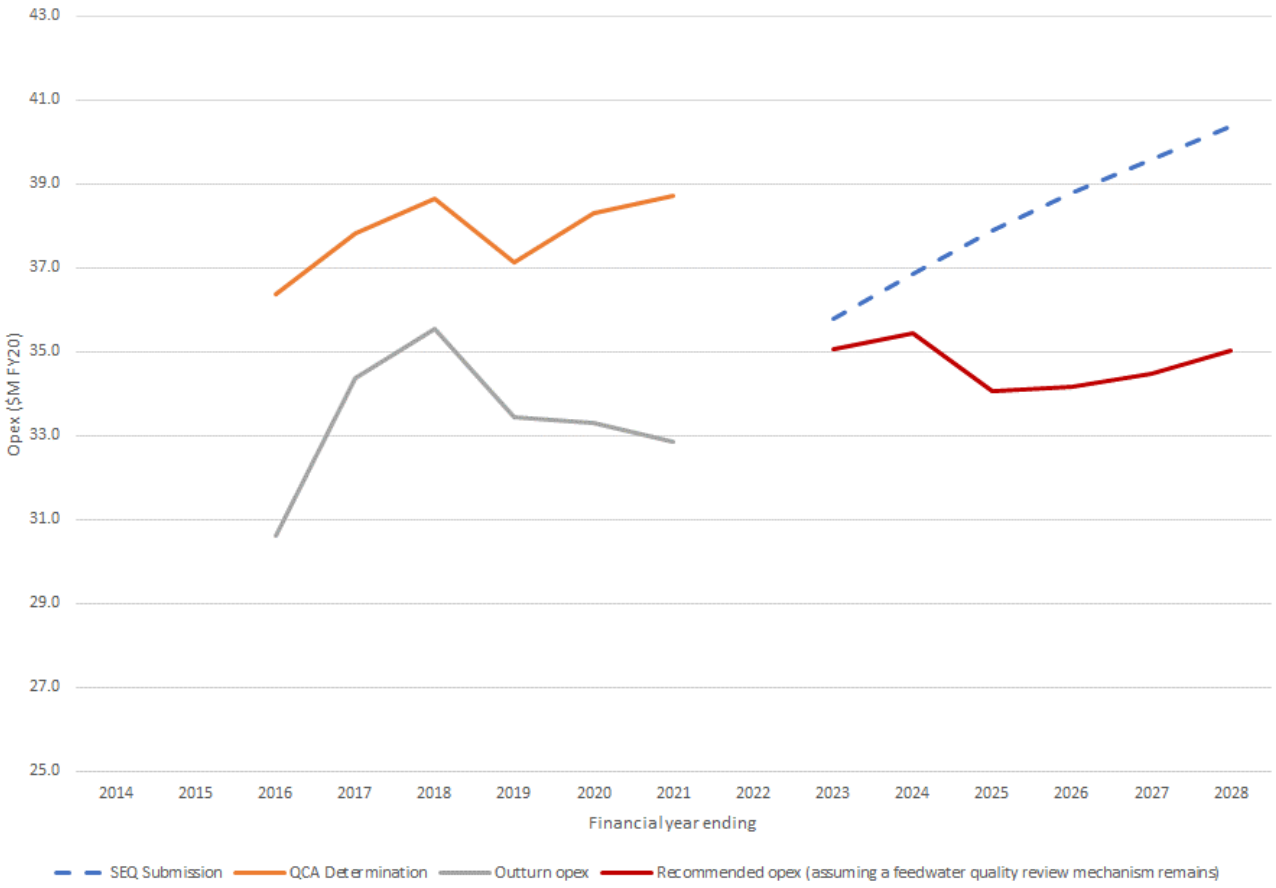
Table 6-28 - Recommended variable opex ($M)

FY ending June	2023	2024	2025	2026	2027	2028	Price base
Seqwater Proposal							
Proposal	35.9	36.9	38.0	39.0	39.8	40.7	$FY20
Atkins Recommendation							
Allowance for feedwater quality (if no Review Mechanism)	0.5	0.5	0.5	0.5	0.5	0.5	$FY20
Other scope adjustments	-0.1	-0.6	-2.9	-3.6	-3.9	-4.1	$FY20
Recommendation if feedwater quality review mechanism remains in place							
Continuing Efficiency	-0.7	-0.9	-1.0	-1.2	-1.4	-1.6	$FY20
Recommended Expenditure ($FY20)	35.1	35.4	34.1	34.2	34.5	35.0	$FY20
Recommended Expenditure (nominal)	37.7	38.9	38.1	39.1	40.3	41.6	nominal
Recommendation if there is no feedwater quality review mechanism							
Continuing Efficiency	-0.7	-0.9	-1.1	-1.2	-1.4	-1.6	$FY20
Recommended Expenditure ($FY20)	35.6	35.9	34.5	34.6	35.0	35.5	$FY20
Recommended Expenditure (nominal)	*38.2*	*39.4*	*38.7*	*39.6*	*40.8*	*42.2*	*nominal*

Source: Atkins analysis and Seqwater document "OPEX Forecast Summary as per sub + LP 2021-06-20 sent to QCA"

Note: nominal opex converted using Seqwater variable cost specific escalators in "OPEX Forecast Summary as per sub + LP 2021-06-20 sent to QCA"

Figure 6-15 - Recommended variable opex ($M FY20)

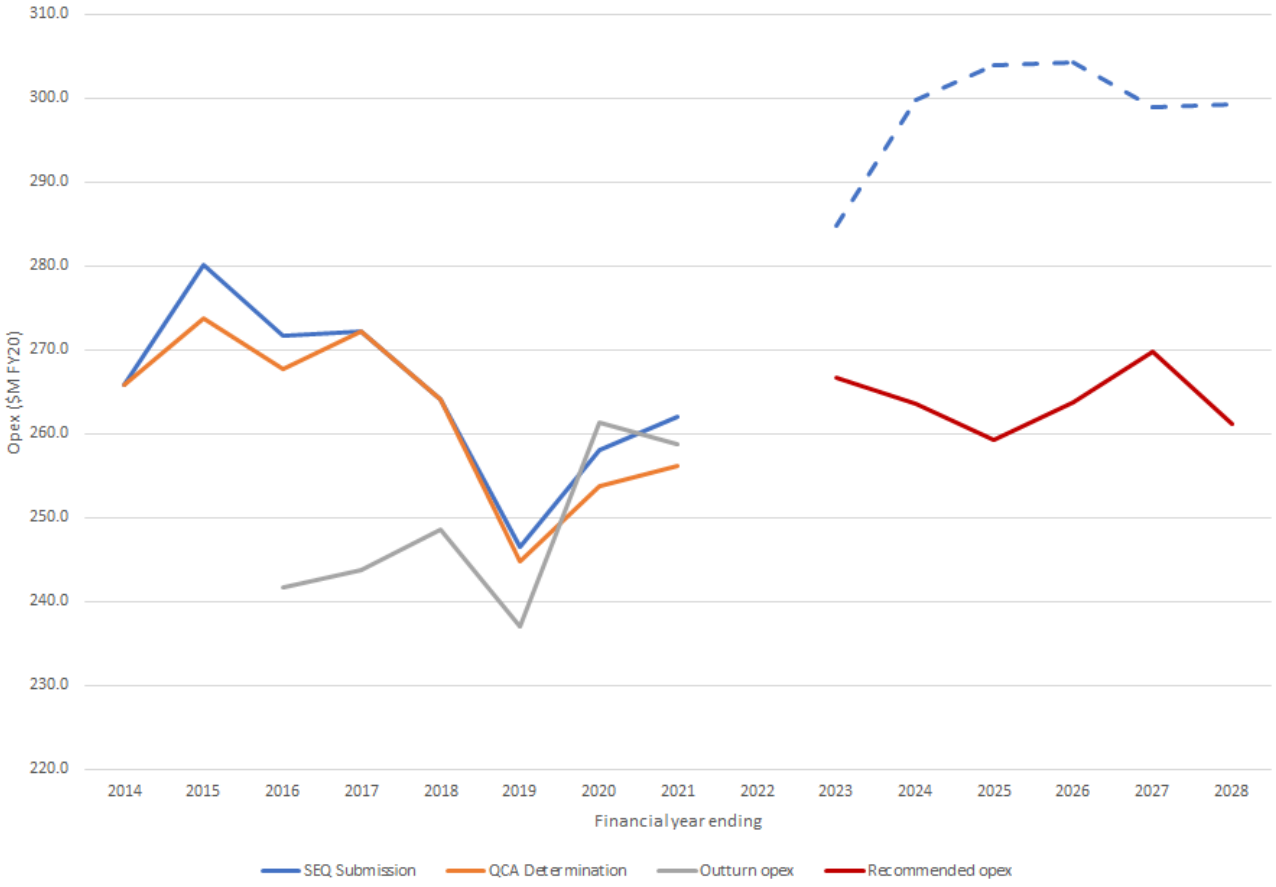


Source: Seqwater Document "RFI 62-66 Attachment" and QCA reports March 2015 and March 2018 and "OPEX Forecast Summary as per sub + LP 2021-06-20 sent to QCA"

Note: unadjusted opex

The figure below also presents the total fixed and variable opex over time (excluding drought allowances).

Figure 6-16 - Recommended total (fixed and variable) opex ($M FY20)



Source: Seqwater Document "RFI 62-66 Attachment" and QCA reports March 2015 and March 2018 and "OPEX Forecast Summary as per sub + LP 2021-06-20 sent to QCA"

Note: unadjusted opex

6.7.8.2 Drought allowance opex

The Referral Notice requires QCA to recommend a drought allowance which could be applied in addition to prices under normal operating conditions,

> *"expected to provide Seqwater with total revenue sufficient to recover prudent and efficient costs where Seqwater is operating at or below the 'Drought Response' trigger per the published SEQ Water Security Program for the length of the Regulatory Period".*

As part of its drought cost submission[39] Seqwater estimated the incremental costs for a "drought allowance". The opex elements are summarised below:

Table 6-29 - Seqwater projected incremental drought allowance opex ($FY20 M)

FY ending June	2023	2024	2025	2026	2027	2028
Incremental GCDP Drought Costs (OPEX)	25.9	25.9	25.9	25.9	NOT GIVEN	
WCRWS Recommissioning Costs (OPEX - Project)	18.5	18.5	18.5	-		
WCRWS Recommissioning Costs (OPEX - Owners)	2.0	2.0	2.0	-		
Incremental WCRWS Drought Costs (OPEX)	15.2	15.2	27.4	51.9		
Total proposed drought opex	61.6	61.5	73.8	77.8		

Source: analysis of Seqwater spreadsheets including " Submission Drought Calculations 2021-08-30 POI" converted to $FY20 using Seqwater's escalation factors and the proportion of energy and chemicals in GCDP/WCRWS opex

We discuss our view of drought allowance opex below.

WCRWS drought opex

WCRWS makes up the largest element of proposed drought allowance opex. Seqwater's projected costs are made up of three components:

i. **"WCRWS Recommissioning Costs (OPEX - Project)":** based on $56.2M (in $FY21) recommissioning costs divided over three years.

ii. **"WCRWS Recommissioning Costs (OPEX - Owners)":** based on $6.2M (in $FY21) recommissioning costs divided over three years.

iii. **"Incremental WCRWS Drought Costs (OPEX)":** which is based on the difference between the costs of anticipated production ($33.6M p.a. for 70 Ml/d ramping up to $70.3M p.a. 162 Ml/d) and the costs of care and maintenance mode ($11.2M p.a.) and the "incremental LP3 costs in fairweather price" i.e. the proposed step change discussed in Section 6.7.5.1.

These costs are in addition to recommissioning capex discussed in Section 7.5.8.

Based on the Drought Calculations provided by Seqwater, we understand that production is envisaged to be 70Ml/d in FY23 and FY24 and eight months of FY25 before ramping up to 162Ml/d. Stepping up production in the WCRWS appears to be consistent with the WSP which sets out a trigger for recommissioning of the WCRWS at 60%. We discuss the issues of beneficial end use and costs below.

The train currently in operation is understood to have the capacity to produce approximately 23Ml/d, as validated by the maximum production in Table 6-30 below. However, despite this, annual average WCRWS production to date has been consistently below 8Ml/d[40], suggesting that full beneficial end use of the production had not been fully secured in this period.

[39] Source: Seqwater document "Submission Drought Calculations 2021-08-30 POI"
[40] Source: Seqwater spreadsheet "Production and Distribution Reporting - 20210917 – 20180702"

Table 6-30 - Luggage Point Production

	Average production achieved (Ml/d)	Maximum daily production in year (Ml/d)
FY19	4.7	23.2
FY20	3.0	23.4
FY21	7.9	23.3

Source: analysis of Seqwater spreadsheet: "Production and Distribution Reporting - 20210917 - 20180702"

Increasing production capacity by a factor of seven requires confidence in the beneficial end use of the PRW. We would expect Seqwater to have reasonably detailed plans and be able to demonstrate high confidence in the utilisation of the additional capacity before proceeding to incur the significant (both opex and capex) sums envisaged. These plans were not made available to us. We recommend that Seqwater prepares clear and robust plans for PRW sales prior to approval of the expenditure.

We have very limited confidence in the costs proposed. The level of detail provided for many of the costs, especially related to recommissioning, is very limited. As the activities mainly involve work to be carried out by a single supplier, we consider that there is a significant possibility of inefficiency. It is not clear to us that this risk has been mitigated by benchmarking, market-testing, or applying efficiency challenge to the recommissioning costs.

We also consider that, given the significance of the expenditure, Seqwater should demonstrate that the expenditure is efficient before approving and committing to it by undertaking benchmarking, market-testing, and/or applying efficiency challenges.

Seqwater has not yet demonstrated to us that these costs are prudent, in terms of the confirmed sales for PRW or efficient though demonstrating that least 'cost efficient' solutions are proposed. We have therefore recommended that incorporation of this very significant expenditure should be subject to a further prudence and efficiency test.

In the meanwhile, we have presented the costs which we consider should be subject to a further prudence and efficiency test in a separate table. As a holding position, we have applied an efficiency challenge on these costs of 10% as well as continuing efficiency.

In addition to this we have recommended incorporating the $7.2M p.a. requested by Seqwater for LP3 opex under normal operating conditions as discussed in Section 6.7.5.1. We consider that these are likely to be prudent.

GCDP drought opex

Seqwater has based the projected costs on the difference between the costs of GCDP in full production operating mode ($38.8M p.a. in $FY20) and the costs of being in "hot standby mode" ($12.9M p.a. in $FY20). The costs of full operating model appear to be based on Veolia's budget proposal for 100% production. The source of the costs of being in hot standby are not clear as they are pasted values in the Drought Calculations.

We have carried out our own assessment of the likely costs of increasing output from GCDP. Analysis of GCDP monthly drought costs and production volumes[41] suggests that the average volumetric "drought" cost (i.e. additional to hot standby) is $528/Ml. Assuming a 120 Ml/d average increase in output, provides an estimate of $23.1M p.a. additional opex (in $FY20). We have recommended using this estimate as it is based on recent actuals, in preference to the budgeted figure.

Other adjustments

We have also included three elements in this assessment which were not apparent in Seqwater's drought cost submission:

i. **Savings from conventional sources** (e.g. if GCPD produces 100Ml then conventional sources can produce 100Ml less, saving on variable opex such as power costs). This reduces the net opex required.

[41] Source: "GCDP forecast costs til end Oct 21_fy2122" actual figures for September 2020 to February 21

For GCDP, these savings are based on the average variable cost of conventional sources in FY20 ($105/Ml) applied to the GCDP production volume, minus 6.5 Gl p.a., an assumed non-drought period production based on FY19 financial audits[42].

For WCRWS the same process has been applied but assuming zero non-drought period production.

ii. **"Other costs"** such as water efficiency campaigns and additional resourcing. We have assessed these and estimate that they are likely to be equal to approximately $3.7M p.a. in $FY20, based on the costs in Seqwater's FY22 drought timeline which we consider are likely to continue (excluding GCDP/WCRWS production costs). The largest cost items relate to water efficiency media campaigns, additional resourcing, carting and contingency supply investigations.

iii. **Continuing efficiency.** We have applied the same level of continuing efficiency as for normal operating conditions opex. We consider this is appropriate as Seqwater should be aiming and able to achieve efficiencies on these through the usual levers of rigorous cost control and challenge.

We have projected these costs in nominal terms, taking account of (i) Seqwater's escalation factors and the proportion of energy and chemicals in GCDP/WCRWS opex and (ii) our recommended average unit variable opex. We have not presented them in $FY20 terms because of the different escalation factors used for the different elements.

These projections are summarised below, separately for the expenditure which we can recommend as prudent and efficient at this stage and those which we consider should be subject to a further prudence and efficiency test.

For the recommended drought allowance opex, as with the drought review event expenditure in the current period, based on the information provided to us, it is not possible to conclude with confidence that the costs are inefficient. However, we consider that there is a risk of potential inefficiency, especially in regard to the negotiations with the single supplier for maintenance and operation of the manufactured water assets for WCRWS. To mitigate this risk, in future, we recommend that Seqwater carry out actions ranging from benchmarking for smaller costs to market testing for significant expenditures.

Table 6-31 - Recommended drought allowance opex ($M nominal)

FY ending June:	2023	2024	2025	2026	2027	2028
Incremental GCDP Drought Costs (OPEX)	24.8	25.4	26.0	26.6	27.2	27.8
Luggage Point 3 opex	7.7	7.9	8.1	8.3	8.4	8.6
Other drought contingent opex	4.0	4.1	4.2	4.3	4.4	4.5
Costs before continuing efficiency	36.6	37.4	38.2	39.1	40.0	41.0
Continuing Efficiency	-0.7	-0.9	-1.1	-1.3	-1.6	-1.8
Costs after continuing efficiency	35.8	36.4	37.1	37.8	38.5	39.2
Offset grid production costs (GCDP)	-4.1	-4.1	-4.0	-4.0	-4.0	-4.0
Net drought allowance opex	31.7	32.3	33.1	33.8	34.5	35.1

Source: Atkins analysis of Seqwater spreadsheets including "OPEX Forecast Summary as per sub + LP 2021-08-30 POI" and " Submission Drought Calculations 2021-08-30 POI"

[42] see https://www.qao.qld.gov.au/reports-resources/reports-parliament/water-2018-19-results-financial-audits

Table 6-32 - Drought allowance opex which needs to be subject to further prudence and efficiency test ($M nominal)

FY ending:	2023	2024	2025	2026	2027	2028
WCRWS Recommissioning Costs (OPEX - Project)	17.9	18.2	18.7	0.0	0.0	0.0
WCRWS Recommissioning Costs (OPEX - Owners)	2.0	2.0	2.1	0.0	0.0	0.0
Incremental WCRWS Drought Costs (OPEX)	14.7	15.0	27.7	53.7	54.9	56.2
Costs before continuing efficiency	34.5	35.2	48.4	53.7	54.9	56.2
Continuing Efficiency	-0.7	-0.9	-1.4	-1.9	-2.2	-2.5
Costs after continuing efficiency	33.8	34.4	47.0	51.8	52.8	53.7
Offset grid production costs (WCRWS)	-2.8	-2.8	-3.9	-6.3	-6.3	-6.4
Net subject to prudence and efficiency test	31.0	31.5	43.1	45.6	46.4	47.3

Source: Atkins analysis of Seqwater spreadsheets including "OPEX Forecast Summary as per sub + LP 2021-08-30 POI" and " Submission Drought Calculations 2021-08-30 POI"

Assumptions and uncertainties

It should be noted that (with the exception of WCRWS production) these costs are based on a continuation of a similar level of drought response as at the time of this review. However, the WSP requires a changing response as KBWS levels change. As such outturn costs may vary significantly as the drought evolves.

The assumption of approximately full production from GCDP is consistent with the WSP for KBWS levels below 60% so we would expect the opex for the GCDP as currently configured to be relatively predictable whilst in drought response.

The “other costs”, whilst more minor, may increase significantly if planning of contingent infrastructure increases.

We note also, that the WSP does not prescribe drought exit triggers stating

> *Drought exit will not be the same trigger as drought entry, and it will be a stepped exit. At the time of each potential stepped drought exit, consideration needs to be given to the climatic conditions, demand, probability of again reaching the drought response entry trigger, drought response action and other relevant matters.*

We appreciate this logic. However, it is also clear that it would not be justified for Seqwater to maintain these measures in place, at significant cost to customers, when business as usual storage levels are maintained. Our view is that it would be reasonable for there to be a time and levels-based exit trigger (for illustrative purposes: >65% storage maintained for at least a year) to balance cost and risk.

7 Capital expenditure

Capital expenditure (capex) is expenditure to upgrade or replace an existing asset or invest in a new asset. Capex may relate to a diverse program of capital works on a single asset (e.g. a water treatment plant (WTP) upgrade or a dam safety upgrade) or a relatively uniform program of capital works on a series of assets (e.g. a meter replacement program). We recommend capex that we assess to be prudent and efficient is included in Seqwater's regulatory asset base (RAB). Seqwater earns a return on the RAB as part of the building block approach to costs and prices.

Our Terms of Reference indicates that we undertake:

> *End of period assessment of capex from the 2018 review*
>
> *The consultant will be required to assess the prudence and efficiency of actual capital expenditure from 1 July 2017 to 30 June 2022 (to the extent actual capital expenditure information is available). The review should focus on capital projects and programs that are material in terms of cost and/or scope. The QCA will work with the consultant to determine an appropriate sample of 3 key projects/programs to be reviewed. Under the referral notice, the findings on prudence and efficiency of the sampled expenditure should not be extrapolated to capital expenditure that did not form part of the sample.*

7.1 Summary of findings

Below we provide a synopsis of the capital expenditure in the current and future determination periods.

7.1.1 Current determination period

Capital expenditure reported in the current Determination period includes actuals for 2018, 2019, 2020 and 2021; forecast expenditure is included for 2022. Seqwater is forecasting a $164M underspend against its five year QCA regulatory capitalised capex allowance with the biggest contributor being the deferral of the Lake MacDonald Dam Safety Upgrade project of $95.6M. As noted in Section 4 we have observed a number of process improvements Seqwater has made within the current determination period. Within the current determination period we recommend three adjustments to arrive at our recommended level of prudent and efficient capital expenditure:

- Reduction of RAB for Grid Support costs of $11.8M which are additional variable operating costs, not tangible assets, incurred in managing the grid to deliver bulk water;
- Sparkes Hill Reservoir roof replacement reduction of $1.4M from the RAB for inefficient procurement processes as a result of the reactive nature of the project; and
- Increase RAB by $363k for the categorisation of some of the drought review event costs that we consider to be capex rather than opex.

7.1.2 Future determination period

Seqwater proposes expenditure of $889M capex over the future period to be capitalised or $675M on an as incurred basis. Overall, we are broadly supportive of Seqwater's capital expenditure plans in terms of the prudency of its investment plans in the future period. We have reviewed Seqwater's capital expenditure proposals in the context of its wider capital processes and corporate objectives, we reviewed sample projects to test how these processes are applied. We have made some specific recommendations related to the scope and timing of expenditure, recategorization between where appropriate and recommendations on top-down catch-up efficiencies which should be achievable within the next determination period as well as our view on frontier shift applied to capex.

Seqwater has not historically captured outturn capital expenditure costs by capital cost driver so we have been unable to compare proposed capex at driver and asset type level against historical levels. Seqwater's proposals for expenditure show the primary driver for each project and at the current time there is no further allocation of expenditure between project drivers for those projects with multiple drivers. Capturing and enhancing the visibility and granularity of cost drivers over time and by asset type would be useful information for both Seqwater management and QCA regulatory purposes.

We recommend a number of specific scope adjustments to Seqwater's proposed capital program:

i. Wivenhoe Dam Gates project recategorisation from opex to capex, increasing capital expenditure by $5.2M (incurred and capitalised)
ii. Emergent works allowance expenditure has not been justified to recommend additional expenditure, decrease capital expenditure by $17.1M (incurred and capitalised)
iii. Solar PV project capex would be prudent given operational efficiencies that can be realised with a rapid payback period, increase capital expenditure by $11.1M (incurred and capitalised)
iv. Energy Efficiency capex would be prudent given operational efficiencies that can be realised with a rapid payback period, increase capital expenditure by $3.4M (incurred and capitalised); and
v. Deferral of the proposed capitalisation of the $140M Lake MacDonald Dam Safety upgrade project from 2025 to 2027 as this project scope is still to be defined and the total estimated expenditure is still to be confirmed.
vi. Netting off of $1.4M of proposed capitalised capex in FY23 for South West Pipeline expenditure for $1.2M capex already capitalised in the current period

We then recommend adjustments to reflect catch-up and continuing efficiency. Catch-up reflects the efficiency needed to be achieved over time to catch up with a frontier utility. Seqwater has not applied any internal efficiency challenge on any of its capital program, either in the round or at sub-program level. We would expect Seqwater to make efficiency savings considering the improvements that Seqwater continue to make to its capital processes.

We have sought to identify, throughout our review, where there are opportunities to realise achievable efficiencies throughout the future determination period. These primarily relate to initiatives that Seqwater is already undertaking and some further opportunities and recommendations that we have identified throughout the course of our review. We have identified three areas where Seqwater should be able to make material improvement to its processes to move towards the efficiency frontier utility level over time and deliver material efficiencies over the next Determination period. These are:

i. Capital planning and asset management
ii. Contingency management and cost estimation
iii. Bundling or packaging of projects for procurement

Frontier shift also known as continuing efficiency relates to the increased productivity derived from process innovation and new systems and technology that all well performing and even efficient businesses should achieve. Seqwater did not propose a continuing efficiency for capex, however we consider that there are productivity gains to be realised within both opex and capex as organisations may substitute efficiently between capital and non-capital inputs to production. We recommend applying a 0.5% p.a. efficiency to capital expenditure.

Our view of prudent and efficient capital expenditure is summarised in Table 7-1 below.

Table 7-1 - Atkins recommended capitalised capital expenditure in the future period

FY ending ($000k, nominal)	2023	2024	2025	2026	2027	2028
Seqwater proposed capital expenditure (incurred)	179,409	189,522	163,218	142,547	228,881	159,645
Seqwater proposed capital expenditure (capitalised)	298,447	139,172	287,461	164,515	177,108	284,586
Atkins recommended scope adjustments (incurred)						
Wivenhoe Dam Gates from Opex to Capex	513	1,153	2,312	1,203	1,233	1,264
Emergent works allowance not justified	- 3,075	- 3,075	- 3,075	- 3,075	-	-
Solar project capex	-	4,532	3,231	3,311	3,394	-
Energy Efficiency capex	348	502	1,689	844	-	-
LP3 Renewals to drought allowance	- 2,968	- 3,024	- 3,087	- 3,159	- 3,234	- 3,312
Atkins recommended expenditure incurred pre-efficiency	174,226	189,610	164,287	141,671	230,274	157,597
Atkins recommended efficiency adjustments (applied to scope adjusted incurred capex)						
Catch-up efficiency %	1.89%	3.36%	6.32%	6.79%	8.79%	8.79%
Catch-up efficiency $	- 3,301	- 6,370	- 10,391	- 9,619	- 20,240	- 13,852
Continuing efficiency %	0.50%	1.00%	1.49%	1.99%	2.48%	2.96%
Continuing efficiency $	- 855	- 1,828	- 2,297	- 2,621	- 5,199	- 4,259
Total recommended efficiency adjustments	- 4,156	- 8,198	- 12,687	- 12,240	- 25,439	- 18,111
Atkins recommended scope adjustments (capitalised)						
Wivenhoe Dam Gates from Opex to Capex	513	1,153	2,312	1,203	1,233	1,264
Emergent works allowance not justified	-	-	-	- 17,177	-	-
Solar project capex	-	4,532	3,231	3,311	3,394	-
Energy Efficiency capex	348	502	1,689	844	-	-
LP3 Renewals to drought allowance	- 2,968	- 3,024	- 3,087	- 3,159	- 3,234	- 3,312
Lake MacDonald deferral			- 140,097		155,624	
South West Pipeline land costs already capitalised	- 1,425	-	-	-	-	-
Total recommended scope adjustments (capitalised)	- 3,533	3,163	- 135,953	- 14,978	157,017	- 2,048
Atkins recommended efficiency adjustments (capitalised)	**- 4,156**	**- 8,198**	**- 12,687**	**- 12,240**	**- 25,439**	**- 18,111**

Source: Seqwater pricing submission, August 2021; Atkins analysis

7.2 Methodology

In this section, we present the results of our review of the efficiency of Seqwater's bulk water capital expenditure. We have attempted to identify the major cost drivers and explain the variances in the current determination period expenditure against the 2018 QCA Determination. We comment on the prudence and efficiency of capital expenditure in the 2018 Determination period which is used to inform our view of future efficiency. Under the ministerial referral notice for the assessment of capital expenditure in the current period we are required to focus on items of material impact in total. As per the notice our findings for the current determination period are not to be extrapolated out. Any recommendations we have made to expenditure are only on the sampled projects. This is the first time that the QCA has undertaken an ex-post review of efficient capital expenditure.

We comment in Section 4 on the strategic management of the business and the structures and systems used to plan and manage capital expenditure.

We make an assessment of an efficient level of expenditure for the period 2022 to 2026 and out to 2028 taking into account our discussions with Seqwater, documents presented and provided and subsequent answers to questions we raised in a formal Request for Information (RFI) process.

Seqwater's original Pricing Proposal submitted in June 2021 outlined proposed expenditure requirements for its Non-Drought activities, in August 2021 Seqwater made a further submission to QCA for Drought related capital and operating expenditure including expenditure on the WCRWS. We have based our assessment on this updated total capital expenditure including both the original, June 2021 submission and August 2021 Drought submission.

Our overall methodology is explained in Section 2. In this section we examine the key drivers for variance in outturn expenditure and for the changes in forecast expenditure, focused on an evaluation of:

i. Actual expenditure for financial years ending 2018 to 2021;
ii. The current budget for year ending 2022; and
iii. The projected costs for the financial years ending 2023 to 2026 and 2027 to 2028.

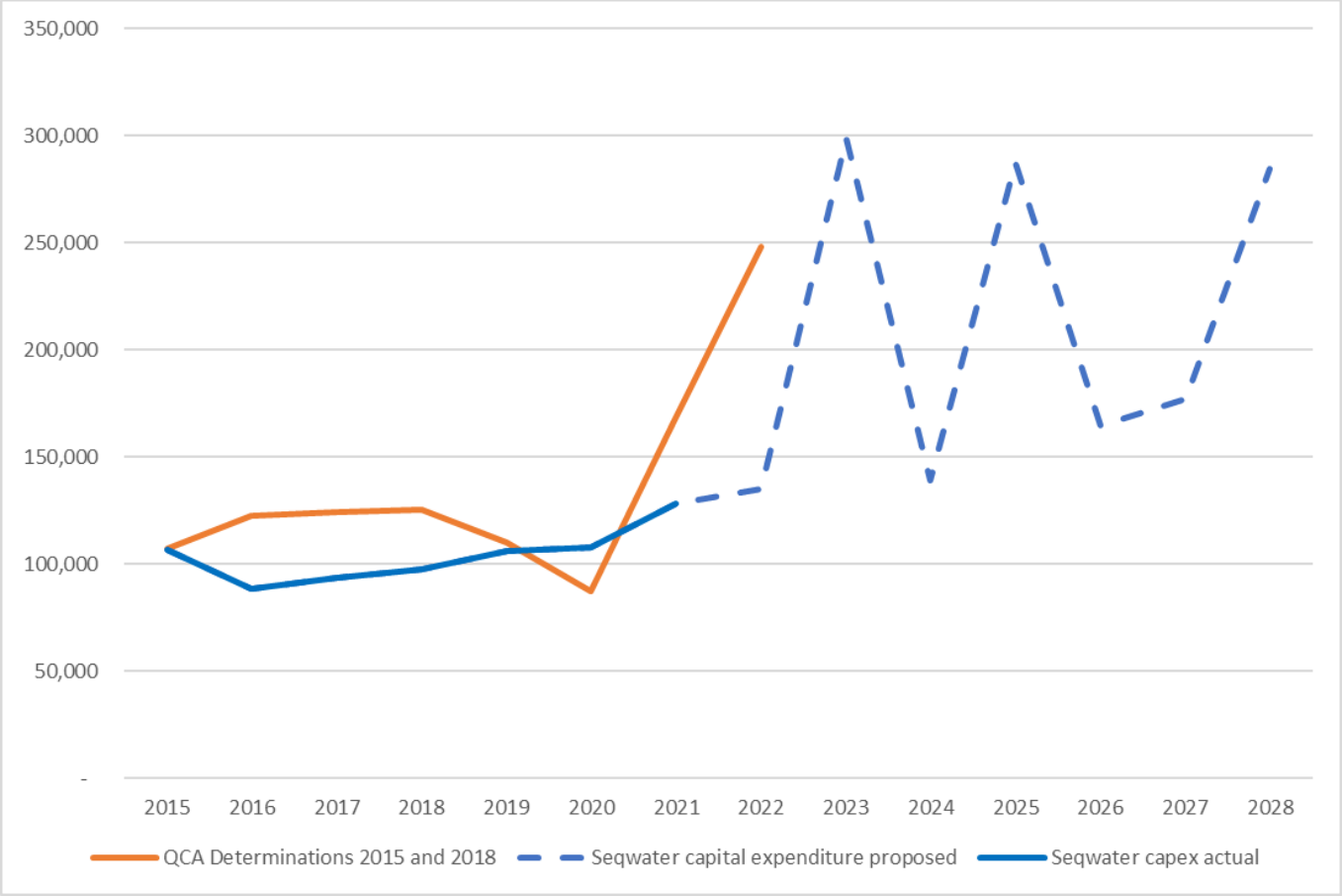
For capital expenditure our analysis is maintained in a nominal price base as per the Seqwater pricing submission. The 'year on year' changes are incremental and the requirement for presenting capital costs is on an as commissioned basis masks any discernible trends that could be obtained by normalising the price base. Additionally, Seqwater has only recently begun to map its outturn capital costs by cost driver so reviewing comparable projects and expenditure trends over time has not been possible.

We have identified six capital projects for review, three in the current determination period and three in the future determination period. We comment below on the justification and rationale for the inclusion of these projects within our sample.

7.3 Overview

During the current determination period between 2018 and 2022 Seqwater has underspent against its QCA regulatory allowance, on a capitalised basis. This was also true for the previous regulatory period from 2015 to 2017.

Figure 7-1 - QCA Determination allowance against Seqwater actual capitalised capital expenditure from 2015 to 2021 and Seqwater proposals from 2023 to 2028 ($000k, nominal)



Source: Seqwater pricing submission, QCA Final Report 2015 and 2018 and Atkins analysis

Figure 7-1 shows that total capital expenditure is proposed to increase significantly in the future determination period with the majority of this being driven by deferred expenditure from the previous period (for Lake Macdonald) along with the South West Pipeline project being proposed to be capitalised in 2023. The scale of proposed capitalisation in the future period is significantly greater than has been achieved in recent years. Table 7-2 shows the variance against the QCA allowance for the last two periods.

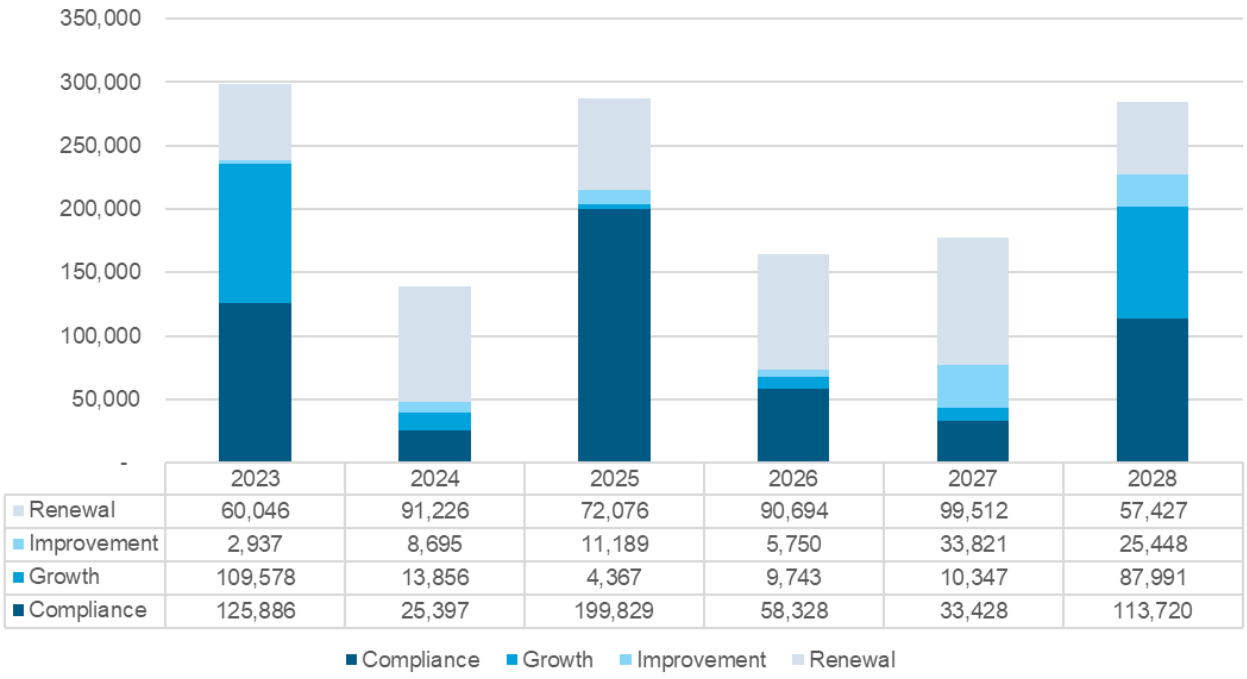
Table 7-2 - Seqwater capitalised expenditure against QCA determinations

FY ending ($000k)	2015	2016	2017	2018	2019	2020	2021	2022
Total Seqwater capitalised expenditure in year	106,611	88,415	93,564	97,633	106,763	107,757	128,232	134,844
QCA Determinations 2015 and 2018	107,400	122,700	124,300	125,069	110,200	87,000	168,400	247,989
Variance	(789)	(34,285)	(30,736)	(27,436)	(3,437)	20,757	(40,168)	(113,145)

Source: Seqwater pricing submission, QCA Final Report 2015 and 2018 and Atkins analysis

Seqwater has not historically captured outturn capital expenditure costs by capital cost driver so we have been unable to compare proposed capex at driver and asset type level against historical levels. Seqwater's proposals for expenditure show the primary driver for each project, at the current time there is no further allocation of expenditure between project drivers for those projects with multiple drivers. Capturing and enhancing the visibility and granularity of cost drivers over time and by asset type would be useful information for both Seqwater management and QCA regulatory purposes.

Figure 7-2 - Seqwater proposed capital expenditure by driver (as capitalised)



	2023	2024	2025	2026	2027	2028
Renewal	60,046	91,226	72,076	90,694	99,512	57,427
Improvement	2,937	8,695	11,189	5,750	33,821	25,448
Growth	109,578	13,856	4,367	9,743	10,347	87,991
Compliance	125,886	25,397	199,829	58,328	33,428	113,720

Source: Seqwater 2021 pricing submission

7.4 Capital expenditure in the 2018 determination period

In this section we discuss those projects and expenditure items that were proposed to be included by Seqwater at the previous price determination and due to be capitalised in the 2018 period. As shown in Figure 7-1 above there was a significant underspend against the QCA regulatory capex allowance. The main drivers for the underspending were:

i. Deferral of the Lake MacDonald Dam Safety Upgrade where $95.6M was proposed to be capitalised in 2022 (this project was also deferred from the previous determination period)

ii. Reprofiling of the Mount Crosby East Bank Flood Resilience program, the exact amounts attributed to this is unclear based on the information in the previous expenditure review report

iii. Mount Crosby East Bank WTP filter upgrade where $35.7M was proposed to be capitalised in 2021 (this project was also deferred from the previous determination period)

iv. Unexpected underspend of $14M on the Ewen Maddock and Leslie Harrison dams safety upgrade projects. The reasons for these savings are discussed in more detail in sections 7.4.3 and 7.4.4 below.

Notwithstanding the specific reasons for each of the underspending items, it demonstrates that overall, Seqwater has been constrained by its capacity to deliver greater than $100m of capital expenditure in recent years. Seqwater has recognised this as an issue and has restructured its business to include the Major Projects Group in order to build the capacity to deliver its capital program.

Below we comment on three sampled projects that have been completed and the costs capitalised within the 2018 determination period.

7.4.1 Capex Project 1: Sparkes Hill reservoir roof replacement project

We chose this project for review as it was not included within the previous 2017 Seqwater pricing submission. We wanted to understand the reasons why this project was not included, what the drivers for the expenditure were and whether the expenditure was prudent and efficient. A detailed project summary can be found in Appendix A.

Sparkes Hill Reservoir is a 92Ml capacity and strategically located reservoir that supplies the local area and also enables the reliable operation of the Northern Pipeline Interconnector (NPI) in a northerly flow direction, this represents 18% of the volume supplied by Seqwater. Sparkes Hill was constructed in 1982 and taken into ownership by Seqwater in 2013. There are two reservoir units at Sparkes Hill: RS2 (main one and larger) and RS1 (smaller and more inefficient). In December 2018 there was a structural failure of the roof of RS2 which led to it being taken offline and a need to replace the section of the roof as quickly as possible. The upgrade of the Mount Crosby East Bank filters was contingent on this project being completed.

As an interim measure to maintain water into supply RS1 was brought back online, this included replacement of valves and cleaning and disinfection of the chamber. Seqwater advised that all expenditure for this was classed as opex including minor works and the large valve replacement ($150k). This is not in line with Seqwater's Non-Current Asset Policy (as per Table 4-3) and in theory should have been classified as capital expenditure. Given the low materiality of the expenditure we have not made any adjustments to categorisation on this basis. There is a need for Seqwater to ensure appropriate recognition of capital expenditure.

We sought to understand if Seqwater had followed its own processes related to inspections and maintenance in the years between 2013 and 2018 when Seqwater took ownership of the asset prior to the roof collapse. Seqwater has provided details of the asset inspections leading up to the collapse which were undertaken at 3 monthly intervals. Seqwater advised that these inspections do not typically require generation of an inspection report, especially if no corrective actions were identified. There was no record of a structural defect recorded from these inspections prior to identification of the roof failure.

In our review of the project, it was identified that there were opportunities much earlier on for Seqwater to have identified the potential defects in the reservoir roof. With this information Seqwater may have been able to plan the project in advance rather than reacting to the asset failure. Being able to plan the project in advance with some earlier contractor involvement and/or competitive tendering could have yielded a more efficient outcome in terms of procurement and expenditure. It has been demonstrated that 5 to 15% savings can be achieved from value based procurement for early involvement[43]. On this basis we recommend that a commensurate 10% reduction of inefficient expenditure compared to the total capitalised project costs be removed from the RAB for the Sparkes Hill Reservoir Roof Replacement project. Notwithstanding our recommendations on efficiency, we do consider the investment prudent given the criticality of the asset. Our expenditure recommendation is shown in Table 7-3 below.

[43] Competitive tendering costs, is it worth it? - Constructing Excellence

Table 7-3 - Recommended capital expenditure for Sparkes Hill Reservoir Roof Replacement project

FY ending ($000k)	2019	2020	2021	2022	Total capitalised capex current period
RS2: Roof Structural Refurbishment - Seqwater proposal	-	13,184	410	-	13,594
Atkins recommended adjustment	-	(1,318)	(41)	-	(1,359)
Atkins recommended expenditure rolled into RAB	-	11,865	369	-	12,234

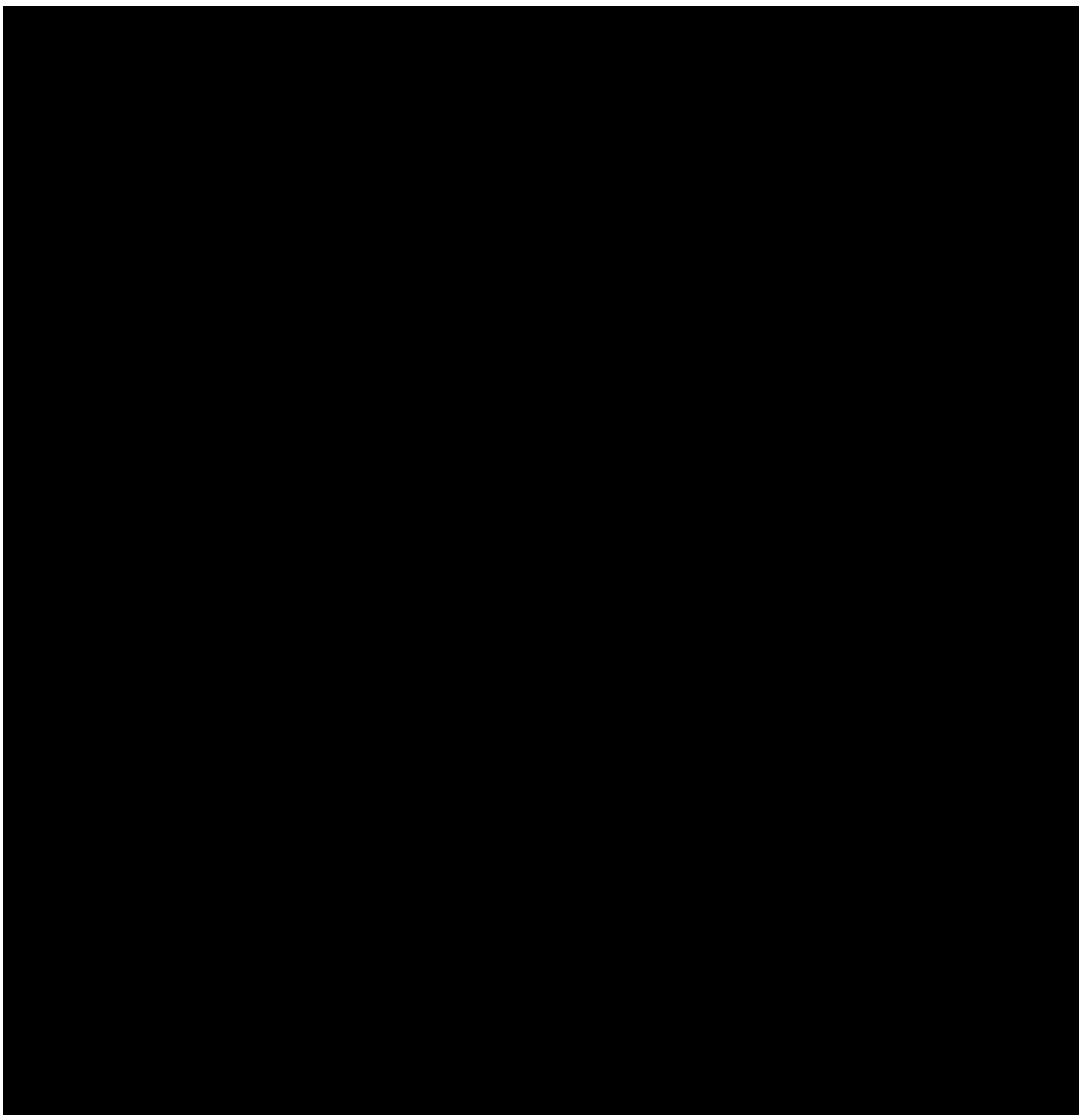
Source: Seqwater RFI 30 – Asset 2021 and Atkins analysis

Since the collapse Seqwater has undertaken a review and update of its reservoir Asset Class Plan. Prior to 2018, Unmanned Aerial Vehicle (UAV) and Remote Operated Vehicle (ROV) inspections were not routinely conducted as part of the Seqwater reservoir inspection program. The asset class plan was substantially reviewed in 2018 concurrent to the time of the Sparkes Hill Reservoir incident with changes including the addition of UAV and ROV inspections. Footage from the UAV and ROV inspections are now reviewed by a team that includes a Registered Professional Engineer of Queensland (RPEQ) engineer, maintenance personnel and water quality specialists. If issues are noted from the footage, follow up inspections are scheduled. Overall, this demonstrates that there is a need to remain focused on the basics of asset management and maintenance, thereby identifying the need for investment

Although we recognise that the overall recommended adjustment is not material in terms of pricing and against the total capital expenditure envelope it does highlight that there may be a need to broaden the ex-post capital expenditure review at the next price review.

7.4.2 Dam Safety Compliance

Seqwater undertook its first Portfolio Risk Assessment (PRA) of its 26 referable dams in 2013, the outputs of which are shown in Figure 7-3. This figure, known as the F-N chart, indicates the probability of failure (F) against likely loss of life (N) due to dam failure, with a limit of tolerability defined in Australian National Committee on Large Dams (ANCOLD) guidelines.



Source: Seqwater Dam Safety presentation, September 2021

This 2013 PRA informed the expenditure proposals for the previous and current periods and under the Queensland dam safety guidelines Seqwater is required to progressively complete its dam upgrades by 1 October 2035. We identified the upgrades of the Leslie Harrison Dam (Stage 1) and Ewen Maddock Dam (2A) as projects for detailed review. We note that the Lake MacDonald Dam Safety upgrade was due to be undertaken in the current period, but the project was deferred. We discuss this further in section 7.5.3.1 below.

7.4.3 Capex Project 2: Leslie Harrison Dam Safety Upgrade

We identified this project for review because it represents $5.2 million of the underspend against the QCA 2018 determination capital expenditure allowance. A detailed project summary can be found in Appendix A.

Leslie Harrison Dam is a 25m high zone embankment located on Tingalpa Creek, approximately 18 km southeast of Brisbane. The original dam was constructed in 1967 and upgraded in 1984 to raise the Full Supply Level (FSL) by 3m to 18.3 mAHD. The Dam is the sole raw water source for the Capalaba Water Treatment Plant which provides drinking water to the Redlands region. As a result of the dam safety concerns and high probability of failure at Leslie Harrison Dam, the reservoir FSL was reduced by 3m in 2015, while further investigations were carried out to determine the most suitable options for upgrade over the long-term planning horizon.

A detailed consequence assessment including Population at Risk and Potential Loss of Life estimates for a range of failure scenarios of embankment and spillway was completed in accordance with ANCOLD regulations and used to allow Seqwater to understand the current risk position as well as options for risk reduction in the detailed design phase. Four distinct options were initially considered by Seqwater to reduce the risks associated with the dam but finally a two-stage risk-based upgrade option was selected. The dam upgrade was preferred to be done in stages to achieve the required risk in a cost-effective manner over the long-term planning horizon.

Seqwater developed a cost estimate of $27M based on a P80 estimate including approximately $3.5M of contingency risk items. A design then construct delivery option was selected to allow Seqwater design control over its own asset. Detailed design was performed by a sole source that had performed well on the preliminary design of the dam. Procurement for the Leslie Harrison Dam was then performed in two phases i.e., Phase 1A and 1B. Phase 1A involved a capability shortlisting of construction tenders and Phase 1B was a collaborative and competitive closed construction tender process with a detailed scope of works.

Non-realisation of contingency items such as wet weather, flood events, flood management and latent ground condition risks resulted in a cost saving of approximately $3M. This along with benefits of a competitive tender process and the inherent efficiencies of the preferred option allowed for the project to be completed in-line with schedule in June 2019 and resulted in a total cost saving of approximately $5.2M, from the original outturn budget estimate of $27M to a final outturn cost of $21.8M.

We consider this expenditure to be both prudent and efficient and we do not recommend any adjustments to the Seqwater RAB for this project.

7.4.4 Capex Project 3: Ewen Maddock Dam Safety Upgrade (2A)

We identified this project for review because it represents a significant proportion ($8.7M) of the underspend against the QCA 2018 determination capital expenditure allowance. A detailed project summary can be found in Appendix A.

Following the Dam Safety Review (2010) and Portfolio Risk Assessment (2013), further foundation investigations and the Dam Safety and Acceptable Flood Capacity review (2016) led to the conclusion that the Population at Risk (PAR) from dam embankment failure was unacceptably high. Probability of failure and the number of fatalities due to dam failure were above the ANCOLD limit of tolerability for existing dams, due to high risks of embankment overtopping, embankment piping (internal erosion), foundation liquefaction and spillway instability. The project objective was therefore to mitigate the risks to below the limit of tolerability.

The preferred option chosen was to carry out a staged upgrade, with Stage 1 of urgent works followed by a Stage 2 of further investigations and implementation of the Dam Safety Management Plan. The Stage 2 works included embankment strengthening works split into Stage 2A with spillway works and fish passage mitigation works moved into a Stage 2B.

Lower bids for Stage 2A were obtained from tendering contractors who provided further efficiencies, with the final selected contractor being locally based with lower overheads and operational costs.

Efficiencies were achieved by using siphons to lower the lake level to 60% FSL, reducing the construction schedule and maximising the dry season for the embankment earthworks while avoiding a cofferdam.

Rates for imported material were renegotiated with the contractor to avoid significant increase in costs when quantities of imports required from an external source were higher than expected.

The project was delivered three months ahead of schedule, and including the non-realisation of contingency risks (e.g. ground conditions and bad weather were less onerous than allowed for) there was a saving of $8.7M on BC approved costs.

We consider this expenditure to be both prudent and efficient and we do not recommend any adjustments to the Seqwater RAB for this project.

7.4.5 Grid Support Costs

We discussed Seqwater's commentary for this expenditure in Section 6.5.5. In line with our conclusions outlined in Section 6.5.5 we propose that expenditure for Grid Support is removed from the RAB for the current period. In its pricing submission Seqwater have indicated actual expenditure of $1.5M in 2018, $1.5M in 2019 and $2.9M in 2020. Expenditure for Grid Support costs in 2021 and 2022 is not explicitly identified within the

total capital expenditure lines which appears to be over and above the project by project breakdown for the current period that we received as part of the RFI process. We have assumed that Seqwater has included $2.9M of capital expenditure for grid support costs is within the total capital expenditure lines. In total for the current period this equates to a recommended reduction of $11.8M from the RAB. We outline the breakdown and our recommended RAB adjustment in Table 7-4 below.

Table 7-4 - Grid support costs capital expenditure in the current period

FY Ending June ($)	2018	2019	2020	2021*	2022*	Total in current period
Grid Support - Desal	1,431,915	1,431,915	2,571,952	2,571,952	2,571,952	10,579,687
Grid Support - SRWP	101,755	101,755	347,012	347,012	347,012	1,244,545
Grid Support -Total recommended adjustment from RAB	1,533,670	1,533,670	2,918,964	2,918,964	2,918,964	11,824,232

**Atkins have assumed FY20 expenditure has been rolled forward into FY21 and FY22*

Source: Seqwater pricing model and Atkins analysis

7.4.6 Natural assets

Seqwater's pricing submission states that

"*Also contributing to our underspend in the 2018-21 period is the reclassification of natural assets capital budgets, as operating expenditure in line with Australian Accounting Standards. This saw approximately $19.5M of approved capital expenditure reclassified as operating expenditure (this is explained further in section 6.3.3.4).*"

We had some concerns that this appeared to conflict with a later statement in the pricing submission that,

"*For natural assets expenditure in the 2018-21 period, we are still proposing to recover this via capitalisation into the RAB, consistent with the prior regulatory treatment.*"

We queried whether this meant there would in effect be any double counting both in terms of capital and operational expenditure. We understand that the reclassified natural assets costs incurred during 2017-18 to 2019-20 have already been capitalised by Seqwater and will be recovered over a useful life of 60 years. 60 years is a generic useful life which is applied in the Seqwater APMP and does not appear to be asset specific. For the projects where costs have been incurred in 2020-21 Seqwater is proposing to capitalise these costs in the same year although the final outturn figures have not been confirmed. Expenditure on Natural capital assets in the current period is in Table 7-5 below. This is on both as incurred and as capitalised basis as the expenditure is incurred and capitalised within the same year.

Table 7-5 - Natural assets capital expenditure in the current period

Natural capital assets expenditure in the current period

FY Ending June ($)	2018	2019	2020	2021
Actual / Estimate	Actual	Actual	Actual	Estimate only
Natural Assets	6,461,243	7,275,117	5,767,272	6,000,000

Source: Seqwater pricing submission July 2021

Seqwater's published statutory financial accounts reported Natural Assets as operating expenditure and the reclassification in the future price determination will align both the regulatory and financial reporting. This aligns with our recommendations for operating expenditure in the future period on natural assets which is discussed in Section 6.7.5.3.

7.4.7 Review event recategorization

As discussed in Section 6.6.2 Seqwater has proposed to recover $79.9M of operational expenditure related to the Drought response. We have reviewed the components of this expenditure and consider some components are more aligned to capital expenditure as such we recommend a commensurate reallocation from the opex review event cost to capex. We comment below in Table 7-6 on our proposed recategorisation of expenditure from opex to capex for each of the component items. This commensurately increases the RAB value in the current determination period.

Table 7-6 - Review event costs recommended recategorisation of expenditure from opex to capex

FY Ending June ($)	2018	2019	2020	2021	2022	Total	Comment
Actual (A) / Estimate (E)	A	A	A	A/E	A	A/E	
Reinstate WCRWS pipework			350,000			350,000	This is reinstatement and replacement
Install Orifice Plate at Lake Manchester Outlet			7,629	5,301		12,930	Installation and above the $10k capitalisation threshold
Total			**357,629**	**5,301**		**362,930**	

Source: Seqwater drought review event costs and Atkins commentary

7.4.8 Prudent and efficient capital expenditure in the 2018 determination period

Based on the reviewed items identified above our recommended prudent and efficient capital expenditure in the current determination period is summarised in Table 7-7 below.

Table 7-7 - Atkins recommended prudent and efficient capital expenditure in the current period ($k)

Description	2018	2019	2020	2021	2022	Total capitalised capex current period
Seqwater proposed capitalised expenditure into RAB	97,633	106,763	107,757	128,232	134,844	575,230
Atkins recommended adjustments:						
Grid support costs not capitalised	(1,534)	(1,534)	(2,919)	(2,919)	(2,919)	(11,824)
Sparkes Hill Reservoir Roof Replacement efficiency	-	-	(1,318)	(41)	-	(1,359)
Drought review event recategorisation opex to capex	-	-	358	5	-	363
Atkins recommended capitalised expenditure into RAB	**96,099**	**105,230**	**103,878**	**125,277**	**131,925**	**574,233**

Source: Seqwater pricing submission, October 2021; Atkins analysis

7.5 Capital expenditure in the 2022 determination period

7.5.1 Price base and cost escalation

As per previous Seqwater pricing submissions forecast capital expenditure is based on nominal dollars utilising an escalation factor. The capex inputs to the pricing model we have reviewed have all been escalated prior to entering the model. In its pricing submission Seqwater state that *'The values used to escalate our capital costs are based on information provided by Queensland Treasury in the preparation of its forward forecast. Using the historical and current indexation rates provided by Queensland Treasury we have applied a 2.5% escalation rate for 2021-22 and future years'.*

Table 7-8 - Capital cost annual inflation escalation

Year	Inflation as per Seqwater submission	Atkins recommended Inflation applied
2021	2.5%	2.5%
2022	2.5%	2.5%
2023	2.5%	2.5%
2024	2.5%	2.5%
2025 - 2050	2.5%	2.5%

Source: Seqwater RFI 157 and Atkins recommendation

We do not recommend making any changes to the proposed approach applied by Seqwater. There are no specific or obvious reasons for us to alter the recommendation from the Queensland Treasury.

The Weighted Average Costs of Capital (WACC) drives the financing costs for capital projects (also referred to as Interest During Construction (IDC) costs included in the Seqwater regulatory model are shown in Table 7-9 below.

Table 7-9 - WACC/IDC costs applied to capital expenditure

FY ending June	2020	2021	2022	2023	2024	2025	2026	2027	2028
Interest During Construction (%)	5.96	5.96	5.88	5.70	5.59	5.48	5.40	5.31	5.29

Source: Seqwater pricing model, August 2021

Seqwater applies the mid-point for each capex year based on the year the costs are incurred to arrive at the final costs for capitalisation. The level of the WACC applied is not part of the scope of our review. We have reviewed the application of the WACC which appears to have been applied appropriately to the incurred capital costs. We have used the same basis for any recommended adjustments we have applied to the future period and have not made any adjustments to this as part of our analysis.

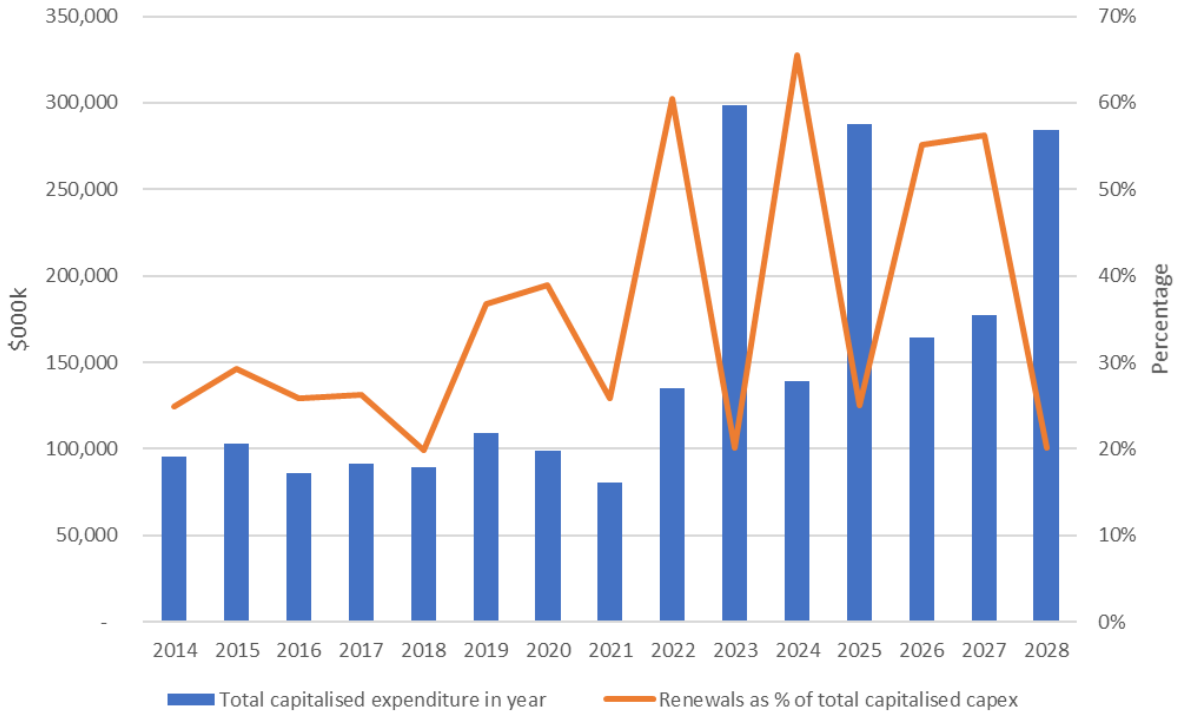
7.5.2 Renewals

Between 2014 and 2021 Seqwater has spent between 20% and 30% of total capital expenditure on renewals[44]. Seqwater has not historically captured outturn expenditure by asset type and driver so we are unable to draw year-on year expenditure comparisons. Reviewing expenditure on an as capitalised basis does not necessarily provide much insight into how expenditure has been deployed over time and asset type; a small number of high value capex projects can skew how the data is interpreted depending on how it has been classified. We did request historical incurred capital expenditure by asset type and driver as part of the review but Seqwater advised that it had only recently started to capture this data. We suggest that this is an area for improvement for Seqwater to capture and provide capex on an incurred basis by asset type and driver so that relative comparisons can be made both from an internal management, and regulatory perspective. We suggest it may be helpful for Seqwater to undertake this exercise retrospectively for its own internal information for asset

[44] Atkins inferred this by utilising a word search against outturn capital expenditure on projects searching for renewals type words e.g. renew, refurb, maintain etc.

management purposes and in support of future regulatory reviews. This is demonstrated by Table 7-10 below which shows that meaningful comparisons are difficult to make over time.

Table 7-10 - Seqwater actual and proposed capital expenditure on renewals (as capitalised, nominal)



Source: RFI 30, Seqwater pricing submission and Atkins analysis

7.5.2.1 Capex Project 4: East Bank sub-station and enabling works

We identified this project for review due to the nature of the funding and delivery arrangements between both Seqwater and its energy provider Energex. This project is informed and directed by the Mount Crosby WTP Raw Water Supply and Flood Resilience Long Term Strategy, 2017 as well as drivers from the WSP 2017. A detailed project summary can be found in Appendix A.

East Bank WTP is the most critical WTP in the Seqwater network, producing typically 60% and 33% of average daily demand across the Central Region and Water Grid respectively. The East Bank WTP receives the entirety of its supply from the East Bank Raw Water Pump Station (RWPS). During the 2011 flood the East Bank Raw Water Pump Station was near to inundation by floodwaters. A 0.93m higher flood level would have inundated the transformer bay serving the pump station forcing a shutdown of the pump station. A further 1.5m rise in flood waters would have inundated the pump station and the pump shafts rendering it inoperable until it could be dewatered, and electrics made safe.

Based on the Brisbane River Catchment Flood Study (BRCFS), flood inundation of critical sub-station and pump station electrical infrastructure occurs for a flood of 1 in 125 year Annual Exceedance Probability (AEP) or worse (27.0 m Australian Height Datum (AHD)). Several climate change models developed as a part of the BRCFS show the frequency of extreme precipitation will increase over time, equating to 2.5 times increase in the probability of a significant flood event occurring within the lifetime of the Mt Crosby facilities.

Inundation by floodwater of critical electrical assets would result in the loss of the electrical supply and consequently water supply from East Bank RWPS. Seqwater estimates the time to repair and source components and fully restore the RWPS to be a minimum of three months and maximum of up to one year. The impacts of a prolonged loss of supply from East Bank are thought to:

- require increased water production and transfer to the central region from relatively expensive sources such as 125Ml/d from the Gold Coast Desalinisation Plant (GCDP) and 125Ml/d from North Pine
- require at least medium level water restrictions (as the loss of supply from East Bank cannot be fully offset elsewhere in the Grid)
- result in general loss of redundancy and reliability across the network

- result in significant reconstruction costs

The substation itself was constructed in the 1940's and is the only one of its kind containing 5.5kV transformers left in Australia. The transformers are obsolete and in need of replacement to avoid failure and loss of electricity supply to the RWPS.

Four project options were considered in the business case:

- Options 1 and 2 involve the provision of a replacement substation in-situ (with 5.5kV and 11kV transformers respectively)
- Option 3 involves a new substation (with 11kV transformers) housed in an elevated structure adjacent to the existing sub-station site, including civil enabling works
- Option 4 involves a new substation (with 11kV transformers) on higher ground, including civil enabling works and the kindergarten relocation

A qualitative assessment found that Options 1 and 2 failed to sufficiently address the service need and were discarded. A subsequent quantitative assessment led to Option 3 being discarded on the basis that it is likely to incur a similar financial cost to Option 4 however delivers a significantly lower level of flood resilience.

- Option 4 was identified as the preferred option and the main components are:
- a new relocated 11KV substation (designed and delivered by Energex with a financial contribution from Seqwater)
- sub-station pad and access road (designed, funded and delivered by Seqwater)
- Eastern Access Road upgrade and new Stumers Road intersection to improve intersection visibility requirements for a design vehicle of 12.5m single unit rigid truck
- shared user path from Mt Crosby weir bridge to the new substation
- new kindergarten relocation of the existing kindergarten due to proximity to new substation site

The total cost for the project components identified in the DBC is estimated to be $35.6M at the P90 level (incurred, nominal) and $37.7M (capitalised in 2023).

Delivery of the scope is a combination of Seqwater direct delivery and a financial contribution to Energex for the construction of the new substation. Energex will procure and deliver the substation itself once the civil pad has been constructed by Seqwater. Seqwater will make a 50% financial contribution to Energex to undertake the substation works ([redacted] contribution). Energex will procure and supply all High Voltage conduits material and other required components that is to be free issued and installed by the Seqwater contractor for the civil works package with the remainder of the project scope to be delivered by Seqwater. There is risk that due to the contribution arrangements that Seqwater does not have control over its costs for the substation component.

Seqwater has included all the expenditure in one project line item which is reasonable however the asset life has been identified as 49 years. Although not material for pricing purposes for this project in reality there are two separate asset types with separate and different asset lives, the Civil enabling works ([redacted] and Seqwater's contribution to the substation ([redacted]) which is assumed to be for Mechanical and Electrical (M&E), however we are unsighted on this cost breakdown as it is held by Energex. We have not been requested to review the asset lives as part of this expenditure review, but we note that this project line includes both Civils and M&E works. We suggest that improvements could be made for the next review where a more detailed approach is taken to identifying a weighted asset life for each project, for example where there are material differences in asset type and life.

We queried why there is a 50% contribution from Seqwater for the funding of the substation and why that level was deemed to be appropriate and equitable from a charging perspective. Seqwater advises that the full costs for the upgrade component and relocation component of the project estimated costs are very similar and that it was pragmatic to assume a 50/50 split of costs between Energex and Seqwater.

We queried whether there is a need to ensure that Seqwater are not in effect paying twice for the project for its contribution to Energex via both its energy tariff (opex) and the separate capital contribution. We are unsighted as to the specific commercial arrangements and it is outside the scope of our review to comment on the regulation of Energex prices and its capital program.

The project appears to be prudent, however Seqwater have limited control over all of the expenditure with a reliance on Energex to ensure efficient delivery of the substation. We have limited view over the detail of the substation expenditure. Where Seqwater does have control over its costs these appear to be efficient in the

context of Seqwater's current capital delivery processes. We do not recommend making any specific expenditure scope adjustments as a result of this project review. We noted above some areas for improvement which would possibly have an immaterial impact on expenditure if there were followed through. This would be a suitable project for an ex-post review at the next QCA determination.

7.5.2.2 Capex Project 5: West Bank – Mount Crosby Monitoring and Control

We identified this project for review due to it being an example of a lower value and routine renewals project where there were a number of related projects identified in the capital program. A detailed project summary can be found in Appendix A.

This Mt Crosby West Bank WTP Monitoring and Control System (MCS) replacement project is one of a number of MCS projects that Seqwater is undertaking to renew and upgrade its on-site operational technology. Seqwater has built up over 50 separate control systems with various vendors over the years. The business case for this project was originally approved in 2015 following the development of a strategic MCS business case. For reasons unknown this project was deferred. At the time of developing the initial Stage 1 scope of this project Seqwater did not have strategy or long term plan for how it plans to operate its SCADA systems into the future. We understand that Seqwater is in the process of developing a new OT strategy with the outcome to identify opportunities for more automation across its sites. At the next expenditure review we would expect to see a strategic OT business case developed which amongst other things identifies key opportunities for operational efficiency savings into the future.

The Mt Crosby West Bank WTP MCS is essential for Seqwater to produce treated water within its quality and contractual requirements. Some MCS components require renewing as they have reached their "end of life" as classified by the original equipment manufacturer or are non-Seqwater standard. The scope of this project entails the detailed design, construction, installation, commissioning, project management and associated controls necessary to renew 3 Programable Logic Controllers (PLCs) as well as the installation of enabling infrastructure for the MCS program and removal of redundant equipment. We understand that this project is being undertaken on a no regrets basis i.e that in the absence of a clearly defined strategy informing a wider program that due to the obsolescence of the current on site technology that this project would need to progress anyway.

Following the long delays in the procurement the completed Preliminary Design determined opportunities to gain efficiencies towards achieving Seqwater's 'End State Plan' including a combined delivery model with the Stage 2 scope of works. This Preliminary Design was thus utilized to revise the Stage 1 Business Case and assist in creating the Stage 2 Business Case. With the Business Cases approved, a Procurement Strategy was developed which was approved by the Program Delivery and Commercial Services Managers on the 22 of April 2020.

As mentioned, this project is one of a number of similar MCS projects that Seqwater has undertaken in the current period and plans to the future period. We have not seen any evidence that Seqwater has put together a strategic programme where individual projects could be packaged and procured together. We would expect that packaging or bundling of these projects would realise more efficient expenditure outcomes.

We have not made any specific scope adjustment recommendations, but we have taken the findings here into consideration with respect to our recommendations on efficiency of bundling or packaging of capital projects for procurement.

7.5.2.3 Emergent works allowance

In the Seqwater pricing model there is a capex line ' allowance for emergent works' with $3.075M p.a. allocated from 2022. We queried how the amount for this proposed capital expenditure allowance was derived and when the expected commissioning date was given that this is an allowance and not attributed to a specific project. Seqwater responded that:

"The emergent works allowance is to enable emergent projects to be developed to address unplanned asset failures. The value was derived from historical figures, in FY19/20 $3.09M was spent on emergent works and $4.8M in FY20/21."

Emergent work is classified as an unplanned asset failure that has occurred and needs to be replaced in order to maintain water quality and supply, in some circumstances this can be a project identified in future years of the APMP that has failed prematurely. The projects are prioritised through the emergent works prioritisation tool with the aim of completing the projects in the same financial year that they are raised.

Each project that is brought into the emergent works program is then allocated an individual project number and the costs forecasted each month with the allowance being reduced accordingly.

The allowance is for budget purposes and will never be commissioned only drawn down for budgeting and forecasting purposes. Rather, the emergent projects that are funded by this allowance will commission on a normal project basis through the capitalised actuals process."

We cannot recommend an expenditure allowance for this line item given the weak justification for its inclusion and lack of a business case. Although we recognise that there are known unknown expenditure items that will be required, we note that, overall, in recent years there has been an underspend against the regulatory allowance, and we would expect that some works will be reprioritised within the envelope of expenditure. Prudent and efficient capital expenditure on emergent works over and above the regulatory allowance can be evaluated via an ex-post review at the next price determination.

Table 7-11 - Emergent works allowance capital expenditure ($000k)

FY ending June	2022	2023	2024	2025	2026
Emerging works allowance - Seqwater proposal (incurred)	3,075	3,075	3,075	3,075	3,075
Emerging works allowance - Seqwater proposal (capitalised)					17,177
Emerging works allowance - Atkins Recommended adjustment (capitalised)					(17,177)
Emerging works allowance - Atkins Recommendation (capitalised)					0

Source: Seqwater pricing submission, August 2021; Atkins analysis

7.5.3 Dam safety compliance program

Legislative compliance with dam safety legislation and state / federal guidelines are primary drivers for the dam safety upgrade works and planning. The legislation starts with the Queensland Water Act 2000 and the Water Supply (Safety and Reliability) Act 2008 which stipulate that dams must be kept safe, maintained under a range of guidelines, which have been issued in the state of Queensland but are based on ANCOLD guidelines.

These include the Queensland Dam Safety Management Guidelines (updated 2020), the guidelines for Failure Impact Assessment (updated 2018) and the guidelines for Acceptable Flood Capacity for dams (updated 2019).

The Portfolio Risk Assessment (PRA) carried out in 2013 on Seqwater's 26 dams showed that ten of their dams were above the limit of tolerability in terms of probability of dam failure against likely loss of life due to dam failure. A significant outcome of this PRA was a large increase in the estimates of likely loss of life compared to earlier assessments, partly due to changes in inundation modelling, mapping, and hydrological estimating methods, and partly due to increased residential developments and populations at risk in the valleys downstream of dams.

The three updates in guidance in a similar period that followed 2013 added impetus to the need for dam safety upgrades, for example the Acceptable Flood Capacity regulations, updated in 2019 led to reviews assessing the spillway capacity of the dams (their ability to safely pass extreme floods). This assessment would have affected the scale of the spillway upgrade works at Ewen Maddock and Leslie Harrison dams for example.

Updates to Portfolio Risk assessment (PRA), 2021

The PRA was revised in 2021 with the following changes, which are shown in Figure 7-4 below.

- Works have been undertaken on several "minor" dams to reduce their risks down to below the limit of tolerability.
- Leslie Harrison and Ewen Maddock dams were the two major dams which were prioritised as being the furthest from the tolerable limit in the 2013 PRA, and their risks were reduced down to the tolerable zone by the two capital projects completed in 2021.
- New information on the largest three remaining dams in the intolerable zone, (Wivenhoe, Somerset and North Pine dams) has actually increased their risk rating further. Seqwater have proposed planning for, these three dam safety upgrade projects in the future period with construction due before October 2035, with the aim of pushing and keeping all Seqwater dams in the tolerable risk zone.

The updated PRA21 has informed the pipeline of major projects related to dam safety and their timing although a detailed program of timing and expenditure has not yet been developed. We comment in Section 6.7.5.9 on our recommendations of approach to strategic planning of these projects.

7.5.3.1 Lake Macdonald Dam Upgrade project

Lake Macdonald Dam upgrade has been proposed in the future determination period. This was not one of our chosen focused projects for review because we were informed early in the review process that the detailed scope was still to be defined and that Seqwater was revising the business case for this project. This project was included within the APMP and therefore taken forward in Seqwater's pricing submission which proposed to capitalise $140.1M of expenditure in 2025. We are informed that the revised forecast for this project is going to be greater than [redacted] and that the program will be delayed. We have therefore proposed an adjustment to Seqwater's capital expenditure to allow deferring the commissioning out to 2027. We requested an updated expenditure profile and capitalisation date from Seqwater as part of the review process but due to the ongoing review they did not provide any alternative spending profile. We recommend deferral of the year of capitalisation rather than make any adjustment to the quantum of expenditure as we have no other information with which to make an informed assessment.

7.5.4 Growth

The South West pipeline is the most significant project with a primary growth driver that Seqwater proposes to complete and capitalise in the future period. Beyond this growth projects do not make up a significant proportion of Seqwater's proposed capitalised expenditure in the future period after 2023. As mentioned

previously we consider that a more sophisticated approach to proportional cost allocation by driver may provide additional useful management information for investment decision making.

7.5.4.1 Capex project 6: South West Pipeline

Figure 7-5 - South West Pipeline project schematic

We identified this project for detailed review as it provided an example of a project within the Major Projects Group where construction is about to commence and there is significant expenditure to be forecast in the future period. A detailed project summary can be found in Appendix A.

The South West Pipeline project is part of the wider Beaudesert water supply project. Beaudesert is not currently connected to the wider Seqwater Grid and according to the Water Security Plan 2017 (version 2) Beaudesert is the only community that does not meet the level of service objectives set by the Queensland Government for the South East Queensland bulk water supply system. The Beaudesert Water Treatment Plant (BWTP) does not have the capacity to meet peak demand and output volume is also limited by raw water quality due to catchment degradation Demand is also expected to increase from an average of 1.9Ml/day in 2017 to 14Ml/day by 2046 with an expected peak demand of 20Ml/day. In 2017, following extensive planning, Seqwater identified a four-stage strategy for the Beaudesert WSZ, which would be progressively implemented over time. The South West Pipeline is one component of the Beaudesert WSZ project with the other major project being a new WTP at Wyaralong. Various options, sub-options and arrangements were considered as part of the development of the Detailed Business Case with the preferred option chosen as a 23km bulk water pipeline connecting BWTP storage reservoirs to the new Wyaralong WTP which will connect Beaudesert and the Scenic Rim to the SEQ Water Grid.

The SWP has been through a number of external reviews and challenges to reduce the costs and identify an optimum solution. Following Board approval in December 2018, the Detailed Business Case (DBC) for the SWP Project was submitted to Seqwater's responsible Ministers on 20 March 2019 requesting approval of a project budget of $134.6M (excluding GST). Following consultation on the DBC with relevant State Government agencies, Seqwater commissioned an Independent Peer Review (IPR) of the DBC and subsequently prepared a DBC Addendum in October 2019 addressing the outcomes of further reviews into the service need, preferred solution and preferred procurement strategy. On 8 March 2020, the Government approved $95M(excluding GST) in funding to construct the SWP.

We queried why within the original DBC approved by Seqwater that there was an Early Contractor Involvement (ECI) arrangement proposed that was subsequently amended to a direct selection of the contractor to deliver the Project under a Design and Construct Contract. Seqwater's view was that utilising an ECI approach would incur additional resource costs which would likely exceed the risk and innovation benefits given improved understanding of geotechnical, approvals, and environmental risks since completion of the DBC.

Seqwater entered into a competitive procurement process with three shortlisted contractors invited to submit proposals which then reduced to two to submit BAFOs with Comdain Infrastructure selected to design and construct the pipeline.

Expenditure for the total SWP project value reconciles with the various documents we have been provided in Table 7-12 below.

Table 7-12 - South West Pipeline expenditure reconciliation

Source	Value ($M)	Comment
Detailed Business Case - Addendum	95.20	This is base expenditure in 19/20 prices
APMP 21	101.05	This is including $5.8M for the development of the detailed business case
Capitalised in the regulatory pricing model	108.01	This includes financing costs

Source: Seqwater SWP project summary and Atkins commentary

The total budget requested for approval for the overall package of works (as part of submission to the Board on 10 December 2020) including construction is $95.2M (excluding GST) including risk and contingency of [redacted] which is [redacted] on base capital cost

The project is at Gate 4 – readiness and the work plan provided indicates that early site works are due to commence is October 2021 with the main construction to begin in December 2021. This appears to align with the timings in the business case. There is some uncertainty around the timing of the growth and demand projections in the Beaudesert community, however given the future projections and how far progressed the project is in terms of planning and contractor procurement we do not recommend any adjustments based on the timing of expenditure or proposed capitalisation. Date for Practical Completion is 30 June 2022, which is consistent with the work plan provided, followed by a twenty-four-month defects liability period where some minor project costs may also be capitalised.

Our main challenge in the review of this project was not around the prudency of the chosen scheme but around how the total costs for the pricing review had been compiled and escalated. We noted that if Seqwater were to apply its nominal escalation approach consistently to this project that the total outturn estimate proposed should have been higher in the pricing model. We understand that Seqwater's approach is that once a business case has been approved, Seqwater cannot spend beyond that investment approved figure (even if it is for nominal escalation). We would agree that on this basis the estimated outturn of $108M capitalised would be conservative if the nominal escalation had been captured within the approved business case and it was transparent how these costs have been escalated over time.

We are satisfied that overall, the project has been developed in line with the guidelines for business case development to the P90 level although there is a lack of clarity and transparency as to how escalation factors have been applied. Given the relative low level of complexity for this particular project we would expect the project to outturn at a lower cost in real terms than has been proposed in the pricing model. We suggest that this project is given a detailed ex-post review at the next QCA price review.

We noted through our review that additionally to the expenditure proposed to be capitalised in the future period that Seqwater had capitalised $1.2M in the current period. Seqwater would in effect be recovering these costs twice both in the current period RAB and future period as capitalised. We queried this with Seqwater who confirmed that $1.2M is capitalised in the current period and relates to a land purchase required for the delivery of the project, the cost of which was included in the $95.2M business case addendum and should be netted off from the proposed expenditure in the future period. Due to the financing costs applied in the pricing to the $1.2M which has already been capitalised this reduces the recommended capitalised costs by $1.4M to $106.6M as shown in Table 7-13 below.

Table 7-13 - South West Pipeline recommended capitalised expenditure ($000k)

FY ending June	Capitalisation	2020	2021	2022	2023
Seqwater proposed South West Pipeline ($ incurred)	2023	6,534	11,450	75,300	7,766
Seqwater proposed South West Pipeline ($ capitalised)	2023				108,013
Atkins recommended adjustment ($ capitalised)	2023				-1,425
Atkins recommendation South West Pipeline ($ capitalised)	2023				106,558

Source: Seqwater pricing submission August 2021; Atkins analysis

7.5.5 Improvement – Energy projects

Seqwater's APMP states that renewable energy generation asset development has been deferred to the outer years with some early works continuing on solar. Seqwater have included some $725k of capex within its pricing submission for and Energy Modelling and Analytics platform (EMaAP). There is no significant capex identified to progress any energy efficiency initiatives or pursue any renewable energy projects in the future period. There does appear to be a misalignment here with the projects and expenditure Seqwater is proposing and its overall Energy Strategy as discussed in Section 4.3.5. There is limited justification for not advancing projects which Seqwater itself has already identified will yield energy savings and therefore operational expenditure savings.

7.5.5.1 Energy efficiency

Seqwater advise that "to date its energy efficiency projects have not been given a priority over investment in aging assets critical to operations and that it is continuing to refine and improve the prioritisation process. Energy efficiency projects will continue to be considered through:

- APMPs Prioritisation Process
- The bundle of energy efficiency projects with other projects
- Strategic funding"

and that "it will seek to bring forward investment in energy efficiency projects so that benefits in energy purchase and carbon savings can be realised earlier than currently scheduled"

Seqwater conducted 23 site energy audits between 2019 and 2020 with over 164 energy efficiency opportunities identified with potential to save more than 37 GWh in annual consumption. This represents around 20% of Seqwater's total energy consumption depending on the prevailing operating environment with opex savings estimated to be $4M p.a. identified within Seqwater's Energy Efficiency Opportunity Register (EEOR). We consider that expenditure on Energy Efficiency project would be prudent expenditure to advance in the future determination period due to both the alignment with the Seqwater's own Energy Strategy and the very short payback periods. Our recommended expenditure on energy efficiency projects is shown in Table 7-14.

Table 7-14 - Seqwater proposed capital expenditure on energy efficiency projects and Atkins recommended expenditure ($100k)

FY ending June	Capitalisation	2023	2024	2025	2026	2027	2028
Seqwater proposed energy efficiency ($ real)	ongoing	0	0	0	0	0	0
Atkins recommendation ($ nominal)	ongoing	348	502	1,689	844		-

Source: Seqwater RFI 173 and Atkins analysis

We recognise that our scope is to recommend an overall envelope of prudent and efficient expenditure rather than approve specific projects. Our scope is not to opine on any specific outputs for the future determination period however on balance we consider that expenditure on these capital projects, rather than utilising

operating expenditure on GHG abatement, is far more prudent and aligns with Seqwater's own emissions hierarchy (discussed in Section 6.7.5.6).

7.5.5.2 Solar project

Seqwater have not proposed any capital expenditure for PV solar renewable energy projects on any of its sites in the future period despite short payback periods. Seqwater's own EEOR and analysis provided as part of this review indicates payback period for solar projects in as little as one year. Seqwater have not provided any strategic business case for its energy expenditure and there does not appear to be any business case which balances the trade-offs of timing between its proposed GHG abatement operational expenditure and alternative options to meet its objectives in its energy strategy. There appears to be a clear opportunity for Seqwater to invest in capital solar projects to save operational expenditure. We consider this to be prudent expenditure.

Seqwater has identified expenditure of $13.4M in solar that would realise energy savings estimated to be 12.4GWh over four years. Seqwater has proposed to defer this expenditure to the FY27 to FY30 period. We consider that this expenditure should be advanced into the future period due to both the alignment with Seqwater's own Energy Strategy, the very short payback periods and to realise operational efficiencies sooner. Our recommended expenditure on solar projects is shown in Table 7-15.

Table 7-15 - Seqwater proposed capital expenditure on solar projects and Atkins recommended expenditure ($000k)

FY ending June	Capitalisation	2023	2024	2025	2026	2027	2028	2029	2030
Seqwater proposed solar capex ($ real)	N/A	0	0	0	0	4,314	3,000	3,000	3,000
Atkins recommendation ($ nominal)	ongoing	0	4,532	3,231	3,311	3,394	-		

Source: Seqwater RFI 164 and Atkins analysis

As discussed above we consider that expenditure on these capital projects, rather than utilising operating expenditure on GHG abatement, is far more prudent and aligns with Seqwater's own emissions hierarchy (discussed in Section 6.7.5.6).

7.5.6 Recategorization of expenditure between opex and capex

Below we comment on those items of expenditure that we have identified that should be recategorized.

7.5.6.1 Wivenhoe gate refurbishment

Normal maintenance of Wivenhoe gates includes annual inspections and touch-up painting which Seqwater ordinarily class as operational expenditure. In 2014 Seqwater developed a more extensive business case for a wider project of touch-up painting and these costs were included within opex for its June 2021 QCA pricing submission. The total costs of this project at the time were assessed to be around $7M. As part of our review of all opex cost we queried whether this expenditure should more appropriately sit within the capex program given that the scope of the work will extend the life of the assets. Seqwater have agreed with our assessment and we make the following recommendation to increase recommended capital expenditure and reduce the commensurate operating expenditure allowance.

Seqwater provided the following table of the expected timing of when the costs are expected to be incurred. As this is a renewals project capitalisation is expected in the following year given the requirement for an appropriate defects liability period.

Wivenhoe gates refurbishment expected capital expenditure incurred.

Table 7-16 - Wivenhoe gates refurbishment expected capital expenditure incurred ($M)

2022	2023	2024	2025	2026	2027	Total Project cost ($)
0.5	1.1	2.2	1.1	1.1	1.1	7.0

Source: Seqwater RFI160 response
Note: total does not reconcile due to rounding

Table 7-17 - Wivenhoe gates refurbishment expected capital expenditure capitalised ($M)

2023	2024	2025	2026	2027	2028	Total Project cost ($)
0.5	1.1	2.1	1.1	1.1	1.1	7.0

Source: Seqwater RFI160 response
Note: total does not reconcile due to rounding

The capitalisation figures provided by Seqwater did not include any allowance for escalation. We have adjusted this expenditure profile using the standard escalation factors in Seqwater's pricing model to give our recommended expenditure as capitalised below.

Table 7-18 - Atkins recommended capital expenditure Wivenhoe gates refurbishment (capitalised including escalation) ($M)

2023	2024	2025	2026	2027	2028	Total Project cost ($)
0.5	1.2	2.3	1.2	1.2	1.3	7.7

Source: Atkins analysis

7.5.7 Digital, Technology and Information (DTI)

7.5.7.1 Strategy, structure and performance

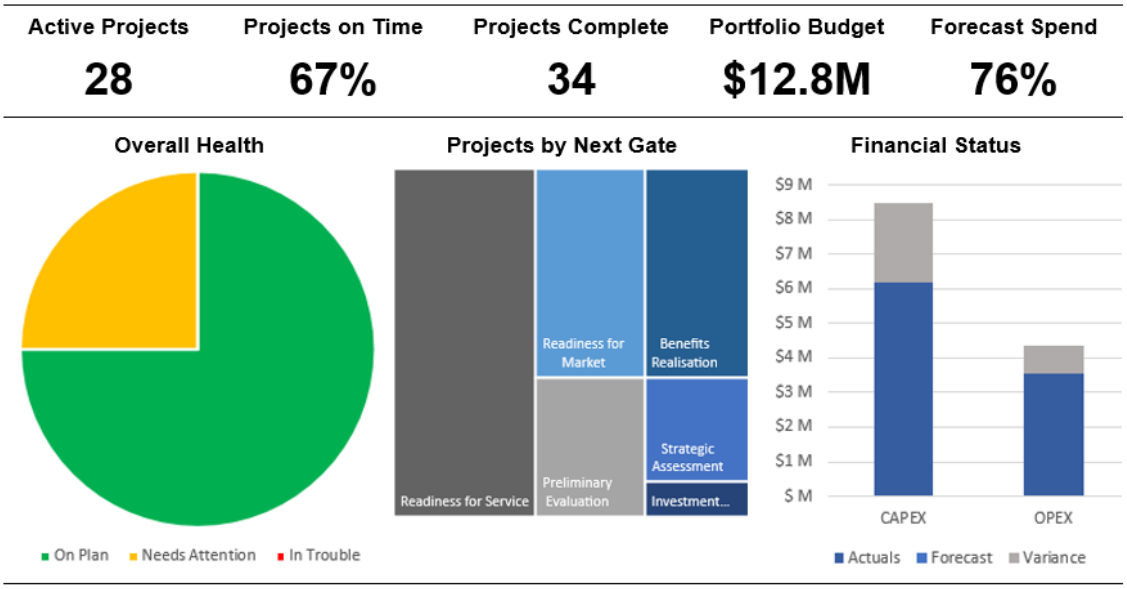
Overall, we have concluded that DTI's strategy and structure is appropriate and fit for purpose. The DTI group was established as part of the organisational change delivered in 2019 in order to maximise the value of technology related business investments by blending the Information, Communications and Technology (ICT) and Operational Technology (OT) functions. This is a trend we have seen in other water utilities in Australia and globally and allows the company to optimise its functions and standardise processes and also associated resources.

There was clear evidence that the digital strategy is aligned with business drivers and that weaknesses are recognised, and projects and renewals are focused on improving existing systems and using technology to enhance business operations. Seqwater summarises the role of "digital" against six headings:

- Safety – promoting safety when working on assets
- Efficiency – both in the way people work and also specifically related to energy consumption
- Connectedness – Access to latest information when and where it is needed
- Responsiveness – Testing and then deploying new solutions
- Viable and Sustainable – Minimise environmental footprint
- Knowledge driven – Reliable, complete and accurate information for decision-making

We reviewed governance including monthly Management Reporting and the DTI End of Year Report covering opex and capex, solutions delivery and services delivery, with KPIs for Service Availability, ICT Operations, Business Systems, Process & Analysis and Cyber Security as well as a large number of KPIs linked to strategic objectives. We could also see evidence that compliance, controls and risk management are being actively monitored and managed.

Figure 7-6 - Extract from Management Report for Solutions Delivery



Source: Seqwater solutions delivery management report

The one area where there has been some potential inefficiency relates to benefits realisation on projects. Benefits management is focused on ensuring that the organisation defines and manages the value that it anticipates gaining from an investment. Seqwater undertook a P3M3 organisational capability maturity assessment in early 2021 and as anticipated DTI scored low in this area. It was widely understood

> *"…that work was required to improve the maturity and performance of projects…. The timing of this assessment is ideal to inform the improvement plans"*[45].

As a result, a new benefits management process and procedure were implemented from 1st July 2021 which aim to drive performance from what would be considered a relatively immature level to a reasonable level. This is an important consideration for an expenditure review because we use past performance on benefits realisation as a proxy for considering the efficiency of future expenditure. The changes made to benefits realisation including individual benefits registers for all DTI projects should allow for more robust review of ex-post expenditure in the future, both internally and as part of the QCA price review process. The findings of the P3M3 assessment stated:

> *"This does not mean that these projects, individually, are not performing well, but it does mean that most likely the delivery of projects is more expensive than it could be"*

and based on the information we have reviewed we would agree. As capability and maturity are generally improved incrementally, we concur with the assessment findings that this is likely to take about 2 years for DTI to reach the more cost effective P3M3 level (3.0) for an organisation.

We could also see clear evidence of a robust and effective prioritisation process to keep within a constrained budget. The main issue we identified in our review was that "spend to save" projects are not a focus of Seqwater and are not present within its pricing submission[46]: The constrained budget does appear to focus expenditure on essential renewals which means there is very limited opportunity for the realisation of potential efficiencies through a more strategic approach with a longer term view.

7.5.7.2 Project expenditure

We focused on two major areas of expenditure: the implementation of the Enterprise Resource Platform (ERP) and asset renewals.

The ERP was the main focus of the last review and we note that the solution presented at the time, which was described as a transformational project involving the major design and implementation of a new system, has been replaced by a solution which is uplifting the existing technology by improving foundational basics through renewals and upgrades in the existing ERP. In summary, Seqwater has been moving in a phased way from a

[45] P3M3 Assessment, Axelos Consulting (April 2021)
[46] RFI 142 response: *"There are no spend to save efficiency projects that can be singled out from the broader transformational program".*

legacy product module by module to an on-premise capability (hosted by CiAnywhere) and will then ultimately migrate to a Cloud based Software as a Service (SaaS) solution. This is the best approach to manage risks to the business from a prudency perspective and compared with the original plan, it is significantly more efficient in terms of total costs. However, we identified that as 2019/20 is used as the base year for operational expenditure, Seqwater was not taking account of the move to Cloud / SaaS platforms for the ERP project. This has been quantified as an increase in opex by $0.5M per annum from July 2022[47] and we have proposed an adjustment from 2022 to 2026 (discussed in Section 6.7). We would expect there to be a shift commensurate in the long-term capital expenditure but only potentially a small reduction in cost over this period. We have therefore not recommended any changes to the ERP capex proposed by Seqwater as there is no way of quantifying these potential reductions have and they are likely to be immaterial from a pricing perspective.

We also reviewed the historical and future expenditure related to DTI asset renewals, which is the single largest item of capital expenditure. Like nearly all organisations, Seqwater has an ongoing need to maintain its ICT and OT asset functionality through asset renewals[48]. The key drivers are to:

- Reduce risk of asset failure
- Ensure support from original manufacturers and suppliers
- Allow installation of latest software (this underpins cybersecurity management)

The renewal program is driven by the Asset Class Plan with an estimated useful life and the ratio of spend across the different IT asset classes adjusting depending on the lifecycle stage. This is standard practice, and we could also see from a review of the asset ages that the assumptions are reasonable, i.e. there is evidence of sweating the assets where appropriate. We also confirmed the approaches to procurement, including benefitting from Whole of Government Contract to maximise purchasing power. Overall, we considered both the replacement cycle and the associated procurement as prudent and efficient, and we have not identified any reason to propose adjustments.

7.5.7.3 Future expenditure reviews

For future expenditure reviews, we recommend that IT related expenditure is presented as total expenditure. Seqwater's submission focused on capex but due to significant changes in the IT landscape in the last five years, the scale of capital and operational expenditure is of a similar magnitude with the trend that expenditure is moving increasingly from capex to opex. Focusing only on capital expenditure does not therefore provide a full and accurate picture against which to assess prudency and efficiency of IT expenditure. Notwithstanding this observation, Seqwater was able to demonstrate in response to our lines of enquiry that they consider whole lifetime costs in investment decisions and that their technology is shifting to Software as a Service ("SaaS") Cloud-based solutions in line with industry best practice, even if their uptake is slightly behind the curve.

7.5.8 Drought allowance capex

The Referral Notice requires QCA to recommend a drought allowance which could be applied in addition to prices under normal operating conditions*, "expected to provide Seqwater with total revenue sufficient to recover prudent and efficient costs associated with Drought operating conditions"*. It defines Drought operating conditions as *"a situation where Seqwater is operating at or below the 'Drought Response' trigger per the published SEQ Water Security Program for the length of the Regulatory Period".*

As part of its drought cost submission[49] Seqwater estimated the incremental costs for a "drought allowance". Additionally, it has requested the costs for the recommissioning of Luggage Point AWTP. We comment below on each of these components.

[47] RFI response 170: *"Seqwater's current on-premise ERP costs are ~$1M opex ($958k vendor support and maintenance and $45k internal resources) and $90k capex (infrastructure) per annum; under the new SaaS arrangement it is expected this will change to ~$1.5M opex per annum. No changes to internal resources are expected. The increase in opex costs will take effect from July 1, 2022".*

[48] There are six categories of asset type:
1. User Compute: PCs, laptops, monitors mobile telephones, etc, which is by far the largest asset class
2. Data Centre Combined: Firewall, load balancers, etc
3. Regional Devices: Switches, UPS, VM servers, etc
4. Minor works: Fibre, cabinets, antennas, etc
5. Operational Technology: Switches, workstations, etc
6. Audio Visual: Screens, devices, etc

[49] Source: Seqwater document "Submission Drought Calculations 2021-08-30 POI"

7.5.8.1 Recommissioning of Luggage Point AWTP

Seqwater is in the process of a full WCWS restart including recommissioning of the 3 trains at Luggage Point AWTP. Seqwater has proposed capital expenditure for Luggage Point recommissioning under normal operating conditions. O&M capex identified within the Annual Asset Renewal Program (AARP) is estimated to be $18.1M for recommissioning of LP3 in FY22 (current period) and c$3M p.a. for ongoing renewals which is $12.2M capex over the future period. We understand that Seqwater has the ability to defer AARP capex costs depending on how quickly the assets needs to be made operable, in drought this is assumed to be immediate.

The expenditure on the ongoing renewals at Luggage Point will be dependent on whether the drought continues or the drought breaks in summer 2021/22 i.e. dam levels would be above or below the 60% trigger point as per the WSP17 (we understand this may change based on the update WSP 2021). We recommend that the proposed expenditure for renewals at Luggage Point 3 in the future period is either included or excluded from the final pricing determination depending on the prevailing conditions, dam levels and triggers identified in the update WSP 2022. The expenditure appears to be prudent if the drought continues with the level of expenditure appearing to be efficient notwithstanding the improvement Seqwater is making to its capital processes. We have made an adjustment for the renewals component of capital expenditure and separated this out into the drought allowance capex as it is contingent expenditure.

Table 7-19 - Luggage Point 3 capital expenditure in the future period ($000k, capitalised, nominal)

FY ending June	2023	2024	2025	2026	2027	2028
Seqwater proposed expenditure	2,968	3,024	3,087	3,159	3,234	3,312
Atkins recommended expenditure – Drought continues	2,968	3,024	3,087	3,159	3,234	3,312
Atkins recommended expenditure – Drought breaks	0	0	0	0	0	0

Source: Seqwater pricing submission, August 2021; Atkins analysis

We suggest the $18.1M capex in FY22 for the recommissioning is reviewed at the next determination to review ex-post from a prudency and efficiency perspective.

7.5.8.2 Full recommissioning of WCRWS

Seqwater is proposing that the WCRWS is fully recommissioned to increase water production from 70Ml/d in 2023 ramping up to 162Ml/d in 2026. Within Seqwater's supplementary drought cost submission it has proposed $109M (nominal) capital expenditure for the WCRWS recommissioning between FY23 and FY25. This is based on a FY21 real $ input of $101M for the recommissioning.

Seqwater has provided no basis for the build-up of this expenditure, with no source documents identified, indeed this amount is not even mentioned within the written submission document Seqwater provided to QCA. Capital charges for FY25 and FY26 of $3M and $7M respectively are assumed but again we have been unable to trail the basis for these charges to source.

As set out in our review of the associated opex costs in Section 6.7.8, Seqwater has not yet demonstrated to us that these costs are prudent, in terms of the confirmed sales for PRW or efficient though demonstrating that least cost-efficient solutions are proposed. We have therefore recommended that incorporation of this very significant expenditure should be subject to a further prudence and efficiency test.

In the meanwhile, and as a holding position, we have presented the costs in the drought allowance capex line unmodified apart from applying the catch-up and continuing efficiencies as discussed below.

Table 7-20 - WCRWS capital expenditure in the future period ($000k, capitalised, nominal)

FY ending June	2023	2024	2025	2026	2027	2028
Seqwater proposed expenditure	35,564	36,334	37,219	0	0	0
Atkins recommended expenditure – Drought continues	35,564	36,334	37,219	0	0	0
Atkins recommended expenditure – Drought breaks	0	0	0	0	0	0

Source: Analysis of Seqwater spreadsheet " Submission Drought Calculations 2021-08-20 sent to QCA "

7.5.9 Capital expenditure efficiencies

Seqwater has not offered up any capital efficiencies within its forecast pricing proposal neither applying a continuing efficiency (frontier shift) or any catch-up efficiencies based on improvements it is making its capital processes.

7.5.9.1 Continuing efficiency

We recommend applying a continuing efficiency adjustment, also known as Frontier Shift, to take account of the ongoing improvements that even efficient utilities should be able to make over time, as more productive ways of working emerge. For operating expenditure Seqwater proposed a continuing efficiency of 0.2% but there has not been an equivalent applied to its capital expenditure proposals. We consider that there are Frontier Shift productivity gains to be realised within both opex and capex and this is supported by Frontier Economics submission to QCA in support of Seqwater's pricing submission in that organisations may substitute efficiently between capital and non-capital inputs to production. We suggest applying our recommended 0.5% efficiency to capital expenditure as well as operating expenditure, we have applied this from FY23 as unlike for opex there is no base year for capital expenditure. We discuss why we have arrived at 0.5% for this review in Section 6.7.7.1.

Table 7-21 - Recommended continuing efficiency challenge

Cumulative efficiency challenge	2023	2024	2025	2026	2027	2028
Continuing efficiency at the Frontier (%)	0.50	1.00	1.49	1.99	2.48	2.96

Source: Atkins analysis

7.5.9.2 Catch-up efficiency

'Catch-up' efficiency refers to the fact that, because water utilities are not operating in a competitive market, they are not compelled, through competitive forces, to be efficient. As such, they may be operating 'behind' the efficiency frontier (either carrying higher costs and/or delivering worse outcomes or performance than would arise in a competitive market).

Seqwater have not applied any internal efficiency challenge on any of its capital program, either in the round or at sub-program level. We would expect Seqwater to make efficiency savings considering the improvements that Seqwater continue to make to its capital processes. We queried this with Seqwater who advised that their key areas of corporate focus are on capital delivery and their asset management framework improvements; it was explained that efficiency is not a key area of focus for the organisation at the current time. This is demonstrable through the Seqwater pricing model for which the capital expenditure proposal is a direct lift from its APMP, with some minor scope changes and escalation factors applied.

Given that no efficiencies have been included within the capital expenditure program in the regulatory pricing model submitted to QCA, we have sought to identify, throughout our review, where there are opportunities to realise achievable efficiencies throughout the future determination period. These primarily relate to initiatives that Seqwater are already undertaking and some further opportunities and recommendations that we have identified throughout the course of our review. We have identified three areas where Seqwater should be able to make material improvement to its processes to move towards the efficiency frontier utility level over time and deliver material efficiencies over the next Determination period. These are:

i. Capital planning and asset management
ii. Contingency management and cost estimation
iii. Bundling or packaging of projects for procurement

Each of these areas is defined and briefly discussed in the following sections.

We apply these efficiencies on the incurred capital expenditure proposed as provided within Seqwater's pricing model. We have calibrated the level of capital process catch-up efficiency against similar process we have reviewed previously within other utilities in Australia, UK and other jurisdictions as well as taken into consideration timing of specific improvements, achievability, and when those efficiencies may come through. We acknowledge that there is a degree of subjectivity in the analysis, however, the relative subjectivity does provide a good test for utilities to catch up to industry peers. Incentive mechanisms which are assessed (rather than merely initially calibrated) on a relative basis typically provide a sharper incentive than absolute targets, in part because of the greater reputational incentives of being ranked relative to industry peers. Relative mechanisms are seen as more powerful, especially for utilities seeking to catch-up industry peers.

Capital Planning and Asset Management

Seqwater's Asset Class Plans do not appear to be readily linked to its decision making or expenditure proposals. Seqwater's focus of its Asset Class Plans is on asset condition. Service levels, performance of assets or risk and operations do not appear to be key drivers of expenditure decision making and these have not been utilised by Seqwater in the development of its expenditure and pricing proposal. Enhancing links between Seqwater's asset performance and its expenditure proposals would likely improve how Seqwater effectively directs and targets its investment and expenditure. Expenditure on assets should be linked to how the assets are expected to be performing in the future and the incremental difference between how they are performing now coupled with an understanding of their deterioration characteristics. Performance parameters can include but not limited to asset availability, reliability, quality, resilience, and operational and environmental requirements.

We consider that there are efficiencies to be realised here in the future and that Seqwater has some way to go to improve its processes in this area. We have deferred the start of this efficiency to 2024 in order for Seqwater to start on this journey. We would then expect that increasing efficiencies can be realised towards the end of the future period and beyond 2027 as performance becomes an input for decision making on capital expenditure.

Table 7-22 - Recommended catch-up efficiency - capital program development and asset management

Cumulative efficiency challenge	2023	2024	2025	2026	2027	2028
Catch-up: capital program development and asset management (%)	-	0.50	2.00	2.00	3.00	3.00

Source: Atkins analysis

Contingency and cost estimation

Seqwater's project cost contingency is all held at project level by project managers and there are currently no more sophisticated approaches employed to managing costs contingency at a program or portfolio level. Managing risk and holding contingency at the portfolio level can be more efficient than providing each project with contingency to cover common risks. Seqwater have not evidenced any of pooling of projects where there may be common risks, this may be particularly applicable for smaller similar projects and increasingly with some of the major project in the pipeline. Identifying these risks and associated cost contingencies at an earlier stage may reduce initial project budgets particularly when basing contingencies on a risk management approach rather than for example uplifts informed by optimism bias or to meet the defined P90 level.

We consider that there is an opportunity for Seqwater to realise efficiencies here by reviewing and improving the way it manages risk and contingency across its portfolio, particularly for similar and related projects. We recommend applying a 0.5% efficiency in 2023 rising to 2.0% by 2026 for contingency management.

Beyond the immediate future period we would expect that Seqwater is able to realise efficiencies from a historical unit cost database. This will take time to develop and embed as a BAU process and tool so we would not expect to see significant efficiencies from this realised in the immediate future period to 2026.

Table 7-23 - Recommended catch-up efficiency – contingency management and cost estimation

Cumulative efficiency challenge (%)	2023	2024	2025	2026	2027	2028
Catch-up: contingency management and cost estimation	0.50	1.00	2.00	2.00	3.00	3.00

Source: Atkins analysis

Bundling or packaging projects for procurement

Budling of projects is an objective within Seqwater's APMP, a number of key examples were provided of how efficiencies are expected to be realised however there was no evidence that these projects had been subject to any efficiency challenge at this stage.

For bundling of projects these refer to smaller projects either through geography or through type of project. Seqwater informed us that no efficiency challenge had been applied to these projects as they *"don't yet know what the expected efficiencies will be of bundling those projects together. We've chosen to be inherently conservative." And "a lot of the projects don't lend themselves to bundling, so particularly larger ones. This is really just the smaller ones that get bundled up"*

In its pricing submission Seqwater identified the following programmes over FY22 and the future FY23 to FY26 determination period for budling of projects:

- Noosa Regional Program: 14 projects ($9.2 million over five years)
- Mt Crosby Program: 38 projects ($44 million over five years)
- Gold Coast Program: 45 projects ($17.6 million over five years)

Seqwater further informed us that it has so far identified 19% of its future four year capital program (on an incurred basis) that is suitable for bundling. We recognise that the expected efficiency benefits will only be quantified after the projects have been completed, however there has been no linkage between the bundling Seqwater has identified, and its expenditure proposal. Seqwater appears to have only identified those projects that are expected to be bundled in the future and has not included those projects that are already in train and should have been identified for bundling earlier in the process of developing its pricing submission. We have taken a broader view of Seqwater's capital plan and have identified that on average between FY23 and FY28 around 46% of Seqwater's capital programme is suitable for bundling or packaging projects for procurement, including projects already progressed through the gateways. For example: Seqwater has proposed expenditure allowances for Long Term Renewals projects across many sites equivalent to $24M capex in the future period; Seqwater has not included these with its list of projects provided to us which it has identified for bundling. We consider that there are opportunities for Seqwater to look at this again in more detail to identify a broader range of projects suitable for bundling. The remainder of its capital program appears to be on larger and more discreet projects which lend themselves less well to bundling. We consider that there are quick wins to be had here with at least 3% efficiency to be gained on these projects from FY23 with a moderate increase thereafter.

Table 7-24 - Recommended catch-up efficiency – capital procurement and project packaging

Cumulative efficiency challenge (%)	2023	2024	2025	2026	2027	2028
Catch-up: capital procurement and packaging gross efficiency (%)	3.00	4.00	5.00	6.00	6.00	6.00
Catch-up: capital procurement and packaging net efficiency (%) (applied to 46% of capital program)	1.39	1.86	2.32	2.79	2.79	2.79

Source: Atkins analysis

7.5.9.3 Cumulative efficiency recommendation

Our total recommended cumulative efficiency challenge for capex including continuing and catch-up in the future period and out to 2028 is provided in Table 7-25 below.

Table 7-25 - Recommended cumulative efficiency challenge (%)

	2023	2024	2025	2026	2027	2028
Continuing efficiency at the Frontier	0.50	1.00	1.49	1.99	2.48	2.96
Catch-up: capital program development and asset management	-	0.50	2.00	2.00	3.00	3.00
Catch-up: contingency management	0.50	1.00	2.00	2.00	3.00	3.00
Catch-up: capital procurement and packaging	1.39	1.86	2.32	2.79	2.79	2.79
Total Catch-up efficiency (%)	1.89	3.36	6.32	6.79	8.79	8.79
Total efficiency (%)	**2.39**	**4.36**	**7.82**	**8.77**	**11.26**	**11.75**

Source: Atkins analysis

7.5.10 Prudent and efficient expenditure in the 2022 determination period

The approach we have taken to derive the capitalised expenditure is based on the Seqwater pricing model so that financing costs are applied consistently and through any scope or efficiency adjustments we have recommended. We have not opined on the quantum of financing costs as part of this review, the financing costs applied are those within the Seqwater pricing model. Our approach has been to:

i. Take Seqwater's own proposed incurred capex;
ii. Apply scope adjustments to the incurred capex;
iii. Apply catch-up efficiency adjustment to the net of 1) and 2);
iv. Apply continuing efficiency adjustment to the net of 1), 2) and 3);
v. Apply deferral adjustment on timing of capitalisation; and
vi. Apply Seqwater's own approach to financing costs

The steps above provide our final recommended capitalised capital expenditure allowance which is shown in Table 7-26 below. We also provide our recommended capitalised capital expenditure for the drought allowance in Table 7-27. We note that this includes significant expenditure which we consider should be subject to further prudence and efficiency test as discussed in Sections 6.7.8 and 7.5.8.2.

Table 7-26 - Atkins recommended capitalised capital expenditure in the future period

FY ending ($000k, nominal)	2023	2024	2025	2026	2027	2028
Seqwater proposed capital expenditure (incurred)	179,409	189,522	163,218	142,547	228,881	159,645
Seqwater proposed capital expenditure (capitalised)	298,447	139,172	287,461	164,515	177,108	284,586
Atkins recommended scope adjustments (incurred)						
Wivenhoe Dam Gates from Opex to Capex	513	1,153	2,312	1,203	1,233	1,264
Emergent works allowance not justified	- 3,075	- 3,075	- 3,075	- 3,075	-	-
Solar project capex	-	4,532	3,231	3,311	3,394	-
Energy Efficiency capex	348	502	1,689	844	-	-
LP3 Renewals to drought allowance	- 2,968	- 3,024	- 3,087	- 3,159	- 3,234	- 3,312
Atkins recommended expenditure incurred pre-efficiency	174,226	189,610	164,287	141,671	230,274	157,597
Atkins recommended efficiency adjustments (applied to scope adjusted incurred capex)						
Catch-up efficiency %	1.89%	3.36%	6.32%	6.79%	8.79%	8.79%
Catch-up efficiency $	- 3,301	- 6,370	- 10,391	- 9,619	- 20,240	- 13,852
Continuing efficiency %	0.50%	1.00%	1.49%	1.99%	2.48%	2.96%
Continuing efficiency $	- 855	- 1,828	- 2,297	- 2,621	- 5,199	- 4,259
Total recommended efficiency adjustments	- 4,156	- 8,198	- 12,687	- 12,240	- 25,439	- 18,111
Atkins recommended scope adjustments (capitalised)						
Wivenhoe Dam Gates from Opex to Capex	513	1,153	2,312	1,203	1,233	1,264
Emergent works allowance not justified	-	-	-	- 17,177	-	-
Solar project capex	-	4,532	3,231	3,311	3,394	-
Energy Efficiency capex	348	502	1,689	844	-	-
LP3 Renewals to drought allowance	- 2,968	- 3,024	- 3,087	- 3,159	- 3,234	- 3,312
Lake MacDonald deferral			- 140,097		155,624	
South West Pipeline land costs already capitalised	- 1,425	-	-	-	-	-
Total recommended scope adjustments (capitalised)	- 3,533	3,163	- 135,953	- 14,978	157,017	- 2,048
Atkins recommended efficiency adjustments (capitalised)	**- 4,156**	**- 8,198**	**- 12,687**	**- 12,240**	**- 25,439**	**- 18,111**

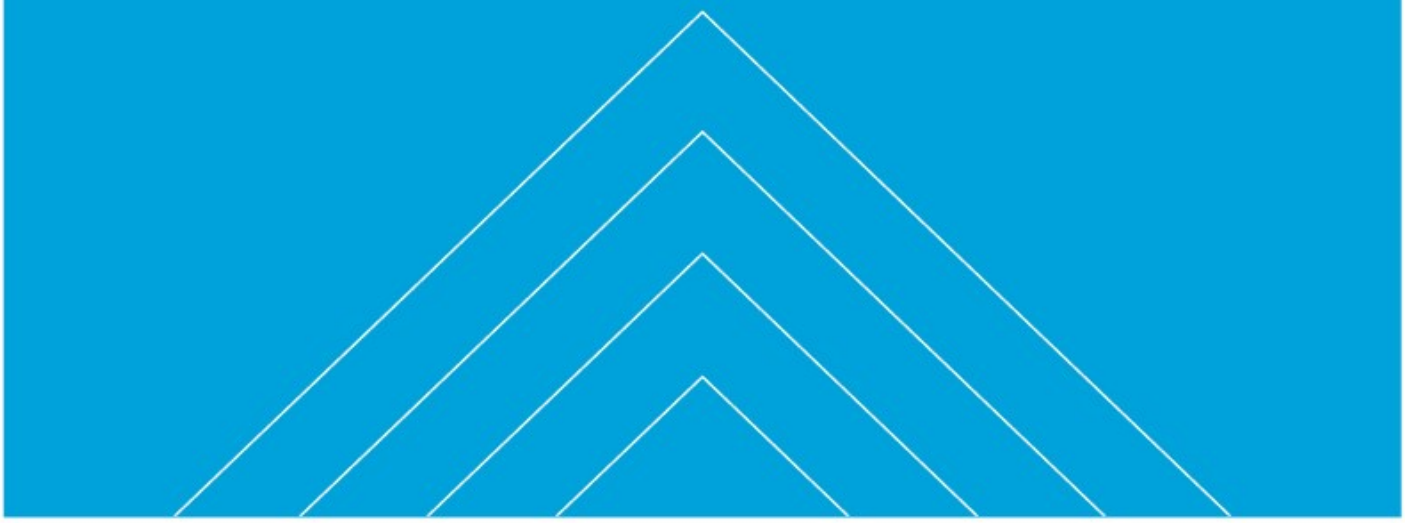
Source: Seqwater pricing submission, August 2021; Atkins analysis

Table 7-27 - Atkins recommended capitalised capital expenditure drought allowance in the future period

FY ending ($000k, nominal)	2023	2024	2025	2026	2027	2028
Seqwater proposed capital expenditure (incurred)	35,564	36,334	37,219	-	-	-
Seqwater proposed drought allowance capital expenditure (capitalised)			109,117	-	-	-
Atkins recommended scope adjustments (incurred)						
LP3 Renewals to drought allowance	2,968	3,024	3,087	3,159	3,234	3,312
Atkins recommended expenditure incurred pre-efficiency	38,532	39,358	40,307	3,159	3,234	3,312
Atkins recommended efficiency adjustments (applied to scope adjusted incurred capex)						
Catch-up efficiency %	1.89%	3.36%	6.32%	6.79%	8.79%	8.79%
Catch-up efficiency $	- 730	- 1,322	- 2,549	- 214	- 284	- 291
Continuing efficiency %	0.50%	1.00%	1.49%	1.99%	2.48%	2.96%
Continuing efficiency $	- 189	- 379	- 564	- 58	- 73	- 90
Total recommended efficiency adjustments	- 919	- 1,702	- 3,113	- 273	- 357	- 381
Atkins recommended scope adjustments (capitalised)						
LP3 Renewals to drought allowance	2,968	3,024	3,087	3,159	3,234	3,312
WCRWS recomissioning			109,117			
Total recommended scope adjustments (capitalised)	2,968	3,024	112,204	3,159	3,234	3,312
Atkins recommended efficiency adjustments (capitalised)	- 919	- 1,702	- 3,113	- 273	- 357	- 381
Atkins recommended capitalised capex - drought allowance	**2,049**	**1,322**	**109,092**	**2,886**	**2,877**	**2,931**

Source: Seqwater pricing submission, August 2021; Seqwater drought submission, October 2021; Atkins analysis

Appendices



Appendix A. Capital projects reviewed

A-1 Sparkes Hill (RS2) Roof Structural Refurbishment

PROJECT DETAILS

Project Name	Sparkes Hill (RS2) Roof Structural Refurbishment	
Project Number	C201004402	2018 Determination Period
Key Investment Driver(s)	Renewal	
Stage	Completed	
Link to asset class plans	Reservoirs	

FINANCIALS AND PROGRAM (costs to $M FY20)

Budget in BC	N/A	**Initial planned Commissioning/ Capitalisation date**	N/A
Outturn costs	13.6M	**Actual / Forecast Commissioning/ Capitalisation Date**	2020 and 2021

Year ending	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total
Planned 2017 Pricing submission	0	0	0	0						
Planned From review documents			13.1M	0.4M						13.5M

NEED FOR SCHEME

Sparkes Hill Reservoir is 92ML capacity and strategically located reservoir supplies the local area and also enables the reliable operation of the Northern Pipeline Interconnector (NPI) in a northerly flow direction, this represents 18% of the volume supplied by Seqwater. Sparkes Hill was constructed in 1982 and taken into ownership by Seqwater in 2013.

Sparkes Hill Reservoir is 92ML capacity and strategically located reservoir supplies the local area and also enables the reliable operation of the Northern Pipeline Interconnector (NPI) in a northerly flow direction, this represents 18% of the volume supplied by Seqwater. Sparkes Hill was constructed in 1982 and taken into ownership by Seqwater in 2013. There are two reservoir units at Sparkes Hill: RS2 (main one and bigger) and RS1 (smaller and more inefficient). In December 2018 there was a structural failure of the roof of RS2 which led to it being taken offline and a need to replace the section of the roof as quickly as possible. The upgrade of the Mount Crosby East Bank filters was contingent on this project being completed.

In May 2019 the CEO approved a business case for the D&C for the repair of the partial roof collapse for a total budget of $4.95M. Following the commencement of works in July 2019 various latent conditions and issues were identified including asbestos and additional repairs to the waterproofing membrane.

In November 2019 additional funding approval was sought from the board to the value of $8.95M. Approval was further sought in January 2020 for $14.32M.

SCOPE OF WORKS

Scope of the works included:

- Investigations including surveys and condition assessment
- Design of refurbishment including structural roof repairs
- Temporary works
- Materials
- Construction works

IMPACT ON OPERATING COSTS

There was some impact on operating costs in for the reinstatement of RS1.

Network Operations arranged the interim works. It was broken up into two components:

- Replace valves and
- Clean and disinfect

All the interim valve work was charged to Opex (as it was reactive maintenance).
The temporary repair of the metal roof, cleaning and disinfecting was Opex, and was $31,051.08.
The replacement of large valves was $149,532.55 and was Opex.
This would have been included in the FY20 base year opex.

OPTIONS APPRAISAL

5 options were considered as part of the rapid business case development:

• Option 1: Business as Usual
• Option 2: Install New U-Planks and Topping Slab at Failed Section of Roof and Conduct Necessary Refurbishment Works to Rectify Legacy Issues Including Waterproof Membrane Over Repaired Roof Section Only
• Option 3: Install New U-Planks and Topping Slab at Failed Section of Roof and Conduct Necessary Refurbishment Works to Rectify Legacy Issues Including Waterproof Membrane Over Entire Roof
• Option 4: Install New Colourbond Roof Sheeting in Place of Existing Concrete Roof and Conduct Refurbishment Works to Rectify Legacy Issues Within Reservoir
• Option 5: Demolish Existing Reservoir and Construct New Reservoir

Option 2 was identified as the preferred option based on net present cost (NPC), inherent risk, and other non-financial benefits

COST ESTIMATING METHOD

The basis of the costs was developed following an initial business case approved by the board followed by two further board approved budgets for the project. The revised total budget was $14.32M with total expenditure outturn at $13.57M

PROCUREMENT METHOD

Due to the requirement for expediency of the works Seqwater identified that enterprise risk of disruption would be too great and an expedient return to service of Sparks Hill Reservoir 2 would outweigh the requirement to engage with the broader market as such a Sole Source Procurement route was taken with a preferred contractor, SMEC.
Ordinarily a sole source procurement would not necessarily yield the best value for money or be the most efficient method of procurement.

DELIVERY

In January 2019, SMEC was engaged by Seqwater to undertake a detailed engineering assessment into the underlying causes and provide remedial options to enable the reservoir to be returned to service by March 2020. engineering assessment identified up to 30% of roof U-Planks are experiencing limited and/or unacceptable end bearing. The key driving cause for the observed movement is axial thermal expansion which is exacerbated by ineffective expansion joints across the reservoir roof. Prior to failure there was very limited bearing supporting the U-planks along Girder line 13 and the additional movement has resulted in the U-planks falling, and in the process, damaging columns C12 and C13

POST PROJECT REVIEW

According to Seqwater, they had undertaken regular maintenance, testing and inspections in line with the then relevant asset class plan, although it was subsequently identified that the roof did not appear to have been constructed per the as-built plans that Seqwater had received at the time of amalgamation.
As a result of the structural collapse, Seqwater implemented a rigorous inspection process for all similar assets that could have the potential failure mode that was like RS2, leading to improved risk management for similar structures.
We sought to understand if all due processes were followed in the years between 2013 and 2018 when Seqwater took ownership of the asset prior to the roof collapse. Seqwater have provided details of the asset inspections leading up to the collapse which were undertaken at 3 monthly intervals. Seqwater advise that these inspections do not typically require generation of an inspection report, especially if no corrective actions were identified. There was no record of a structural defect recorded from these inspections prior to identification of the roof failure.
We noted that in the consultant's report that the consultant had reviewed historic aerial imagery and noted *the "depression" above column 13C which would have been visible in September 2017.* Although we recognise that the identification of this was very much after the fact it does appear as though there were opportunities to have identified the potential collapse sooner and avoided the reactive work and possible inefficiencies incurred inherent within a sole source procurement arrangement.
Since the collapse Seqwater has undertaken a review and update of its reservoir Asset Class Plan. Prior to 2018, Unmanned Aerial Vehicle (UAV) and Remote Operated Vehicle (ROV) inspections were not routinely conducted as part of the Seqwater reservoir inspection program. The asset class plan was substantially reviewed in 2018 concurrent to the time of the Sparkes Hill Reservoir incident with changes including the additional of UAV and ROV inspections. Footage from the UAV and ROV inspections are now reviewed by a team that includes an RPEQ engineer, maintenance personnel and water quality specialists. If issues are noted from the footage, follow up inspections are scheduled.

KEY DOCUMENTS REVIEWED

RFI 102:
D219529 - Detailed Engineering Assessment - Sparkes Hill 2 Reservoir - Roof Failure
D219532 - Design Basis Report - Sparkes Hill 2 Reservoir Roof Rehabilitation
D1938202 - RS2 - Roof Structural Refurbishment and Ancillary Works at Sparkes Hill Reservoir
D19109129 - PID02439 - Concrete scanning - PO Request Form.PDF
D19111447 - 03733 - Sparks Hill Res 2- Procurement Plan_0.PDF"
D20130494 - IPC4 - Sparkes Hill Reservoir Roof - Financial Summary - Att B.xls
D20139871 - PID03358-Sparkes Hill #2 Roof Refurbishment Activity Schedule B.xls
D20139873 - PID03358 - Sparkes Hill #2 Roof Refurbishment Material Quantity Rev B.xls
D20221124 - RS2 - Roof Structural Refurbishment and Ancillary Works at Sparkes Hill Reservoir .doc
PID03358 FINAL - Project Summary Template RS2 Roof Structural Repairs - Sparkes Hill
RFI 113:
1 Extract for QCA - OM08 - 06.02- Revised Project Budget and Contract - November 2019 Board Meeting
2 Extract for QCA - Attachment to November 2019 Board Report - Revised Project Budget and Contract –
3 Extract for QCA - Board Report - 28 January 2020 Board Meeting - Sparkes Hill Matter
4 Extract for QCA - Board Report Attachment A - 28 January 2020 Board Meeting - Sparkes Hill Matter
5 Extract for QCA - Board Report Attachment B - 28 January 2020 Board Meeting - Sparkes Hill Matter
6 Extract for QCA - Reservoir Roof Refurbishment Project – Completion Update - IPC Meeting August - August 2020
7 Summary of Resolutions - Sparkes Hill.pdf"
RFI 111:
Reservoir Asset Class Plan – 2018
D18 62526 Integrated Sanitary and Structural Integrity Inspection Program for Treated Water Reservoirs
RFI 51:
PLN-00441 Asset Lifecycle Planning - Reservoirs Asset Class Plan
RFI 154 and 155:
Reservoir roof inspections - Investigation report

A-2 Leslie Harrison Dam Safety Upgrade – Stage 1

PROJECT DETAILS

Project Name	Leslie Harrison Dam Upgrade - Stage 1 Works	
Project Number	PID01430	2018 Determination Period / 2022 Determination Period
Work Program	Dam Improvement program	
Key Investment Driver(s)	Legislative Compliance (Queensland Dam Safety Regulation) Improvement (of probability of failure / likely loss of life)/ Water Security	
Stage	Completed	
Similar Projects	Ewen Maddock Dam Upgrade	

FINANCIALS AND PROGRAM ($M FY20)

Project Budget approved in Business Case	27.0M	**Initial planned Commissioning/ Capitalisation date**	December 2019
Outturn cost	21.8M	**Actual / Forecast Commissioning/ Capitalisation Date**	December 2019

Year ending	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total
Planned 2017 Pricing submission	6M	18.5M	1.5M	1M						27.0M
Outturn From review documents		20.9M	0.7M	0.1M						21.8M

NEED FOR SCHEME

The Leslie Harrison dam is the sole raw water source for the Capalaba Water Treatment Plant which is a source of existing and future water supply for the Redlands region. Following the Portfolio Risk Assessment (URS 2013) and Dam Safety Review (GHD 2014) commissioned by Seqwater, the Leslie Harrison dam was determined to be (approximately one magnitude) above the ANCOLD limit of tolerability for societal risk for existing dams and therefore not in accordance with Acceptable Flood Capacity (AFC) guidelines. Furthermore, the Leslie Harrison dam did not satisfy the requirements of the Queensland Dam Safety Management (DSM) Guidelines 2002 and was classified as an Extreme Hazard Dam. The key contributors to dam safety risks included failure of the concrete spillway ogee crust and liquefaction of the dam foundation during an earthquake and piping through the embankment, overtopping of the dam and loss of spillway lower chute slabs during different flood loading conditions. Consequences of failure of the dam were deemed to be catastrophic and expected to be significantly worse downstream due urban development. The failure impact assessment in 2014 estimated the population at risk (PAR) as over 3,500 for a sunny day failure and over 6,500 for dam crest flood failure due to piping. Reservoir restrictions were implemented in 2014 and 2015 (e.g., reservoir FSL reduced by 3m) as temporary solutions to the assessed risk however, upgrade works were required to permanently reduce the risks to an acceptable level below the limit of tolerability.

SCOPE OF WORKS

Stage 1 works comprised a partial upgrade of the main dam and spillway as well as removal of spillway gates. The scope of upgrade works was split into four main tasks that is spillway works, the main embankment, outlet works and miscellaneous works.

Stage 1 works on the main embankment included construction of a downstream cofferdam as part of key trench excavation and permanent operational access, a new downstream toe weighting berm with rock and key trench with engineering fill and extension of filter zones to existing dam crest level and earth fill buttress.

The spillway ogee crest and chute were anchored, and dowels were provided for the lower part of the chute floor subject to high uplift pressure. The upper block walls in the approach channel were also waterproofed.

Modifications were made to the existing conduit access shaft, conduit, and intake tower. Downstream conduit sections were extended with select downstream sections being replaced and temporary works such as temporary raw water bypass and conduit replacement retaining wall were completed.

Miscellaneous works included relocation of power and communication services, water drainage and an access road.

IMPACT ON OPERATING COSTS

The upgrade works involved construction works on the shared Capalaba WTP/Leslie Harrison Dam site as well as modifications to the existing embankment and spillway. Construction works affected existing dam operations/dam safety on site and increased general activities/traffic movements. Exclusion zones were established for construction works to separate WTP operations from construction works and access protocols were developed for the construction interface.

During stage 1 works the reservoir operated at reduced FSL which resulted in removal of the spillway gates and reduced the flood management requirements at the dam consequently lowering mmaintenance and operation costs associated with hydraulic controls, motors and winches, pneumatic equipment, and spillway gates.

On the other hand, the reduced FSL resulted in minor increase in operation cost and effort associated with the WTP operations due changes in water quality from the reduced storage buffer within the reservoir and catchment operations due to an extended buffer zone between the reduced storage level and adjacent properties.

Additional operation costs of $50k p.a. are estimated to:

1) maintain the dam in good condition prior to further upgrading before 2035.
2) For Stage 1 the Full Storage Level (FSL) has reduced from 18.3 mAHD to 15.3 mAHD. The impact of any changes on raw water quality have not been factored into the economic assessment.

We understand that the additional opex has been included within the FY20 base year.

OPTIONS APPRAISAL

Four distinct options were considered by Seqwater to resolve issues associated with the dam as follows:

- Option 1 - Status quo (do nothing)
- Option 2 - Decommissioning of the dam
- Option 3 - Risk based two-stage upgrade of the dam
    - Stage 1: Partial upgrade to reduce the life safety risk to an acceptable level below the ANCOLD limit of tolerability and to meet Queensland dam safety regulator requirement (FSL 15.3 mAHD)

- Stage 2: Full upgrade from stage 1 by 2035 to meet Seqwater business planning objectives and Queensland Acceptable Flood Capacity Criteria (FSL 18.3 mAHD)

- Option 4 - Full standards-based upgrade of the main dam and spillway for design FSL 18.3 mAHD and reinstate the spillway gates.

Financial analysis and consideration of non-price benefits by Seqwater showed that the two-stage upgrade of the dam provided better value for money (e.g., Net Present Cost in real $2018 terms of $39M vs >$55M for full upgrade of the dam) and best addressed compliance and regulatory drivers.

COST ESTIMATING METHOD

Seqwater developed a cost estimate by generating a comprehensive cost risk model including allowances for principal and internal costs and prepared a detailed list of contingency items based on an estimate provided by dam specialist consultant (GHD) and WT Partnership. The result was an outturn budget estimate of $27M based on a P80 estimate, including approximately $3.5M of contingency risk items. The actual project outturn cost, however, was $21M thus realising a cost saving of approximately $6M (22.2%) from the approved business case estimate.

PROCUREMENT METHOD

A Significant Procurement Plan was prepared for the project by Program Delivery in collaboration with Asset Planning and Commercial Services. The procurement of the Leslie Harrison dam upgrade was bundled with the Sideling Creek dam upgrade (concurrent project) to maximise the resource pool and attract a wider market. An expression of interest (EOI) process was followed for construction works to shortlist suitably experienced contractors with a separate closed tender for each project to avoid external factors that could have affected both projects. Seqwater further held a collaborative forum to provide the shortlisted contractors with a more comprehensive understanding of the scope of works and site complexities and the tender was evaluated in accordance with the Seqwater approved Evaluation Plan.

DELIVERY

A design then construct delivery option was selected over other options because it allowed Seqwater design control over its own asset and allowed for definition of construction and dam safety risks.
The detailed design (completed in 2017) was allocated to GHD as the sole source as it had performed well on the previous engagement of the preliminary design and could carry forward benefits provided from knowledge of the past engagements.
The strong level of detail included in scope definition and risk allocations for tender packages resulted in strong bidding and competitive prices due to the greater scope certainty in the tender. The bundled procurement and competitive tender process resulted in a final tender price of $16.7M realising a $1.7M cost saving from the engineers estimate based on Class 2 cost estimate of $18.4M.
Construction works were undertaken by Fulton Hogan in June 2018 and completed in-line with schedule in June 2019 with a defects warranty period expiring in June 2021. There were no material changes to the standard of work over the term of the project.
The project delivery method provided several inherent efficiencies most of which derived from the competitive tender process for example a military style bridge proposed by Fulton Hogan that allowed access to site; sealed access road that reduced dust; a temporary pipeline that provided water supply; an alternate rock source (Fulton Hogan quarry at Cedar Creek) which introduced cost saving and finally, spillway dowel inspection for the Stage 2 upgrade.
Most of the risk provisions for known uncertainties presented in the Detailed Business Case were not required except for acid sulphate soils whose risk provision was exceeded. Unrealised contingency items such as wet weather, flood events, flood management and latent that were not required during the project resulted in a cost saving of approximately $3M.
Strong contract administration, inspection, and surveillance presence on site during construction works also contributed to cost saving by minimising changes made to the scope and risk exposure.

POST PROJECT REVIEW

The key benefits realised because of the upgrade project were achieving compliance and the reduction to social, economic, and business risks relative to the risk of dam failure.

Economically, Seqwater realised a cost saving of $6M from the stage 1 works as well as reduction in operational requirements following the removal of spillway gates. The upgraded dam also provided extended asset life and reduced dam safety monitoring due to upgrade works.
Environmentally, the project was completed with negligible disturbance to site footprint for the dam and regulatory approval for construction works.
Socially, the dam was upgraded to a robust asset that meets modern standards and compliance requirements in terms of regulations over 30-year horizon. In terms of risk, the upgraded dam safety risk profile was lowered to at least 1.5 orders of magnitude below the limit of tolerability for existing dams.

KEY DOCUMENTS REVIEWED

QCA Capital Project Presentation – PID01430
Project Summary template – PID01430 – DLH – Leslie Harrison Dam Upgrade (Stage 1)
Leslie Harrison Dam – Dam Safety Upgrade – Stage 1 – Business case – Asset planning
RFI 184 – For the Leslie Harrison Dam Project

A-3 Ewen Maddock Dam Safety Upgrade

PROJECT DETAILS

Project Name	Ewen Maddock Dam Upgrade - Stage 2A Works	
Project Number	PID01422	2018 Determination Period
Work Program	Dam improvement program	
Key Investment Driver(s)	Compliance (Queensland Dam Safety Regulation) Water security/ Improvement (of probability of failure / likely loss of life)	
Stage	completed	
Similar Projects	Leslie Harrison Dam safety improvement	
Link to asset class plans	N/A	

FINANCIALS AND PROGRAM ($M FY/20)

Budget in 2020 Needs Assessment BC (Project Budget approved)	24.5M	**Initial planned Commissioning/ Capitalisation date**	30th July 2021
Outturn cost in Submission	15.8M	**Actual / Forecast Commissioning/ Capitalisation Date**	22nd April 2021

Year ending ($M)	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**Total**
Outturn costs			2.7M	13.1M	**0**					**15.8M**
Planned in BC			4.2M	20.4M	**0**					**24.5M**

NEED FOR SCHEME

Following the Dam Safety Review (2010) and Portfolio Risk Assessment (2013), further foundation investigations and the Dam Safety and Acceptable Flood Capacity review (2016) led to the conclusion that the population at risk (PAR) from the dam embankment failure was unacceptably high. Probability of failure and the number of fatalities due to dam failure were above the ANCOLD limit of tolerability for existing dams, due to high risks of embankment overtopping, embankment piping (internal erosion), foundation liquefaction and spillway instability. The project objective was therefore to mitigate the risks to below the limit of tolerability.

SCOPE OF WORKS

The preferred option chosen was to carry out a staged upgrade, with Stage 1 of urgent works followed by a Stage 2 of further investigations and implementation of the Dam Safety Management Plan. The stage 2 works included embankment strengthening works split into Stage 2A with spillway works and fish passage mitigation works moved into a Stage 2B.

The embankment was strengthened with the addition of new chimney filters, a wider berm to add weight to the downstream (outer) shoulder, rock protection on the upstream face and a concrete parapet wave wall to add flood capacity.

IMPACT ON OPERATING COSTS

There are no significant changes to operating or maintenance costs for the dam as a result of the safety improvement works, as the full storage level (FSL) will be restored from the current 75% level.

OPTIONS APPRAISAL

A range of options were considered as part of the Dam Safety Review and the PRA, including the reduction of consequences downstream by purchasing homes, up to a full upgrade while maintaining full storage capacity. The discounted and non-preferred options were either considered excessively high cost or not practicable. Further concept options were assessed by a dam specialist consultant (GHD) in 2016, these were refined through engagement with Seqwater, and a Multi Criteria Assessment was used to shortlist four options to allow 30% design drawings and cost estimates.

The shortlisted concept options were then subjected to a secondary MCA.

COST ESTIMATING METHOD

Concept options were developed with Class 3 (AACE) cost estimates before the Multi Criteria Assessment. Estimates were refined with development of construction methodologies.

The Project budget included a contingency of approximately 10% of both contractor costs and internal /owners engineer and overheads.

PROCUREMENT METHOD

The Stage 2A works were procured via an open tender market, after an earlier stage of tender process for both Stages 2A and 2B was stopped because of non-conforming tender submissions and outstanding development approval issues.

The tender was evaluated in accordance with the Seqwater approved Evaluation Plan.

DELIVERY

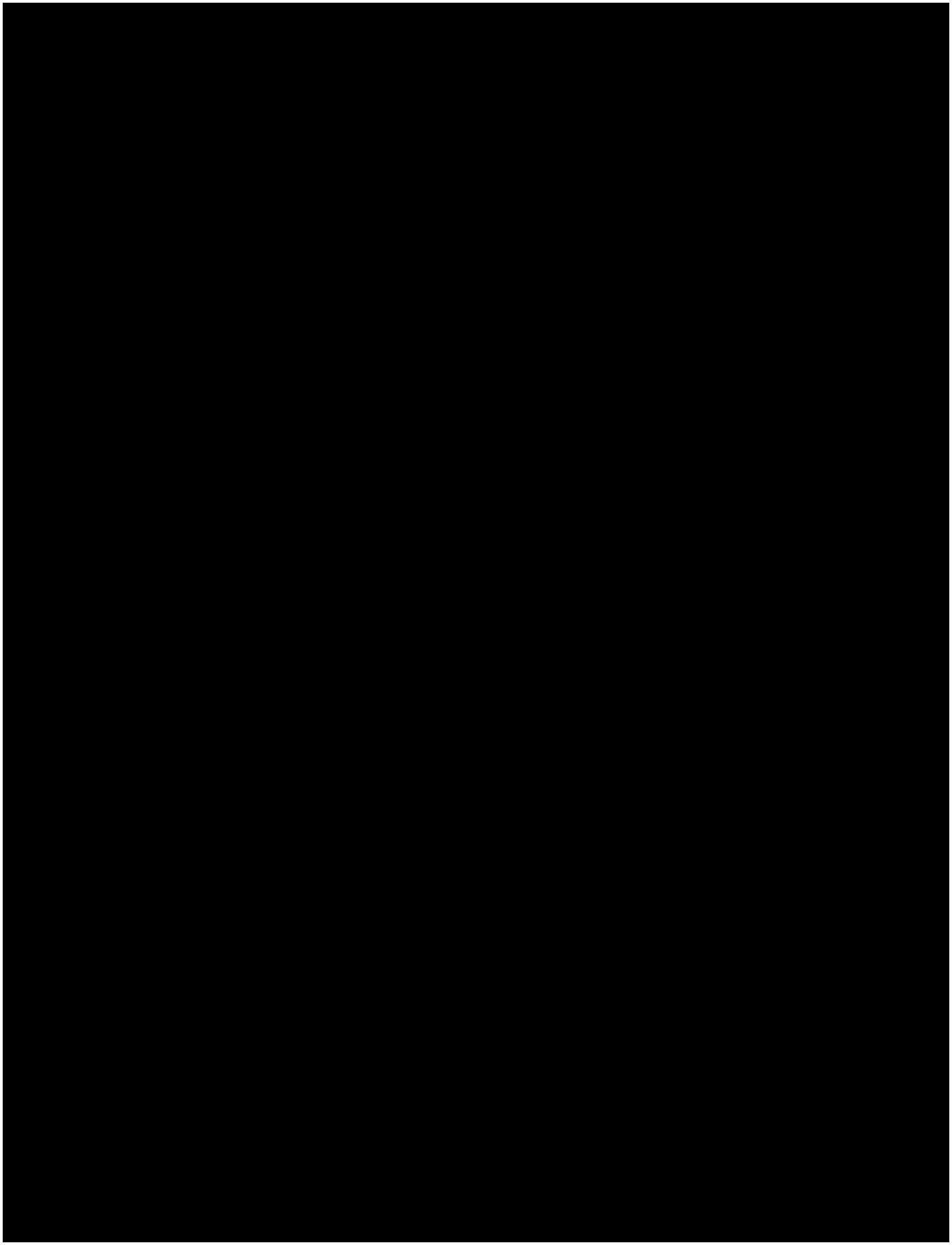
Lower bids for Stage 2A were obtained from tendering contractors who provided further efficiencies, with the final selected contractor being locally based with lower overheads and operational costs.
Efficiencies were achieved by using siphons to lower the lake level to 60% FSL, reducing the construction schedule and maximising the dry season for the embankment earthworks while avoiding a cofferdam.
Rates for imported material were renegotiated with the contractor to avoid significant increase in costs when quantities of imports required from an external source were higher than expected.
The project was delivered three months ahead of schedule, and including the non-realisation of contingency risks (e.g. ground conditions and bad weather were less onerous than allowed for) there was a saving of $8.7 million on BC approved costs.

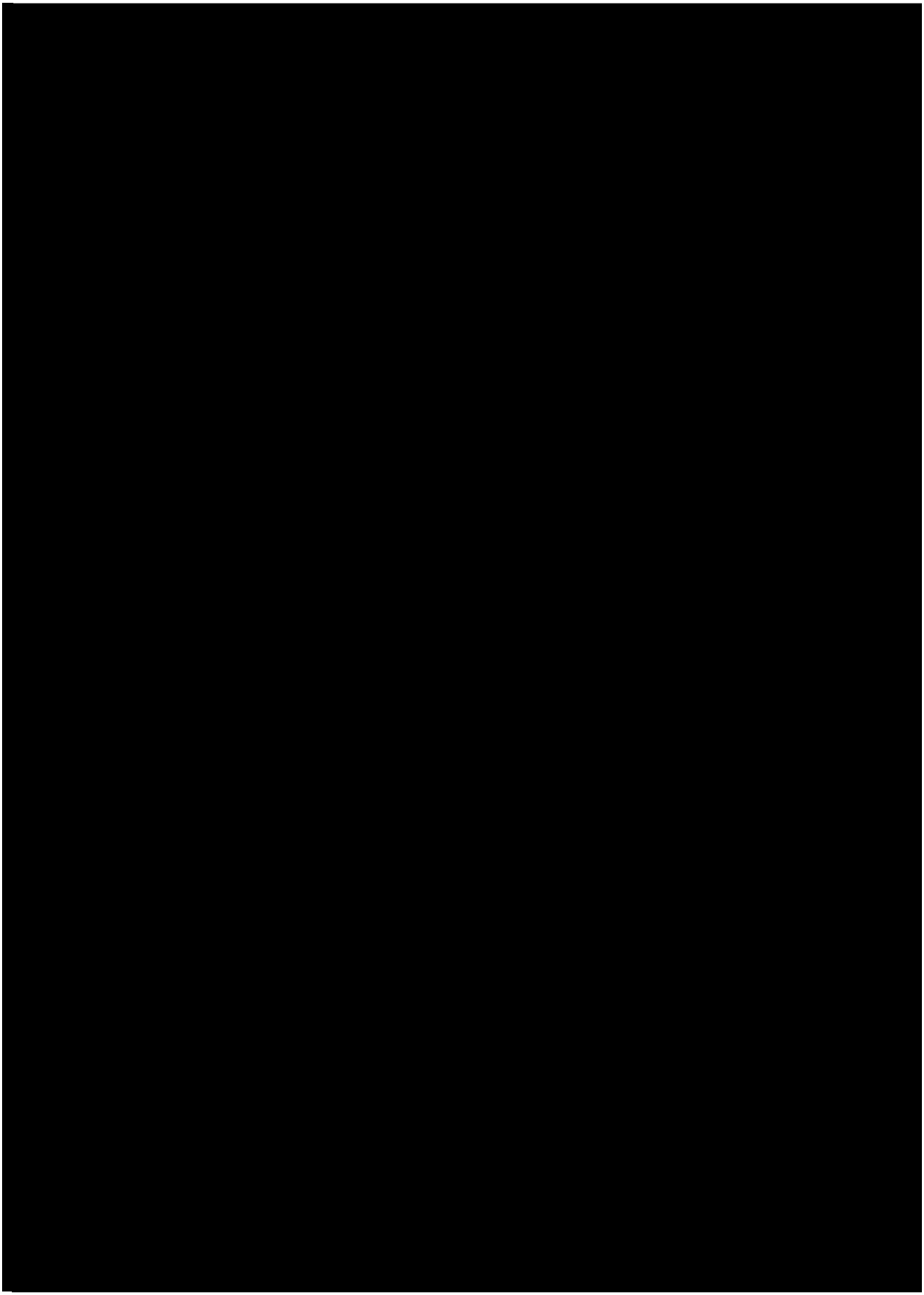
POST PROJECT REVIEW

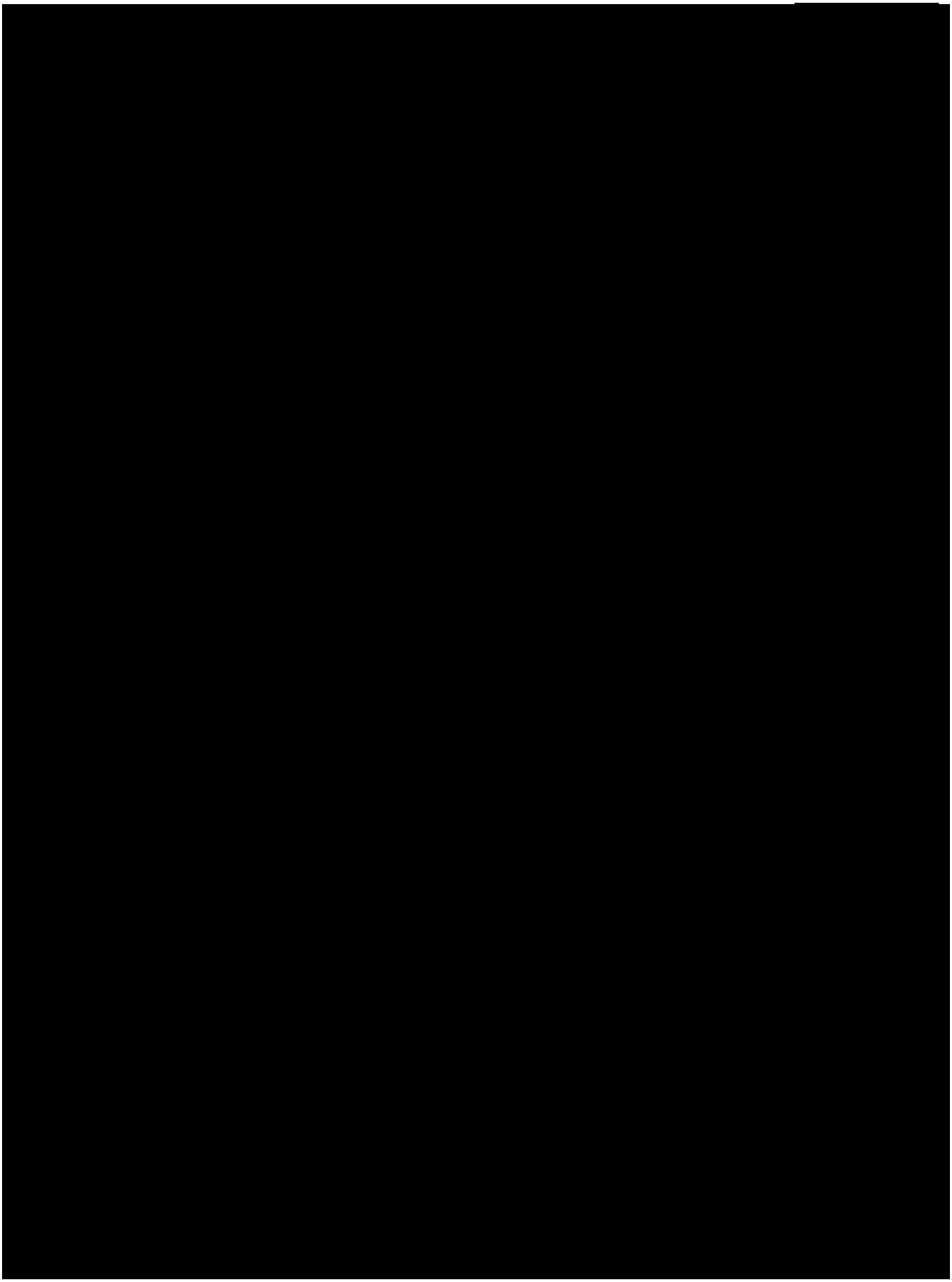
A benefits realisation report is not currently complete but is under way and will summarise the findings along with lessons learnt, which are indicated above.

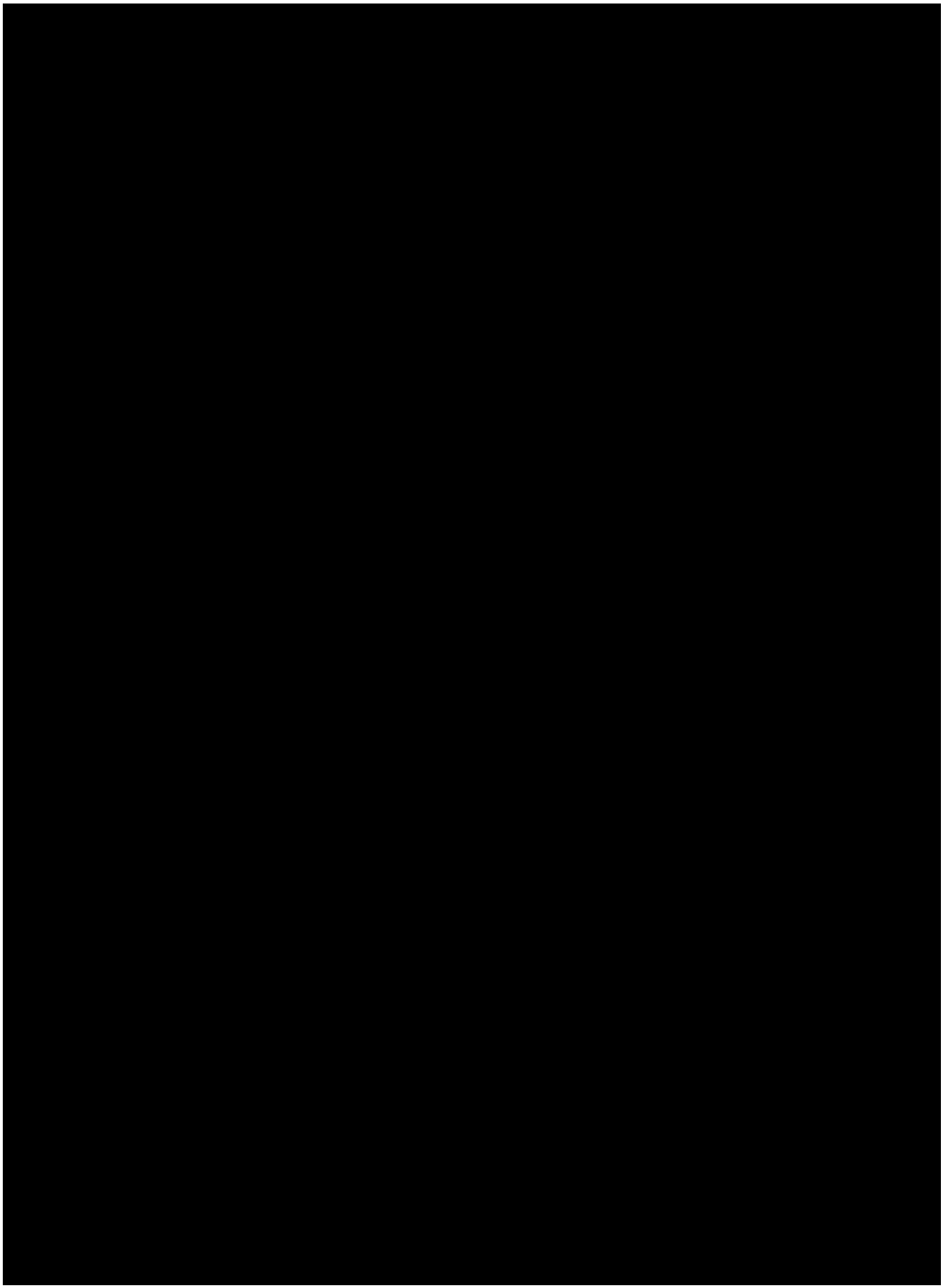
KEY DOCUMENTS REVIEWED

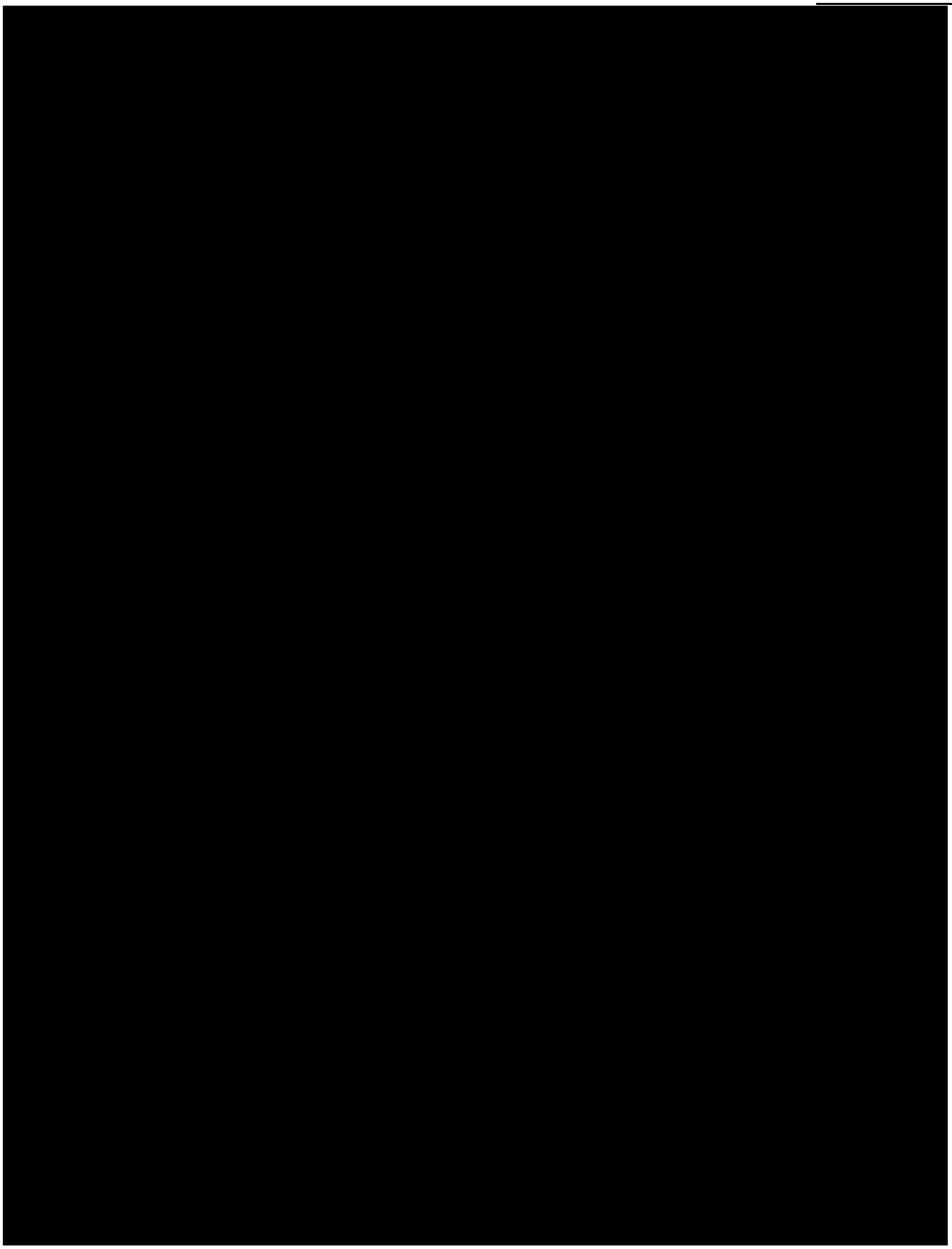
QCA Capital Project Presentation – PID01422
Project Summary: DEM – Ewen Maddock Dam Upgrade (Stage 2A)
20190281 - PID01422- DEM - Ewen Maddock Stage 2 Dam Safety Upgrade - Project Summary Document
D1494524 - DEM - Ewen Maddock Dam - Seqwater Dams Portfolio Risk Assessment (PRA) - 2013 - URS - Risk Assessment Report
D2060190 - Approved Evaluation Report 3766
D2123195 - OM07 - 06.1 - Ewen Maddock Dam ST2A Safety Upgrade - Board Meeting September 2019
D2178182 - PID01422 - DEM - Ewen Maddock Dam ST2A Upgrade - Project Management Plan- Rev 2 - complete

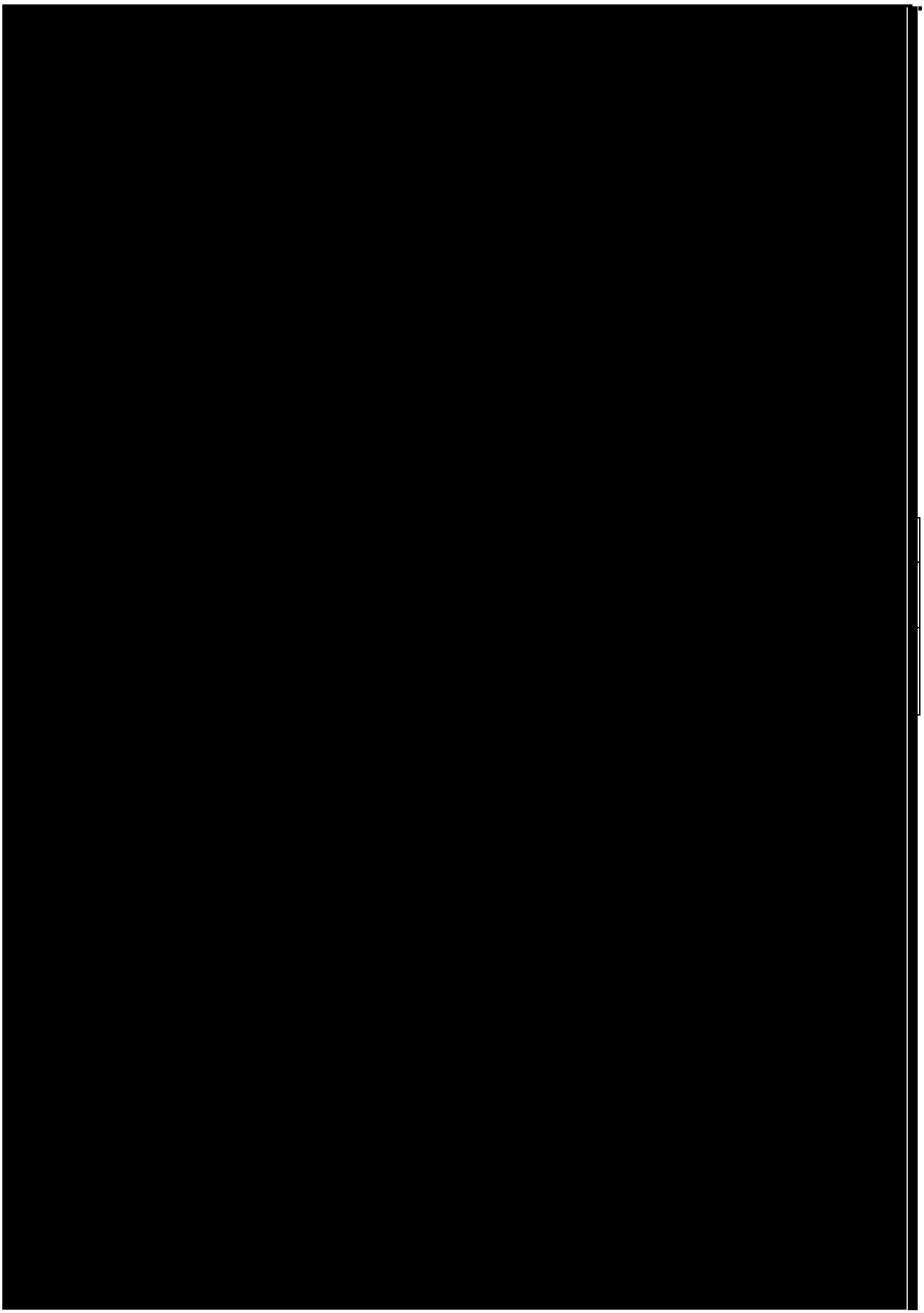


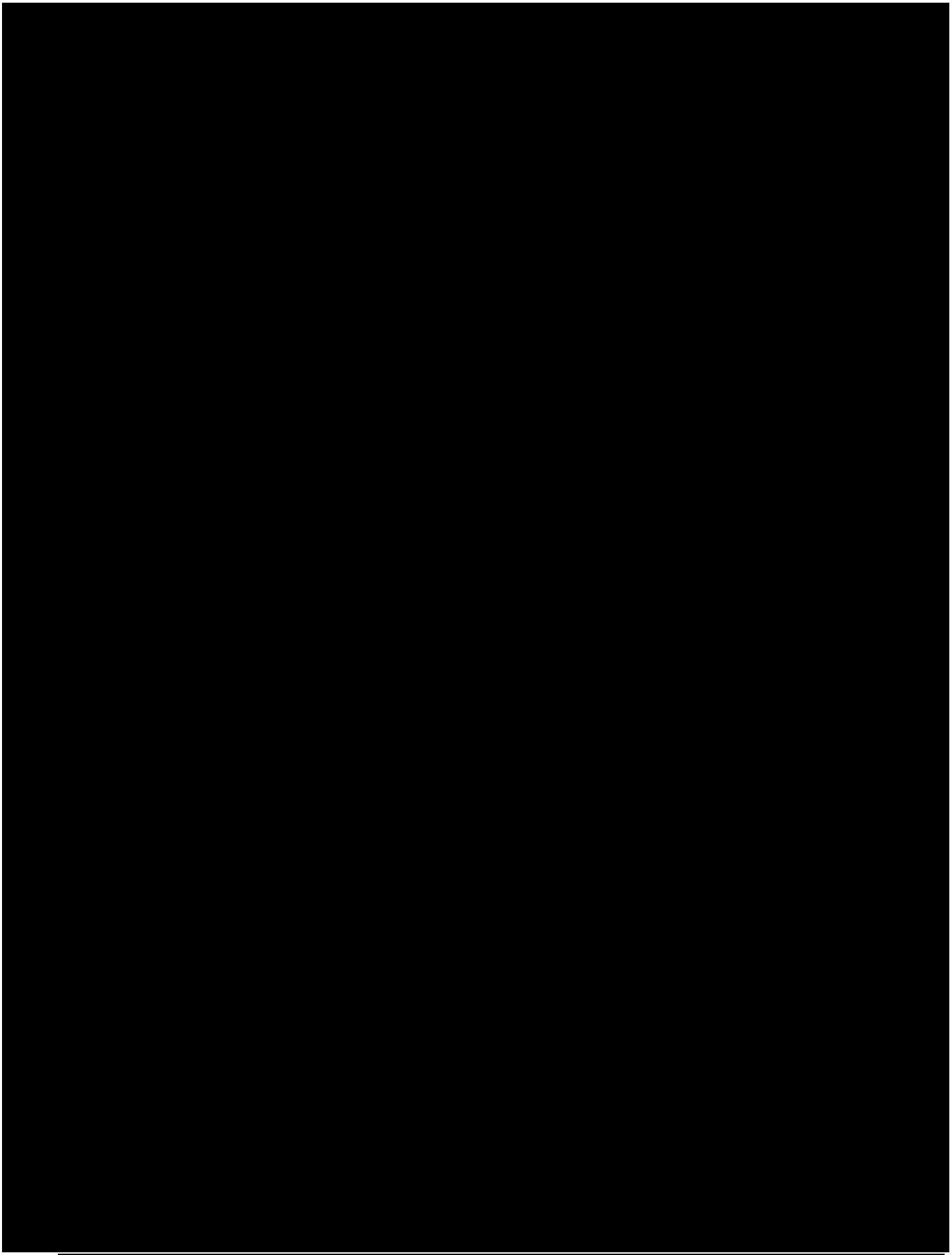


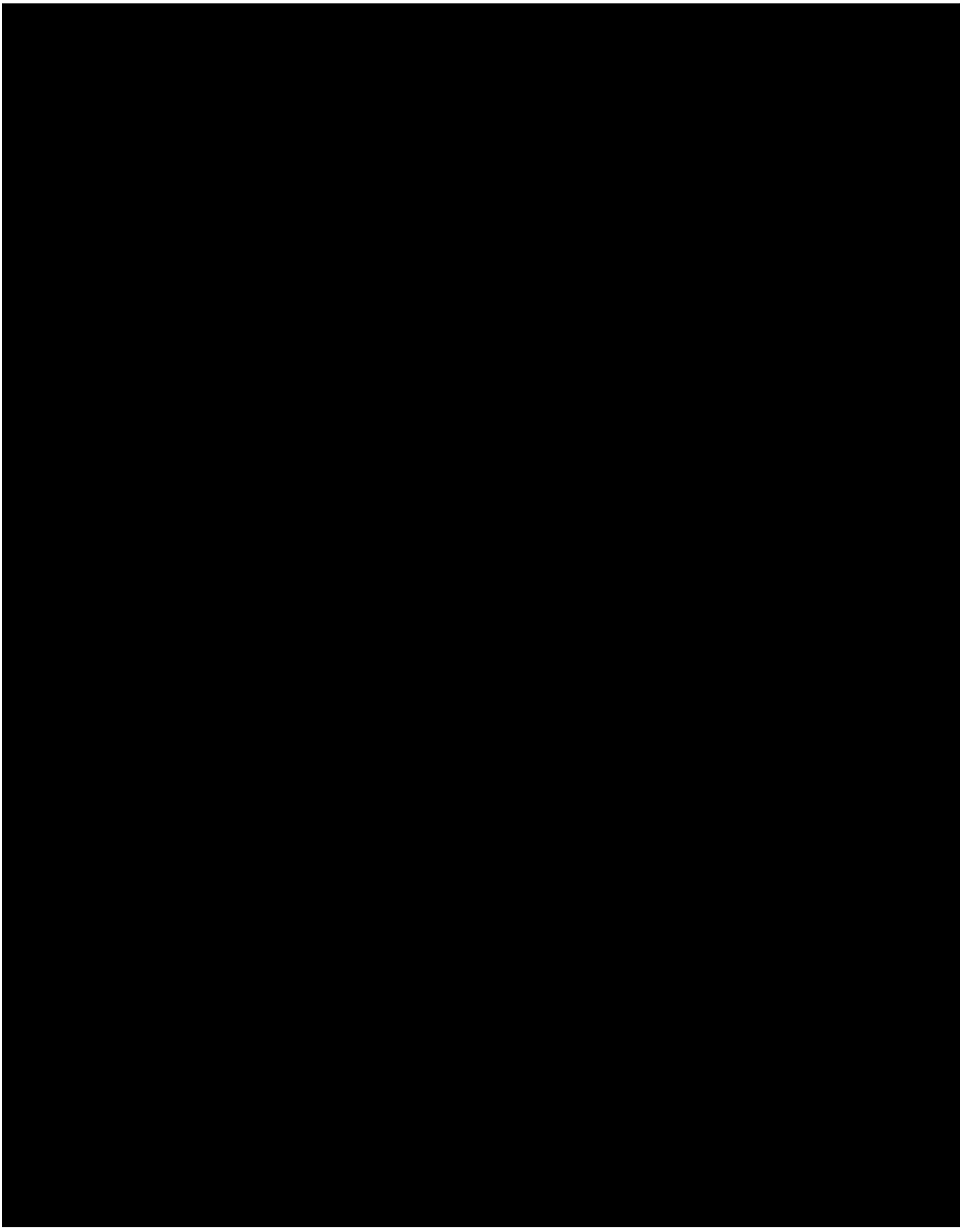












Appendix B. Asset Class Plans

Asset Class Plan	Last Review Date	Next Review Date
Air Conditioners & Coolers	19/06/2020	19/06/2022
Analysers	14/01/2021	14/01/2023
Auxliary Power	3/05/2020	3/05/2022
Blowers & Compressed Air System	10/05/2020	10/05/2022
Bridges	30/05/2020	30/05/2022
Buildings	23/01/2021	23/01/2023
Bunds	21/03/2020	21/03/2022
Cathodic Protection	29/09/2020	29/09/2022
Centrifuges	27/06/2020	27/06/2022
Chemical Dosing	19/05/2021	19/05/2023
Concrete Process Vessels and Valve Pits	15/11/2020	15/11/2022
Conveyors	23/12/2020	23/12/2022
Cranes and Hoists	2/03/2020	2/03/2022
Dam, Concrete & Earth Embankments	19/12/2020	19/12/2022
Diesel Pumps and Generators	6/04/2020	6/04/2022
Drainage Systems	6/04/2020	6/04/2022
Drive Systems	6/04/2020	6/04/2022
Earth Channels and Lagoons	21/03/2020	21/03/2022
Electric Motors (including Drives)	2/03/2020	2/03/2022
Erosion Protection	18/01/2021	18/01/2023
Fencing & Gates	14/12/2020	14/12/2022
Filters	4/09/2020	4/09/2022
Fire and Security Systems	24/07/2020	24/07/2022
Fluid Flow Meters	23/05/2020	23/05/2022
Gaseous Chemicals	13/11/2020	13/11/2022
Hydraulic Systems	14/06/2020	14/06/2022
Hydroelectric	24/07/2020	24/07/2022
Liquid Chemical Storage and Batching	9/10/2020	9/10/2022
Monitoring and Control Systems	16/01/2020	15/01/2022
Ozone Generators	19/07/2020	19/07/2022
Personnel Lifts	10/05/2020	10/05/2022
Pipelines	27/06/2020	27/06/2022
Playgrounds	16/02/2020	15/02/2022

Asset Class Plan	Last Review Date	Next Review Date
Powder Chemical Storage and Batching	4/09/2020	4/09/2022
Power Distribution and Switchboards	2/03/2020	2/03/2022
Pressure Vessels	17/03/2021	17/03/2023
Process Water Reticulation	23/02/2021	23/02/2023
Pumps	2/03/2020	2/03/2022
Reservoirs	16/02/2020	15/02/2022
Roads, Trails and Hardstands	4/07/2020	4/07/2022
Sewage Systems	7/08/2020	7/08/2022
Steel Process Vessels	31/07/2020	31/07/2022
Structures	28/10/2020	28/10/2022
Submerged Metalwork	13/08/2020	13/08/2022
Transformers	6/04/2020	6/04/2022
Tunnels	25/04/2020	25/04/2022
Valves and Actuators	5/11/2020	5/11/2022
Walkways, Platforms and Ladders	14/01/2021	14/01/2023
Weirs	25/04/2020	25/04/2022

Appendix C. Review of drought response review event claims by year

C-1 Seqwater claim for FY18

Table C-1 - Seqwater drought response event claim for FY18 ($k Nominal)

Drought Phase	Initiative	Easily Compliant with Drought Response Trigger	Related to particular item in Water Security Program	Expenditure $k	If it isn't easily compliant with drought response trigger, why was the initiative done (and at that timing)?	Atkins view	Recommended review event expenditure $k	Year the cost should have been incurred
Response	Baroon Pocket Supply System Water Security Improvement Operational Options Report	No	Other	56	This version of the Water Security Program does not identify sub-regional triggers (other than requirements for carting at Off-grids). This is being corrected in WSP 2022. While rainfall to the area had historically been reliable, at the start of 2017 Baroon Pocket Dam had been drawn down to less than 50%. If the dry conditions had continued there was a risk of level of service shortfalls due to limitations on the quantity of water that could be imported into the area. A study was completed to reduce the take from the Baroon Pocket Dam and provide more time to either capture rainfall and or progress with a contingency supply for the northern region.	Baroon Pocket is part of the KBWS and the action does not relate to a drought response trigger in the WSP. We have considered if it should be treated as a cost which would have been incurred at a later date anyway. However, it is not clear to us that Baroon Pocket Dam specific studies would have been triggered at a later date. As such, it does not appear to meet the review event definition.	0	
Response	Northern Drought – Contingency Strategy	No	Other	195	At this time Baroon Pocket was less than 50%. This study was a technical assessment of contingency supply options - engineering concept and estimates.	Acceptance as a drought response event would also require demonstration that the having and maintaining of an operational options approach (for example) is not a core BAU expectation rather than a specific drought response.	0	
Readiness	Water efficiency messaging at 70% as per WSP	No	70% - Increase general water efficiency messaging in preparation for drought	567	The Water Security Program includes for media messaging at 70%. This work is dependent on drought/ water grid storage levels and is not a predictable expenditure.	As dam storage did not reach the 70% trigger level and the 70-60% range is classified as “drought readiness” (not drought response) in the WSP it is not possible to recommend this expenditure as a drought response event.	0	
Readiness	GCDP Readiness test complete	No	60% Up to full production Gold Coast Desalination Plant	226	The modelling that supports the Water Security Program assumes that the GCDP is operating at full production from 60%. Therefore, this test was completed earlier to allow an opportunity to rectify any issues that arose. This would not have been possible if the testing had started at 60% or less. There was no increased cost in completing these works at 70% rather than at 60%.	We accept that (a) there is some uncertainty around the appropriate timing of this action given that the WSP trigger at 60% is for GCDP to be at full production, indicating that some actions would be required in advance of 60%. (b) the cost would have been incurred at a later date We therefore recommend accepting this expenditure	226	2019
Readiness	Recommissioning first train at Luggage Point	No	60% Western Corridor Recycled Water Scheme recommissioning commences	694	As grid levels were starting to decrease, it was determined it would be wise to recomission a small portion of the scheme, considered helpful as it is unusual to have an asset dormant for so long. The recommissioning of one train was considered to help gain operational knowledge and experience to be applied to the broader recommissioning program and future operations and build community acceptance and confidence in recycled water and build a track record on water quality.	This does not appear to be consistent with the **timing** set out in the WSP which envisages that recommissioning of the WCRWS should commence at 60% storage. However, we accept that some of this the cost would have been incurred at a later date anyway and therefore recommend accepting this part of the expenditure[50]. We have not recommended accepting the ongoing additional operating costs which have been incurred earlier and for longer than envisaged in the WSP.	500	2020

[50] Seqwater has requested $1.5M for this line across FY18 and FY19. Its document RFI 126 provides a breakdown of $0.5M for the first four months remobilisation and $1.0M for remaining four months of operation at 6Ml/d. We have therefore recommended accepting $0.5M for the remobilisation only.

Drought Phase	Initiative	Easily Compliant with Drought Response Trigger	Related to particular item in Water Security Program	Expenditure $k	If it isn't easily compliant with drought response trigger, why was the initiative done (and at that timing)?	Atkins view	Recommended review event expenditure $k	Year the cost should have been incurred
						We think it useful for Seqwater to bear in mind that, had the drought not continued to worsen, the case for accepting any of the claim would not have been clear.		
Response	Fixed term team resourcing - <60%	No	All	181	This version of the WSP does not specifically mention internal resourcing, however this is required to deliver the increasing number and complexity of projects as drought progresses. Initial resourcing started at the start of January 2017 in response to an acute and rapidly deteriorating situation in the Northern sub region and continued until mid-2018 while wrapping up that exercise. Resourcing for drought recommenced April 2019 in response to hitting drought trigger and has largely continued since. Resourcing was a mixture of drought response and drought readiness - much of resourcing attention was focussed on off-grids drought response and sub-regional as well as overall WGS levels. An estimate of the split has been made.	The KBWS drought readiness and response triggers were not met in FY18 and Seqwater has not provided sufficient justification or explanation of the need for off-grid drought response in this period. This means it is not possible for us to recommend this as review event expenditure with confidence.	0	

Seqwater document "QCA 2021 Drought Timeline Revised_v2"

Key: green is recommended expenditure, grey is not recommended and amber is not recommended because of non-compliance with the WSP or due to lack of justification.

C-2 Seqwater claim for FY19

Table C-2 - Seqwater drought response event claim for FY19 ($k Nominal)

Drought Phase	Initiative	Easily Compliant with Drought Response Trigger	Related to particular item in Water Security Program	Expenditure $k	If it isn't easily compliant with drought response trigger, why was the initiative done (and at that timing)?	Atkins view	Recommended review event expenditure $k	Year the cost should have been incurred
Readiness	Recommissioning first train at Luggage Point	No	60% Western Corridor Recycled Water Scheme recommissioning commences	836	As grid levels were starting to decrease, it was determined it would be wise to recomission a small portion of the scheme, considered helpful as it is unusual to have an asset dormant for so long. The recommissioning of one train was considered to help gain operational knowledge and experience to be applied to the broader recommissioning program and future operations and build community acceptance and confidence in recycled water and build a track record on water quality.	As set out above, we accept that the recommissioning costs would have been incurred at a later date and therefore recommend accepting this part of the expenditure. However, we have not recommended accepting the earlier, and therefore longer lasting, operational costs as they are not consistent with the WSP.	0	
Readiness	PRW - 70%-60%	No	60% Western Corridor Recycled Water Scheme recommissioning commences	2,180	Associated with initiative recommissioning one train at Luggage Point AWTP; operational and public confidence; water quality track record. Note that WSP also states (p175) that: Both recommissioning and full production triggers for the WCRWS were developed for the drought response. For modelling purposes, a KBWS volume of 40%, for full operation of the WCRWS, will be targeted. During a drought response the WCRWS may be operated regardless of whether recommissioning is complete before or after KBWS reach 40%.	Whilst we accept that, under the WSP, recommissioning costs (discussed above) would have been incurred anyway at a later date, it is not clear that customers should be asked to pay for the earlier and therefore longer operation of the plant than required under the WSP. (noting that the WSP requires that recommissioning of the WCRWS should commence at 60% storage). It does not appear possible, therefore, to recommend this as drought review event expenditure.	0	
Readiness	Feasibility assessment of Banksia Beach as a potential drought supply	No	20% Contingency infrastructure construction commences	88	The WSP talks about investigating further potential contingency supplies from 60% and specifically cites Banksia Beach (p79). This initiative was done earlier (68%). There was no increase in costs to completing the study earlier rather than at 60%, and 60% has been reached a number of times in the Review Event period. There are a limited number of resources internally to manage the drought response events, so completing some earlier is helpful for managing workload. Please note 60% was reached in Nov 2019, when study would have been required anyway.	The WSP states that the *"planning for contingent infrastructure will commence at 60% KBWS once the GCDP is operational and the WCRWS recommissioning has commenced"*. It is therefore clear this action happened ahead of the trigger. However, we accept that the cost would have been incurred at a later date and therefore recommend accepting this expenditure. We think it useful for Seqwater to bear in mind that, had the drought not continued to worsen, the case for accepting the claim would not have been clear.	88	2020
Readiness	Fixed term team resourcing - >60%	No	All	138	This version of the WSP does not specifically mention internal resourcing, however this is required to deliver the increasing number and complexity of projects as drought progresses. Initial resourcing started at the start of January 2017 in response to an acute and rapidly deteriorating situation in the Northern sub region and continued until mid 2018 while wrapping up that exercise. Resourcing for drought recommenced April 2019 in response to hitting drought trigger and has largely continued since. Resourcing was a mixture of drought response and drought readiness - much of resourcing attention was focussed on off-grids drought response and sub-regional as well as overall WGS levels. An estimate of the split has been made.	The review event definition refers to drought response costs. The KBWS drought response trigger was not met in FY19 and Seqwater has not provided sufficient justification or explanation of the need for off-grid drought response in this period. This means it is not possible for us to recommend this as review event expenditure with confidence.	0	

Seqwater document "QCA 2021 Drought Timeline Revised_v2"

Key: green is recommended expenditure; grey is not recommended and amber is not recommended because of non-compliance with the WSP or due to lack of justification.

C-3 Seqwater claim for FY20

Table C-3 - Seqwater drought response event claim for FY20 ($k Nominal)

Drought Phase	Initiative	Easily Compliant with Drought Response Trigger	Related to particular item in Water Security Program	Expenditure $k	If it isn't easily compliant with drought response trigger, why was the initiative done (and at that timing)?	Atkins view	Recommended review event expenditure $k	Year the cost should have been incurred
Readiness	PRW - 70%-60%	No	60% Western Corridor Recycled Water Scheme recommissioning commences	1,490	Associated with initiative recommissioning one train at Luggage Point AWTP; operational and public confidence; water quality track record. Note that WSP also states (p175) that: Both recommissioning and full production triggers for the WCRWS were developed for the drought response. For modelling purposes, a KBWS volume of 40%, for full operation of the WCRWS, will be targeted. During a drought response the WCRWS may be operated regardless of whether recommissioning is complete before or after KBWS reach 40%.	We cannot recommend accepting this expenditure as part of the drought review event as it relates to opex in advance of the 60% drought response trigger. Before this date, it does not appear possible to recommend that customers should be asked to pay for the earlier and therefore longer operation of the plant than required under the WSP.	0	
Readiness	WCRWS Readiness activities	No	60% Western Corridor Recycled Water Scheme recommissioning commences	500	Veolia hiring specialised procurement and engineering staff and engaging with providers of membranes and other long lead items to gauge delivery times and cost without committing to purchases; Implementing labour force plans and strategies and engaging with labour force providers to be ready for a full restart at 60%. 60% was reached November 2019. The modelling work completed, and the implementation of these relatively inexpensive preliminary restart activities were considered sufficient to justify deferring full restart of WCRWS until after summer.	We recommend accepting this expenditure in the review event as it would have been incurred at a later date anyway. However, as elsewhere, we note that, had the drought not worsened, the case for accepting the claim would not have been clear.	500	2020
Response	WCRWS Full scheme readiness submission	Yes	60% Western Corridor Recycled Water Scheme recommissioning commences	130		We recommend accepting this expenditure which was carried out in the drought response phase	130	2020
Readiness	Reinstate WCRWS pipework	No	60% Western Corridor Recycled Water Scheme recommissioning commences	350	This work would have been required as part of full WCRWS triggered at 60% (which occurred in November 2019, September 2020 etc). Completing the work at 69% trigger did not increase the expense associated with the works. The intitiative allowed PRW to be supplied to Tarong, reducing the demand on Wivenhoe. The increase of supply of PRW to Tarong was purely a drought initiative - the basis was that supply would not continue outside of drought.	We recommend accepting this expenditure in the review event as it would have been incurred at a later date anyway. However, as elsewhere, we note that, had the drought not worsened, the case for accepting the claim would not have been clear. We also note, however that the description is more aligned to capex than opex and have therefore classified it as capex.	350 CAPEX NOT OPEX	n/a
Readiness	Confirm need for WCRWS in drought	No	60% Western Corridor Recycled Water 0Scheme recommissioning commences	372	This work was prompted by Building Queensland and the work was considered necessary to satisfy the information requirements for seeking responsible Ministers' approval, which is required as recommissioning the WCRWS is above $40M. The work included an options assessment. As the Water Security Program assumes that WCRWS starts at 60%, the work was required to be completed beforehand, and the timing was impacted by the requirements of Building Queensland.	The timing of this expenditure appears to be reasonably consistent with the WSP. We have considered whether it represents an efficient level of expenditure and concluded that, given the sums of expenditure under appraisal, it appears acceptable.	372	2020
Response	Investigating use of PRW at Tarong	No	60% Western Corridor Recycled Water Scheme	45	While not specifically cited in the Water Security Program, this study considered potential management options for supplying the Tarong Power Station with a range of different feedwater scenarios. The study supported use of PRW by Tarong,	We recommend accepting this expenditure which was carried out in the drought response phase	45	2020

Drought Phase	Initiative	Easily Compliant with Drought Response Trigger	Related to particular item in Water Security Program	Expenditure $k	If it isn't easily compliant with drought response trigger, why was the initiative done (and at that timing)?	Atkins view	Recommended review event expenditure $k	Year the cost should have been incurred
			recommissioning commences		reducing the take from Wivenhoe. Ultimately it has facilitated the take of PRW by Stanwell via a partial restart of WCRWS.			
Response	Playing Fields demand management	Yes	50% - Water conservation messaging and medium level water restrictions	49	Further enquiry has shown that tenders were invited Nov 2019, with contract signed Jan 2020 (both when grid levels less than 60%). First costs had been received March 2020. Completion of a high-level review of the existing QWC Active Playing Surface Guidelines and development of an educational package to support the industry sector progression to best management practices for active playing surfaces and provide managers with the knowledge and skills that will be required by them to implement the active playing surface guideline should it become mandatory under High Level Water Restrictions. If the narrow definition of drought response review event is adopted, then some of this expenditure did occur below the drought response trigger and shold be included in the review event costs.	We cannot recommend accepting this expenditure as it was carried out in advance of the 50% trigger Seqwater associates it with, and which has not, at the moment of writing been reached.	0	
Readiness	Install Orifice Plate at Lake Manchester Outlet	No	20% Contingency infrastructure construction commences	8	p90 of the WSP references further investigations into potentially connecting assets to the grid - Lake Manchester would fit into this category. The decision to proceed with these low cost works occurred one month before 60% was reached (November 2019) while levels were just above 60%. One of the reasons this intiative was implemented somewhat earlier was due to the low levels at Wivenhoe - Somerset and Wivenhoe combined levels were at 58% and Wivenhoe was at levels not seen since the Millenium drought. Lake Manchester works directly benefits Wivenhoe dam level. The works were considered a very economic drought initiative - relatively low capital costs and neglible on-going operational costs for accessing a further potential 4700 ML/ year.	This expenditure appears reasonable, but the description suggests it is capex, not opex, epscially when taken with FY21 expenditure which takes it over the $10k capitalisation threshold.	8 CAPEX NOT OPEX	
Readiness	Water efficiency rebate program	No	50% - Water conservation messaging and medium level water restrictions	115	The decision to proceed with the study occurred after grid levels had been steadily decreasing and occurred one month before the grid levels hit 60%. The current Water Security Program drought response indicates that at 50% Water Grid storage level Seqwater would investigate potential water efficiency rebate programs for both residential and non-residential end customers. The timing was wanting to be complete comfortably before 50% so it could assist with the planning of the Water Service Providers as needs be.	We cannot recommend accepting this expenditure as it was carried out in advance of the 50% trigger Seqwater associates it with, and which has not, at the moment of writing been reached.	0	
Response	Feasibility assessment of Brisbane Aquifers	Yes	20% Contingency infrastructure construction commences	5		We recommend accepting this expenditure which was carried out in the drought response phase and aligns with the 60% trigger for this action.	5	2020
Response	Water Carting Canungra 2019	Yes	Other	345		We recommend accepting this expenditure which was carried out in the drought response phase and aligns with the WSP trigger for this action	345	2020
Response	Water Carting Dayboro 2019	Yes	Other	148		We recommend accepting this expenditure which was carried out in the drought response phase and aligns with the WSP trigger for this action	148	2020

Drought Phase	Initiative	Easily Compliant with Drought Response Trigger	Related to particular item in Water Security Program	Expenditure $k	If it isn't easily compliant with drought response trigger, why was the initiative done (and at that timing)?	Atkins view	Recommended review event expenditure $k	Year the cost should have been incurred
Response	GCDP Operation - grid levels less than 60%	Yes	60% Up to full production Gold Coast Desalination Plant	4,035		We recommend accepting this expenditure which aligns with the drought response WSP trigger for this action and it appears reasonable that it remained in production.	4,035	2020
Response	Pumping more expensive direction (SRWP) to support drought	Yes	Other	508		We recommend accepting this expenditure which was carried out in the drought response phase and aligns with the WSP trigger for this action. We note that Seqwater has proposed to remove this cost from base year opex, which is consistent with allowing this as a drought review event cost.	508	2020
Response	PRW < 60%	Yes	60% Western Corridor Recycled Water Scheme recommissioning commences	1,073		This expenditure appears to be appropriate and consistent with the WSP.	1,073	2020
Response	60% water efficiency messaging	Yes	60% - Water conservation messaging and non-residential voluntary programs	1,122		We recommend accepting this expenditure which was carried out in the drought response phase and aligns with the WSP trigger for this action	1,122	2020
Response	Review of Water Carting Canungra 2019	Yes	Other	71		We recommend accepting this expenditure which was carried out in the drought response phase and aligns with the WSP trigger for this action	71	2020
Response	Off grid carting workshop	Yes	Other	2		We recommend accepting this expenditure which was carried out in the drought response phase and aligns with the WSP trigger for this action	2	2020
Response	Kilcoy WTP raw water pumping investigation	No	Other	2	p275 of WSP2017 refers to investigating raw water pumping system at Kilcoy. The WSP refers to a 35% trigger to start investigations, however we started earlier (67% in Nov 2019) due to the WTP already reaching maximum capacity to meet demand. This meant that diminishing Somerset levels were going to impact plant capacity sooner than expected in WSP.	We have not been able to recommend including this expenditure in the review event as it is not clear that it was appropriate to undertake the work so far in advance of the WSP trigger	0	
Response	60% water efficiency messaging and awareness of WCRWS	Yes	60% Western Corridor Recycled Water Scheme recommissioning commences	165		It is not clear to us how this action (Water Grid Asset Awareness Videos (by Growth Ops featuring Bernie Hobbs). is linked to drought response.	0	
Readiness	Drought risk appetite assessment	No	All	118	This initiative was approved in February 2020, when the water grid storage levels improved from Drought Response levels (about 56%) to about Drought Readiness (67%) in the one month. The concept was prompted by WGS levels being less than 60% with worsening drought conditions and limited likelihood of further rainfall (approaching the dry season) the	This appears to relate to drought planning rather than drought response. We cannot therefore recommend it is included as part of the drought response review event.	0	

Drought Phase	Initiative	Easily Compliant with Drought Response Trigger	Related to particular item in Water Security Program	Expenditure $k	If it isn't easily compliant with drought response trigger, why was the initiative done (and at that timing)?	Atkins view	Recommended review event expenditure $k	Year the cost should have been incurred
					work was accelerated to prepare ahead of potential drought contingency assessments.			
Readiness	PRW - 70%-60%	No	60% Western Corridor Recycled Water Scheme recommissioning commences	1,788	This initiative is linked to the motivation for recomissioning the first train at Luggage Point Advanced Water Treatment Plant. The Purified Recycled Water supplied offset water that otherwise would've been taken from Wivenhoe (and the grid). Reliable recomissioning of the firt train and supply of PRW to industry also helped provide confidence that full restart did not necessarily need to start as soon as 60% WGS was reached, and a risk assessment could instead be undertaken. Should the risk assessment not have been undertaken full WCRWS would have commenced Nov 2019.	Whilst we accept that, under the WSP, recommissioning costs (discussed above) would have been incurred anyway at a later date, it is not clear that customers should be asked to pay for the earlier and therefore longer operation of the plant than required under the WSP. (noting that the WSP requires that recommissioning of the WCRWS should commence at 60% storage). We have therefore not been able to recommend these costs as part of the drought response review event.	0	
Readiness	70% - Messaging to assist awareness Key Customers and Stakeholders	No	70% - Increase general water efficiency messaging in preparation for drought	5	Improved stakeholder communications asssociated with 70% drought readiness trigger	We cannot recommend accepting this expenditure as part of the drought response review event as the action (improvements to the monthly Water Security Status Reports) is not associated with any WSP drought responses	0	
Readiness	Water Quality sampling Lake Manchester	No	20% Contingency infrastructure construction commences	1	This initiative is not specifically listed in the Water Security Program, which is not intended to list every initiative. The water quality testing helped inform the contingency supply planning, however it also supported releasing water from Lake Manchester, increasing the water available at Lake Wivenhoe, in drought conditions in 2021 where production peaked at 60 ML/d. THe water quality testing supported a very economical supply of water in drought.	This was commenced in advance of the WSP trigger. However, the WSP trigger (to commence investigating contingency supply options) was reached in year and we recommend accepting it provided that it is also removed from base year opex.	1	2020
Response	Fixed term team resourcing - <60%	No	All	290	This version of the WSP does not specifically mention internal resourcing, however this is required to deliver the increasing number and complexity of projects as drought progresses. Initial resourcing started at the start of January 2017 in response to an acute and rapidly deteriorating situation in the Northern sub region and continued until mid 2018 while wrapping up that exercise. Resourcing for drought recommenced April 2019 in response to hitting drought trigger and has largely continued since. Resourcing was a mixture of drought response and drought readiness - much of resourcing attention was focussed on off-grids drought response and sub-regional as well as overall WGS levels. An estimate of the split has been made.	We recommend accepting this part of the resourcing expenditure which was carried out in the drought response phase provided that it is also removed from base year opex.	290	2020
Readiness	Fixed term team resourcing - >60%	No	All	579	This version of the WSP does not specifically mention internal resourcing, however this is required to deliver the increasing number and complexity of projects as drought progresses. Initial resourcing started at the start of January 2017 in response to an acute and rapidly deteriorating situation in the Northern sub region and continued until mid 2018 while wrapping up that exercise. Resourcing for drought recommenced April 2019 in response to hitting drought trigger and has largely continued since. Resourcing was a mixture of drought response and drought readiness - much of resourcing	We cannot recommend accepting this expenditure as part of the drought response review event as it was carried out in the drought readiness phase and does not have a clear WSP trigger.	0	

Drought Phase	Initiative	Easily Compliant with Drought Response Trigger	Related to particular item in Water Security Program	Expenditure $k	If it isn't easily compliant with drought response trigger, why was the initiative done (and at that timing)?	Atkins view	Recommended review event expenditure $k	Year the cost should have been incurred
					attention was focussed on off-grids drought response and sub-regional as well as overall WGS levels. An estimate of the split has been made.			

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Key: green is recommended expenditure, grey is not recommended and amber is not recommended because of non-compliance with the WSP or due to lack of justification.

C-4 Seqwater claim for FY21

Table C-4 - Seqwater drought response event claim for FY21 ($M Nominal)

Drought Phase	Initiative	Easily Compliant with Drought Response Trigger	Related to particular item in Water Security Program	Expenditure $k	If it isn't easily compliant with drought response trigger, why was the initiative done (and at that timing)?	Atkins view	Recommended review event expenditure $k	Year the cost should have been incurred
Readiness	Install Orifice Plate at Lake Manchester Outlet	No	20% Contingency infrastructure construction commences	5	p90 of the WSP references further investigations into potentially connecting assets to the grid - Lake Manchester would fit into this category. The decision to proceed with these low cost works occurred one month before 60% was reached (November 2019) while levels were just above 60%. One of the reasons this intiative was implemented somewhat earlier was due to the low levels at Wivenhoe - Somerset and Wivenhoe combined levels were at 58% and Wivenhoe was at levels not seen since the Millenium drought. Lake Manchester works directly benefits Wivenhoe dam level. The works were considered a very economic drought initiative - relatively low capital costs and neglible on-going operational costs for accessing a further potential 4700 ML/ year.	This expenditure appears reasonable, but the description suggests it is capex, not opex, especially when taken with FY20 expenditure which takes it over the $10k capitalisation threshold.	5 CAPEX NOT OPEX	
Response	Feasibility assessment of Brisbane Aquifers	Yes	20% Contingency infrastructure construction commences	19		We recommend accepting this expenditure which was carried out in the drought response phase and aligns with the 60% trigger for this action.	19	2021
Response	GCDP Operation - grid levels less than 60%	Yes	60% Up to full production Gold Coast Desalination Plant	980		We recommend accepting this expenditure which aligns with the drought response WSP trigger for this action	980	2021
Response	Review of Water Carting Canungra 2019	Yes	Other	8		We recommend accepting this expenditure which was carried out in the drought response phase and aligns with the WSP trigger for this action	8	2021
Readiness	Drought risk appetite assessment	No	All	25	This initiative was approved in February 2020, when the water grid storage levels improved from Drought Response levels (about 56%) to about Drought Readiness (67%) in the one month.The concept was prompted by WGS levels being less than 60% with worsening drought conditions and limited likelihood of further rainfall (approaching the dry season) the work was accelerated to prepare ahead of potential drought contingency assessments.	This appears to relate to drought planning rather than drought response. We cannot therefore recommend it is included as part of the drought response review event.	0	
Readiness	PRW - 70%-60%	No	60% Western Corridor Recycled Water Scheme recommissioning commences	1,413	This initiative is linked to the motivation for recommissioning the first train at Luggage Point Advanced Water Treatment Plant. The Purified Recycled Water supplied offset water that otherwise would've been taken from Wivenhoe (and the grid). Reliable recommissioning of the first train and supply of PRW to industry also helped provide confidence that full restart did not necessarily need to start as soon as 60% WGS was reached, and a risk assessment could instead be undertaken. Should the risk assessment not have been undertaken full WCRWS would have commenced Nov 2019.	Whilst we accept that, under the WSP, recommissioning costs (discussed above) would have been incurred anyway at a later date, it is not clear that customers should be asked to pay for the earlier and therefore longer operation of the plant than required under the WSP. (noting that the WSP requires that recommissioning of the WCRWS should commence at 60% storage). We have therefore not been able to recommend these costs as part of the drought response review event.	0	
Readiness	70% - Messaging to assist awareness	No	70% - Increase general water	5	Improved stakeholder communications asssociated with 70% drought readiness trigger	We cannot recommend accepting this expenditure as part of the	0	

Drought Phase	Initiative	Easily Compliant with Drought Response Trigger	Related to particular item in Water Security Program	Expenditure $k	If it isn't easily compliant with drought response trigger, why was the initiative done (and at that timing)?	Atkins view	Recommended review event expenditure $k	Year the cost should have been incurred
	Key Customers and Stakeholders		efficiency messaging in preparation for drought			drought reposne review event as the action (improvements to the monthly Water Security Status Reports) is not associated with any WSP drought responses		
Readiness	Water Quality sampling Lake Manchester	No	20% Contingency infrastructure construction commences	2	This initiative is not specifically listed in the Water Security Program, which is not intended to list every initiative. The water quality testing helped inform the contingency supply planning, however it also supported releasing water from Lake Manchester, increasing the water available at Lake Wivenhoe, in drought conditions in 2021 where production peaked at 60 ML/d. THe water quality testing supported a very economical supply of water in drought.	As above, we recommend accepting this expenditure as it appears consistent with the WSP trigger	2	2021
Response	Cooling Tower and Vehicle Washing guidelines	Yes	50% - Water conservation messaging and medium level water restrictions	44		We recommend accepting this expenditure as the WSP 60% storage trigger for “Water conservation messaging and non-residential voluntary program” had been reached in the previous year and again in FY21.	44	2021
Readiness	60% - Water conservation messaging (Count the Ways)	No	60% - Water conservation messaging and non-residential voluntary programs	500	This initiative was entirely to support the approaching 60% trigger and drought response - it occurred just behorehand at 62% in August. August is in the dry season so there was some confidence the trigger would be reached. The advertising campaign started on emonth before the 60% trigger was reached and continued while grid levels were less than 60%.	Although it commenced shortly before the associated 60% trigger, we recommend accepting the expenditure in the review event as it would have simply been incurred at a slightly later date.	500	2021
Response	60% Up to full production Gold Coast Desalination Plant	Yes	60% Up to full production Gold Coast Desalination Plant	13,700		We recommend accepting this expenditure as it appears consistent with the WSP trigger	13,700	2021
Response	Pumping costs for SRWP north, to support drought and GCDP production	Yes	Other	1,134		We recommend accepting this expenditure as it appears consistent with the WSP trigger	1,134	2021
Readiness	Supply PRW to Tarong Power Station as Drought Initiative.	No	60% Western Corridor Recycled Water Scheme recommissioning commences	3,646	The Water Security Program (p5) supports using existing assets, including the WCRWS to their maximum advantage. To quote the WSP (p5): " This program is adaptive. It does not propose one water security solution with a set timeframe. Rather, it identifies ways we can respond to changeing influences..." p80 states that medium term operational strategy (ie the Annual Operating Strategy) would look to "develop, review and monitor triggers that maintain water security, reliability and cost considerations. The Annual Operating Strategy identified (AOS Nov 2020, p15): "As the drought progresses supply to Tarong will be increased so that the current Luggage Point capability of 23 ML/day will be maximised when the WGS level is below 60%. Current operation is maximised due to the WGS level being under 60%. "	We recommend accepting this expenditure as the WSP 60% storage trigger for commencement of WCRWS commissioning had been reached in the previous year and again in FY21.	3,646	2021
Readiness	Bundamba AWTP membranes - initial planning, procurement and design work	No	60% Western Corridor Recycled Water Scheme recommissioning commences	1,200	The Water Security Program identifies a trigger for full recommissioning of the WCRWS at 60%. The Bundamba AWTP membranes project is a portion of the scope that was required for full commissioning. The Bundamba AWTP project was commenced when the grid level was 61% - ie 1% higher and 1 month earlier than when the scope would have been triggered anyway as part of the full recommissioning. The trigger for full recommissioning of the WCRWS	We recommend accepting this expenditure as the WSP 60% storage trigger for commencement of WCRWS commissioning had been reached in the previous year and again in FY21.	1,200	2021

Drought Phase	Initiative	Easily Compliant with Drought Response Trigger	Related to particular item in Water Security Program	Expenditure $k	If it isn't easily compliant with drought response trigger, why was the initiative done (and at that timing)?	Atkins view	Recommended review event expenditure $k	Year the cost should have been incurred
					was based on a restart period of 2 years (p77 WSP). However, an option study determined that the type of membrane at the Bundamba Advances Water Treatment Plant was a risk to the whole program - the 18 inch diameter membranes were no longer produced and would need a supplier to agree to manufacture them as a special item - this was considered to have a high risk to both cost and program. The Bundamba Membranes project to redesign and complete preliminary procurement activities based on currently available membrane sizes were therefore completed to prevent the trigger for the whole WCRWS being required to be brought forward - incurring expense earlier.			
Response	Readiness Activities WCRWS - Phase 1	Yes	60% Western Corridor Recycled Water Scheme recommissioning commences	909		We recommend accepting this expenditure as the WSP 60% storage trigger for commencement of WCRWS commissioning had been reached in the previous year and again in FY21.	909	2021
Response	Supply of PRW to Swanbank while grid levels less than 60%.	Yes	60% Western Corridor Recycled Water Scheme recommissioning commences	2,503		We recommend accepting this expenditure	2,503	2021
Response	Water Carting Dayboro 2020	Yes	Other	127		We recommend accepting this expenditure	127	2021
Response	Media campaign (WGS<60%)	Yes	60% - Water conservation messaging and non-residential voluntary programs	800		We recommend accepting this expenditure	800	2021
Response	Drought Information dashboard.	No	All	33	While not specifically mentioned in the Water Security Program, this project was implemented in Drought Response (less than 60%) and is used to assist in responding to stakeholder queries on past dam levels and can also be used for assisting in projections.	We cannot recommend incorporating this in the event as it is not part of the WSP drought response.	0	
Response	Kalbar WTP pumping pool	Yes	Other	4		We recommend accepting this expenditure	4	2021
Response	Readiness Activities WCRWS - Phase 1	Yes	60% Western Corridor Recycled Water Scheme recommissioning commences	350		We recommend accepting this expenditure	350	2021
Response	PRW Awareness Resources	Yes	60% Western Corridor Recycled Water Scheme recommissioning commences	160		We recommend accepting this expenditure	160	2021
Response	Team resourcing - new permanent resources for managing drought (step change)	No	All	320	This version of the WSP does not specifically mention internal resourcing, however this is required to deliver the increasing number and complexity of projects as drought progresses. Resourcing for drought initially used consultants employed for a fixed duration, however this was replaced by direct fixed term labour to be more	We recommend accepting this part of the resourcing expenditure which was carried out in the drought response phase provided that it is also removed from base year opex.	320	2021

Drought Phase	Initiative	Easily Compliant with Drought Response Trigger	Related to particular item in Water Security Program	Expenditure $k	If it isn't easily compliant with drought response trigger, why was the initiative done (and at that timing)?	Atkins view	Recommended review event expenditure $k	Year the cost should have been incurred
					economical as drought conditions continued. Moving to a model where part of the team was permanently and would flex up as required was considered to be the optimal balance in cost efficiency for resourcing for drought.			
Response	Fixed term team resourcing - <60%	No	All	511	This version of the WSP does not specifically mention internal resourcing, however this is required to deliver the increasing number and complexity of projects as drought progresses. Initial resourcing started at the start of January 2017 in response to an acute and rapidly deteriorating situation in the Northern sub region and continued until mid 2018 while wrapping up that exercise. Resourcing for drought recommenced April 2019 in response to hitting drought trigger and has largely continued since. Resourcing was a mixture of drought response and drought readiness - much of resourcing attention was focussed on off-grids drought response and sub-regional as well as overall WGS levels. An estimate of the split has been made.	We recommend accepting this part of the resourcing expenditure which was carried out in the drought response phase provided that it is also removed from base year opex.	511	2021
Readiness	Fixed term team resourcing - >60%	No	All	116	This version of the WSP does not specifically mention internal resourcing, however this is required to deliver the increasing number and complexity of projects as drought progresses. Initial resourcing started at the start of January 2017 in response to an acute and rapidly deteriorating situation in the Northern sub region and continued until mid 2018 while wrapping up that exercise. Resourcing for drought recommenced April 2019 in response to hitting drought trigger and has largely continued since. Resourcing was a mixture of drought response and drought readiness - much of resourcing attention was focussed on off-grids drought response and sub-regional as well as overall WGS levels. An estimate of the split has been made.	We recommend accepting this part of the resourcing expenditure which was carried out after the drought response phase had been entered provided that it is also removed from base year opex.	116	2021
Response	Contingency supply investigations	Yes	20% Contingency infrastructure construction commences	600		We recommend accepting this expenditure which was carried out in the drought response phase and aligns with the 60% trigger for this action.	600	2021
Response	Contingency supply investigations - Brisbane aquifers phase 2	Yes	20% Contingency infrastructure construction commences	70		We recommend accepting this expenditure which was carried out in the drought response phase and aligns with the 60% trigger for this action.	70	2021
Response	Media campaigns to support water conservation at 60%	Yes	60% - Water conservation messaging and non-residential voluntary programs	1,200		We recommend accepting this expenditure which was carried out in the drought response phase and aligns with the 60% trigger for this action.	1,200	2021
Response	Contingency supply investigations	Yes	20% Contingency infrastructure construction commences	130	p90 of the WSP references further investigations into potentially connecting assets to the grid - Lake Manchester would fit into this category. The decision to proceed with these low cost works occurred one month before 60% was reached (November 2019) while levels were just above 60%. One of the reasons this intiative was implemented somewhat earlier was due to the low levels at Wivenhoe - Somerset and Wivenhoe combined levels were at 58% and Wivenhoe was at levels not seen since the Millenium drought. Lake Manchester works directly benefits Wivenhoe dam level. The	We recommend accepting this expenditure	130	2021

Drought Phase	Initiative	Easily Compliant with Drought Response Trigger	Related to particular item in Water Security Program	Expenditure $k	If it isn't easily compliant with drought response trigger, why was the initiative done (and at that timing)?	Atkins view	Recommended review event expenditure $k	Year the cost should have been incurred
					works were considered a very economic drought initiative - relatively low capital costs and neglible on-going operational costs for accessing a further potential 4700 ML/ year.			

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Key: green is recommended expenditure, grey is not recommended and amber is not recommended because of non-compliance with the WSP or due to lack of justification.

C-5 Seqwater claim for FY22

Table C-5 - Seqwater drought response event claim for FY22 ($M Nominal)

Drought Phase	Initiative	Easily Compliant with Drought Response Trigger	Related to particular item in Water Security Program	Expenditure $k	If it isn't easily compliant with drought response trigger, why was the initiative done (and at that timing)?	Atkins view	Recommended review event expenditure $k	Year the cost should have been incurred
Readiness	70% - Messaging to assist awareness Key Customers and Stakeholders	No	70% - Increase general water efficiency messaging in preparation for drought	5	Improved stakeholder communications associated with 70% drought readiness trigger	We cannot recommend accepting this expenditure as part of the drought response review event as the action (improvements to the monthly Water Security Status Reports) is not associated with any WSP drought responses	0	
Readiness	Water Quality sampling Lake Manchester	No	20% Contingency infrastructure construction commences	1	This initiative is not specifically listed in the Water Security Program, which is not intended to list every initiative. The water quality testing helped inform the contingency supply planning, however it also supported releasing water from Lake Manchester, increasing the water available at Lake Wivenhoe, in drought conditions in 2021 where production peaked at 60 ML/d. THe water quality testing supported a very economical supply of water in drought.	We recommend accepting this expenditure as it appears consistent with the WSP trigger	1	2022
Response	60% Up to full production Gold Coast Desalination Plant	Yes	60% Up to full production Gold Coast Desalination Plant	7,700		We recommend accepting this expenditure	7,700	2022
Readiness	Supply PRW to Tarong Power Station as Drought Initiative.	No	60% Western Corridor Recycled Water Scheme recommissioning commences	1,436	The Water Security Program (p5) supports using existing assets, including the WCRWS to their maximum advantage. To quote the WSP (p5): " This program is adaptive. It does not propose one water security solution with a set timeframe. Rather, it identifies ways we can respond to changing influences..." p80 states that medium term operational strategy (ie the Annual Operating Strategy) would look to "develop, review and monitor triggers that maintain water security, reliability and cost considerations. The Annual Operating Strategy identified (AOS Nov 2020, p15): "As the drought progresses supply to Tarong will be increased so that the current Luggage Point capability of 23 ML/day will be maximised when the WGS level is below 60%. Current operation is maximised due to the WGS level being under 60%. "	We recommend accepting this expenditure	1,436	2022
Response	Supply of PRW to Swanbank while grid levels less than 60%.	Yes	60% Western Corridor Recycled Water Scheme recommissioning commences	7,091		We recommend accepting this expenditure	7,091	2022
Response	Readiness Activities WCRWS - Phase 1	Yes	60% Western Corridor Recycled Water Scheme recommissioning commences	214		We recommend accepting this expenditure	214	2022
Response	Commisssioning two additional Trains at Luggage Point	Yes	60% Western Corridor Recycled Water Scheme recommissioning commences	1,844		We recommend accepting this expenditure as recommissioning of the WCRWS is consistent with the WSP 60% trigger having been reached.	1,844	2022
Response	PRW Awareness Resources	Yes	60% Western Corridor Recycled Water Scheme	970		We recommend accepting this expenditure	970	2022

Drought Phase	Initiative	Easily Compliant with Drought Response Trigger	Related to particular item in Water Security Program	Expenditure $k	If it isn't easily compliant with drought response trigger, why was the initiative done (and at that timing)?	Atkins view	Recommended review event expenditure $k	Year the cost should have been incurred
			recommissioning commences					
Response	Team resourcing - new permanent resources for managing drought (step change)	No	All	678	This version of the WSP does not specifically mention internal resourcing, however this is required to deliver the increasing number and complexity of projects as drought progresses. Resourcing for drought initially used consultants employed for a fixed duration, however this was replaced by direct fixed term labour to be more economical as drought conditions continued. Moving to a model where part of the team was permanently and would flex up as required was considered to be the optimal balance in cost efficiency for resourcing for drought.	We recommend accepting this expenditure	678	2022
Response	Fixed term team resourcing - <60%	No	All	257	This version of the WSP does not specifically mention internal resourcing, however this is required to deliver the increasing number and complexity of projects as drought progresses. Initial resourcing started at the start of January 2017 in response to an acute and rapidly deteriorating situation in the Northern sub region and continued until mid 2018 while wrapping up that exercise. Resourcing for drought recommenced April 2019 in response to hitting drought trigger and has largely continued since. Resourcing was a mixture of drought response and drought readiness - much of resourcing attention was focussed on off-grids drought response and sub-regional as well as overall WGS levels. An estimate of the split has been made.	We recommend accepting this expenditure	257	2022
Response	Contingency supply investigations	Yes	20% Contingency infrastructure construction commences	1,000		We recommend accepting this expenditure	1,000	2022
Response	Potential Carting to Moogerah	Yes	Other	200		We recommend accepting this expenditure	200	2022
Response	Media campaigns to support water conservation at 60%	Yes	60% - Water conservation messaging and non-residential voluntary programs	1,600		We recommend accepting this expenditure	1,600	2022

Seqwater document "QCA 2021 Drought Timeline Revised_v2"

Key: green is recommended expenditure, grey is not recommended and amber is not recommended because of non-compliance with the WSP or due to lack of justification.

Appendix D. Terms of reference

TERMS OF REFERENCE - 22/06/2021

Project: Review of expenditures and demand for the investigation ofSeqwater's bulk water prices for 2022–26

Project Background

Queensland Competition Authority

The Queensland Competition Authority (the QCA) is an independent statutory body established in the *Queensland Competition Authority Act 1997* (QCA Act).

On 16 June 2021 the Treasurer and Minister for Investment issued the QCA with a referral notice (under s. 23(1) of the QCA Act) to undertake an investigation into Seqwater's bulk water pricing practices for the period of 1 July 2022 to 30 June 2026, for eleven local government areas.

Seqwater's regulatory submission is due to the QCA by 30 June 2021.

The QCA must complete a draft report by 30 November 2021 and a final report by 31 March 2022.

Seqwater

Seqwater is a statutory authority responsible for providing bulk urban and industrial water supply and irrigation supply services in south east Queensland (SEQ).

Seqwater owns and operates 26 dams, 46 water treatment plants (WTPs), 47 weirs and 14 bores and aquifers that supply up to 90 per cent 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 and the Gold Coast Desalination Plant.

Purpose & outline of consultancy

The purpose of the consultancy is to provide expert advice to assist the QCA to determine the prudence and efficiency of Seqwater's forecast capital and operating expenditure (capex and opex), and the appropriateness of its water demand forecasts.

The consultant should be aware that the final scope and nature of the consultancy task will be influenced by the specific issues raised in Seqwater's regulatory submission. QCA staff will discuss, and agree with the successful consultant, any necessary revisions to the task following receipt of Seqwater's regulatory submission.

Under the referral notice, the QCA has fixed deadlines and limited time to complete this review. The successful delivery of this project will depend on the scope of the consultancy task being established with the consultant at the outset, to ensure the project is delivered on time. Given the timeframe, the consultant should propose a practical and 'fit for purpose' review approach to ensure the consultancy tasks can be delivered.

Subject to the scope of the consultancy task, the consultant may be required to assess the following:

- Seqwater's forecast opex and capex over the period 1 July 2022 to 30 June 2028
- Seqwater's actual capex (to the extent information is available) over the period 1 July 2017 to 30 June 2022
- costs arising from any review events

- Seqwater's demand forecasts
- any other related matter.

The consultant should explain its proposed approach to completing these tasks, including the proposed methodology and any assumptions, in their proposal. Further guidance is set out below.

Scope of the consultancy

Overview

The consultant will review, and provide reasoned expert opinions on, the prudence and efficiency of Seqwater's capex and opex. This includes expenditure on activities related to the provision of bulk water supply services (including catchment management), recreation management and flood mitigation, but excludes expenditure associated with Seqwater's declared irrigation services.[1]

Opex refers to Seqwater's recurrent expenditure such as labour and external services costs, maintenance expenditure, corporate costs, and other operating costs. Capex may relate to a diverse program of capital works on a single asset (such as a WTP upgrade) or a relatively uniform program of capital works on a series of assets (such as a meter replacement program).

For the purposes of this review opex and capex 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 an increase in the reliability or quality of supply explicitly endorsed or desired by customers
- **efficient** if it represents the lowest long-term cost means of providing the relevant service or achieving the intended outcome.

In considering prudence and efficiency of opex and capex, the consultant is to consider:

- **Scope of the works:** The best means of achieving the desired outcomes after having regard to the options available, including more cost-effective network solutions, the substitution possibilities between capex and opex and non-network alternatives such as demand management (opex/capex trade-offs).
- **Standard of the works**: Conformity with technical, design and construction requirements in legislation, industry and other standards, codes and conventions. Compatibility with existing and adjacent infrastructure is relevant, as is consideration of modern engineering equivalents and technologies.
- **Cost of the defined scope and standard**: Whether the proposed cost is consistent with conditions prevailing in the markets (for example, engineering, equipment supply and construction).

The consultant will also review Seqwater's demand forecasts to assess whether they are appropriate. Forecast water demand is used to inform the assessment of expenditure forecasts, and to calculate bulk water prices. Demand forecasts should be as accurate as possible, particularly given that Seqwater's bulk water prices are fully volumetric. Accurate demand forecasts minimise the likelihood of Seqwater under- or over-recovering its revenue requirement for the regulatory period.

Seqwater is expected to propose two demand forecasts; one for normal operating conditions and one for drought operating conditions. Drought operating conditions refers to a situation where Seqwater is

[1] Irrigation costs to be excluded from opex and capex must be calculated consistent with the cost allocation approach adopted by the QCA in its review of Seqwater's irrigation price paths for 2020–24.

operating at or below the 'drought response' trigger published in the SEQ Water Security Program for thelength of the regulatory period.

Assessment of forecast opex and capex

The consultant's proposed approach to assessing the prudence and efficiency of Seqwater's forecast opex and capex over the period 1 July 2022 to 30 June 2028 should:

(1) include a review of Seqwater's governance arrangements, policies and procedures relevant to operating and capital expenditure decisions. Documentation reviewed should include but need not be limited to; asset planning and management policies; risk management approaches; procurement and investment decision-making frameworks. The consultant should form a view as to whether Seqwater's governance, policies and procedures are:

  (a) consistent with good industry practice

  (b) appropriately and consistently applied in developing and delivering its opex and capex programs, and

  (c) are likely to result in efficient expenditure and investment decisions.

(2) if necessary, recommend potential improvements to governance arrangements, policies and procedures relevant to Seqwater's operating and capital expenditure decisions and quantify potential savings from such improvements, if possible.

(3) assess the reasonableness of Seqwater's opex and capex forecasting methodologies and their application, including inputs, assumptions and modelling. The consultant should form a view on whether Seqwater's methodologies provide a reasonable basis for developing forecasts that reflect efficient costs, including:

  (a) the reasonableness of Seqwater's proposed base year for establishing an efficient level of recurring opex and, if not reasonable, an alternative base year

  (b) the prudence and efficiency of proposed base-year opex, including any adjustments required to account for non-recurrent costs and identified efficiencies. The consultant should recommend an estimate of the base-year expenditure that reflects efficient recurrent ongoing costs

  (c) the prudence and efficiency of any proposed incremental step changes to base-year opex, including whether the drivers of those step changes are reasonable

  (d) the reasonableness of Seqwater's methods of allocating shared costs, where relevant.

(4) focus on operating cost categories and capital projects that are material to the overall expenditure program (depending on the scope of capital projects proposed by Seqwater, a sample of capex key projects/programs should be assessed (e.g. three)

(5) take into account the uncertainty around projects at an early stage of development, and adopt a suitable assessment approach for dealing with risk and uncertainty (recognising that such projects will have relatively lower levels of documentation than more advanced projects)

(6) assess the efficiency of the proposed mix of opex and capex — i.e. whether there is scope to substitute (less expensive) opex solutions for capex solutions or vice versa. The consultant should form a view on:

  (a) whether Seqwater has given appropriate consideration to substitution opportunities between opex and capex, as evidenced in business cases and expenditure proposals

  (b) the extent to which there are further opportunities for prudent and efficient capex/opex substitution

  (c) the extent to which the opex forecast is reasonable given the assumed capex program (and vice versa). For example, whether the opex impacts of any projected capex programs are reasonably reflected in the opex forecast.

(d) any factors that constrain or enable prudent and efficient substitution opportunities, for example; statutory obligations, customer preferences, risk assumptions, and practical engineering and technical considerations.

(7) assess the appropriateness of any cost escalation methods proposed by Seqwater (e.g. whether they are consistent with prevailing market conditions, relevant data sources and historical trends). If the consultant considers the proposed escalations are not appropriate, it should recommend alternative nominal escalation rates, clearly explaining the basis for any such recommendations.[2]

(8) assess the extent to which the opex and capex forecasts are reasonable given the corresponding demand forecast for normal operating conditions

(9) consider the prudence and efficiency of Seqwater's proposed incremental costs expected to be incurred during drought operating conditions, which form Seqwater's proposed 'drought allowance'

(10) assess the potential for efficiency gains and the reasonableness of any expenditure efficiency targets proposed by Seqwater. Where the consultant recommends efficiency adjustments in excess of those proposed by Seqwater, the consultant must provide robust justification for any such adjustments (e.g. by reference to relevant benchmarks)

(11) assess the deliverability of Seqwater's proposed capex and opex programs

(12) be able to identify the value of any expenditure that is considered to be inefficient and/or imprudent

(13) have regard to the strategic and operational plans approved by the responsible Ministers under the South East Queensland Water (Restructuring) Act 2007

(14) substantiate all findings and recommendations with comprehensive referencing to relevant benchmarks and information sources, as required.

End of period assessment of capex from the 2018 review

The consultant will be required to assess the prudence and efficiency of actual capital expenditure from 1 July 2017 to 30 June 2022 (to the extent actual capital expenditure information is available).

The review should focus on capital projects and programs that are material in terms of cost and/or scope. The QCA will work with the consultant to determine an appropriate sample of 3 key projects/programs to be reviewed.

Under the referral notice, the findings on prudence and efficiency of the sampled expenditure should not be extrapolated to capital expenditure that did not form part of the sample.

[2] Note that the referral notice prescribes the methodology to be used to estimate inflation. The QCA will discuss the implications of this with the successful consultant on commencement.

Assessment of costs associated with review events

Under the referral notice, the QCA must consider additional prudent and efficient operating and capital costs arising from review events.

Review events, as defined in the QCA's 2015 and 2018 reviews, include:

- emergency events, changes in law or government policy, and feedwater quality events, that cause a change in revenue, or prudent and efficient costs
- drought response measures taken in accordance with the Water Security Program, which give rise to a change in prudent and efficient costs.[3]

Should Seqwater make a submission to recoup costs associated with a review event, the consultant will be required to assess the prudence and efficiency of this expenditure.

Assessment of Seqwater's demand forecasts

The consultant will assess Seqwater's proposed demand forecasts for normal operating conditions, and drought operating conditions.

Under the referral notice, Seqwater must provide water demand forecasts for normal operating conditionsthat are within the range published in the SEQ Water Security Program. The QCA can recommend adjustments to Seqwater's demand forecast for normal operating conditions to ensure it is appropriate for regulatory pricing purposes, as long as the adjusted forecast remains within the range published in the SEQ Water Security Program.

The QCA can also make adjustments to the demand forecast for drought operating conditions as long as the adjusted forecast remains at or above target demand consistent with medium-level water restrictions as published in the Water Security Program (not including demand from power stations and Toowoomba Regional Council).

To assist the QCA in its assessment, the consultant will undertake a desktop review of Seqwater's proposed demand forecasts and form a view on whether they are appropriate. In doing so, the consultant should consider the appropriateness of the proposed forecasting methodology, data sources and assumptions.

If the consultant considers that Seqwater's proposed demand forecasts are not appropriate, the consultant must:

- clearly explain why it considers the forecast inappropriate
- recommend an alternative forecast that it considers is appropriate, within the parameters prescribedin the referral notice.

Project time frame

The consultancy will commence in July 2021 (after receipt of Seqwater's proposal and initial submissions from stakeholders) with the first stage to be completed by October 2021. To the extent the QCA requires further advice following consultation on its draft report, a second stage of the consultancy may be required. The second stage will commence in January 2022 be completed by early March 2022. Specific dates for commencement and completion will be determined at the time of appointment. However, an indicative timeline is as follows.

[3] QCA, *Seqwater bulk water price review 2018–21*, final report, March 2018, pp. 80-81.

Stage 1

- Seqwater will provide a written submission and supporting information to the QCA by 30 June 2021
- Consultant proposals due — 15 July 2021
- Consultant engagement and commencement — 25 July 2021
- a preliminary visit to Seqwater's offices during early August 2021 to interview key Seqwater staff and seek further information where required
- consultation with stakeholders between early July and late August 2021 (stakeholder submissions on Seqwater's proposal close on 13 August 2021).
- an outline of the consultant's report and the overview of key preliminary findings to the QCA by 3 September 2021
- a draft consultant's report to the QCA by 1 October 2021 for QCA staff review and feedback
- a final consultant's report by 15 October 2021 incorporating QCA staff feedback

- the QCA's draft report is due to the responsible minister on **30 November 2021**.

Stage 2

The consultant may also be required to provide further advice following the receipt of submissions on the QCA's draft report. The extent and scope of this work will depend on the nature of submissions. If required, this work will be undertaken by the consultant during February–March 2022 and form a separate item under the contract (with separate terms of reference) to be quoted at the time and charged at the agreed hourly rates. It is therefore important that the consultant quotes their standard fee rates for any ad hoc tasks or contract variations to the proposed consultancy task.
The QCA's final report is due to the responsible minister by **31 March 2022**.

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