

Rural Irrigation Capital Expenditure Review

Seqwater



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Seqwater

Client: Queensland Competition Authority

ABN: 43812633965

Prepared by

AECOM Australia Pty Ltd

Level 8, 540 Wickham Street, PO Box 1307, Fortitude Valley QLD 4006, Australia

T +61 7 3553 2000 F +61 7 3553 2050 www.aecom.com

ABN 20 093 846 925

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Table of Contents

Glossary	i
Executive Summary	ii
1.0 Introduction	1
1.1 Scope of the Review	2
1.2 Report Structure	4
2.0 Summary of the Capital Submission	5
2.1 Historical Actuals (FY14-FY18)	5
2.2 Transitional and Forward Renewals	6
3.0 Assessment Methodology	10
3.1 Objective	10
3.2 Priority Areas	10
3.3 Approach	11
3.4 Project Assessment	12
3.5 Information Sources	13
3.6 Interpreting this Report	15
3.7 Extrapolating Findings	15
3.8 Sample of Projects Selected for Assessment	16
3.8.1 Historical Sample	16
3.8.2 Transitional and Forward Renewal Sample	17
4.0 Policies and Procedures Review	19
4.1 Review of Recommendations from the 2013 Review	19
4.2 Seqwater's Renewal Planning Processes	19
4.2.1 Best Practice	20
4.2.2 Renewal Planning by Seqwater	22
4.2.3 Options Analysis	30
4.2.4 Seqwater's Planning Period	31
4.3 Cost Estimation	32
4.4 Consultation Processes	32
4.4.1 Variance Reporting in NSPs	33
4.4.2 Customer Consultation on the Annual NSPs	33
4.5 Procurement	34
4.5.1 The Benchmarks	34
4.5.2 The Procurement Review	34
4.6 Cost Allocation	37
4.7 Conclusions	38
4.7.1 Seqwater's Renewal Planning Processes	38
4.7.2 Cost Estimation	39
4.7.3 Consultation Processes	39
4.7.4 Procurement	39
4.7.5 Cost Allocation	39
5.0 Historical Renewals Assessments (FY14-FY18)	40
5.1 Project Reviews	40
5.2 Themes and Systemic Issues Arising from Project Reviews	40
5.3 Conclusions and Recommendations	42
6.0 Transitional and Forward Renewals Assessments (FY19-FY53)	43
6.1 Project Reviews	43
6.2 Themes and Systemic Issues Arising from Project Reviews	43
6.3 Conclusions and Recommendations	45
7.0 Summary of Conclusions and Recommendations	46
7.1 Policies and Procedures	46
7.2 Renewals Projects Sample Review	46
7.2.1 Historical Renewals	46
7.2.2 Transitional and Forward Renewals	46
Appendix A	
Project Reviews for Historical Renewals	A

Appendix B	
Project Reviews for Transitional and Forward Renewals	B
Appendix C	
Assessment Forms for Historical Renewals	C
Appendix D	
Assessment Forms for Transitional and Forward Renewals	D

Table of Figures

Figure 1 FY14-FY18 Historical Actuals (\$ million)	5
Figure 2 Historical Renewals by Water Supply Scheme (% Total Period Value)	6
Figure 3 Seqwater's Revised Transitional and Forward Renewals Submission (\$ million, FY19)	7
Figure 4 Transitional Years Renewals by Water Supply Scheme (% Total Period Value)	8
Figure 5 Price Path Period Renewals by Water Supply Scheme (% Total Period Value)	8
Figure 6 Beyond Price Path Planning Period Renewals by Water Supply Scheme (% Total Period Value)	9
Figure 7 Outline of Methodology	11
Figure 8 Total Value of Projects by Facility Type (% Total Period Value)	17
Figure 9 Total Contribution of Facility Type to Total Costs for All Projects and for the Sample	18
Figure 10 Failure Distribution and Risk of Failure of Cast Iron Pipes	21
Figure 11 Seqwater's Asset Management System Diagram	23
Figure 12 Seqwater's Capital Project Gateway Summary	27
Figure 13 Seqwater's Project Gateway Approval / Pass-Through Percentages	28
Figure 14 Seqwater's Annual Works Program Development Timeline	29
Figure 15 Summary of Historical Projects Review	42
Figure 16 Summary of Project Reviews in the Transitional Years	45
Figure 17 Summary of Forward Project Reviews in the Price Path Period	45
Figure 18 Summary of Forward Project Reviews Beyond the Price Path Period	45

Table of Tables

Table 1 QCA Recommendations from 2018-21 Bulk Water Pricing Review	2
Table 2 Report Structure	4
Table 3 Top Projects by Value in Years of High Expenditure	7
Table 4 Project Documentation Assessment	14
Table 5 Sample Project - Interpreting the Report	15
Table 6 Possible Forms of Inefficiency and Extrapolation	15
Table 7 Historical Sample	16
Table 8 Forward Projects Sample Representation	18
Table 9 Recommendations made by the QCA in its 2013 Review Relating to Capital Expenditure	19
Table 10 Review of the Renewals Planning Process	20
Table 11 Options Analyses for Material Renewals Expenditure	30
Table 12 Renewals Planning Period	31
Table 13 Variance Reporting and Re-Forecasting of Renewals	33
Table 14 Customer Consultation on the Annual NSPs	33
Table 15 Assessment of Seqwater's Procurement Policy	35
Table 16 More Appropriate Allocation of Fixed Bulk Renewals Costs	37
Table 17 More Appropriate Allocation of Fixed Distribution Renewals Costs	37

Glossary

Term	Definition
AMP	Asset Management Plan
AMS	Asset Management System
APMP	Asset Portfolio Master Plan
ARR	Asset Restoration Reserve
ASX	Australian Securities Exchange
BOM	Bill of Materials
CAPEX	Capital Expenditure
CPR	Commonwealth Procurement Rules
DoA	Delegation of Authority (or Delegation of Authorisations)
HUF	Headworks Utilisation Factor
ICT	Information and Communications Technology
ISO	International Organization for Standardization
kW	Kilowatt (1 thousand watts)
MCA	Multi Criteria Analysis
ML	Megalitre (1 million litres)
NPV	Net Present Value
NSP	Network Service Plan
P3MF	Project, Program and Portfolio Management Framework
PAMP	Portfolio Asset Management Plan
QCA	Queensland Competition Authority
RAB	Regulatory Asset Base
RFI	Request for Information
SAMP	Strategic Asset Management Plan
SAP	Systems, Applications and Products in Data Processing (an Enterprise Resource Planning system by SAP AG)
SEQ	South East Queensland
The price path period	The period 1 July 2020 to 30 June 2024
The referral	the referral for the review issued by the Queensland Government to the QCA under section 23 of the QCA Act
The review	the QCA's review of irrigation prices for the period 1 July 2020 to 30 June 2024
The historical transitional period	The period 1 July 2018 to 30 June 2020
ToR	Terms of Reference
WAE	Water Access Entitlements
WSS	Water Supply Scheme
WTP	Water Treatment Plant

Executive Summary

Seqwater is a statutory authority responsible for providing bulk urban and industrial water supply and irrigation supply services in south east Queensland (SEQ). Seqwater's water storage and distribution infrastructure includes 26 major dams, 47 weirs, 46 water treatment plants (WTPs), 14 bores and aquifers, and more than 600 kilometres of pipelines. It also owns and operates the Western Corridor Recycled Water Scheme and the Gold Coast Desalination Plant.

The Queensland Government has directed the QCA to conduct an investigation into pricing practices relating to the monopoly business activities of Seqwater. A key objective of the investigation is to recommend prices to be charged by Seqwater to irrigation customers in specified water supply schemes (WSSs) and distribution systems for the price path period from 1 July 2020 to 30 June 2024.

AECOM was engaged by the QCA to provide advice and guidance to assist the QCA to determine the prudence and efficiency of the Seqwater's historical and forecast renewals expenditure in specific WSSs and distribution systems.

The scope of our review of Seqwater's renewals expenditure related to the seven WSSs and two distribution systems and covered:

- Review of Seqwater's submissions on proposed renewals capital expenditure
- Review of Seqwater's policies and procedures for renewals expenditure
- Assessment of the prudence and efficiency of proposed renewals capital expenditure including:
 - Forecast renewals expenditure proposed over Seqwater's proposed planning period from 1 July 2020 to 30 June 2053¹, which in this report is expressed as price path period starting from 1 July 2020 (FY21) to 30 June 2024 (FY24) and planning period beyond the price path starting from 1 July 2024 (FY25) to 30 June 2053 (FY53)
 - Renewals expenditure in previous price path periods until 30 June 2020, which in this report is expressed as historical actuals from 1 July 2013 (FY14) to 30 June 2018 (FY18) and historical transitional period from 1 July 2019 (FY19) to 30 June 2020 (FY20)

It should be noted that QCA had recommended a 20-year planning period, but Seqwater proposed a 30-year planning period. The review has therefore been completed for the 30-year period. AECOM has applied a team of specialist staff for this review, including engineers of various disciplines, cost management specialists and analysts coordinated by its Advisory group.

This review has primarily been a desktop review based on the documentation requested through an initial round of requests for information, with several rounds of requests for additional documentation to clarify particular issues. Where the documentation did not provide sufficient clarity, AECOM conducted a number of in-person interviews with key Seqwater staff to understand the practical applicability of policy and procedures and obtain evidence that would further support a recommendation. To ensure consistency of approach, each technical reviewer used a standard template for the review, which was designed to address all items required by the terms of reference for the review and constructed to ensure that all issues that could influence a decision on prudence or efficiency were included.

In general, the assessment of renewals project expenditure was undertaken by reviewing a representative sample (in consultation with the QCA) with focus on material renewal items while seeking to ensure that any inferences drawn from the sample assessment are applicable across un-sampled renewals expenditure, for example, any adjustments due to observed systemic issues could be applied to the wider renewals program.

The sample selection and the overall review have also accounted for, where relevant, the findings of the QCA's recent investigation of Seqwater's bulk water prices. This investigation reviewed Seqwater's capital planning and asset management frameworks and assessed the prudence and efficiency of Seqwater's proposed operating and capital expenditure from 1 July 2018 to 30 June 2028 for the bulk water assets.

¹ QCA RFI 2 - Renewals 2019-20 to 2053-54

The review of the projects in the sample did not conclude that any deductions should be made; however, through their review as well as the review of Seqwater's relevant policies and procedures, a number of conclusions and recommendations were made that highlighted potential areas for improvement. This executive summary highlights key deductions and improvement opportunities.

Historical Renewals (FY14-FY18)

Seqwater's submission includes 137 individual projects (these can be individual projects or programs of works) for the schemes under review, for the historical FY14-FY18 period. Seqwater's historic renewals expenditure over this period amounts to \$6.34 million including non-metering renewals, metering renewals, and flood damage related costs. We observed very little variation between Seqwater's actual expenditure (\$6.34 million) to QCA's accepted capital expenditure proposed for the period (\$6.16 million). The actual costs also included \$1.36 million in flood damage related costs, which were not included in the QCA approved expenditure for the period.

The two projects reviewed amounted to 22% of the total actual expenditure. There were no recommended adjustments for the two historical projects reviewed. While the overall prudence and efficiency of the projects reviewed have been considered acceptable, potential improvements have been identified in areas of scope definition, options analysis, and documentation completeness.

Transitional (FY19-FY20) and Forward Renewals (FY21-FY53)

The January 2019 submission includes 70 individual projects for the FY21-FY53 forward period for a total value of \$48.5 million (in \$FY19). The projects in the transitional period (FY19-FY20) have a total value of \$5.2 million, which makes the total value of projects across all transitional and forward periods as \$53.7 million (in \$FY19). It should be noted that the 70 projects are predominantly allowances for renewals at a particular facility and, in reality, will evolve into a suite of asset equipment renewals at the facility; therefore, the total actual number of renewal projects, once disaggregated, will be much higher.

There were six projects reviewed in the transitional and forward renewals periods. The total value of the projects in the sample was \$17.2 million, which represents 32% of the total transitional and forward renewals costs. Two projects were in the price path period and represented 24% of the total value of all projects in the price path period. Four projects were in the planning period beyond the price path and represented 36% of the total value of all projects in the period beyond the price path.

There were no recommended adjustments for the six projects reviewed. While the overall prudence and efficiency of the projects reviewed have been considered acceptable, potential improvements have been identified in areas of project scoping, use of the asset register, and consistency of cost estimating.

Policies and Procedures

QCA's 2013 review included several recommendations regarding improved planning and customer consultation. Since then, Seqwater have made significant improvements in their policies and procedures. They have introduced asset management frameworks, introduced customer consultation processes, and updated procurement policies.

While Seqwater has introduced an asset management framework, the implementation of this framework still appears to be a work in progress. The documentation for the projects reviewed and an examination of the renewals forecasting spreadsheets indicate that the objectives and requirements set out in the planning documents have not been readily applied. Further to this, areas for improvement to the planning tools themselves have been identified. These include adding specific references to service levels, accounting for cost of service interruptions, greater project definition in the five-year outlook, completing date in the asset register, finish developing the strategic asset management tool, and improving meaningfulness of options analyses. Seqwater's asset valuation and cost estimation processes also require further refinement outside the 12-month outlook and greater consistency across the various databases and documents.

1.0 Introduction

Seqwater is a government owned corporation that owns and manages a regional network of bulk water supply infrastructure throughout South East Queensland. It provides water for 3.1 million people and irrigation water to 1,200 rural customers in seven water supply schemes and two distribution schemes. It also provides flood mitigation services, catchment management and recreation facilities.

Seqwater's water storage and distribution infrastructure includes 26 major dams, 47 weirs, 46 water treatment plants, 14 bores and aquifers, and more than 600 kilometres of pipelines. It also owns and operates the Western Corridor Recycled Water Scheme and the Gold Coast Desalination Plant.

The seven irrigation (or part-irrigation) water supply schemes (WSSs) and two distribution schemes owned by Seqwater and regulated by the QCA include:

- Cedar Pocket
- Central Brisbane River
- Central Lockyer Valley
- Logan River
- Lower Lockyer Valley
- Mary Valley
- Warrill Valley
- Morton Vale Pipeline distribution (taken from Central Lockyer)
- Pie Creek distribution (taken from Mary Valley)

The Queensland Government has directed the QCA to recommend prices to be charged by Seqwater and Sunwater (the businesses) to irrigation customers in specific WSSs and distribution systems for the period 1 July 2020 to 30 June 2024. A copy of the Minister's referral notice (the referral) is available on the QCA's website.

The referral requires that prices allow the recovery of prudent and efficient costs associated with operational, maintenance and administrative activities and renewing existing assets. The allowance for renewals should also account for prudent and efficient expenditure incurred in the previous price path periods. Both businesses are intending to recover renewals expenditure using a rolling renewals annuity calculated with either a 20-year or 30-year planning period. It should be noted that QCA had recommended a 20-year planning period, but Seqwater proposed a 30-year planning period for this review.

Costs recovered should include those required to meet regulatory obligations and deliver agreed service levels, where costs to deliver agreed service levels are not materially higher than the costs of like-for-like replacement or modern equivalent replacement.

The referral also asks the QCA to account for, where relevant, the findings of the QCA's recent investigation of Seqwater's bulk water prices. This investigation reviewed Seqwater's capital planning and asset management frameworks and assessed the prudence and efficiency of Seqwater's proposed operating and capital expenditure from 1 July 2018 to 30 June 2028. From this review, the QCA had four recommendations. These recommendations and their relevance to the irrigation review, are described in Table 1.

Table 1 QCA Recommendations from 2018-21 Bulk Water Pricing Review

#	QCA Recommendation	Relevance to Irrigation Review
1	Bulk water prices for each council area should be set according to pricing option 1 or pricing option 2, as set out in Table 60 in Chapter 9.	Bulk water prices not relevant to irrigation customers.
2	The definition of feedwater quality events that we recommended in the 2015 review should not be changed.	Feedwater quality, specifically the cost of water treatment at Mt Crosby WTP, is not relevant to irrigation customers.
3	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: <ol style="list-style-type: none"> Where the impact is material, drought response costs should be recouped through a price adjustment during the three-year regulatory period. Where the impact is not material, drought response costs should be recouped through an end-of-period adjustment. 	Drought response costs for diverting bulk water around south-east Queensland are not relevant to irrigation customers
4	The QCA should have discretion to undertake an ex post assessment of the prudence and efficiency of capex in future reviews, regardless of whether actual capex is higher or lower than allowed capex.	An ex post assessment of the prudence and efficiency of capex for historical projects is already done under the irrigation review.

1.1 Scope of the Review

The scope of review is defined in the Terms of Reference (ToR), which is available on the QCA's website.² The following is a summary of the tasks required by the ToR.

The consultant is required to identify the data, information and access requirements to the businesses' personnel required to undertake the specified tasks, as well as any other tasks the consultant considers may be of benefit.

The tasks required include:

a. A Review of Policies and Procedures

The businesses' policies and procedures as relevant to renewals expenditure, including unit rates adopted and the determination of renewals timing, will be reviewed to determine whether they are likely to ensure a prudent and efficient outcome.

The way in which the businesses addressed the policy and procedures recommendations of QCA's previous irrigation reviews in 2012 (Sunwater) and 2013 (Seqwater) will be reviewed.

Opportunities for improvement will be identified and expected cost savings quantified.

b. Prudence and Efficiency Assessment

The prudence and efficiency of the businesses' historic and forecast renewals expenditure will be reviewed at the scheme / system level and be applicable to each of the schemes / systems. The approach taken should:

² <http://www.qca.org.au/Water/Rural/Irrigation-price-investigations>

- Consider uncertainty around projects at an early stage of development, and propose suitable methods for dealing with risk and uncertainty (recognising that such projects will have relatively lower levels of documentation than projects at a later stage of development)
- Assess the appropriateness of cost escalation methods proposed by the businesses
- Assess the potential for efficiency gains and provide appropriate justification
- Clearly identify the nature and value of any proposed renewals expenditure considered not prudent or efficient and recommend an alternative timing or cost estimate where necessary.

On-site assessment of sampled assets is expected and written reasoning, justification and conclusions from the findings are required.

c. Assessment of Renewals Expenditure

For the schemes / systems, assess the prudence and efficiency of:

- Historical renewals expenditure from previous price path periods up until 30 June 2020, to ensure the opening renewals annuity balances as at 1 July 2020 are based on prudent and efficient expenditure
- Forecast renewal expenditure over the proposed planning period.

This will be done using a representative sample of the renewals expenditure, where the sample will focus on material renewal items and seek to ensure that any inferences drawn from the sample assessment are applicable across un-sampled renewals expenditure.

For each item in the sample, an assessment will be made to:

- i. Conclude whether the proposed expenditure is prudent by reviewing:
 - The timing of asset replacement or refurbishment, commenting on the standard run-to-failure asset life and risk-adjusted asset life determined or proposed by the business, explaining any material variations in expected asset lives.
 - The condition assessments carried out, including the frequency of assessments and results of most recent assessments, and noting any reason to revise condition assessments (with reference to photographic evidence where available).
- ii. Assess whether the proposed expenditure is efficient by reviewing:
 - The proposed refurbishment / replacement cost, commenting on the Bill of Materials, specifically details of item specification (scope and scale), volumes / quantities of key inputs (materials etc.), unit rates for inputs, and the level of indirect cost allowances. Technological change and process redundancy should be taken into account, as well as costs associated with improving general business performance.
 - Options proposed, and procedures used by the business for determining the least cost or preferred option and commenting on whether the business' approach is appropriate that delivers efficient and least cost outcomes.

The nature and value of any proposed renewals expenditures considered not prudent or efficient must be identified, and recommendations made to generalise findings across a particular asset class (in all schemes / systems) or to other asset classes.

1.2 Report Structure

The structure of this report is outlined in Table 2.

Table 2 Report Structure

Main Report	
Section 1	Introduction
Section 2	Summary of Capital Submission
Section 3	Assessment Methodology
Section 4	Policies and Procedures Review
Section 5	Historical Renewal Assessments (FY12-FY18)
Section 6	Transitional and Forward Renewal Assessments (FY19-FY53)
Section 7	Summary of Conclusions and Recommendations
Appendices	
Appendix A	Project Reviews for Historical Renewals
Appendix B	Project Reviews for Transitional and Forward Renewals
Appendix C	Assessment Forms for Historical Renewals
Appendix D	Assessment Forms for Transitional and Forward Renewals

2.0 Summary of the Capital Submission

This section summarises Seqwater’s historical and forward renewals expenditure.

2.1 Historical Actuals (FY14-FY18)

Seqwater’s submission includes approximately 137 individual projects (these can be individual projects or programs of works) for the schemes under review for the historical FY14-FY18 period. Seqwater’s historical renewals expenditure over the FY14-FY18 period amounts to \$6.34 million including non-metering renewals, metering renewals, and flood damage related costs. The annual expenditure is summarised in Figure 1.

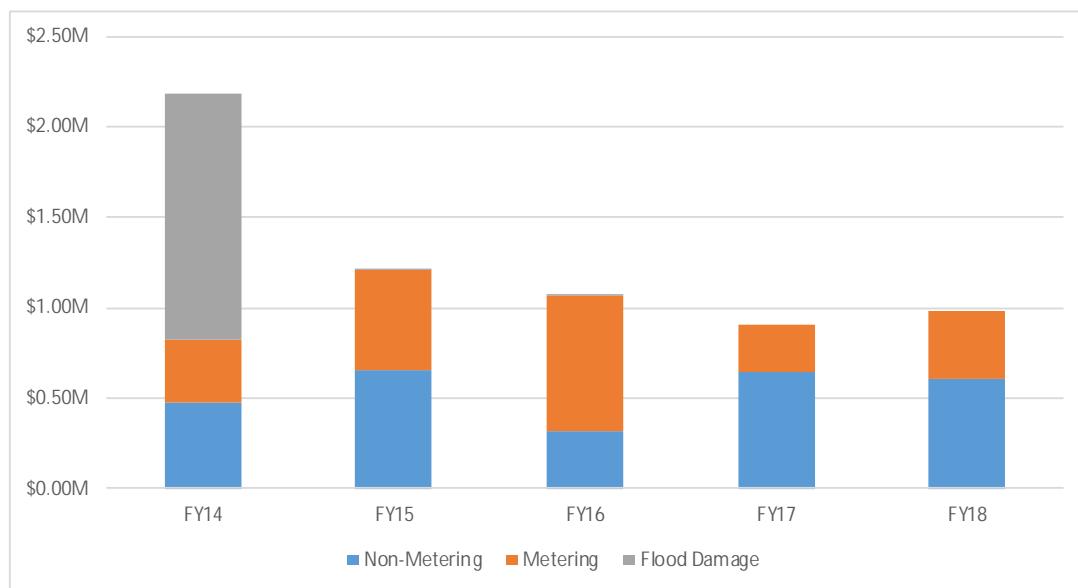


Figure 1 FY14-FY18 Historical Actuals (\$ million)

By WSS, Central Lockyer has the largest share of costs in the historical period. The Central Brisbane River WSS, would have the highest total costs, but the scheme’s costs have been adjusted to account for the relative hydrological benefit to irrigation customers. The scheme’s costs are primarily attributable to bulk water services. The annual costs for asset renewals benefitting irrigation customers have been calculated by applying two factors to the total actual costs. The first factor (44%) eliminates approximate costs related to flood damages. The second factor (1.6%), referred to as the Headworks Utilisation Factor, is the percentage of utilisable water storage dedicated to irrigation customers.

Figure 2 shows the total cumulative historical costs (FY14-FY18) for each WSS, as a percentage of total costs. This includes non-metering, metering and flood damage costs.

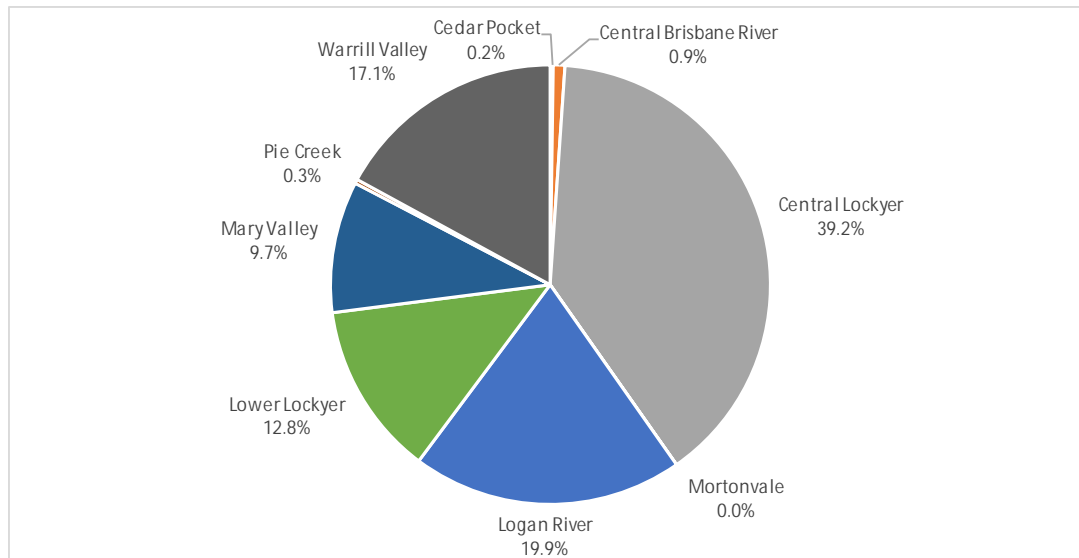


Figure 2 Historical Renewals by Water Supply Scheme (% Total Period Value)

2.2 Transitional and Forward Renewals

Seqwater first submitted the renewals forecast as part of the December 2018 submission (also referred to as the November 2018 submission). It was later revised in January 2019 stating that the previous submission omitted some assets. The revised projections were also updated to change the source of data to match that used for the bulk water price review. Seqwater noted that although the source is the same, the data has been updated since the bulk water price review. Lastly, the non-metering costs for FY20 were later revised in May 2019 to reflect the approved FY20 Asset Portfolio Master Plan (APMP).

For the same reasons described in the historical renewals section, costs for the Central Brisbane WSS have been adjusted to account for the relative hydrological benefit of scheme costs to irrigation customers. For the renewals projections, instead of applying reduction factors to cost projections, Seqwater has proposed to simply exclude all expenditure and not recover the costs from irrigation customers. The only costs attributable to irrigation customers, as stated by Seqwater, are those for the costs of meter reading and water accounting, which will be treated as other service charges outside the review by QCA.

The January 2019 submission includes 70 individual projects (or allowances for renewals) for the FY21-FY53 forward period. The annual value of works is presented in Figure 3. The totals for each of the historical transitional period (FY19-FY20), the price path period (FY21-FY24), and the planning period beyond the price path (FY25-FY53) are also shown on the graph in Figure 3. All values are in \$FY19, with expenditure split between metering renewals and non-metering renewals.

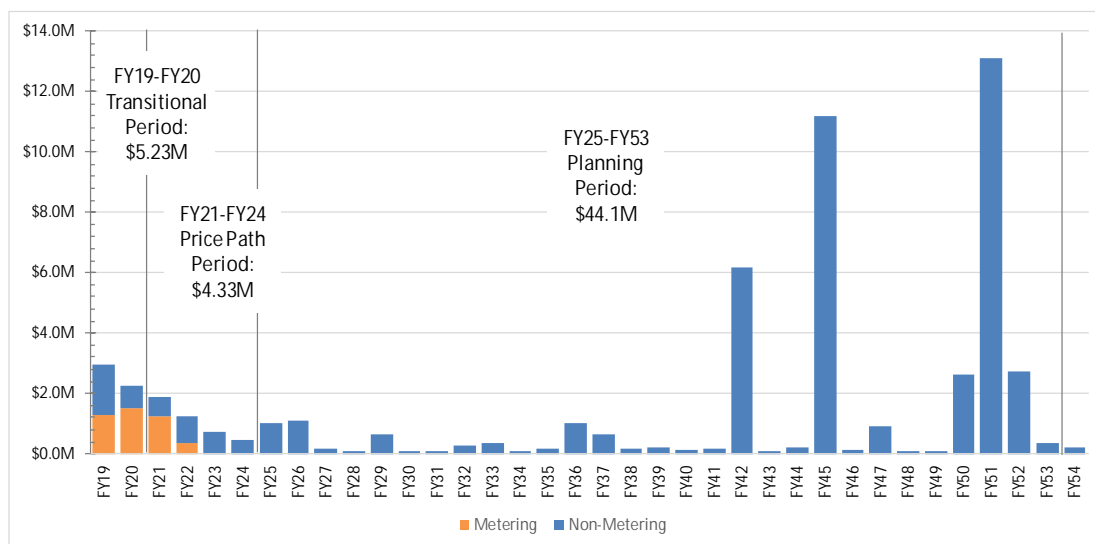


Figure 3 Seqwater's Revised Transitional and Forward Renewals Submission (\$ million, FY19)

Expenditure in the transition period (approximately \$2.5M per year) is higher than average due to water meter renewals. It then trends downwards over the price path period when the water meter renewals are completed by the end of FY22. The long-term average annual expenditure is approximately \$360,000, excluding the three large spikes in FY42, FY45, and FY51 and the two medium spikes in FY50 and FY52.

Table 3 outlines the years where the spikes in expenditure occur and the projects that drive their total annual value. Six of the eight projects involve renewal of buildings. The other two relate to electrical and controls equipment (e.g. switchboards).

Table 3 Top Projects by Value in Years of High Expenditure

Year	Expenditure (\$FY19)	Scheme	Project
FY42	\$5,370,625	Warrill Valley	An allowance for long term renewals at Moogerah Dam (buildings, ladders/platforms)
	\$787,500	Logan River	An allowance for long term renewals at Wyaralong Dam (electrical and controls, pump)
FY45	\$10,625,000	Mary Valley	An allowance for long term renewals at Borumba Dam (buildings)
	\$440,000	Logan River	An allowance for long term renewals at Maroon Dam (electrical and controls)
FY50	\$2,600,000	Central Lockyer Valley	An allowance for long term renewals at Clarendon Dam (building)
FY51	\$2,652,000	Central Lockyer Valley	An allowance for long term renewals at Redbank Creek Raw Water Pump Station (building, outlet structure)
	\$13,085,700	Lower Lockyer	An allowance for long term renewals at Atkinson Dam (buildings)
FY52	\$2,694,000	Warrill Valley	An allowance for long term renewals at Moogerah Dam (building, hoists)

The total cumulative expenditure by scheme (as a percentage of total costs) is provided for each of the periods (transitional, price path, beyond price path) in Figure 4, Figure 5, and Figure 6. These include non-metering and metering costs.

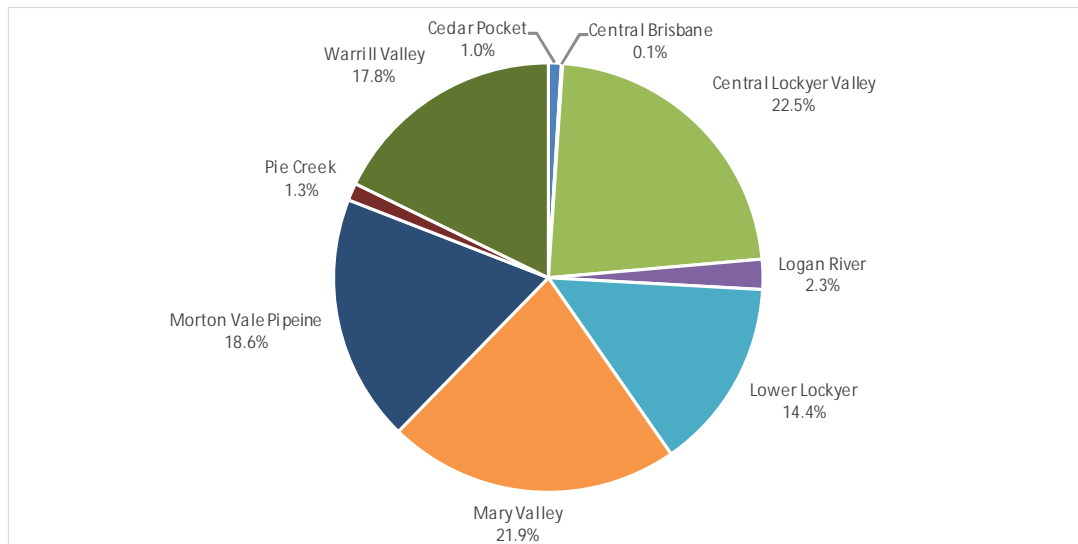


Figure 4 Transitional Years Renewals by Water Supply Scheme (% Total Period Value)

The Central Lockyer Valley WSS, similar to the historical expenditure, has the greatest share of the costs for both the transitional years and price path period. In the price path period, as seen in Figure 5, Pie Creek WSS has a 17.7% share of the costs. This is high compared to the historical, transitional, and beyond price path planning periods.

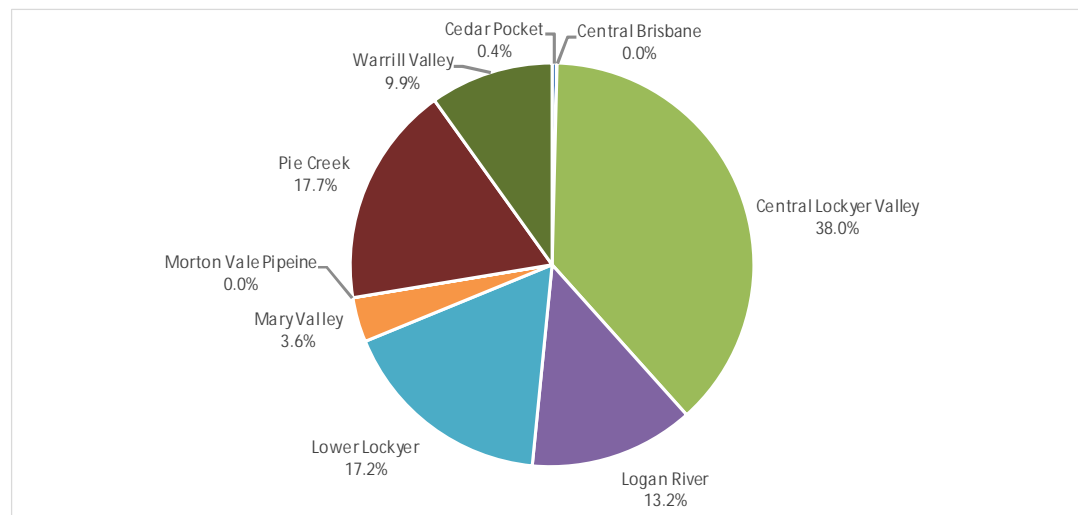


Figure 5 Price Path Period Renewals by Water Supply Scheme (% Total Period Value)

For the planning period beyond the price path, expenditure in the Central Lockyer Valley WSS reduces relative to other schemes. As seen in Figure 6, expenditure in the Lower Lockyer, Mary Valley and Warrill Valley schemes, have the greatest share of planned expenditure beyond the price path period.

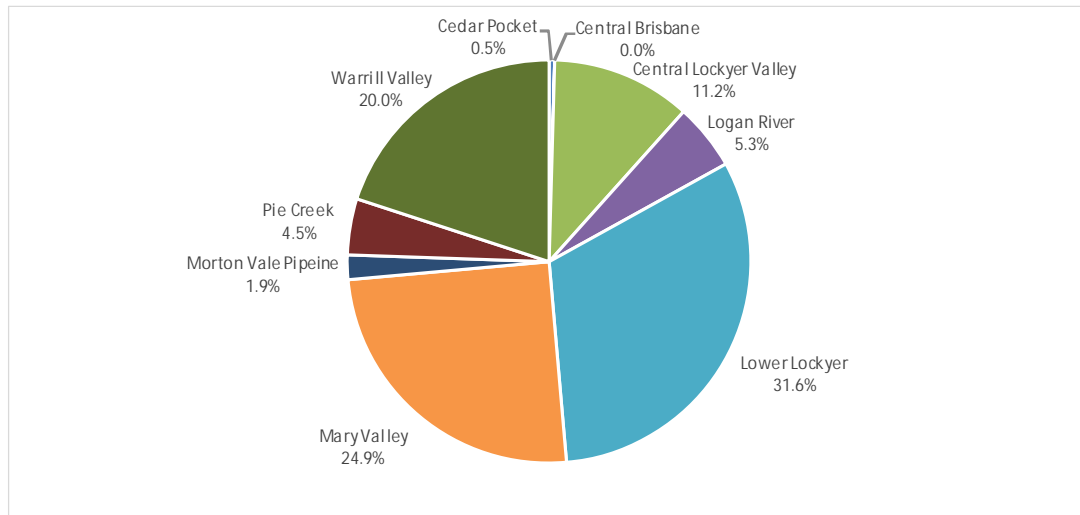


Figure 6 Beyond Price Path Planning Period Renewals by Water Supply Scheme (% Total Period Value)

3.0 Assessment Methodology

This section outlines the assessment methodology including the objectives of the review, priority areas to be reviewed, the approach to the review, our project assessment approach, information sources, a guide for interpretation of the report, options for extrapolation of findings, and a description of the projects sample.

3.1 Objective

QCA engaged AECOM to undertake a desktop review to assist the QCA in determining the prudence and efficiency of Seqwater's historical and forecast renewals expenditure in specified water supply schemes (WSSs).

AECOM was required to:

- Review Seqwater's submissions on proposed renewals capex, and assist the QCA in identifying additional information required
- Review Seqwater's policies and procedures for renewal expenditure
- Assess the prudence and efficiency of proposed capital projects including
 - Renewals expenditure in previous price path periods up until 30 June 2020
 - Forecast renewals expenditure during each business' proposed planning period from 1 July 2020 to 30 June 2053³

The Terms of Reference includes the following definitions of prudence and efficiency to be used in the review.

Prudence	Expenditures are considered prudent when there is an identified need or cost driver (agreed service levels, a legal or compliance obligation or a regulatory obligation). Prudence of project timing will also be assessed in order to determine whether the least whole-of-life cost approach has been taken to deliver the required levels of service.
Efficiency	Expenditures are efficient if they represent the least-cost means of providing the requisite level of service. This assessment includes determining whether: <ul style="list-style-type: none">• The scope of the works is the best means of achieving the desired outcomes• The standard of the works conforms with technical, design and construction requirements in legislation, industry and other standards• The cost of the defined scope and standard of works is consistent with conditions prevailing in the markets for engineering, equipment supply and construction.

3.2 Priority Areas

In conducting the assessment, AECOM addressed the following priority areas across the major asset categories:

- Confirmation that asset renewal strategies were implemented appropriately
- Assessment of adequacy of asset planning and management, taking into account the extent to which QCA recommended improvements from the previous review have been implemented
- Separation of flood damage related projects from asset renewals
- Stronger emphasis on review of projects in the price path period

³ It should be noted that QCA had recommended a 20-year planning period, but Seqwater proposed a 30-year planning period. The review has therefore been completed for the 30-year period.

- Lesser emphasis on projects beyond the price path period (relative to projects in the price path period) due to the inherent uncertainty in the project scope and cost
- Identification of systemic issues that necessitate adjustments to the broader renewals program

3.3 Approach

A sampling approach was adopted for this assessment of Seqwater’s capital expenditure due to the high number of projects contained in Seqwater’s submission, and the limited number of projects able to be reviewed at the required level of depth in the required time frame. The sample of projects selected for assessment and the methodology employed in selecting the project sample is outlined in Section 3.8.

For this assessment of Seqwater’s capital expenditure, the selected sample of projects was evaluated using the methodology summarised in Figure 7.

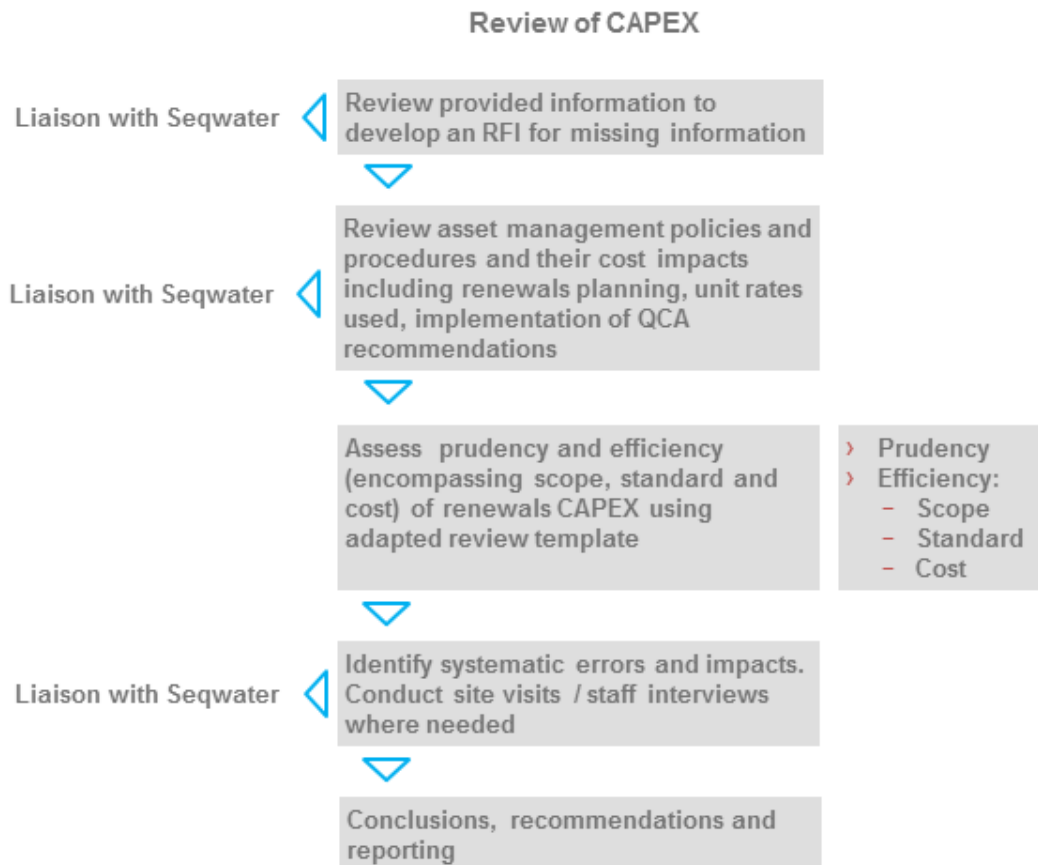


Figure 7 Outline of Methodology

3.4 Project Assessment

A standard project assessment template was developed for use by our team of reviewers to ensure consistency of the technical assessment by all reviewers. The template was structured to address all items required by the terms of reference for the review and constructed to ensure that all issues that could influence a decision on prudence or efficiency were included.

The template included questions on technical topics, questions on cost estimating and cost control, and questions on project governance and implementation, each subject intended to be addressed by a relevant, qualified assessor (as indicated in the tables below).

The templates themselves were reviewed by the core study team with a view to extracting any themes or common issues that could represent systemic issues.

Prudency Assessment	
<p>For expenditure to be prudent, there must be an identified need or cost driver, e.g. if it:</p> <ul style="list-style-type: none"> - is required to deliver agreed service levels - results from a legal or compliance obligation - is required to fulfil regulatory obligations such as those specified in a water management protocol, resource operation plan, resource operation licence or interim resource operations licence. 	
<p>Prudency</p>	<p>Were/are the works reasonably required to continue to deliver agreed service levels?</p> <p>Were/are the works reasonably required to address a legal or compliance obligation with safety, environmental or other legislative requirements?</p> <p>Were/are the works reasonably required to fulfil regulatory obligations such as those specified in a water management protocol, resource operation plan, resource operation licence or interim resource operations licence?</p> <p>Is the proposed timing of the expenditure appropriate (i.e. based on lowest whole-of-life costs)? Should the expenditure be delayed or brought forward?</p> <p>Is the assessed (risk adjusted) asset life consistent with standard run-to-failure asset life expectancy? Explain any material variations.</p> <p>Do the results of the most recent condition assessment support the proposed works? Is the frequency of condition assessment appropriate?</p>

Efficiency Assessment

For expenditure to be efficient, it must represent the least-cost means of providing the requisite level of service within the relevant regulatory framework.

Efficiency

Were/are alternatives evaluated (including an option analysis undertaken) as part of the scoping process?

Is the scope of the works the best means of achieving the desired outcomes after having regard to the options available?

Were/are non-capex options considered (such as operational solutions)?

Does the standard of the works conform with technical, design and construction requirements in legislation, industry and other standards, codes and manuals?

Is the standard of works compatible with existing and adjacent infrastructure or modern engineering equivalents?

Outline any considerations relating to technological change, process redundancy and/or cost associated with improving general business performance.

Was/is the incurred/proposed cost reasonable for the scope of the project?

Was/is the cost of the defined scope and standard of works consistent with conditions prevailing in the markets for engineering, equipment supply and construction? Nominate relevant interstate or international benchmarks, and other information sources.

If not, why?

Was/is the allowance for indirect costs reasonable for the scope of the project?

Were/are suitable approaches taken for managing risk and uncertainty regarding projects at an early stage of development?

Are the proposed cost escalation methods appropriate? (e.g. consistent with prevailing market conditions and historical trends)

Were options considered in determining the least cost or preferred option?

Were the procedures/approach used for determining the preferred option appropriate in terms of determining efficient and least cost outcomes?

Did the project consider whole of life costs, including future maintenance and operating costs?

Have any potential efficiency gains been identified?

3.5 Information Sources

This review has primarily been a desktop review, with requests for additional documentation to clarify issues in relation to the policies, procedures and projects being reviewed. Each of the projects in the review sample have been evaluated for prudence in terms of scope, standard and cost, and recommendations made based on:

- Review of project documentation provided by Seqwater and supplemented by request for information (RFI) process
- Interviews with key Seqwater staff to obtain evidence to further support a recommendation where documentation did not provide sufficient clarity and where deemed necessary
- The professional judgement of the technical reviewers

The use of project documentation is the preferred and best practice, but not the sole means of evaluating project prudence.

In general, the type of information reviewed for historical or ongoing projects included, but was not limited to:

- Documents identifying project needs such as business cases
- Documents identifying selection of appropriate scope such as feasibility studies, options assessments

- Documents identifying selection of appropriate standards of work such as concept design reports, detailed design reports
- Documents showing quality of project execution such as project scoping documents, project management plans, risk assessments
- Documents showing how works were procured such as procurement plans, bid evaluations, offer recommendation reports
- Cost documentation at all stages of the project
- Documents showing how the project was executed including as-built drawings, photographs, and project closeout reports




In general, the type of information reviewed for forward projects included, but was not limited to:

- Early planning documents such as business cases, options studies, cost estimates, etc.
- Policies and planning documentation such as asset renewal strategies, asset management plans, maintenance strategies
- Data from the asset register such as asset type, start-up date, and asset replacement cost
- Condition and risk assessments

We have assessed the suitability (in terms of quality and range) of the documentation provided by Seqwater for each project in the sample. A colour-coded scoring system (using shades of green) is used to easily indicate the degree to which existing documentation has enabled an assessment to be made on each project; and highlight where documentation could be improved for future reviews and for better internal project controls (Table 4). In summary:

- The quality of documentation is high where the documentation alone was sufficient to make sound recommendations. This rating indicates that all information required to make the recommendation was documented and available, to a sufficient level of quality.
- The quality of documentation is medium where there was insufficient quantity and range, but when supplemented by interviews, informal documentation and/or professional judgement, supported a conclusion of prudence.
- The quality of documentation is low where the documentation provided was inadequate in range or quality, and our reviewers were reliant on professional judgement to make sound recommendations.

Table 4 Project Documentation Assessment

Quality and Range of Documentation	Legend	Description
High		Sufficient documentary evidence to support and demonstrate a recommendation
Medium		Incomplete documentary evidence, but interviews, informal documentation and/or professional judgement support a recommendation
Low		Limited documentary evidence, but professional judgement supports a recommendation.

3.6 Interpreting this Report

An example of a review summary for a project is provided in Table 5. The prudence assessment, and efficiency assessment comprising of scope, standard and cost are denoted by ticks or crosses. The colours of the cells indicate the level of documentation quality for the assessment.

Table 5 Sample Project - Interpreting the Report

Project	Prudence Assessment	Efficiency Assessment			Claim (\$ millions)		
		Scope	Standard	Cost	Claim	Adjust.	Accepted
Review summary	✓	✓	✓	✗	\$0.64	\$0.04	\$0.6

In the example, the project is found to be:

- Prudent, supported by a high-level of documentation quality
- Efficient in scope supported by a medium-level of documentation quality
- Efficient in standard supported by a medium-level of documentation quality
- Not efficient in cost supported by a medium-level of documentation quality

In addition, the inefficient project cost has resulted in a recommendation for \$0.4 million to be removed from the accepted value of the claim.

3.7 Extrapolating Findings

If systemic issues are found in the review, these issues may be able to be extrapolated to the wider population of projects. A summary of the types of inefficiencies that may be encountered, and how they may be extrapolated is provided in Table 6.

Table 6 Possible Forms of Inefficiency and Extrapolation

Type of Inefficiency Identified	Examples	Extrapolation
<i>Organisation-wide</i> – inefficiencies that are found within the organisation’s policies or processes which will likely impact the entire sample.	Procurement process Cost estimating processes Capital planning model	Organisation wide inefficiencies should be applied to the whole sample
<i>Scheme-wide</i> – inefficiencies found within the planning for a certain scheme or schemes.	Differences found in the planning processes between schemes (considered unlikely as most planning is performed from central location)	Scheme wide inefficiencies to be applied to the specific scheme(s)
<i>Asset type-wide</i> – Inefficiencies found within the planning documentation for a certain type of asset.	Asbestos Cement Pipes - planning or delivery processes Design issues	Asset type related inefficiencies should be applied to the same asset types in the population
<i>Project type</i> – inefficiencies found that are linked to the type of project.	For example, metering replacements, dam inspections Design issues	Project type related inefficiencies should be applied to the project type
<i>Specific project</i> – specific issues associated with an individual project.	Cost overruns due to project management (historical projects) Over-scoped project	No extrapolation Project application only

3.8 Sample of Projects Selected for Assessment

This section outlines the sample of projects selected for assessment and methodology employed in selecting project sample.

In general, the sample was selected with the following principles:

- Include projects across all periods (historical, transitional, price path period, planning period beyond price path)
- Capture high value projects
- Focus on those schemes with highest costs, and most affected by cost overruns
- Capture both non-flood damage related and flood damage related projects
- Capture projects in all facility types (i.e. asset classes), including metering

It is also noted that QCA recently (March 2018) completed a review of Seqwater's bulk water prices for the 2018-21 period. Many of the assets and projects under the bulk water review are also applicable to irrigation portfolio. The conclusions from that assessment could also be extended to supplement this sample review.

3.8.1 Historical Sample

Seqwater's submission included 137 individual projects (these can be individual projects or programs of works) for the schemes under review for the historical FY14-18 period.

Seqwater's actual expenditure for the historical period was \$6.34M, which included \$1.36M of flood damage repair costs associated with major weather events across the period. The total expenditure is less than the QCA recommendation of \$6.16M from the 2013 review (when excluding flood damage costs).

It was necessary to assess both costs related to flood damage and those unrelated. Flood damage related projects occurred in five of the nine schemes/distribution systems – Central Lockyer, Logan River, Lower Lockyer, Mary Valley, and Warrill Valley. These projects were created to recoup the costs not covered under the insurance claim, which includes the insurance deductible and components of the project not insured. To assess the flood damage related costs, the best project was concluded to be the Central Lockyer Flood Costs Not Claimed (PID00147), which occurred in FY14. This project had the majority of costs.

Through collaboration with QCA, it was decided that the most critical non-flood related project in this historical period was the Clarendon Dam Main Channel Refurbishment (C0025800), which occurred in FY17. This was a high value non-metering renewal project. Metering projects would be covered under the forward projects sample.

The list of projects forming the historical project sample, their value, and their rationale for inclusion is provided in Table 7.

Table 7 Historical Sample

Project	Scheme	Value	Rationale for Inclusion
Clarendon Dam - Refurbish 6.4 km of main channel (C0025800)	Central Lockyer	\$515,000	55% of WSS's non-metering renewal costs
Flood Costs Not Claimed (PID00147)	Central Lockyer	\$849,749	63% of total flood damage costs

3.8.2 Transitional and Forward Renewal Sample

Seqwater's submission included 70 individual projects for the schemes under review, for the transitional and forward FY18-53 period. The total value (in \$FY19) of the projects in each period are:

- Historical transitional period (FY19-FY20) - \$5.23 million
- Price path period (FY21-FY24) - \$4.33 million
- Planning period beyond the price path (FY25-FY53) - \$44.1 million

The total value of the projects in the sample was \$16.9 million, which represents 35% of the total renewals costs in the price path and planning periods. Two projects were in the price path period and represented 24% of the total value of all projects in the period. Four projects were in the planning period and represented 36% of the total value of all projects in the period.

The sample selection was guided by project materiality and a reasonable representation of the value of the total project population; however, it was also manually developed in consultation with the QCA, giving consideration to:

- Focus on the schemes with the highest expenditure
- Achieving appropriate representation of different facility types

With respect to the focus on the schemes with the highest expenditure, the three schemes with the greatest significance were Central Lockyer Valley, Pie Creek, and Lower Lockyer. As summarised in Section 2.2, the Central Lockyer Valley WSS has the greatest share of costs in the transitional years and the price path period. Pie Creek WSS was also identified to have a large share of the price path period, especially relative to all other periods. Lastly, the Lower Lockyer WSS has the greatest share of costs for the planning period beyond the price path.

With respect to facility type, the projects in the sample were selected to have representation across all facility types except for lagoon/off-stream storages, which had insignificant costs as a facility type. The breakdown of the costs for all projects by facility type are summarised for the combined price path and planning periods in Figure 8.

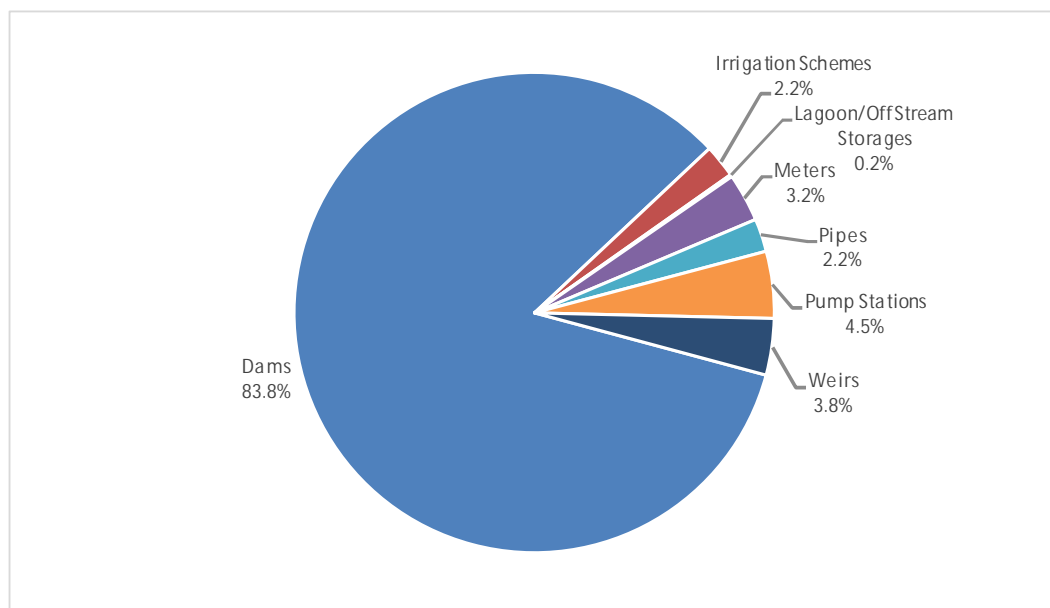


Figure 8 Total Value of Projects by Facility Type (% Total Period Value)

One project per facility type was included in the sample. The specific project was selected such that the percentage of the project's cost within the total value of sample mirrors the contribution of the percentage of the facility type within the value of all projects. For example, dam projects contribute 83.3% of total costs in the price path and planning periods. The dam project selected in the sample contributes 77% of the total sample – a similar contribution. The comparison of contributions by facility type for all projects and for the sample projects is shown in Figure 9.

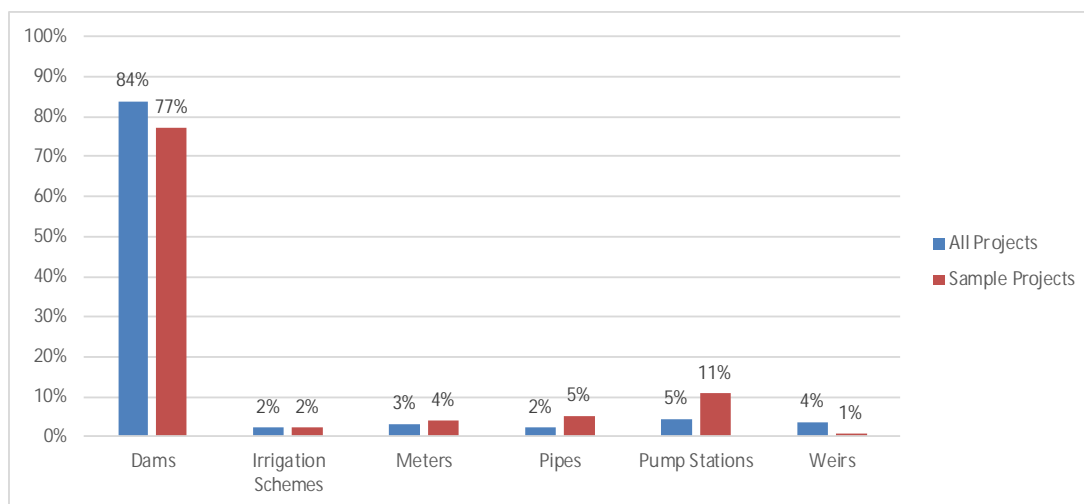


Figure 9 Total Contribution of Facility Type to Total Costs for All Projects and for the Sample

A total of six projects were included in the transitional and forward renewal sample. While the projects were generally selected to be high value projects that represented a large percentage of the total scheme or facility type, a small project (Crowley Vale Weir Inlet Works Raw Water Pump) was also selected to assess how asset planning methods were being applied to small projects. The list of projects sampled and their representation by scheme and by facility type are shown in Table 8.

Table 8 Forward Projects Sample Representation

Project Name	Scheme	Facility Type	Period	Project Cost as % of All Projects in the Scheme (by Period)	Project Cost as % of All Projects in the Facility Type
Air Valve Replacements at Pie Creek Main Channel	Pie Creek	Irrigation Scheme	Price Path	49%	35%
Air Valve Type 1 Replacements	Central Lockyer	Pipe	Planning	17%	80%
Allowance for Long Term Renewals at Pie Creek Pump Station	Pie Creek	Pump Station	Planning	91%	83%
Atkinson Dam Buildings Renewals	Lower Lockyer	Dam	Planning	93%	32%
Crowley Vale Weir Inlet Works - Raw Water Pump	Central Lockyer	Weir	Planning	2%	5%
Meter Replacement 35 meters in 2020, 2021 and 2022	Central Lockyer	Meter	Price Path	41%	44%

4.0 Policies and Procedures Review

This section reviews Seqwater's policies and procedures, as relevant to renewals expenditure, to determine whether they are likely to drive a prudent and efficient outcome. This section considers Seqwater's current policies and procedures in relation to recommendations related to policies and procedures made by the QCA in its review of Seqwater's Irrigation Prices in 2013 and associated issues identified by the QCA's consultants.

4.1 Review of Recommendations from the 2013 Review

A summary of the recommendations related to policies and procedures made by the QCA in its review of Seqwater's Irrigation Prices in 2013 is outlined in Table 9⁴.

Table 9 Recommendations made by the QCA in its 2013 Review Relating to Capital Expenditure

Topic	Recommendation
Improved Planning	1.1 Implement improvements to renewals planning process (p98)
	1.2 Adopt MEAV and/or specific asset class indices for renewals costing (p101)
	1.3 Options analysis for material renewals expenditure (p122)
	1.4 20-year renewals planning period to be reviewed at subsequent price review (p128)
Annual publication of and consultation on improved NSPs	2.1 Variance reporting and re-forecasting of renewals (p135)
	2.2 Establish and support irrigation advisory committees, and publish stakeholder submissions and responses (p135)
	2.3 Revise Strategic and Operational Plans to commit to annual consultation with irrigators (p135)
Improved Cost Allocation	3.1 Non-metering bulk renewals be allocated by HUFs, MP WAE, or adjusted MP WAE depending on WSS (p149)
	3.2 Nominal WAE be used for allocation of fixed distribution systems costs between priority groups (p152)

These recommendations are considered throughout the review of policies and procedures.

4.2 Seqwater's Renewal Planning Processes

Infrastructure assets are intended to deliver one or more specified service (such as water storage) and are designed to satisfy specific performance specifications, including statutory or regulatory outcomes (such as safety) as well as level of service requirements (including capacity, reliability, delivery capability, etc.).

The majority of these assets deteriorate with use or age, and the risk of failure to meet the required service levels increases as a result, to a point where the risk of failure becomes unacceptable. A competent infrastructure manager will attempt to predict when assets in each of its asset classes will reach that point, and plan for refurbishment or replacement as appropriate so that minimum service level targets continue to be met.

In the 2013 review, the QCA and its consultant outlined numerous issues related to Seqwater's renewals planning process and recommended that Seqwater review its renewals planning process

⁴ Queensland Competition Authority (2013). *Final Report – Seqwater Irrigation Price Review: 2013-17*. <https://www.qca.org.au/getattachment/3662b6af-fbd0-43a5-a52b-e99c2f6e85be/Seqwater-Irrigation-Price-Review-2013-17-Volume-1.aspx>

and implement improvements. This recommendation, along with Seqwater's actions taken in relation to the recommendation are summarised in Table 10.

Table 10 Review of the Renewals Planning Process

<p>QCA Recommendation Seqwater implement improvements to its renewals planning and processes as outlined in the SKM Final Report by 30 June 2015.</p>
<p>Original Action Proposed / Taken by Seqwater Seqwater proposed to review and improve the existing renewals planning framework in light of the suite of suggestions from the QCA's consultants. These included:</p> <ul style="list-style-type: none"> • Complete development of the Asset Management Framework • Include irrigation asset details in the new Asset Register • Record (and update on an ongoing basis) key asset assessment data (such as condition, criticality, estimated remaining life and asset failure information) • Analyse asset performance and develop preliminary renewal projections • Develop a Facility Asset Management Plan for each WSS • Ongoing improvements to criticality and condition assessment processes and other business processes
<p>Seqwater's Current Position In Seqwater's 2018 submission, they state their renewals approach is split into metering and non-metering renewals. The metering renewals are planned through the water meter replacement program started in 2013. The non-metering renewals are based on the asset management renewals planning process and supplemented with data from prior long-term renewals forecast for the years beyond FY36. The asset management processes include the existing Facility Asset Management Plans, the existing asset maintenance program, reports from site safety inspections and dam safety management program, and advice from operators. For the upcoming few years, they use condition information to assess opportunities to defer the timing of major renewals. Seqwater stated that a significant improvement in their renewals process is the introduction of Network Service Plan reporting to its customers.</p> <p>While Seqwater did not state it in the 2018 submission, they have also made improvements to their asset management framework, although not by the FY15 date set by QCA. Notable milestones/outcomes include:</p> <ul style="list-style-type: none"> • Development of an asset management policy, a strategic asset management plan, an asset lifecycle management plan, a portfolio asset management plan, and continued updates to Asset Class Plans • Condition assessments for a great number of assets have been made (73% of assets in the asset register reported to have an assessment complete)

This review of Seqwater's renewals planning processes takes the QCA recommendation, the issues identified by the QCA's consultants and Seqwater's actions into account. The following section describe current best practices and those employed by Seqwater.

4.2.1 Best Practice

Some assets are more significant (critical) than others to an organisation (in terms of service levels), and generally the organisation will have a lower tolerance for risk of failure for such critical assets, and they will therefore be refurbished or replaced earlier than less critical assets.

Assets not regarded as critical may be allowed to deteriorate more than critical assets before being replaced. In practice, a competent infrastructure manager will attempt to avoid being in a position of having critical assets i.e. assets with lower tolerance for risk of failure, by investing in redundancy or having contingency planning in place, so that the impact of asset failure on service levels or delivery is minimised.

Best practice renewal planning is designed to identify the economic optimum for a critical asset, where the total cost of ownership of the asset and the risk cost (due to asset failure) are optimised via an asset management plan that specifies asset maintenance requirements and the service life. This represents an optimisation of level of service requirements, the assessed risk of failure to achieve those, and the funding required and represents the most prudent, cost-effective way to manage the asset.

The timing of asset refurbishment or renewal is based on a prediction of the time in the asset’s lifecycle where the risk (or frequency) of failure becomes unacceptable. Projecting asset performance into the future is done by deriving an expected risk of failure of each asset type based on experience gained (and informed by the manufacturer, other users or industry experience), and assuming an ongoing degradation of asset condition reaching an unacceptable condition (risk of failure) at the end of its expected service life.

An example of the risk-based approach is shown in Figure 10, which presents a typical failure curve for cast iron pipes based primarily on history. It should be noted that:

- The life expectancy for the asset class is set at 154 years, which is the median (the age at which 50% of the class is considered to have failed)
- The asset manager uses two standard deviations (in advance of the median) to define the end of life for critical assets, which in this case is 127 years (implying a maximum acceptable risk of failure in this case of approximately 5 in 1000)

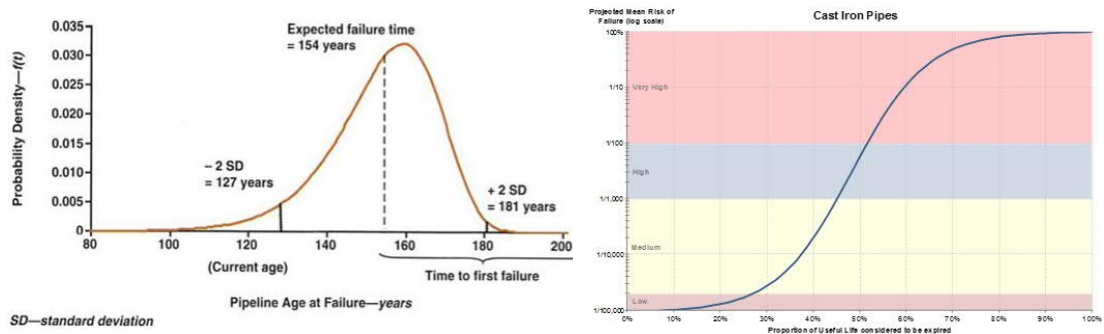


Figure 10 Failure Distribution and Risk of Failure of Cast Iron Pipes

Service life and the rate of deterioration (increase in the risk of failure) typically varies considerably site to site, and curves derived from experience elsewhere are only indicative – there is no substitute for local experience. In the absence of useful local experience, however, the failure curve is often assumed initially to be a normal distribution, and procedures are put in place to revise that assumption based on experience.

Best practice for critical assets (those that have a lower tolerance of failure for business or compliance reasons than others) is that an inspection and maintenance regime is developed to understand actual performance of the assets, and procedures put in place to adjust the expected age of asset failure (the point where the risk of failure becomes intolerable) based on established condition at points during the asset lifecycle.

If a specific asset is established on inspection as being in better condition than expected, the planned service life of the asset will be increased (the renewal will be deferred). As the asset moves through its lifecycle, the accuracy of the planned renewal time should increase as its performance becomes better understood.

The renewal of an asset is allocated to a particular financial year for accounting purposes, but it should be noted that the allocation is based on an assessment of probability, so the actual renewal may occur in an adjacent year.

4.2.2 Renewal Planning by Seqwater

This section examines Seqwater’s policies, procedures and practice for renewal planning, with reference to best practice as summarised above.

Asset Management Policy	<p>Seqwater’s current policy⁵ has statements including:</p> <ul style="list-style-type: none"> • <i>Set asset management objectives aligned with the Strategic Plan</i> • <i>Engage with customers to define service requirements</i> • <i>Undertake asset planning that targets best social, environmental and economic outcomes</i> • <i>Use risk and opportunity based asset investment and management decisions</i> • <i>Pursue innovative and new technologies to drive efficient service delivery</i> • <i>Implement asset management and information systems, processes, and governance aligned with appropriate standards to support information based decisions and continuous improvement of asset management outcomes</i> <p>The policy document does not explicitly refer to the cost of risk (the cost to customers of service interruption). The policy does not refer to or specify a requirement to optimise whole-of-life costs by including the impact of failure on customers and makes no reference to the concept of criticality.</p>
Strategic Asset Management Plan	<p>The requirement under the <i>Water Act 2000</i> to prepare a Strategic Asset Management Plan (SAMP) was repealed in 2008, but Seqwater has attempted to align with industry good practice as defined by ISO55001:2014 and maintain a SAMP. In its SAMP, Seqwater provides asset management objectives in support of its policy document and its strategic objectives and outlines its Asset Management System (AMS).⁶</p> <p>Seqwater’s approach to strategic asset management is illustrated in the diagram in Figure 11, taken from the SAMP.</p>

⁵ Asset Management Policy Statement, issued December 2016.

⁶ Strategic Asset Management Plan, August 2016

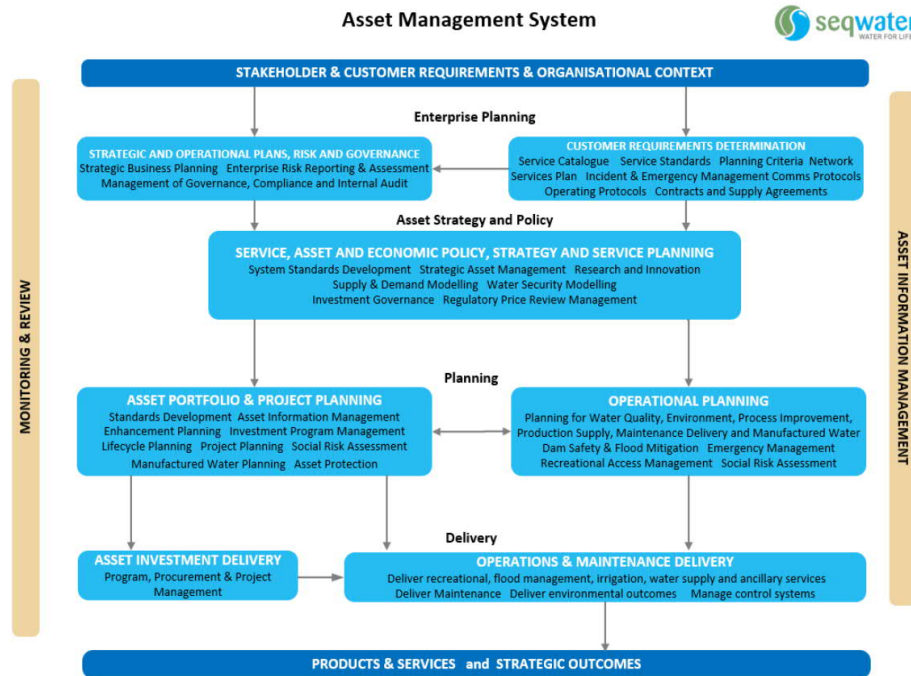


Figure 11 Seqwater's Asset Management System Diagram

In the SAMP's Executive Summary (page 5), the asset management objectives are summarised, and includes the following statements:

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

These are expanded into asset management principles (in Section 4.3 of the SAMP) and include:

- *Assets will be managed to meet regulatory requirements and satisfy the corporate risk appetite*
- *Assets will be managed using an agreed and articulated asset management system that drives quality asset decision making across all of our business*
- *Asset management processes and performance targets are linked to and support delivery of services to the agreed standards*
- *Assets will be capable of meeting future service requirements and challenges*
- *Asset investment will be optimised across the value chain, from catchment to tap*

- *Assets will achieve service standards at minimum economic, environmental and social cost across the asset lifecycle*
- *Assets will be planned for, managed and operated to achieve general environmental duty, our duty of care to the public and our cultural heritage responsibilities, and continuous improvement in our performance of each.*
- *Assets will be managed to achieve consistent workplace health and safety standards*

These statements provide a clear intent to plan to meet future service commitments, to satisfy a specified risk appetite, and to achieve extended service lives where economically feasible. They also provide intent to achieve a comprehensive understanding of the assets.

The objectives are further supported by the list of Asset Management Principles, listed in Section 6.3 of the SAMP. They include statements, among others, committing that:

- *Asset planning decisions will be based on a rigorous evaluation of alternatives that assesses risks and benefits, and applies the principle of value for money across the asset's life-cycle*
- *Asset maintenance activities will focus on maintaining asset capability by taking account of asset criticality, reliability and resilience requirements*

These principles appear to have been designed to use a lifecycle approach to asset management which considers whole-of-life implications in relation to customer service targets. Although there is no specific reference to the use of the cost of risk (the cost to customers of service interruption), we consider that the principles do describe an intent to achieve prudent and cost effective (optimised over whole-of-life) asset management.

Section 5.2 of the SAMP defines roles and responsibilities in relation to asset management. These are listed in some detail, but there appears to be no specific responsibility for optimisation of whole-of-life costs.

Asset Management Plans - Portfolio Asset Management Plan

In lieu of asset management plans, Seqwater has two components to asset management planning – the Portfolio Asset Management Plan and the Asset Class Plans.

Seqwater developed a draft Portfolio Asset Management Plan (PAMP) in December 2017. This document is intended to provide a clear line-of-sight from customer service targets through asset strategies to works programs planned for by region (northern, central, southern). The PAMP is intended to be read in conjunction with the Asset Class Plans, which provide asset management strategies by asset type.

The PAMP provides information on:

- Planned engineering inspections
- Five-year capital investment program for renewals, minor works enhancements, and opportunities
- Key asset risks
- Strategic programs of work to increase efficiency
- Gaps and how they will be addressed to achieve corporate asset management objectives

It was noted that the capital investment program was not directly included in the PAMP. It referred to a spreadsheet, which was not attached. In general, the PAMP was considered to be in early stages of development.

Asset Management Plans - Asset Class Plans Seqwater has developed a suite of Asset Class Plans (and associated Asset Class Plan Assessments) that describes the respective asset and define the asset lifecycle management strategy to be implemented. These include assets such as pumps, pipelines, weirs, meters, buildings, valves and actuators, etc.

Each Asset Class Plan generally includes the following key elements:

- Description of the asset class, its function, its various components, and identification of asset sub-classes
- Relevant standards and specifications
- Typical failure modes
- Preventative actions
- Asset lives and decay curves
- Condition assessment criteria
- Preventative action trigger points
- Cost estimates for replacement and maintenance
- Options analysis and recommended intervention strategies (including NPV analysis)
- Tactical maintenance plan
- A list of all assets

These Asset Class Plans drive the timing and cost estimate of renewals. The renewal strategies vary by asset type. For example, pipelines are renewed based on condition assessment whereas pumps are regularly refurbished on plan intervals. For the majority of Asset Class Plans reviewed, the decay curves used for asset renewal planning used linear curves. Current best practice planning for asset renewal usually involves derivation or adoption of a family of Weibull curves, with a specific curve used to represent the failure risk of a specific asset type derived from actual asset failure records. There are a variety of tools in common use to support this approach, but there is no evidence that they are used by Seqwater. That said, the fact Seqwater has developed decay curves specific to each asset class is positive.

Long-Term Renewal Planning Methodology Seqwater has provided a summary of the methodology used for renewal planning in the January 2017 Asset Lifecycle Management Plan. The document comprises five main sections:

- Asset Lifecycle Management Plan

This section describes the objectives, elements, and framework of the plan as well as the risk management framework and asset criticality ratings approach.

- Asset Lifecycle Management Strategy

The section states that five different asset lifecycle management strategies are applied based on asset criticality. For each asset criticality, the strategy for each lifecycle stage differs. The stages include design, procure, commission/install, operate, maintain, life extend/replace/renew, and disposal. Each asset criticality level also has specific asset service targets for availability, reliability, resilience, and fit for purpose.

- Modes of Operation

The four modes of operation are described as operation, hot standby, care and maintenance, and decommissioned. The services that need to be maintained for the asset in each mode of operation are described.

- Likelihood of Loss

This section describes how likelihood ratings are established, and are based on the systematic evaluation of asset condition, asset performance/function, and asset versatility. Seqwater has a five-level scoring guideline for likelihood of loss, each with a % useful life designation.

Annual programs of asset condition assessments are developed in July each year based on the requirements set out in the Asset Class Plans, but is also dependent on emergent works, maintenance programs, renewals program, capital improvement plan, and asset data availability. Information sources and expected deliverables are defined for the asset condition assessments.

Asset performance and function assessment includes a water quality assessment, asset capability assessment and process assessment, with each given a rating between 1-5. The program of assessments is developed in January each year.

Asset versatility is a measure of the impact of lost opportunity on providing a service, and is used to prioritise effort and investment. The assessments include four elements: root causes analysis, utilisation analysis, reliability analysis, and state of the assets analysis. It is noted that the last two components have not been defined. The section also describes how data is managed.

- Investment Planning

The investment planning proposes good definition for the first five years and forecast definition for the five to 30-year outlook. Planning is done for three annual programs of work: emergent works, renewals, and minor works enhancement. Seqwater has a goal for a five-year rolling program of work.

Emergent works are projects completed by the Operations team in response to extreme or high-risk issues.

The renewals, refurbishment, and replacement, program consists of the following steps:

1. Asset data desktop review, using the asset register, asset details, O&M records, likelihood of loss data, and the Asset Class Plans
2. Project validation planning for the five-year outlook or high value projects (>\$2m or >\$750k with a plant shutdown requirement)
3. Project validation execution, involving condition/performance inspection, and development of project specific details and functional need
4. High-level options analysis, conducted in conjunction with stakeholders, with +/-50% cost estimates, and assessment of new technologies
5. Risk assessment and prioritisation of projects
6. Stakeholder prioritisation of projects through series of workshops
7. Ongoing development and review, including business case development and review

Minor works enhancement projects are those that deliver business efficiencies and improvements stimulated by external drivers or close opportunity gaps.

These projects are less than \$2 million and apply to existing assets or operational processes. These projects typically represent 10%-20% of the annual capital budget. They follow the same process as the renewals projects.

Cost estimates in the annual program are based on the data in the relevant Asset Class Plan, which establishes costs for refurbishment, renewal or replacement. The basis of the unit rates are from industry quotations, estimates from consulting agencies, industry standard cost estimating resources (e.g. Rawlinson), asset valuations, or past project delivery costs. The costs include non-direct costs for design, procurement, installation, testing, etc. for an asset in a standard location and a like-for-like replacement. Unit rates are revised based on a five-year rolling program of asset valuations, project delivery, introduction of new technology, or changes to legislation, engineering standards, or operating strategies. A project complexity factor is also used to escalate the unit rates for project specific complexities such as location, requirement of specialised methods/tools/personnel, or implementation of a new technology.

Asset Information Management Systems

Effective asset management relies on accurate data related to asset details, condition, criticality, replacement costs, etc. It appears that data is predominantly stored in Microsoft Excel spreadsheets. Following the 2013 review, Seqwater initiated work to develop a strategic asset management tool. After failed attempts to integrate a tool from *Technology One*, Seqwater approached the open market, from which seven different tools were concluded to meet company requirements. A business case for the SAM tool was approved in January 2018.

The asset register (file AssetList_IrrigationSchemes.xlsx or Renewals 2019-20 to 2053-54.xlsx, tab 2 Data Final) lists all assets, hierarchy information, some physical details, acquisition date, and assessment data such as complexity, criticality, condition, and maintenance condition. Of the 7576 records, 73% had recorded a condition score, 56% had a maintenance score, 75% had a criticality score. It appears that much progress has been made since the last review period. The 2013 review noted that Seqwater had only been formed four years prior to the review and had inherited very limited asset data from the previous owners. Seqwater had committed to improving its asset data.

One critical item that was noted missing from the asset register, was the date of the last condition assessment and/or criticality assessment. Without this information, it is difficult to predict where the asset is on its decay curve and how its renewal should be prioritised.

Capital Planning Processes

Seqwater developed the document *Capital Investment Lifecycle Framework* in December 2017, although it does not appear to have been finalised. The document describes a process of gateways for formal endorsement and approval for the stages of a capital project. The gateways are shown in Figure 12.

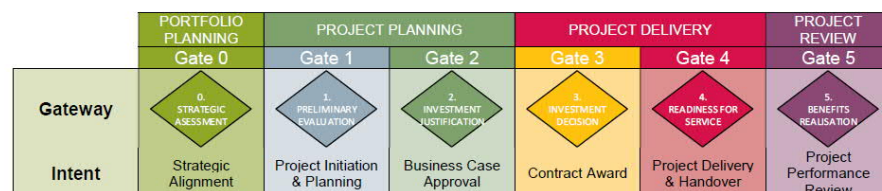


Figure 12 Seqwater's Capital Project Gateway Summary

The key question and associated outcome in each stage gate are:

- Gate 0 – Strategic Assessment
 - Is it a prudent investment
 - Approval to include in the asset portfolio plan
- Gate 1 – Preliminary Evaluation
 - Is the project still required and how will it be progressed
 - Approval to conduct project planning
- Gate 2 – Investment Justification
 - What is the most prudent and efficient option
 - Approval to deliver the project
- Gate 3 – Investment Decision
 - Is delivery planning complete and tender cost within approval
 - Approval to award the contract
- Gate 4 – Readiness for Service
 - Is everything in place for normal operation and management
 - Approval to make the asset operational
- Gate 5 – Benefits Realisation
 - Have the benefits expected been achieved
 - Approval of performance and learnings

The number of projects within each stage gate reduces as they are assessed and prioritised. An example of the percentages of projects that pass through each stage is provided by Seqwater and shown in Figure 13.

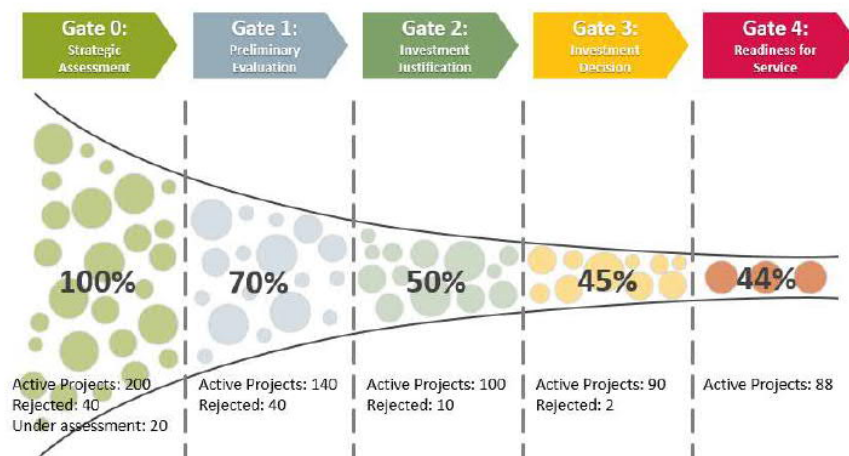


Figure 13 Seqwater's Project Gateway Approval / Pass-Through Percentages

Seqwater's *Asset Lifecycle Management Plan (January 2017)* provides additional details surrounding the project planning phase in Gates 1 and 2. The renewals, refurbishment, replacement and minor works program of works is developed on an annual basis. The timeframe for each of the process elements is shown in Figure 14.



Figure 14 Seqwater's Annual Works Program Development Timeline

There are a range of document templates used in each project phase. These would be expected to be completed for every project that passes through the gates to allow appropriate review and approval. The key documents for Gate 2, Gate 3 and Gate 4 are described as follows:

- Gate 2 Investment Justification includes:
 - Options Analysis Report
 - Business Case

- The Gate 3 Investment Decision stage includes:
 - Project Management Plan
 - Procurement Plan and Tender Documents
 - Contractor Evaluation Report and Contract Award Recommendation

- The Gate 4 Readiness for Service stage includes:
 - Construction Inspections
 - Certificate of Practical Completion

These documents would be expected to be completed as a minimum; however, depending on the project size and need, there could be supplementary documents. In the review of the projects in the historical sample, there was evidence of the following documents only:

- Business Case
- Scope of Works
- Project Management Plan
- Construction Inspection
- Closure Report
- Practical Completion Certificates

4.2.3 Options Analysis

As discussed in Section 4.1, during the 2013 review, the QCA's consultants found deficiencies relating to Seqwater's renewals planning process. This included the undertaking of options analyses in Seqwater's renewals planning process.

The QCA recommended that Seqwater undertake options analysis according to both cost materiality and the planning horizon. This, along with Seqwater's actions taken in relation to the recommendation are summarised in Table 11.

Table 11 Options Analyses for Material Renewals Expenditure

<p>QCA Recommendation</p> <p><i>The Authority recommended that Seqwater undertake:</i></p> <ul style="list-style-type: none"> • <i>High-level options analysis for all material renewals expenditures expected to occur over the Authority's recommended planning period, with a material renewal expenditure being defined as one which accounts for 10% or more in present value terms of total forecast renewals expenditure;</i> • <i>Detailed options analysis (which also take into account trade-offs and impacts on operational expenditures) for all material renewals expenditures expected to occur within the subsequent five-year regulatory period, with a material renewal expenditure being defined as one which accounts for 10% or more in present value terms of total forecast renewals expenditure over that period.</i> • <i>The costs of options analyses provided by Seqwater (\$217,000 p.a.) be recovered in future prices via an application for an end-of-period adjustment</i> <p>Original Action Proposed / Taken by Seqwater</p> <p>The following actions were taken by Seqwater:</p> <ul style="list-style-type: none"> • Seqwater started publishing Annual Network Service Plans for each WSS, which included a section on material planning period renewals (i.e. projects with 10% or more of the total forecast renewals expenditure for the planning period). • Seqwater developed asset management and capital planning documentation, which have stated the intention for conducting options analyses. These include: <ul style="list-style-type: none"> - <i>Strategic Asset Management Plan</i>, which states that an economic evaluation framework will be developed that underpins options analyses throughout the asset lifecycle. It also states that asset planners will consider both capital and non-capital solution options. - <i>Capital Investment Lifecycle</i>, which states that an Options Analysis Report is a deliverable under Gateway 2 - <i>Asset Lifecycle Management Plan</i>, which states that a high-level options analysis will be conducted in conjunction with stakeholders - <i>Asset Class Plans</i>, with some including an assessment of the lifecycle options that can be employed to manage the assets and a preferred option <p>Seqwater's Current Position</p> <p>In Seqwater's November 2018 submission, there was no specific mention of how options analyses were being integrated into renewals planning.</p>
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Seqwater generally assumed like-for-like replacement in its renewals planning with costs generally estimated based on similar previous projects. Detailed planning was generally only undertaken by Seqwater for the projects due within the coming 12-month period.

From the planning policies and procedures, there appears to be an intent to conduct options analysis at all stages of the project lifecycle. The Asset Class Plans provide options analysis with a long-term view and the annual development of works program provides project specific options analysis.

For the historical and transitional year projects reviewed in the sample, there was documentation for a Business Case, but there was no documentation for an Options Analysis Report (as specified in the *Capital Investment Lifecycle*). The Business Case included a section for potential options, but the majority of projects tend to only propose a 'do-nothing' option and a single alternative. This type of options analysis appears to be of limited value. The value of this process may be increased if more realistic analytical options are considered. For instance, consideration could be given to alternative technological solutions, construction techniques, or alternative timing. Furthermore, the evaluation methodology of the options is not explicit. The preferred option appears to be selected based on

professional judgment as opposed to an evaluation system such as multi-criteria options analysis (MCA).

The options analyses shown in Seqwater's *Asset Class Plans Assessments* are generally more detailed and meaningful. We note that the *Asset Class Plans* give consideration to both routine maintenance and renewals expenditure (and the relationship between these), and reflects an efficient framework for optimizing lifecycle costs. The options analyses approach recommended by the QCA involved a high-level options analyses for the longer-term outlook and a more detailed analysis for material projects in the near-term outlook (price path period). It appears that Seqwater has undertaken the opposite approach and provided a less detailed review during the Business Case development for the projects in the near-term outlook. Furthermore, the QCA recommended options analyses be completed for material projects only, but the policies and procedures documentation does not refer to the separation of project analysis by value.

We recommend that Seqwater review the options selection process with the intent of ensuring greater consistency, ensuring that material projects within the five-year regulatory period are accounted for, and reviewing the quality of the options analysis in terms of the nature of the options considered and the formal assessment methodology.

4.2.4 Seqwater's Planning Period

The renewals annuity is calculated over a specified planning period with a view to smoothing the significant variation in capital expenditure that is typical for large infrastructure owners. A 20-year price path was adopted for the 2013-17 price path period to minimise uncertainties associated with estimating expenditures over longer periods, stating that there is a high degree of uncertainty as to the precise need for and timing of expenditure between 20-30 years.

In 2013, the QCA recommended that Seqwater continue with a 20-year planning period, but the length of the planning period be revisited in subsequent price reviews (or as a result of a price trigger) should problems of intergenerational equity arise as a result of significant capital expenditure proposals. This, along with Seqwater's actions taken in relation to the recommendation are summarised in Table 12.

Table 12 Renewals Planning Period

<p>QCA Recommendation <i>The Authority recommends that a 20-year planning period be adopted, as proposed by Seqwater.</i></p> <p><i>The Authority also recommends that the length of the planning period be revisited in subsequent price reviews (or as a result of a price trigger) should problems of intergenerational equity arise as a result of significant capital expenditure proposals.</i></p> <p>Original Action Proposed / Taken by Seqwater</p> <ul style="list-style-type: none"> • Seqwater initially proposed a 20-year planning period. <p>Seqwater's Current Position</p> <ul style="list-style-type: none"> • Seqwater has proposed that the annuity be extended to 30 years.

In the 2013 review the QCA accepted the proposed planning period of 20 years in preference to 30 years due to concerns that a 30-year planning period may result in substantial increases in renewals annuity payments that are based on highly uncertain project costs and scope. QCA made recommendations to improve the reliability of Seqwater's approach to defining project costs and scope. Until improved reliability could be demonstrated, the 30-year period was not recommended.

Seqwater has proposed that the annuity be extended to 30 years and stated that:

- Many assets have lives greater than 20 years, and recovery period should match the asset life
- The 30-year annuity is less volatile
- The annuity and renewal expenditure are recalculated regularly (at each price reset) so uncertainty in forecasts is reduced over time
- The ARR provides a balancing mechanism to prevent over-recovery of renewal costs

With regards to forecasting non-routine expenditure, we have identified similar issues to those identified in the 2013 review, including the accuracy of the long-term renewals planning approach, shortcomings relating to whole-of-life cost optimisation and the incorporation of options analysis into renewals planning, but consider that the purpose and value of the annuity approach is better achieved if the period of the annuity is similar to the service life of the assets included.

4.3 Cost Estimation

This section reviews Seqwater's cost estimation process in relation to long-term renewals and short-term non-routine works.

In the 2013 review, SKM noted that Seqwater's approach to the capital expenditure budget formation was based on renewals forecasts for the large and more predictable renewals. They did not include renewals less than \$10,000, renewals on water treatment plants at recreation areas, or any allowance for contingency on damage (e.g. floods) or changes in law.

Renewals expenditure is forecasted using the existing *Facility Asset Management Plans*, the asset maintenance program, reports from site safety and dam safety inspections, and advice from operators. For projects above \$60,000 occurring in the price path period, Seqwater undertook a detailed cost estimate from first principles. For smaller projects, between \$10,000 and \$60,000, or project beyond the price path period, Seqwater relied on costs from previous asset owners' asset management plans. These costs did not include any non-direct costs.

In this review, Seqwater stated that cost estimates are undertaken by Seqwater engineers once a business need has been established. These costs are reported in the internally produced business cases. For all other projects, including long term future renewals, costs are documented in the asset register, and termed intervention costs which appear to be standard costs for some but not all asset classes and sub-class. It has been assumed these costs are derived from cost estimates in the various *Asset Class Plans*, which predominantly are based costs on previous project experience. It was also noticed that the intervention costs do not always match cost estimates in the *Asset Class Plan*, nor do the *Asset Class Plans* provide costs for all types/sizes of equipment.

This approach, while potentially inaccurate, also uses 'like-for-like' replacement as the basis for calculating replacement costs. This methodology results in an overestimation of replacement costs for asset types where technological advancement has reduced costs. Modern equivalent asset value was proposed as an alternative calculation methodology for replacement value.

4.4 Consultation Processes

Seqwater publishes Network Service Plans (NSPs) annually for each scheme. In the 2013 review, the QCA made numerous recommendations relating to customer consultation on Seqwater's annual NSPs, relating to:

- Variance reporting in NSPs
- Customer consultation on the annual NSPs

4.4.1 Variance Reporting in NSPs

In the 2013 review, the QCA recommended that Seqwater report on variances for material renewals in NSPs. This, along with Seqwater's actions taken in relation to the recommendation are summarised in Table 13.

Table 13 Variance Reporting and Re-Forecasting of Renewals

<p>QCA Recommendation <i>Seqwater annually publish enhanced NSPs on its website by 30 September each year (starting in 2013) for each WSS comparing actual renewals (and operating) costs against forecast and account for significant variances.</i></p> <p>Original Action Proposed / Taken by Seqwater</p> <ul style="list-style-type: none"> • Seqwater has included tables of project completed in the previous year showing the budgeted and actual costs, along with short notes to describe reasons for variations. <p>Seqwater's Current Position</p> <ul style="list-style-type: none"> • Seqwater continue to report on renewals cost variances to the QCA's five-year price path period in NSPs.

NSPs report key capital projects for the previous year along with budgeted costs, actual costs, and short notes providing reasons for the variation. Renewals forecasted for the following year are also summarised.

4.4.2 Customer Consultation on the Annual NSPs

In the 2013 review, the QCA recommended that Seqwater establish and support irrigation advisory committees and consultation associated with the NSPs and publish stakeholder comments and responses on their website. Furthermore, Seqwater's Strategic and Operational Plans be revised to state annual consultation will take place. This, along with Seqwater's actions taken in relation to the recommendation are summarised in Table 14.

Table 14 Customer Consultation on the Annual NSPs

<p>QCA Recommendation <i>Seqwater establish and support irrigation advisory committees.</i></p> <p><i>Seqwater recover the proposed annual costs (\$49,000), associated with the NSPs and irrigation advisory committees, from irrigators only – shared equally across the seven WSSs (i.e. \$7,000 per WSS annually).</i></p> <p><i>After consulting on the basis of these NSPs and through the irrigation advisory committees, Seqwater should annually publish on its website any stakeholder submissions and Seqwater's responses and decisions.</i></p> <p><i>As Seqwater's Statement of Obligations now explicitly requires Seqwater to consult with irrigation customers, but does not specify that this should occur (at least) annually, Seqwater should alter its Strategic and Operational Plans immediately to achieve certainty that (at least) annual consultation with irrigators will take place in each year of the 2013-17 regulatory period.</i></p> <p>Original Action Proposed / Taken by Seqwater</p> <ul style="list-style-type: none"> • Seqwater consulted with customers via annual irrigation forums and the Seqwater website. • Analysis of customer NSP feedback and responses to NSP Feedback posted on the Seqwater website. <p>Seqwater's Current Position</p> <ul style="list-style-type: none"> • Seqwater has continued the adopted approach of customer consultation.

The consultation approach taken by Seqwater at annual irrigation forums and the respective publications on the Seqwater website reflects the requirements of the QCA recommendation; however, there does not appear to be any evidence that irrigation advisory committees have been established.

4.5 Procurement

A review of procurement policies and practices forms part of Seqwater's policies and procedures review. The review was primarily based on documents provided by Seqwater through the Request for Information process, namely:

- Procurement Policy; Document POL-00045; Revision 3 dated February 2018
- Procurement Decision Matrix; Document PRO-01336; Revision 8 dated November 2018
- Procurement Procedure; Document PRO-01514; Revision 4 dated June 2018
- Procurement Guideline; Document GDE-00252; Revision 1 dated December 2018

We note that no follow-up interviews with Seqwater's procurement department were conducted to augment this desktop review.

Additionally, we also researched and reviewed the following documents:

- Seqwater's Code of Conduct⁷
- Boards Code of Conduct Policy⁸
- AS 4120—1994, Australian Standard - Code of tendering

4.5.1 The Benchmarks

For reference, the following documents were relied on as benchmarks for this review:

- Queensland Government's Procurement Policy; dated June 2018, which is the State Government's overarching policy for the procurement of goods and services, including construction, intended to deliver excellence in procurement outcomes for Queenslanders
- The Commonwealth Procurement Rules (CPRs); dated April 2019, issued by the Finance Minister under section 105B(1) of the Public Governance, Performance and Accountability Act 2013 (as amended in August 2017). The CPRs are the core of the Commonwealth's procurement framework.
- The ASX Code of Conduct for Suppliers; dated August 2017

The Commonwealth and the State procurement frameworks can be considered to incorporate national and international best practices and ASX Code of Conduct for Suppliers is considered to be industry best practice for listed entities and have therefore been considered as benchmarks for this review.

4.5.2 The Procurement Review

The CPRs define Procurement as the process of acquiring goods and services. It begins when a need has been identified and a decision has been made on the procurement requirement. Procurement continues through the processes of risk assessment, seeking and evaluating alternative solutions, and the awarding and reporting of a contract.

Central to Seqwater's procurement framework is the *Procurement Policy* whose purpose is to provide guidance for procurement activities to support Seqwater's business objectives and its customer outcomes. The policy purports to be aligned with the Queensland Government's Procurement Policy 2017.

Seqwater's *Procurement Decision Matrix* provides a guide to Seqwater staff when undertaking any purchasing activity. For major goods and services with total consolidated costs of >\$100,000 and for all consultancy, individual or professional service, the Commercial Services team must be engaged, although the matrix does not specify the number of quotes required for these types of projects. The decision matrix also specifies that for projects up to \$1,000, only one quote is required - verbal or

⁷ Source: <https://d1ggft7m82h57a.cloudfront.net/s3fs-public/PDF%20Documents/Governance/Seqwater%20Code%20of%20Conduct%20-%20web%20version%20291018.pdf>

⁸ Source: <https://www.seqwater.com.au/s3fs-public/PDF%20Documents/Governance/Queensland%20Bulk%20Water%20Supply%20Authority%20%28%20QBWSA%20%29%20Board%20Code%20of%20Conduct%20-%20202014.PDF>

written. In our view, all services should require a written proposal/methodology, however small as the current arrangement has potential for willful or negligent misuse.

Seqwater's *Procurement Procedure* provides high-level guidance on Seqwater's procurement approach. It describes Seqwater's requirements and methods for topics including, but not limited to, value for money considerations, procurement approaches (open market, select RFX, sole source), procurement methods for each type of project, procurement guideline exceptions (e.g., emergency works, sole source necessity), record keeping, and performance tracking.

Seqwater's *Procurement Guideline* provides detailed step by step guidance for each stage of the procurement process for the different categories of projects, which include:

- Existing arrangements
- Routine (under \$100,000 and low risk)
- Leveraged or Focused (high value or high risk)
- Strategic (high value and high risk)

The procurement process for routine projects are generally conducted by the stakeholder. Guidance is provided for seeking, evaluating, and awarding quotations but procurement specialists are generally not involved. Leveraged, focused, and strategic projects are classified as significant procurement activities under the Queensland Procurement Policy; therefore, Seqwater employs its five-stage procurement process including identifying the procurement need, developing a procurement approach, executing the procurement strategy and evaluating offers, awarding the contract, and managing the contract.

We present the findings of our review of the alignment of Seqwater's procurement processes with the Procurement Principles in Table 15

Table 15 Assessment of Seqwater's Procurement Policy

Principle Number	Topic	Alignment with Benchmarks
1	Value for Money	Aligns with Value for Money principles of benchmarked frameworks
2	Advance Economic, Environmental and Social Objectives	Aligns with Queensland Government's objectives to support the long-term wellbeing of community. For leveraged, focused, and strategic projects, the local benefits test is recommended with up to 30% weighting for suppliers who utilise a local workforce.
3	Integrity, Probity and Accountability	Broad alignment with benchmarked frameworks other than specifically prohibiting bribery and facilitation payments. The <i>Procurement Policy</i> is silent on assigning clear roles and responsibilities. The <i>Procurement Decision Matrix</i> provides some guidance on when the corporate procurement (Commercial Services) should get involved in procurement activities; however, definition of Financial Delegate outside of corporate procurement is unclear. AECOM has not sighted the organisational structure of procurement departments or relevant Financial Delegates within Seqwater and their interaction with corporate procurement.
4	Leaders in procurement practice	This Principle refers to timely and effective procurement which is in line with benchmarked frameworks to ensure that focus is on outcomes rather than process. Seqwater applies a fit for purpose procurement approach depending on the project type, and annually review the procurement policies and procedures to allow continuous improvement.

Principle Number	Topic	Alignment with Benchmarks
5	Working together to achieve outcomes	<p>This Principle sets out to coordinate procurement activity across the organisation to reduce duplication of effort and increase leverage procurement practices and outcomes. Seqwater has broad alignment with benchmarked frameworks, and indirectly collaborates with Queensland government agencies through use of the QTenders website for leveraged, focused and strategic projects. Seqwater states it collaborates with stakeholders, sponsors, and areas across Seqwater for share procurement efficiencies, but has not specifically stated formal activities.</p>
6	Governance and Planning	<p>The governance and planning regime aligns well with benchmarked frameworks. The governance over the procurement policies and guidelines as well that for larger (high value or high risk) projects appears to be strong. For routine procurement, while guidelines are still provided, the review and approvals requirements are not clear, noting that Seqwater's <i>Delegations and Authorisations Manual</i> was not provided for review.</p> <p>Seqwater's <i>Procurement Guideline</i> describes the roles and responsibilities, including approvals, for the various procurement activities for leveraged, focused, and strategic projects. It does not, however, state what documentation is minimum in order to allow this approval. Seqwater's procurement process could benefit from close alignment with the structured documentation process. For example, most benchmarked frameworks also have a requirement to document and record the business need that led to the requirement for the procurement. It is also considered good practice to record the close out documentation related to the procurement.</p>

4.6 Cost Allocation

In the 2013 review, the QCA recommended that Seqwater improves its cost allocation for fixed bulk renewals and fixed distribution system expenditure. These, along with Seqwater's actions taken in relation to the recommendation are summarised in Table 16 for the fixed bulk renewals cost and Table 17 for the fixed distribution system costs.

Table 16 More Appropriate Allocation of Fixed Bulk Renewals Costs

<p>QCA Recommendation</p> <p><i>In relation to proposed cost allocation methodologies, the Authority recommends that fixed bulk (non-metering) renewals costs be allocated using:</i></p> <ul style="list-style-type: none"> • <i>the HUFs as submitted by Seqwater for Logan River, Mary Valley and Warrill Valley WSSs;</i> • <i>the Authority's adjusted medium priority WAE in Central Brisbane River WSS; and</i> • <i>medium priority WAE for Cedar Pocket Dam, Central Lockyer Valley and Lower Lockyer Valley WSSs.</i> <p><i>The prudent and efficient irrigation metering costs forecast for each tariff group (over the Authority's recommended renewals planning period) be recovered exclusively from irrigation customers in that tariff group via the renewals annuity.</i></p> <p><i>Such costs should be allocated on the basis of irrigation customer nominal WAE.</i></p> <p>Original Action Proposed / Taken by Seqwater</p> <ul style="list-style-type: none"> • Seqwater supported the QCA's recommended fixed renewals allocation approach. <p>Seqwater's Current Position</p> <ul style="list-style-type: none"> • Seqwater has allocated fixed bulk (non-metering) renewals costs on the same basis that the QCA recommended in the 2013 review.⁹ Seqwater has updated HUFs for some schemes (Mary River, Logan River and Warrill Valley) since the 2013 review.
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Table 17 More Appropriate Allocation of Fixed Distribution Renewals Costs

<p>QCA Recommendation</p> <p><i>In relation to proposed cost allocation methodologies, the Authority recommends that nominal WAE be used for the allocation of fixed distribution system costs between priority groups. Fixed distribution system charges should remain with customers if they convert between priority groups.</i></p> <p><i>At the conclusion of the review into the allocation of fixed renewals costs in distribution systems recommended by the Authority for Sunwater, Seqwater should, for subsequent regulatory periods, adopt the relevant outcomes.</i></p> <p>Original Action Proposed / Taken by Seqwater</p> <ul style="list-style-type: none"> • Seqwater supported the QCA's recommended fixed distribution system cost allocation approach. <p>Seqwater's Current Position</p> <ul style="list-style-type: none"> • Seqwater has allocated 100% of fixed distribution system renewals costs to Medium Priority customers, consistent with the QCA's recommendation made in the 2013 review.¹⁰

⁹ SEQ Irrigation Model 2019-06-05

¹⁰ SEQ Irrigation Model 2019-06-05

4.7 Conclusions

Key findings from our review of Seqwater's policies and procedures are discussed in relation to the relevant topic, and key recommendations provided.

4.7.1 Seqwater's Renewal Planning Processes

The QCA and their consultant's 2018 review of Seqwater bulk water pricing found Seqwater's capital planning framework to generally be consistent with Seqwater's legislative requirements and good industry practice. AECOM notes this significant development in asset management documentation since the QCA 2013 recommendation and supports the bulk water review conclusion.

In our review of Seqwater's renewal planning processes, we find that:

- Seqwater's asset management system appears to be satisfactory and consistent with good industry practice; although its implementation is a work in progress.
- Seqwater's asset management policies could be improved by including specific clauses around optimisation of asset management expenditure and with reference to the cost to its customers of service interruption.
- We would have expected to see service level expectations based on interruption duration as well as frequency. If interruption duration is not a significant concern for customers, then we accept the more limited definition of service levels but note that both measures (among others such as measures of quality) are usually needed for prudent cost-effective asset management.
- It appears that Seqwater have developed unique asset decay curves for each asset type. This is the preferred method for projecting asset remaining life and renewals timing. AECOM recommends that Seqwater continue to develop and optimise these decay curves, preferably based on its own experience of asset failures.
- Seqwater's intention, as per the *Asset Lifecycle Management Plan*, is to develop greater project definition and validation for the five-year outlook and lesser definition for the outer years forecast. There didn't appear to be any evidence for greater project definitions in the five-year outlook; although, the *Portfolio Asset Management Plan* spreadsheet was not provided for review.
- The asset register, a spreadsheet-based database, has gaps in both missing assets and the data for the assets that have been included. AECOM also recommends inclusion of key data such as dates of conditions assessments. Seqwater's *Portfolio Asset Management Plan* stated that an asset information management system (likely incorporating the asset register) is still in development. Seqwater attempted to build a tool with Technology One but abandoned the effort as they could not align the product with Seqwater's technical requirements. They have since approached the open market for a new tool, have identified better fits, and have prepared a business case in January 2018 for the purchase of a SAM tool.
- Seqwater's *Asset Class Plans* give consideration to both routine maintenance and renewals expenditure (and the relationship between these) and reflects an efficient framework for optimising lifecycle costs; however, we note that this documented framework does not appear to have been consistently applied in Seqwater's renewals submission.
- The options analysis process for renewals projects has been found deficient in some respects.
 - The proposed approach for identifying renewal works which require options analysis does not align with the QCA's recommendation to undertake detailed options analysis as based upon materiality.
 - We have identified shortcomings of the reviewed options analysis in terms of the nature of the options considered and the formal assessment methodology employed.

4.7.2 Cost Estimation

We note that:

- Seqwater continue to prepare detailed works forecasts on a 12-month basis. We have not sighted evidence of scheduling (or other) efficiencies being provided for outside of the 12-month period.
- It has been assumed that the renewal cost beyond 12 months have been derived from cost estimates in the various *Asset Class Plans*, which are predominantly based costs on previous project experience. It was noticed that the intervention costs in the asset register do not always match cost estimates in the *Asset Class Plan*, nor do the *Asset Class Plans* provide costs for all types/sizes of equipment.

4.7.3 Consultation Processes

In relation to the QCA's recommendations around NSPs and customer consultation, we have concluded that there are potential deficiencies or areas for improvement in Seqwater's approach, specifically:

- In their current form, NSPs provide comparison of renewals budget to actuals for the prior year, but reasoning for variances appears overly brief (i.e. short footnotes to the table).
- The consultation approach taken by Seqwater at annual irrigation forums and the respective publications on the Seqwater website reflects the requirements of the QCA recommendation; however, there does not appear to be any evidence that irrigation advisory committees have been established.

4.7.4 Procurement

From the procurement review, we conclude that Seqwater's policy and procedures are reasonable overall, however, we note that:

- Projects under \$1,000 do not require a written quote. In our view, all services should require a written proposal/methodology however small, as there is potential for wilful or negligent misuse.
- The procurement guidelines are intended to apply to all projects including those under \$100,000, but the Commercial Services team is typically not involved below \$100,000. There are no clear guidelines for how these 'routine' projects are reviewed and approved.
- Procurement roles and responsibilities for review and approval of each stage is defined, however the specific type of document required to inform the approval has not been defined. It is good practice to align records management closely with the procurement process steps. For example, the Commonwealth framework requires that documentation should provide accurate and concise information on:
 - the requirement for the procurement
 - the process that was followed
 - how value for money was considered and achieved
 - relevant approvals
 - relevant decisions and the basis of those decisions.

It has been noted during other parts of this review that business cases, decision rationale or offer evaluation reports were either not available or were never developed and hence not recorded.

4.7.5 Cost Allocation

Seqwater's adopted approach of allocating fixed bulk renewals costs and fixed distribution renewals costs between priority groups is consistent with the QCA's 2013 recommendations.

5.0 Historical Renewals Assessments (FY14-FY18)

5.1 Project Reviews

Two historical projects from the period FY14-FY18 were reviewed under the project sample, which comprised one high value flood damage project and one high value non-flood damage project. The project review summaries are provided in Appendix A. They consist of a description of each project's background, the options assessment process, its implementation, and the findings on prudence and efficiency.

The assessment forms for the historical projects are included in Appendix C. The assessment forms include specific information on cost estimating, cost control, project governance and implementation based on the standard templates developed for this review.

5.2 Themes and Systemic Issues Arising from Project Reviews

The two projects reviewed included the Clarendon Dam Main Channel Refurbishment (C0025800) and Flood Damage Repairs to Wilson Weir, Jordan 1 Weir, Jordan 2 Weir, and Clarendon Weir (PID00147). In general, both projects had a high-level of quality in terms of documentation (with the exception of the Clarendon and Jordan Weirs) and no adjustments to the expenditure claims have been recommended. Over the review of these projects, a number of areas for improvement have been identified. Three key themes and the potential systemic issues related to these areas for improvement are described herein.

1. Scope Definition or Scope Creep

Both projects have been considered efficient in terms of project scope, but both included scope that was not identified in the original business case or scoping documents. For the Clarendon Main Channel Refurbishment project, the scope was originally defined to be the removal of silt from the channel to re-establish the channel capacity to its base elevation. In delivery of the project, it evolved to include repairs to the embankment batters from excessive erosion. This increased the schedule by 140 working days and cost of the project by approximately 60%. The prudence and efficiency of the added scope was demonstrated, but the scope was not necessarily related to the project driver for recovering channel capacity. It was related to the structural integrity of the channel embankments. It also highlights a potential deficiency in the original scoping of the project. This work could have been identified during the business case and scoping phase had a more thorough site investigation been completed. It was also noted in the Scope of Works document that a survey had not yet been completed to establish the extent of silt build-up and required excavation volumes. The Scope of Works document formed the basis for contractor quotes and the lack of excavation volumes makes it difficult for a contractor to estimate construction costs, which leaves the project at risk of variations.

The Flood Damage Repairs project had a very detailed project specification and technical specification that formed the basis for the Wilson Weir construction; however, this only formed part of the project costs. There is no documentation defining the scope of the remediation works at Clarendon and Jordan Weirs. There was also no reference to the Clarendon or Jordan Weirs in the Business Case for the full remediation program at all the dams and weirs. For the purposes of the prudence and efficiency assessment, the documentation has been assumed as missing, but there is a possibility that the project included scope creep. A decision during the project may have been made to increase the scope to include the Clarendon and Jordan Weirs to utilise available program funds, but this cannot be confirmed.

2. Options Analysis

The Seqwater Capital Investment Lifecycle Framework shows that in ‘Gate 2 Investment Justification’, a Business Case and an Options Analysis are required to show the investment is prudent and efficient. Based on the two projects reviewed, the options analysis process appears to be a sub-section of the Business Case as opposed to an independent document or process. The number of options, the level of detail, and the methods for selecting the preferred option all appear to be lacking.

The options analysis for the Clarendon Main Channel Refurbishment project was overly brief and did not appear to appropriately propose and assess potential options. It was limited to a short table describing a ‘Do-Nothing’ option and a single alternative to ‘remove silt from the channel’. In this case, the options analysis was simply do or do not undertake works to address the identified problem. The intention of the options analysis is to assess different approaches to reaching the project goal. For example, different construction approaches for desilting the channel could have been included as potential options.

The options analysis for the Flood Damage Repairs project included three options: ‘do-nothing’, ‘minor remediation works at high risk sites’, and ‘remediation works at all sites’. The options analysis in this case is a comparison of three high-level approaches to the level of scope and risk reduction. The options were each detailed with capital costs, details of scope, benefits, limitations and dependencies, and a high-level risk assessment. The preferred option appears to have been selected based on professional judgment, as opposed to a semi-quantitative approach such as multi-criteria analysis.

3. Documentation

While the overall quality of documentation was considered high, there were still components of documentation that were either missing or could be improved. The range of documentation required for an assessment of capital projects is easy to define and should be readily available for in-house post project reviews carried out for audit purposes and to identify performance improvement opportunities (i.e. “lessons learned”). The documents should be standard practice for Seqwater. The consistency in preparing these documents is important to facilitate reviews such as this, whether done by third parties or done internally.

For both of the projects reviewed, one of the areas lacking sufficient information was with regards to procurement. Both projects included information to describe the proposed procurement strategy, but neither project included evidence of the offers received and the offers evaluation. Without this information, it is difficult to assess if the preferred offeror’s costs were consistent with market conditions and project cost efficiency was achieved. Furthermore, without this documentation it is unclear whether Seqwater’s procurement guidelines were followed.

The project close-out report is an example where there was intention for meaningful project documentation, but the documentation was not completed with sufficient rigour. For the Clarendon Main Channel Refurbishment project, the template included valuable content for project close-out such as comparisons to the scope and costs estimated in the planning phase, reviews of internal and external service providers, and description of variations. The document appears to have been completed in haste without providing useful feedback. For example, comments in the contractor review were limited to a statement stating, ‘always happy to work with JCB’. The reasons for the positive relationship and specific contractor strengths or positive outcomes of the project were not defined.

The biggest issue with respect to project documentation, although not necessarily a systemic issue, occurred on the Flood Damage Repairs project. The project was related to flood damage costs not covered under the flood damage insurance claim. Specifically, it involved costs related to Wilson Weir, Jordan 1 Weir, Jordan 2 Weir, and Clarendon Weir and their share of the insurance deductible and costs outside the coverage of the insurance claim. All the documentation provided was either related to Wilson Weir only or the entire program of flood damage remediation works at all dams and weirs, but there was no documentation for Jordan 1 Weir, Jordan 2 Weir, and Clarendon Weir. For this reason, it was not clear why these three weirs were included in the project. For the purposes of the prudence and efficiency assessment, the

conclusions from the Wilson Weir component of the project were extended to the Clarendon and Jordan Weirs instead of applying an adjustment for missing documentation.

5.3 Conclusions and Recommendations

The review of the projects in the historical sample generally show project prudence and efficiency have been appropriately justified. The themes and systemic issues highlighted in Section 5.2 have identified potential areas for improvement but have been concluded to not have major impacts on project prudence or efficiency.

The summary table of the project review is provided in Figure 15. In this figure, the green colour coding represents the level of document quality. Dark green refers to high quality, which applied to all components of the two projects.

Project	Prudence Assessment	Efficiency Scope	Assessment		FY14-18 Cost \$FY19				
			Standard	Cost	Claim	Adjust.	Accepted	% Deduct	
Clarendon Dam - Refurbish 6.4 km of main channel (C0025800)	✓	✓	✓	✓	\$0.5			\$0.5	
Flood Costs Not Claimed (PID00147)	✓	✓	✓	✓	\$0.8			\$0.8	
All Projects Reviewed					\$1.4			\$1.4	

Figure 15 Summary of Historical Projects Review

6.0 Transitional and Forward Renewals Assessments (FY19-FY53)

6.1 Project Reviews

A total of six transitional and forward projects from the period FY19-FY53 were reviewed under the project sample. The projects were a combination of once-off projects and rolling programs. There were two projects in the price path period, of which one (water meter replacements) started in the transitional years period. There were four projects in the planning period beyond the price path.

The project review summaries are provided in Appendix B. They consist of a description of each project's background, the options assessment process, its implementation, and the findings on prudence and efficiency.

The assessment forms for the historical projects are included in Appendix D. The assessment forms include specific information on cost estimating, cost control, project governance and implementation.

6.2 Themes and Systemic Issues Arising from Project Reviews

In general, all projects have been considered prudent and efficient; although due to the poor quality of documentation, some key assumptions have been made on various components of the projects.

The scope of work for the forward projects was generally interpreted only through the title of the proposed project. Where the title was sufficiently descriptive to establish the scope, the *Asset Class Plan* for the type of asset was used to assess the prudence of the timing of the renewal. In general, timings were found to align with those recommended in the *Asset Class Plans*.

Over the review of these projects, a number of areas for improvements have been identified. Three key themes and the potential systemic issues related to these areas for improvement are described herein.

1. Grouping of Asset Renewals and Ambiguous Project Scope

The scope of work for the forward projects was generally interpreted only through the title of the proposed project. For example, the project 'Air Valve Type 1 Replacements' indicates the project is for replacement of type 1 air valves. Seqwater's response to RFI 13 included a note stating this project had 43 air valve replacements. Upon further investigation in the asset register, it appears this project is not only for the replacement of type 1 air valves, but also for type 2 air valves, type 3 air valves and an isolation valve.

The project 'Allowance for Long Term Renewals at Pie Creek Pump Station' is another example where Seqwater has grouped asset renewals into a single ambiguous project. Based on the project cost, it has been assumed this project is a placeholder for the renewal of all mechanical and electrical equipment at the pump station.

The grouping of different assets into single renewal projects reduces the ability to separate renewals timing where the assets have different life expectancies, different renewal strategies, and different conditions or criticalities.

2. Incomplete Asset Register

The asset register is the foundation for renewals planning. It is intended to house the asset data used in forecasting the timing and cost of renewals. The key asset data is the asset type and description, criticality, condition, date of condition assessment, replacement value, and date of valuation.

Seqwater's asset register appears to be a work in progress with many fields either missing or not populated. For example, there are empty fields for equipment manufacturer, make, and model. These fields enable more accurate application of the renewal strategies and associated intervention costs as documented in the *Asset Class Plans*. For example, the 'Crowley Vale Weir Inlet Works – Raw Water Pump' project is presumably for the replacement of the pump. The

Pumps Asset Class Plan assigns different asset decay curves and effective lives for different types of pumps. It also defines different replacement costs for the various types and sizes of pumps. To cross-reference the intervention cost in the asset register with the replacement cost in the *Asset Class Plan*, the type and size of the raw water pump is needed. For this particular project, the intervention cost was listed at \$100,000, which matches the cost for a dry mount centrifugal pump between 51 kw and 100 kW. Including this equipment information in the asset register enables the connection between the asset register and the *Asset Class Plan*.

The criticality and condition fields in the asset register have predominantly been populated, with much progress since the last review period. As described in Section 4.2.2, of the 7576 records, 73% had recorded a condition score, 56% had a maintenance condition score, and 75% had a criticality score. What is missing, however, is the date that the condition assessment was completed. Without this information, it is difficult to assess where the asset is on its decay curve.

The asset register is also missing certain assets. The Pie Creek Raw Water Pump Station only has two entries – one for the pump well and one for the pump well access pits. There are no entries for the pumps, valves, and other equipment at the pump station. The project ‘Allowance for Long Term Renewals at Pie Creek Pump Station’ therefore does not have respective assets listed in the asset register.

3. Standardisation of Renewals Costing

The intervention costs listed in the asset register and the intervention costs documented in the various *Asset Class Plans* do not always match. For example, the project ‘Air Valve Replacements at Pie Creek Main Channel’ is predominantly for air valve replacements, although the scope appears to also include slide gates, a gate valve, and an air vent. The asset register intervention costs show \$20,000 for each valve. The *Valves and Actuators Asset Class Plan* includes a table of suggested replacement costs based on past projects. The costs range from \$13,000 for replacement of a 150 mm scour valve and 225 mm drain valve on a water treatment plan clarifier, to \$200,000 for replacement of a barrel union joint on a 600 mm valve in the network. The \$20,000 cost estimate (from the asset register) is not one of the listed renewal cost items in the *Asset Class Plan*. Furthermore, it is also important to state the year the cost estimates have been made. This allows the cost of future renewals to be adjusted for inflation and other escalation factors if needed.

6.3 Conclusions and Recommendations

The review of the six projects in the transitional and forward renewals sample generally show acceptable prudence and efficiency. While the quality of documentation was low, AECOM was able to apply reasonable assumptions to understand the scope and costs. In general, renewal timings were found to align with those recommended in the *Asset Class Plans*.

The summary of project reviews has been divided into three tables for the various review periods (transitional years, price path period, and beyond price path period). They are presented in Figure 16, Figure 17, and Figure 18 respectively. In the figures, the green colour coding represents the level of document quality. Dark green refers to high quality. Light green refers to medium quality. White refers to low quality.

The transitional year period had costs for one project – the water meter replacements. No adjustments have been recommended.

Project	Prudence Assessment	Efficiency Assessment			FY19-20 Cost \$FY19			
		Scope	Standard	Cost	Claim	Adjust.	Accepted	% Deduct
Forward Projects								
Air Valve Replacements at Pie Creek Main Channel	✓	✓	✓	✓				
Air Valve Type 1 Replacements	✓	✓	✓	✓				
Allowance for Long Term Renewals at Pie Creek Pump Station	✓	✓	✓	✓				
Atkinson Dam Buildings Renewals	✓	✓	✓	✓				
Crowley Vale Weir Inlet Works - Raw Water Pump	✓	✓	✓	✓				
Meter Replacement 35 meters in 2020, 2021 and 2022	✓	✓	✓	✓	\$0.3			\$0.3
All Projects Reviewed					\$0.3			\$0.3

Figure 16 Summary of Project Reviews in the Transitional Years

The price path period had costs for two projects. No adjustments have been recommended.

Project	Prudence Assessment	Efficiency Assessment			FY21-24 Cost \$FY19			
		Scope	Standard	Cost	Claim	Adjust.	Accepted	% Deduct
Forward Projects								
Air Valve Replacements at Pie Creek Main Channel	✓	✓	✓	✓	\$0.4			\$0.4
Air Valve Type 1 Replacements	✓	✓	✓	✓				
Allowance for Long Term Renewals at Pie Creek Pump Station	✓	✓	✓	✓				
Atkinson Dam Buildings Renewals	✓	✓	✓	✓				
Crowley Vale Weir Inlet Works - Raw Water Pump	✓	✓	✓	✓				
Meter Replacement 35 meters in 2020, 2021 and 2022	✓	✓	✓	✓	\$0.7			\$0.7
All Projects Reviewed					\$1.1			\$1.1

Figure 17 Summary of Forward Project Reviews in the Price Path Period

The planning period beyond the price path had costs for four projects. No adjustments have been recommended.

Project	Prudence Assessment	Efficiency Assessment			FY25-53 Cost \$FY19			
		Scope	Standard	Cost	Claim	Adjust.	Accepted	% Deduct
Forward Projects								
Air Valve Replacements at Pie Creek Main Channel	✓	✓	✓	✓				
Air Valve Type 1 Replacements	✓	✓	✓	✓	\$0.9			\$0.9
Allowance for Long Term Renewals at Pie Creek Pump Station	✓	✓	✓	✓	\$1.8			\$1.8
Atkinson Dam Buildings Renewals	✓	✓	✓	✓	\$13.1			\$13.1
Crowley Vale Weir Inlet Works - Raw Water Pump	✓	✓	✓	✓	\$0.1			\$0.1
Meter Replacement 35 meters in 2020, 2021 and 2022	✓	✓	✓	✓				
All Projects Reviewed					\$15.8			\$15.8

Figure 18 Summary of Forward Project Reviews Beyond the Price Path Period

7.0 Summary of Conclusions and Recommendations

7.1 Policies and Procedures

Seqwater have made significant improvements in their policies and procedures since the 2013 review. They have introduced asset management frameworks, introduced customer consultation processes, and updated procurement policies.

While Seqwater has introduced an asset management framework, the implementation of the planning systems still appears to be a work in progress. Further to this, areas for improvement to the planning tools and policies themselves have been identified. These include adding specific references to service levels, accounting for cost of service interruptions, greater project definition in the five-year outlook, completing date in the asset register, finish developing the strategic asset management tool, and improving meaningfulness of options analyses. Seqwater's asset valuation and cost estimation processes also require further refinement outside the 12-month outlook and greater consistency across the various databases and documents.

With respect to customer consultation, Seqwater has introduced customer consultation forums and publication of Network Service Plans on their website. It is not clear, however, whether they have set up irrigation advisory committees. Furthermore, the variation reporting in the NSPs appears overly brief. Greater detail should be provided, at least for larger projects with big variations.

For procurement processes, Seqwater appears to have addressed concerns in the 2013 review for a high limit of \$100,000 for single source purchases from panel arrangements. The 2018 procurement decision matrix requires consultation with the Commercial Services department for all professional services contracts. While the number of quotes was not specified, through the procurement approach described in the guidelines and procedures, it appears that more oversight has been applied. Minor improvements to the procurement process have still been identified. This includes disallowing verbal quotes altogether, defining approval requirements for projects under \$100,000, and defining the required documentation for each approval stage in the procurement process.

7.2 Renewals Projects Sample Review

7.2.1 Historical Renewals

There were no recommended adjustments for the two historical projects reviewed. While potential improvements have been identified in areas of scope definition, options analysis, and documentation completeness, the overall prudence and efficiency of the projects reviewed have been considered acceptable.

7.2.2 Transitional and Forward Renewals

There were no recommended adjustments for the six projects reviewed. While potential improvements have been identified in areas of project scoping, use of the asset register, and consistency of cost estimating, the overall prudence and efficiency of the projects reviewed have been considered acceptable.

Appendix A

Project Reviews for
Historical Renewals

C0025800 – Clarendon Dam – Refurbish 6.4 km of Main Channel

Project Overview

The 6.4 km section of main channel between Clarendon Dam and Redbank Weir Raw Water Pump Station was damaged in both the 2011 and 2013 floods. The refurbishment of this channel and associated structures was completed to ensure Seqwater’s compliance with the Central Lockyer IROL 2008.

Summary of Findings

Review Summary	Prudent ✓	Scope ✓	Capital expenditure claim	\$515,000
		Standard ✓	Impact of findings on claim	\$0
		Cost ✓	Total Accepted	\$515,000

Background

The channel from Redbank Pump Station to the Clarendon Dam is 6.4 km long and supplies water from the Redbank Lockyer Creeks to Clarendon Dam. The channel's flat base allows for the flow of water in both directions (from the Dam to the creeks also) in order for the dam to top up the weirs which in turn charge the ground water for irrigation purposes. As such, Clarendon Dam forms a critical part of the Central Lockyer Scheme. The floods in both 2011 and 2013 have caused the channel and siphon bases to fill with silt from the heavily laden waters of Redbank and Lockyer Creek.

The project driver has been identified in accordance with the Guideline for Capital Expenditure Projects Budget FY15. The works are an improvement that involves dredging of the channel to restore its capacity to original levels. The drains at bank level also require re-establishment as they are full of silt.

The channel is critical for water management at Clarendon Dam. Siltation in the channel has resulted in a rise in the channel's base level. This in turn reduces the channel's capacity which causes premature cut out of the Redbank Pump Station submersible pumps. It also results in a failure to comply with the Central Lockyer IROL 2008 due to the change in level of the channel base from its set base of 94.00 AHD. The proposed works are required to restore Seqwater's water management capability.

Effects of the siltation of the channel and siphon were described in the Business Case document. Additional images taken of the channel, batters and crest in May 2017 clearly demonstrate the extent and severity of erosion resulting from the 2011 and 2013 floods. Immediate works were justified to comply with the Central Lockyer IROL 2008.

Options Assessment

Two options were considered for this project

1. Base case: status quo (do nothing)
2. Remove silt from Channel and re-establish bank drains

The preferred option was Option 2, which involves removal of silt from the channel base and the concrete slabs at the siphon using a long reach excavator. The bank drains will be re-established using a 20T excavator. Compared to the do-nothing option, the silt removal works present the following benefits:

- Restoration of pumps to original capacity of 400 ML/day
- Restoration of channel to original level of 94.00 in line with the Central Lockyer IROL 2008

- Increased rate in filling Clarendon Dam
- Improved environmental conditions within the channel through removal of silt
- Improved water quality conditions within the channel through removal of silt
- The drains at bank level will flow at design capacity due to the removal of silt

A do-nothing option was considered although disregarded as the consequences of not proceeding with works will put Seqwater at risk of breaching their regulatory requirements per the Central Lockyer IROL.

Implementation

A high-level financial analysis for the preferred option estimated the total nominal project cost as \$354,000. The cost accuracy was noted as being $\pm 30\%$. Actual contractor costs were documented in the Closure Report. The original contract price was \$269,715 (ex. GST). Cost increases were required as part of this project due to changes in project scope. These were suitably documented as variations, which were priced by the engaged Contractor. The variations included seeding of spoil site, remediation of bank slip in Lake Clarendon Diversion Channel, Slashing (3-person crew), and additional works required to remediate Lake Clarendon Diversion Channel. The variations were well documented and resulted in a final contract price of \$462,678, presenting an increase of \$282,155. The total revised approved budget was \$603,390. The final reported project expenditure was \$515,000 which includes Seqwater project management and execution. The incurred cost for the restoration works is therefore deemed reasonable. The costs reflected the market conditions as the contractor was engaged through a Request for Offer via Seqwater's Minor Works Panel. Based on the figures reported in the Closure Report, the indirect costs including Seqwater internal costs appear to be reasonable.

Findings

- Prudency:

There is sufficient evidence based on the information provided that the remedial works at Clarendon Dam including the channel and batters are prudent to ensure the design intent of the channel and compliance with Central Lockyer IROL 2008.

- Efficiency:

Seqwater demonstrated suitable project efficiency in the refurbishment of the 6.4 km section of main channel from Clarendon Dam to Redbank Weir Raw Water Pump Station. Justification for implementation of restoration works was evident in the Business Case. Two options were considered with the preferred option being to proceed with channel refurbishment to comply with the Central Lockyer IROL 2008 and restore design intent enabling effective water management at Clarendon Dam. A defined scope of works was provided and the project was effectively managed in accordance with the Project Management Plan. Changes to the original budget estimate were appropriately documented and variations in scope were costed by the preferred Contractor at market conditions. Based on the high-level quality of information provided, this project is considered efficient.

PID00147 – Flood Costs Not Claimed

Project Overview

The 2011 and 2013 flood events resulted in a significant amount of damage to Seqwater dam and weir assets. This project is for the flood costs not covered under insurance claims.

Summary of Findings

Review Summary	Prudent	✓	Scope	✓	Capital expenditure claim	\$849,749
			Standard	✓	Impact of findings on claim	\$0
			Cost	✓	Total Accepted	\$849,749

Background

The January 2011 flood event resulted in a significant amount of damage to Seqwater dam and weir assets. Following the flood event, initial inspections were carried out at all dam and weir sites by Seqwater personnel to confirm the extent of flood damage and the status of dam and weir safety and operation. The following sites were identified as being of particular concern and warranted further assessment of flood damage prior to remediation works:

- Borumba Dam
- Lake Manchester
- Mt Crosby Weir
- Somerset Dam
- Wilson Weir
- Wivenhoe Dam

Remediation works are justified, otherwise Seqwater are at risk of non-compliance with insurer over future damage claims through failure to maintain assets and non-compliance with DERM Dam Safety Management Guidelines (2002).

Further, the following Legislative Compliance and Government Priorities apply:

- Compliance with the Water Reliability and Safety Act (2008) and the DERM Dam Safety Conditions issued under the Act to maintain asset condition
- Compliance with the Workplace Health and Safety Act (2011) to provide safe access for inspection and maintenance
- Compliance with insurance requirements to maintain Seqwater assets to a suitable standard

Service improvements include:

- Ensure public safety on key Seqwater sites
- Reinstate access to Seqwater recreational facilities
- Minimise the risk of further damage in future flood events

In their current state, the assets as part of this project were at risk of loss of operation. This exposes Seqwater to breaching their regulatory requirement to manage and supply water under the water supply schemes. The damages observed at the dams and weirs were directly caused by a flooding natural disaster; therefore, the standard run-to-failure asset life expectancy is not applicable in this instance. Images of the assets were provided in the Business Case and show the extent of damage at

each respective location. Moderate to severe damages were recorded at each site, with the risk allowance assessment provided in the Business Case demonstrating high or extreme risk ratings for all assets under consideration.

The project also includes costs associated with rehabilitation works at the Clarendon Weir, Jordan 1 Weir, and Jordan 2 Weir as a result of the 2013 flood damage. This includes rock mattresses at the Jordan Weirs and re-instatement of the ladder at Clarendon Weir. There was no supporting information provided to assess the prudence of this component of the CAPEX claim, but it has been assumed prudent by extending the justifications from the documentation provided on the Wilson Weir.

Options Assessment

An options analysis was completed for the affected assets. Three options were considered, including:

1. Maintain Status Quo (Do Nothing)
2. Minor Remediation Works at High Risk Sites
3. Implement Remediation Works at All Flood Damage Sites

Option 3 has been identified as the preferred option after considering the associated risks as well as benefits for each option.

A do-nothing option was considered; however, this presented several limitations including:

- Key infrastructure exposed to minimum level of service
- Unknown cost of ongoing operational costs to meet minimum levels of service
- Risks of exacerbating existing damage through future flood events
- Risk of loss of operation of sites
- Risk of unsafe access for operations
- Risk to public safety
- Closure of key recreational facilities
- Non-compliance with insurer over future damage claims through failure to maintain assets
- Non-compliance with DERM Dam Safety Management Guidelines (2002)

Implementation

Appendix F of the Business Case stated the 2011 flood damage remediation works were carried out in four stages:

- Stage 1 – Flood damage assessment
- Stage 2 – Preliminary remediation works design
- Stage 3 – Emergency remediation works at Wivenhoe Dam and Mt Crosby Weir
- Stage 4 – Detailed Design & Tender Preparation
- Stage 5 – Procurement
- Stage 6 – Construction & Commissioning

Appendix F (Project & funding Approval dated April 2012), stated that Stage 1-3 had been completed. Funding was being requested for Stage 4 (\$493,000), Stage 5, and Stage 6 (\$12,849,950). Stage 6 would start in FY13, and \$2,954,000 was planned for FY14. The cost for Wilson Weir was estimated at \$1,792,948.

A competitive tender process was undertaken for the flood damage remediation works (ref FDRW-AD-2012). Doval Constructions (QLD) PTY LTD was awarded the works under Seqwater's Formal Instrument of Agreement for a contract sum of \$6,505,585.90 incl. GST. The portion for Wilson Weir was \$1,434,198.

According to Item 11 A – Project Close Out Report, the actual costs at Wilson Weir were \$2,015,844. The overspend was attributed to the variations from Doval, which were appropriately documented and justified. The overspend would be covered by underspend on other components of the overall flood damage remediation program.

The documentation provided on the Wilson Weir was of high quality, and the project appears to have been delivered to an efficient standard, scope and cost.

The total insurance claim for 2011 was \$23,115,447 according to Item 13 – Share of insurance deductible. Of this, \$1,572,047 was attributed to Wilson Weir. This CAPEX project is for the flood costs not covered under the insurance claim and includes:

- \$315,777 for the FY14 share of the \$5M insurance excess for the total flood claim (all sites) attributed to Wilson Weir (as a percentage of Wilson Weir costs to total costs)
- \$412,965 for the FY14 costs not included in the insurance claim on Wilson Weir

It also included \$121,007 for the FY14 costs for the Jordan 1 Weir, Jordan 2 Weir, and Clarendon Weir remediation works from the 2013 flood damages. From, Item 13 – Share of insurance deductible, it appears that no insurance claim was made for these damages from the 2013 flood.

There was no supporting information provided to assess the efficiency of the \$121,007 for the Jordan 1, Jordan 2 and Clarendon Weirs. Considering the magnitude of the costs compared to the Wilson Weir, and the quality of documentation and appropriate implementation for Wilson Weir, the costs for Jordan 1, Jordan 2, and Clarendon Weirs has been assumed reasonable.

Findings

- Prudency:

The January 2011 flood event resulted in a significant amount of damage to Seqwater dam and weir assets. Six assets were identified as being at extreme or high risk of failure and require remediation works. These assets include Borumba Dam, Lake Manchester, Mt Crosby Weir, Somerset Dam, Wilson Weir, and Wivenhoe Dam. Several legislative compliance and government priorities apply in which Seqwater will be in breach should no remediation works be undertaken. The 2013 flood affected additional assets including the Jordan 1 Weir, Jordan 2 Weir, and the Clarendon Weir. Based on the importance of each asset and the high to extreme risk they pose in their current condition, this project's prudency is clearly demonstrated.

- Efficiency:

Based on the information provided for the overall Flood Damage Remediation Works project and the Wilson Weir component, adequate project management processes were demonstrated to ensure effective project delivery. Three options were considered at the scoping phase, with the preferred option chosen based on risk mitigation and overall benefits provided. The quality of work delivered under this project appears to be consistent with current industry standards and clear consideration for suitability of remediation works with existing or adjacent structures evident. A competitive tender process was documented, with the preferred contractor, Doval, quoting a price within the estimated budget as documented in the Business Case. The CAPEX claim is significantly less than the estimated project cost, as the CAPEX claim only represents FY14 costs for flood damage rehabilitation costs not funded by the insurance claim. It is noted that \$728,742 of the claim is for Wilson Weir. \$120,007 of the claim is for 2013 flood damage remediation works for Jordan 1 Weir, Jordan 2 Weir, and Clarendon Weir. Given the information provided on the 2011 flood damage remediation works program and the Wilson Weir works, this project is considered efficient.

Appendix B

Project Reviews for
Transitional and
Forward Renewals

Air Valve Replacements at Pie Creek Main Channel

Project Overview

There are 19 valves at Pie Creek Main Channel that are proposed to be replaced in FY23 under this forward planning project.

Summary of Findings

Review Summary	Prudent	✓	Scope	✓	Capital expenditure claim	\$380,000
			Standard	✓	Impact of findings on claim	\$0
			Cost	✓	Total Accepted	\$380,000

Background

There are multiple air valves along the Pie Cree Main Channel and pipeline. These air valves are installed at high points in the pipeline to allow free air to escape from within the pipeline. In sealed water pipelines, a build-up of free air forms a physical barrier, which will decrease the hydraulic efficiency of the pipeline. Air valves form a critical part of a pipeline and prevent water hammer issues under transient conditions. They may be automatic, or manually operated. While no information was provided to show the criticality of the valve to the Pie Creek Tariff Group, they have been assumed as necessary for operation of the pipeline.

There are 19 air valve replacements proposed under this project. While the document *QCA RFI 2-Renewals 2019-20 to 2053-54*, (tab “2 Data”), confirmed a total of 19 valves on the Pie Creek Main Channel, there were only 14 air valves. The others were comprised of three slide gates, one gate valve, and one air vent. Each have been assigned a replacement cost of \$20,000. The title of this project refers to air valve replacements, but it has been assumed the title is in error, and the intention is for the replacement of all types of valves. Seqwater manages each of these valves under the same renewal strategy.

The valves on the Pie Creek Main Channel were installed in 1972. At the proposed time of replacement, in FY23, the valves will have reached their typical asset life of 50 years. The *Seqwater Valves and Actuators - Asset Class Plan* shows a decay curve identifying the valves undergo a renewal at a condition score of 4, which is projected to occur at age 38 for a non-plastic valve. Note that it is assumed these valves are non-plastic. No information was provided to identify their material or size.

The *QCA RFI 2-Renewals 2019-20 to 2053-54* document identifies a condition score of 2 for all the valves but the date of the assessment was not provided. While the asset age indicates the proposed replacement in FY23 would be prudent, there may be opportunity to delay the project pending a condition assessment on each valve.

Options Assessment

As part of Seqwater's *Valves and Actuators - Asset Class Plan*, three standard Maintenance and Renewals Options are considered:

- Option 1: Do nothing and operate valve and actuator to failure
- Option 2: Preventative action and corrective maintenance
- Option 3: Routine maintenance and renewal option

A high-level risk assessment was completed for the three options considered, with the following noted:

- Option 1: this option carries high levels of safety and operational risks to Seqwater

- Option 2: this option allows for increased preventative/corrective maintenance to the asset being programmed as identified in routine inspections. This option will be selected where detailed condition assessment confirms that the asset can be rehabilitated back to a condition that the asset can safely meet its operational performance requirements. This option carries a level of risk that maintenance works will fail to render the asset back to an acceptable condition
- Option 3: this option allows for proactive renewal of the asset when the condition assessment of the asset is assessed as condition 4; and a detailed condition assessment confirms that increased corrective maintenance is unlikely to render the asset back to condition 1 or 2

Given the age of the valves and the standard serviceable life for mechanical equipment, Option 3 is likely the most appropriate option as operating the valves beyond this presents a risk to Seqwater should sudden failure occur. An updated condition assessment should be done prior to renewal.

Implementation

The *Valves and Actuators - Asset Class Plan* states that renewal costs are based on estimates adapted from Rawlinson's Construction Handbook, with allowance for design, project management and contingency. Further cost information was referenced in the Appendix E of the document, but the appendix was not included in the document.

The document also provides typical renewal costings from past FY16 valve and actuator projects. The two projects most similar to air valve replacements were the \$13,000 scour and drain valve replacement and \$24,000 scour and non-return valve replacement. Both were at a water treatment plant, so are expected to be less than a valve replacement on the Pie Creek Main Channel pipeline due to access and location.

While there was no specific information provided to support the \$20,000 allowance per valve for this project, it appears to be within range the values stated in the *Valves and Actuators - Asset Class Plan*, and the proposed capital expenditure appears to be reasonable.

Findings

- Prudency:

There is sufficient evidence to conclude the valve replacements are prudent to support the continued operation of the pipeline. This is based on the asset class plan and the age of the valves. That said, the condition score (date unknown) shows renewal is not yet needed. Pending a future condition assessment in the year prior to the replacements, there may be an opportunity to delay the replacements.

- Efficiency:

This project cannot be fully assessed for its efficiency as no supporting information for the cost estimate, the scope of work, or the type, material, or size of valve were provided. The asset class plan for valves and actuators appears to set a strong foundation for assessing assets, and costing maintenance, inspections and renewals. For this reason, the project has been assumed as efficient.

Air Valve Type 1 Replacements

Project Overview

This project proposes the replacement of 43 valves under this project.

Summary of Findings

Review Summary	Prudent	✓	Scope	✓	Capital expenditure claim	\$860,000
			Standard	✓	Impact of findings on claim	\$0
			Cost	✓	Total Accepted	\$860,000

Background

The Morton Vale Pipeline conveys water from Lake Clarendon to customers in the Central Lockyer Valley water supply scheme. The project title describes replacement of type 1 air valves along the pipeline.

Air valves are installed at high point in pipelines to allow for escape of free air from within the pipeline. They may be automatic, or manually operated. In sealed water pipelines, a build-up of free air forms a physical barrier, which will decrease the hydraulic efficiency of the pipeline. Air valves form a critical part of a pipeline and prevent waterhammer issues under transient conditions. While no information was provided to show the criticality of the valves to the Moreton Vale Pipeline, they have been assumed as necessary for operation of the pipeline and ability to meet service levels in the Central Lockyer Valley water supply scheme.

The Seqwater *RFI13 Supporting Information Forward Renewals Sample* document stated that this project included 43 Air Valve Replacements, planned in FY47 for \$860,000. While the document *QCA RFI 2-Renewals 2019-20 to 2053-54*, (tab "2 Data"), confirmed a total of 43 valves on the Moreton Vale Pipeline, there were not all type 1 air valves. Instead, there are 21 type 1 air valves, 14 type 2 air valves, two type 3 air valves, and one isolating valve. All valves were assigned a replacement cost of \$20,000 with the intervention year of FY47.

The valves on the Morton Vale Pipeline were installed in 1997. At the proposed time of replacement, in FY47, the valves will have reached their typical asset life of 50 years. The Seqwater *Valves and Actuators - Asset Class Plan* shows a decay curve identifying the valves undergo a renewal at a condition score of 4, which is projected to occur at age 38 for a non-plastic valve. Note that it is assumed these valves are non-plastic. No information was provided to identify their material or size.

The *QCA RFI 2-Renewals 2019-20 to 2053-54* document identifies a condition score of 2 for all the valves but the date of the assessment was not provided. While the asset age indicates the proposed replacement in FY47 would be prudent, there may be opportunity to delay the project pending a condition assessment on each valve closer to the time.

Options Assessment

As part of Seqwater's Valves and Actuators - Asset Class Plan, three standard Maintenance and Renewals Options are considered:

- Option 1: Do nothing and operate valve and actuator to failure
- Option 2: Preventative action and corrective maintenance
- Option 3: Routine maintenance and renewal option

A high-level risk assessment was completed for the three options considered, with the following noted:

- Option 1: this option carries high levels of safety and operational risks to Seqwater

- Option 2: this option allows for increased preventative/corrective maintenance to the asset being programmed as identified in routine inspections. This option will be selected where detailed condition assessment confirms that the asset can be rehabilitated back to a condition that the asset can safely meet its operational performance requirements. This option carries a level of risk that maintenance works will fail to render the asset back to an acceptable condition
- Option 3: this option allows for proactive renewal of the asset when the condition assessment of the asset is assessed as condition 4; and a detailed condition assessment confirms that increased corrective maintenance is unlikely to render the asset back to condition 1 or 2

Given the age of the valves and the standard serviceable life for mechanical equipment, Option 3 is likely the most appropriate option as operating the valves beyond this presents a risk to Seqwater should sudden failure occur. An updated condition assessment should be done prior to renewal.

Implementation

The *Valves and Actuators - Asset Class Plan* states that renewal costs are based on estimates adapted from Rawlinson's Construction Handbook, with allowance for design, project management and contingency. Further cost information was referenced in the Appendix E of the document, but the appendix was not included in the document.

The document also provides typical renewal costings from past FY16 valve and actuator projects. The two projects most similar to air valve replacements were the \$13,000 scour and drain valve replacement and \$24,000 scour and non-return valve replacement. Both were at a water treatment plant, so are expected to be less than a valve replacement on the Morton Vale Pipeline due to access and location.

While there was no specific information provided to support the \$20,000 allowance per valve for this project, it appears to be within range the values stated in the *Valves and Actuators - Asset Class Plan*, and the proposed capital expenditure appears to be reasonable.

Findings

- Prudency:

There is sufficient evidence to conclude the valve replacements are prudent to support the continued operation of the pipeline. This is based on the asset class plan and the age of the valves. That said, the condition score (date unknown) shows renewal is not yet needed. Pending a future condition assessment in the year prior to the replacements, there may be an opportunity to delay the replacements.

- Efficiency:

This project cannot be fully assessed for its efficiency as no supporting information for the cost estimate, the scope of work, or the type, material, or size of valve were provided. The asset class plan for valves and actuators appears to set a strong foundation for assessing assets, and costing maintenance, inspections and renewals. For this reason, the project is considered efficient.

Allowance for Long Term Renewals at Pie Creek Pump Station

Project Overview

This project is in forward planning phase for the long-term renewals at Pie Creek Pump Station.

Summary of Findings

Review Summary	Prudent	✓	Scope	✓	Capital expenditure claim	\$1,820,000
			Standard	✓	Impact of findings on claim	\$0
			Cost	✓	Total Accepted	\$1,820,000

Background

The Pie Creek Pump Station delivers raw water from the Mary River into Pie Creek, McIntosh Creek and Callico Creek. An expenditure of \$920,000 is planned in FY26 and \$900,000 in FY36 for long term renewals. This project appears to be a placeholder for long term forward renewals, without any supporting documentation or planning to determine what specific asset renewals are required. The document *QCA RFI 2-Renewals 2019-20 to 2053-54*, (tab “2 Data”), only has two assets listed under Pie Creek RWPS – the pump well and the pump well access pits. These assets have a scheduled intervention in FY55 but no costs have been included. It is likely that this project is a placeholder for the renewal of all mechanical and electrical equipment at the pump station.

The *Seqwater Pumps Asset Class Plan* describes the recommended asset life cycle management strategy to be implemented for pumps. The asset strategy varies depending on the type of pump. No information was provided to identify the type of pumps used at the Pie Creek Pump Station; however, the *Asset Class Plan* states that raw water pumps are typically centrifugal dry mount pumps, and can be single stage, multistage or submersible. Assuming the pumps are dry mount centrifugal pumps, they are to be refurbished based on condition that typically occurs on 7.5 year cycles. Their adjusted effective life is 45 years. The pump station appears to have a start-up date of 1972, which would make the assets 54 in FY26 and 64 in FY36. Based on this, FY26 appears to be appropriate and could even be brought forward.

Options Assessment

There has been no options assessment completed. This project is a placeholder for future undefined scope of renewals at the Pie Creek Pump Station.

Implementation

From the *Seqwater 2009 Strategic Asset Management Plan*, obtained from the flood commission website, the Pie Creek Pump Station has two 112 kW pumps that provide 27 ML/d. From the *Pumps Asset Class Plan*, a dry mount centrifugal pump, in the range of 101 kW to 250 KW, has a total replacement cost of \$187,500.

Considering the proposed costs per renewal are in the \$900,000 range, it can be assumed that the proposed scope of renewals is for more than the pumps. The scope is likely to include all mechanical and electrical assets at the pump station including but not limited to pumps, valves, motors, switchboards, and controls equipment.

Based on information in the document *QCA RFI 2-Renewals 2019-20 to 2053-54*, there does not appear to be any other renewal projects planned for this pump station. It is assumed this project is a placeholder and as such is considered reasonable; although, Seqwater’s asset management systems should be improved to improve the granularity of forecast by asset type since different asset types will have different renewal timing, frequency and costs.

Findings

- Prudency:

There is insufficient information in the *QCA RFI 2 - Renewals 2019-20 to 2053-54* document to determine which assets at the pump station fall under the intended long-term renewal plan for FY26 and FY36. According to the asset start-up date for the pump station pump wells, the pump station appears to have started up in 1972, which may support pump replacement based on the 45-year effective life reported in the *Pumps Asset Class Plan*. While the project has been considered prudent, the level of documentation is very poor. Further information on the scope of the planned renewal, including the asset types as a minimum, should be available. The project outlook is only 6 years.

- Efficiency:

Assessment of project efficiency is not possible as there was no specific information provided on the planned scope of renewal at the pump station. Based on the cost of pump replacements in the *Pumps Asset Class Plan*, it has been deduced that the proposed scope includes more than just pump replacement. It likely includes all mechanical and electrical renewals at the pump station. The expenditure of \$1,820,000 has been assumed as a placeholder. While it has been assumed as efficient, Seqwater should have a more refined process for identifying specific renewals by asset type, and the individual assets should have individual replacement costs documented in an asset register.

Atkinson Dam Buildings Renewals

Project Overview

The renewals for the buildings at Atkinson Dam are managed under Seqwater’s Buildings Asset Class Plan. As part of Seqwater’s forward planning and asset management plan, the buildings at Atkinson Dam are scheduled to be replaced in FY2051.

Summary of Findings

Review Summary	Prudent ✓	Scope ✓	Capital expenditure claim	\$13,050,000
		Standard ✓	Impact of findings on claim	\$0
		Cost ✓	Total Accepted	\$13,050,000

Background

The buildings at Atkinson Dam were acquired in 1970 and are scheduled to be renewed in FY51 at a cost of \$13,050,000. The buildings provide shelter for critical operational equipment and serve as functional space for personnel at Atkinson Dam. The buildings proposed for renewal include the main building, core sample storage shed, piezometers huts 1 and 2, workshop, and residence. Considering many of these buildings house equipment / assets, it is likely that the renewals fulfil regulatory obligations regarding the water management protocol of Atkinson Dam.

The *Seqwater RFI13 Supporting Information_Forum Renewals Sample* document states that the project includes the following buildings with the respective costs:

Building	Cost
Core Sample Storage Shed	\$50,000
Main Building	\$2,600,000
Piezometer Hut 1	\$2,600,000
Piezometer Hut 2	\$2,600,000
Residence	\$2,600,000
Workshop	\$2,600,000
TOTAL	\$13,050,000

The Buildings Asset Class Plan includes a building decay curve (applicable to concrete, timber and steel), which indicates the service life of buildings deteriorate from condition 1 (new) to condition 4 (poor) after approximately 40 years before being refurbished back to condition 1.

In the proposed renewal year, the buildings will be 81 years. This would align with the second renewal in the building’s asset life since their construction in 1970. Had the first renewal not occurred, the proposed renewal would have substantially surpassed the expected serviceable life based on this decay curve. That said, the assessed condition in the *QCA RFI 2-Renewals 2019-20 to 2053-54*, (tab “2 Data”), document is a score of 2. The project has been considered prudent, but could be brought forward or delayed based on condition assessment closer to the time of renewal.

Options Assessment

The proposed works are outside the Renewal Program time frame for development of a Business Case or Options Assessment, therefore no options analysis is required at this stage.

Implementation

The cost for this project is assumed to be based on the standard rates per the Buildings Asset Class Plan. These are presented in the following table.

Intervention Type	Cost	
Renewal / Maintenance	Reinforced concrete slab on ground	\$78 per m ²
	Reinforced concrete slab (suspended)	\$351 per m ²
	Steel roof framing	\$332 per m ²
	Steel wall framing	\$107 per m ²
	Timber roof framing	\$273 per m ²
	Timber wall framing	\$111 per m ²
	Windows	\$897 per m ²
	Carpet (commercial / industrial grade)	\$88 per m ²
	Fibre cement wall sheeting	\$102 per m ²
	Paint	\$22 per m ²
	Plasterboard wall sheeting	\$98 per m ²
	Floor tiling	\$263 per m ²
	Wall tiling	\$215 per m ²
	Vinyl flooring	\$88 per m ²

While no scope of work, bill of materials, or detailed cost estimate breakdown has been provided, the asset class plan appears to set a strong foundation for assessing assets and costing maintenance, inspections and renewals. For this reason, the project has been assumed as efficient.

Findings

- Prudency:

Based on the information provided, the buildings at Atkinson Dam will likely reach the end of their serviceable life by 2051 and will require renewal. The typical serviceable life for concrete/brick is approximately 80 years, which means the proposed intervention date is in line with standard run-to-failure asset life expectancy.

- Efficiency:

This project cannot be fully assessed for its efficiency as no supporting information for the cost estimate, the scope of work, or building construction types were provided. The asset class plan appears to set a strong foundation for assessing assets and costing maintenance, inspections and renewals. For this reason, the project is considered efficient.

Crowley Vale Weir Inlet Works – Raw Water Pump

Project Overview

This project proposed the replacement of the raw water pump at the Crowley Vale Weir for a cost of \$100,000 in FY40.

Summary of Findings

Review Summary	Prudent	✓	Scope	✓	Capital expenditure claim	\$100,000
			Standard	✓	Impact of findings on claim	\$0
			Cost	✓	Total Accepted	\$100,000

Background

The Crowley Vale Weir forms part of the Central Lockyer Valley Water Supply Scheme. It has a storage capacity of 8 ML. The weir provides ponds water in Laidley Creek as a pumping pool for an off-stream storage owned by the Crowley Vale Water Board. An expenditure of \$100,000 has been planned for FY40 for replacement of the raw water pump at the weir inlet works.

The Seqwater Pumps Asset Class Plan describes the recommended asset life cycle management strategy to be implemented for pumps. The asset strategy varies depending on the type of pump. No information was provided to identify the type of pump used at the Crowley Vale Weir; however, the Asset Class Plan states that raw water pumps are typically centrifugal dry mount pumps, and can be single stage, multistage or submersible. Assuming the pumps are dry mount centrifugal pumps, they are to be refurbished based on condition that typically occurs on 7.5 year cycles. Their adjusted effective life is 45 years.

The document *QCA RFI 2-Renewals 2019-20 to 2053-54*, (tab “2 Data”), identifies a pump start-up date of 1995, which would make the asset 45 in FY40. Based on this, the project timing appears to be appropriate. It has a criticality score of 1 but does not have any condition information. A condition assessment closer to the proposed time of renewal may bring forward or delay the pump replacement.

Options Assessment

There has been no options assessment completed.

Implementation

The *Pumps Asset Class Plan* lists replacement costs for different sizes of dry mount centrifugal pump. The 51 kW to 100kW range has a replacement cost of \$100,000. While no information was provided to identify the size of the raw pump at Crowley Vale Weir, it has been assumed to be in this range as the proposed expenditure is \$100,000.

Findings

- Prudency:

There is sufficient evidence to conclude the pump replacement is prudent to continue to provide service levels under the Central Lockyer Valley Water Supply Scheme. This is based on the asset class plan and the age of the pump. Pending a future condition assessment in the years closer to the replacement year, there may be an opportunity to delay the project.

- Efficiency:

This project cannot be fully assessed for its efficiency as no supporting information for the cost estimate, the scope of work, or the type or size of pump were provided. The asset class plan for pumps appears to set a strong foundation for assessing assets, and costing maintenance, inspections and renewals. For this reason, the project is considered efficient.

Meter Replacement 35 Meters in 2020, 2021 and 2022

Project Overview

Seqwater's meter replacement is driven by renewal and compliance requirements. This project forms part of a rolling project, and involves the replacement of 35 meters in 2020, 2021 and 2022.

Summary of Findings

Review Summary	Prudent	✓	Scope	✓	Capital expenditure claim	\$1,020,000
			Standard	✓	Impact of findings on claim	\$0
			Cost	✓	Total Accepted	\$1,020,000

Background

The Central Lockyer Irrigation Scheme provides for the supply of bulk untreated water to irrigation and commercial customers. Customers are entitled to take an allocation of water through works that are subject to a Development Approval Process. Customers in the scheme are metered so as to record the volume of water taken. This metering is required for management, reporting and billing purposes.

Seqwater have identified inaccurate flow measurement and WHS issues which must be resolved to enable the sites to meet the compliance requirements.

Seqwater's meter replacement is driven by renewal and compliance requirements. The Central Lockyer Irrigation Scheme has an associated Resource Operations License (ROL) or Interim Resource Operations License (iROL) issued by the regulator. Seqwater is the license holder in each case. The ROLs requires the license holder to undertake monitoring and reporting in accordance with the Resource Operations Plan (ROP). The ROPs require the license holder to record the total volume of water taken by each water user.

The January 2017 PID02801 Business Case also identified safety risks associated with the current meters. They are located low on stream banks, which presents a high risk of slips, trips, and falls, as well as the risk of snake bites. The Work Health and Safety Act (2011) requires elimination of risks to health and safety, so far as is reasonably practicable; and if it is not reasonably practicable to eliminate risks to health and safety, to minimise those risks so far as reasonably practicable.

The January 2017 PID02801 Business Case also stated as a result of the dry period preceding 2008, many irrigators abandoned their works and the assets, including the meters, had fallen into a state of disrepair. Furthermore, due to their installation arrangement and technology (mechanical paddle wheel), the meters cannot provide accurate flow measurement irrespective of condition.

The project is a continuation of a meter replacement program stated in 2013 with the aim to replace all meters within a 12-year period. The project involves the replacement of 35 water meters with expenditures of \$340,000 in each of FY20, FY21 and FY22 for a total project cost of \$1,020,000.

Options Assessment

Two options were considered:

- Option 1: Do nothing;
- Option 2: Renewal of Meter.

The do nothing option was not pursued since it would not address the safety concerns or improve the accuracy of the metering.

Implementation

The *PID02801 Business Case for ICL: Central Lockyer – Replace 40 Flow Meters* document included a cost estimate of \$467,000 for the replacement of 40 meters. The cost estimate included investigations, excavation, construction, the flow meter, valving, pipework, installation, and commissioning. It also included a 30% contingency for market fluctuations and brownfield site work, \$20,000 for 20 days of project management, and an additional 15% of contingency. Table 1 shows the cost estimate, but scaled to 35 meters as described in the project title.

Table 1 Business Case Cost Estimate (Scaled from 40 to 35)

Item	Unit Rate	Unit	Total
Project Documentation	\$ 200	per meter	\$ 7,000
Investigations	\$ 200	per meter	\$ 7,000
Excavation	\$ 600	per meter	\$ 21,000
Construction	\$ 1,500	per meter	\$ 52,500
Flowmeter	\$ 500	per meter	\$ 17,500
Valving and pipework	\$ 1,500	per meter	\$ 52,500
Mechanical Install	\$ 3,000	per meter	\$ 105,000
Commissioning/Handover	\$ 200	per meter	\$ 7,000
SUBTOTAL	\$ 7,700	per meter	\$ 269,500
Standard Contingency	30%		\$ 80,850
Seqwater PM	1000	per day	\$ 20,000
Contingency	15%		\$ 40,425
TOTAL			\$ 410,775

The project forms part of Seqwater’s rolling replacement strategy for water meters that started in 2013 with a goal of replacing all meters in the scheme within 12 years. Based on the QCA RFI 2 - Renewals 2019-20 to 2053-54 document (tab ‘2 Data Final’), there are 483 meters; although, 15 of those are labelled as ‘DO NOT USE’, so it is assumed the total is actually 468 meters. Over a 12-year program, this represents an average of 39 meters per year, with the program finishing in 2025.

There was no information provided to show how many meters have already been replaced, but assuming the program is on track (or ahead of schedule), the CAPEX project for 35 meters in 2020, 2021, 2022 appears to match the program annual scope. It is assumed that it is 35 meters per year, as opposed to 35 meters across three years. The annual CAPEX claim is \$340,000, which is less than the estimate of \$410,775 scaled from the business case and shown in Table 1. It appears that the contingency amounts have been reduced in the CAPEX claim estimate. Based on these, the proposed costs appear reasonable.

Findings

- Prudency:

Information given in *RFI 13 Main Response* indicated that these meters fall under the planned renewal of Central Lockyer prioritised meters which are to be replaced through a rolling program planned to be completed in 2020-2022. The *PID02801 Business Case for ICL: Central Lockyer – Replace 40 Flow Meters* states the meter replacements are part of a greater program that commenced in 2013 with the goal of replacing all meters over a 12-year period. The Business Case stated project drivers of improvement to metering accuracy and safe access, with appropriate references to regulatory and compliance requirements. This three year project appears to be consistent with the overall meter replacement program and has been considered prudent.

- Efficiency:

There is a low level of documentary evidence available to support the assessment of efficiency of this project, however the project appears to be related to a greater 12-year program of meter replacements as referenced in the *PID020801 Business Case for ICL*. The Business Case was not written for this project, but the project drivers, scope, and costs are all transferable to the CAPEX project under review. Based on the assumption that 35 meters will be replaced per year, as opposed to 35 meters across all three years, the CAPEX claim of \$340,000 per year appears reasonable, as it is less than the costs per meter stated in the Business Case.

Appendix C

Assessment Forms for Historical Renewals

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Project Name	Clarendon Dam - Refurbish 6.4 km of main channel
Project Number	C0025800
Project Description	Refurbish 6.4 km of main channel
Asset Type	Dam
Year(s) to be Delivered	2016-2018
Cost	\$515,000

Assessment Notes
<ul style="list-style-type: none"> - Your assessment must take into account the project timing, specifically the uncertainty around projects within the longer term planning horizon. - Consider if any issues you find are project specific or systemic

Prudency Assessment

For expenditure to be prudent, there must be an identified need or cost driver, e.g. if it:

- is required to deliver agreed service levels
- results from a legal or compliance obligation
- is required to fulfil regulatory obligations such as those specified in a water management protocol, resource operation plan, resource operation licence or interim resource operations licence.

Please complete the following	Response	Comment	Impact on Value	Recommended Adjustment	Information assessed
<p>Prudency</p> <p>Were/are the works reasonably required to continue to deliver agreed service levels?</p>	YES	<p>The channel from Redbank Pump Station to the Clarendon Dam is 6.4km long and supplies water from the Redbank Lockyer Creeks to Clarendon Dam. The channel's flat base allows for the flow of water in both directions (from the Dam to the creeks also) in order for the dam to top up the weirs which in turn charge the ground water for irrigation purposes. As such, Clarendon Dam forms a critical part of the Central Lockyer Scheme.</p> <p>The floods in both 2011 and 2013 have caused the channel and siphon bases to fill with silt from the heavily laden waters of Redbank and Lockyer Creek.</p>	None		Attach 1 - Lake Clarendon Information_Business Case
<p>Were/are the works reasonably required to address a legal or compliance obligation with safety, environmental or other legislative requirements?</p>	NO	<p>The project driver has been identified in accordance with the Guideline for Capital Expenditure Projects Budget FY15. The works are an improvement which require dredging of the channel to restore its capacity to original levels. The drains at bank level also require re-establishment as they are full of silt. The project will restore the channel to a suitable condition, having indirect effects of improving safety and environment along the channel, but the project doesn't appear to have direct compliance obligations.</p>	None		Attach 1 - Lake Clarendon Information_Business Case
<p>Were/are the works reasonably required to fulfil regulatory obligations such as those specified in a water management protocol, resource operation plan, resource operation licence or interim resource operations licence?</p>	YES	<p>The channel is critical for water management at Clarendon Dam. Siltation in the channel has resulted in a rise in the channel's base level. This in turn reduces the channel's capacity which causes premature cut out of the Redbank Pump Station submersible pumps. It also results in a failure to comply with the Central Lockyer IROL 2008 due to the change in level of the channel based from its set base of 94.00 AHD. The proposed works are required to restore Seqwater's water management capability.</p>	None		Attach 1 - Lake Clarendon Information_Business Case Attach 3 - Lake Clarendon Information_Project Management Plan
<p>Is the proposed timing of the expenditure appropriate (i.e. based on lowest whole-of-life costs)? Should the expenditure be delayed or brought forward?</p>	YES	<p>Immediate works were justified to comply with the Central Lockyer IROL 2008.</p>	None		Attach 1 - Lake Clarendon Information_Business Case

	Is the assessed (risk adjusted) asset life consistent with standard run-to-failure asset life expectancy? Explain any material variations.	YES	Erosion of batters and siltation of the channel were typical consequences for soil structures.	None		
	Do the results of the most recent condition assessment support the proposed works? Is the frequency of condition assessment appropriate?	YES	Siltation of the channel and siphon were presented in the Business Case document. Additional images taken of the channel, batters and crest in May 2017 clearly demonstrate the extent and severity of erosion resulting from the 2011 and 2013 floods.	None		Attach 1 - Lake Clarendon Information_Business Case Attach 5 - Lake Clarendon Information_Report detailing damage found during works
Comment on Prudence			There is sufficient evidence based on the information provided that the remedial works at Clarendon Dam including the channel and batters are prudent to ensure the design intent of the channel and compliance with Central Lockyer IROL 2008.			
Prudent			YES			
Documentation Quality			High			

Efficiency Assessment

For expenditure to be efficient, it must represent the least-cost means of providing the requisite level of service within the relevant regulatory framework.

Please complete the following:		Response	Comment	Impact on Value	Recommended Adjustment	Information assessed
Efficiency	Were/are alternatives evaluated (including an option analysis undertaken) as part of the scoping process?	YES	Two options were considered for this project: 1. Base case: status quo (do nothing); 2. Remove silt from Channel and re-establish bank drains.	None		Attach 1 - Lake Clarendon Information_Business Case
	Is the scope of the works the best means of achieving the desired outcomes after having regard to the options available?	YES	The preferred option was Option 2, which involves removal of silt from the channel base and the concrete slabs at the siphon using a long reach excavator. The bank drains will be re-established using a 20T excavator. Compared to the do-nothing option, the silt removal works present the following benefits: - Restoration of pumps to original capacity of 400 ML/day; - Restoration of channel to original level of 94.00 in line with the Central Lockyer IROL 2008; - Increased rate in filling Clarendon Dam; - Improved environmental conditions within the channel through removal of silt; - Improved water quality conditions within the channel through removal of silt; - The drains at bank level will flow at design capacity due to the removal of silt.	None		Attach 1 - Lake Clarendon Information_Business Case
	Were/are non-capex options considered (such as operational solutions)?	YES	A do-nothing option was considered although disregarded as the consequences of not proceeding with works will put Seqwater at risk of breaching their regulatory requirements per the Central Lockyer IROL.	None		Attach 1 - Lake Clarendon Information_Business Case
	Does the standard of the works conform with technical, design and construction requirements in legislation, industry and other standards, codes and manuals?	Insufficient information	The project appears to be completed to appropriate standards, but the Scope of Work document does not reference any specific standard, codes or manuals.	None		Attach 2 - Lake Clarendon Information_Scope of Works
	Is the standard of works compatible with existing and adjacent infrastructure or modern engineering equivalents?	YES	The works restored the channel and batters per original design intent. A typical cross section of the diversion channel demonstrating the original design was provided in documentation regarding additional damages observed during repair works.	None		Attach 1 - Lake Clarendon Information_Business Case Attach 5 - Lake Clarendon Information_Report detailing damage found during works

Outline any considerations relating to technological change, process redundancy and/or cost associated with improving general business performance.

Was/is the incurred/proposed cost reasonable for the scope of the project?

Was/is the cost of the defined scope and standard of works consistent with conditions prevailing in the markets for engineering, equipment supply and construction? Nominate relevant interstate or international benchmarks, and other information sources.

If not, why?

Was/is the allowance for indirect costs reasonable for the scope of the project?

Were/are suitable approaches taken for managing risk and uncertainty regarding projects at an early stage of development?

Are the proposed cost escalation methods appropriate? (e.g. consistent with prevailing market conditions and historical trends)

Were options considered in determining the least cost or preferred option?

Were the procedures/approach used for determining the preferred option appropriate in terms of determining efficient and least cost outcomes?

Did the project consider whole of life costs, including future maintenance and operating costs?

Have any potential efficiency gains been identified?

	None identified	None		
YES	A high level financial analysis for the preferred option estimated the total nominal project cost as \$354,000. The cost accuracy was noted as being ±30%. Actual contractor costs were documented in the Closure Report. The original contract price was \$269,715 (ex. GST). Several variations including seeding of spoil site, remediation of bank slip in Lake Clarendon Diversion Channel, Slashing - 3 person crew, additional works required to remediate Lake Clarendon Diversion Channel were documented and resulted in a final contract price of \$462,678, presenting an increase of \$282,155. The final reported project expenditure was \$515,000 which includes Seqwater project management and execution. The total approved budget was \$603,390. The incurred cost for the restoration works is therefore deemed reasonable.	None		Attach 1 - Lake Clarendon Information_Business Case Attach 4 - Lake Clarendon Information_Closure Report.xlsx
Insufficient information	The costs were a reflection of the market conditions as the contractor was engaged through a Request for Offer via Seqwater's Minor Works Panel; although, the quotes were not provided for review to confirm the preferred contractor was the lowest bid or within range of other quotes.	None		Lake Clarendon Information_Seqwater RF116 Supporting Information_Historical Renewals.xlsx
Insufficient information	Based on the figures reported in the Closure Report, the Seqwater PM costs were 8%, which is reasonable. Other indirect costs were not documented.	None		Attach 4 - Lake Clarendon Information_Closure Report.xlsx
YES	A detailed Project Management Plan was provided that demonstrates Seqwater utilised an appropriate approach for managing delivery of this project.	None		Attach 3 - Lake Clarendon Information_Project Management Plan
N/A	The project occurred in a single year	None		Attach 4 - Lake Clarendon Information_Closure Report.xlsx
YES	Two options were considered. The preferred option presented benefits which justified its cost.	None		Attach 1 - Lake Clarendon Information_Business Case
YES	Refer above.	None		Attach 1 - Lake Clarendon Information_Business Case
NO	There was no discussion on whole of life costs, and only one non-do-nothing options was presented.	None		Attach 1 - Lake Clarendon Information_Business Case
YES	The Contractor whom was previously engaged to complete the restoration works were selected to price and deliver variations in scope. Seqwater presented a project efficiency by saving mobilisation costs and internal costs associated with the Request for Offer process.	None		Attach 4 - Lake Clarendon Information_Closure Report.xlsx

Comment on Efficiency

Seqwater demonstrated suitable project efficiency in the refurbishment of the 6.4 km section of main channel from Clarendon Dam to Redbank Weir Raw Water Pump Station. Justification for implementation of restoration works was evident in the Business Case. Two options were considered with the preferred option being to proceed with channel refurbishment to comply with the Central Lockyer IROL 2008 and restore design intent enabling effective water management at Clarendon Dam. A defined scope of works was provided and the project was effectively managed in accordance with the Project Management Plan. Changes to the original budget estimate were appropriately documented and variations in scope were costed by the preferred Contractor at market conditions. Based on the high-level quality of information provided, this project is considered efficient.

Efficient

YES

Documentation Quality

High

Project Name	Flood Costs Not Claimed
Project Number	PID00147
Project Description	Flood damage repair - design, procurement and construction works: Wivenhoe Dam, Somerset Dam, Borumba Dam, Mt Crosby Weir and Wilson Weir.
Asset Type	Dam and Weir
Year(s) to be Delivered	2014
Cost	\$849,749

Assessment Notes
<p>- Your assessment must take into account the project timing, specifically the uncertainty around projects within the longer term planning horizon.</p> <p>- Consider if any issues you find are project specific or systemic</p>

Prudency Assessment

For expenditure to be prudent, there must be an identified need or cost driver, e.g. if it:

Please complete the following	Response	Comment	Impact on Value	Recommended Adjustment	Information assessed
<p>Prudency</p> <p>Were/are the works reasonably required to continue to deliver agreed service levels?</p>	YES	<p>The January 2011 flood event resulted in a significant amount of damage to Seqwater dam and weir assets. Following the flood event, initial inspections were carried out at all dam and weir sites through Seqwater personnel to confirm the extent of flood damage and the status of dam and weir safety and operation. The following sites were identified as being of particular concern and warranting further assessment of flood damage prior to remediation works:</p> <ul style="list-style-type: none"> - Borumba Dam; - Lake Manchester; - Mt Crosby Weir; - Somerset Dam; - Wilson Weir; - Wivenhoe Dam. <p>In their current state, the assets as part of this project are at risk of loss of operation. This exposes Seqwater to breaching their regulatory requirement to manage and supply water under the water supply schemes. The project relevant to this CAPEX claim (Wilson Weir and Jordan Weir) are part of the Central Lockyer Valley Water Supply Scheme.</p>	None		Seqwater RF117 Supporting Information_Historical Renewals Item 1A, 5A Business Case
<p>Were/are the works reasonably required to address a legal or compliance obligation with safety, environmental or other legislative requirements?</p>	YES	<p>Remediation works are justified, otherwise Seqwater are at risk of non-compliance with insurer over future damage claims through failure to maintain assets and non-compliance with DERM Dam Safety Management Guidelines (2002).</p> <p>Further, the following Legislative Compliance and Government Priorities apply:</p> <ul style="list-style-type: none"> a) Compliance with the Water Reliability and Safety Act (2008) and the DERM Dam Safety Conditions issued under The Act to maintain asset condition. b) Compliance with the Workplace Health and Safety Act (2011) to provide safe access for inspection and maintenance. c) Compliance with insurance requirements to maintain Seqwater assets to a suitable standard. <p>Service Improvements include:</p> <ul style="list-style-type: none"> a) Ensure public safety on key Seqwater sites. b) Reinstate access to Seqwater recreational facilities. c) Minimise the risk of further damage in future flood events. 	None		Item 1A, 5A Business Case

Were/are the works reasonably required to fulfil regulatory obligations such as those specified in a water management protocol, resource operation plan, resource operation licence or interim resource operations licence?

YES	The Project Management Plan states one of the project objectives are for compliance of activities in a watercourse or lake undertaken by a holder of an interim resource operations licence.	None		Project Mangement Plan within Item 11A Project Closeout Report
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Is the proposed timing of the expenditure appropriate (i.e. based on lowest whole-of-life costs)? Should the expenditure be delayed or brought forward?

YES	The works are required immediately to repair flood damage and return the assets to a serviceable and safe level.	None		Item 1A, 5A Business Case
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Is the assessed (risk adjusted) asset life consistent with standard run-to-failure asset life expectancy? Explain any material variations.

N/A	The damages observed at the dams and weirs were directly caused by a flooding natural disaster. Therefore, the standard run-to-failure asset life expectancy is not applicable in this instance.	None		Item 1A, 5A Business Case
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Do the results of the most recent condition assessment support the proposed works? Is the frequency of condition assessment appropriate?

YES	Images of the assets were provided in the Business Case and show the extent of damage at each respective location. Moderate to severe damages were recorded at each site, with the risk allowance assessment provided in the Business Case demonstrating high or extreme risk ratings for all assets under consideration.	None		Item 1A, 5A Business Case
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Comment on Prudency

The January 2011 flood event resulted in a significant amount of damage to Seqwater dam and weir assets. Six assets were identified as being at extreme or high risk of failure and require remediation works. These assets include Borumba Dam, Lake Manchester, Mt Crosby Weir, Somerset Dam, Wilson Weir, and Wivenhoe Dam. Several legislative compliance and government priorities apply in which Seqwater will be in breach should no remediation works be undertaken. The 2013 flood affected additional assets including the Jordan 1 Weir, Jordan 2 Weir, and the Clarendon Weir. Based on the importance of each asset and the high to extreme risk they pose in their current condition, this project's prudency is clearly demonstrated.

Prudent

YES

Documentation Quality

High

Efficiency Assessment

For expenditure to be efficient, it must represent the least-cost means of providing the requisite level of service within the relevant regulatory framework.

Please complete the following:

	Response	Comment	Impact on Value	Recommended Adjustment	Information assessed
<p>Efficiency</p>	YES	<p>An options analysis was completed for the 2011 flood affected assets. Three options were considered, including:</p> <ol style="list-style-type: none"> 1. Maintain Status Quo (Do Nothing); 2. Minor Remediation Works at High Risk Sites; 3. Implement Remediation Works at All Flood Damage Sites. 	None		Item 1A, 5A Business Case
<p>Were/are alternatives evaluated (including an option analysis undertaken) as part of the scoping process?</p>	YES	<p>Option 3 has been identified as the preferred option after considering the associated risks as well as benefits for each option.</p>	None		Item 1A, 5A Business Case
<p>Is the scope of the works the best means of achieving the desired outcomes after having regard to the options available?</p>	YES	<p>A do-nothing option was considered, however this presented several limitations including:</p> <ul style="list-style-type: none"> - Key infrastructure exposed to minimum level of service; - Unknown cost of ongoing operational costs to meet minimum levels of service; - Risks of exacerbating existing damage through future flood events; - Risk of loss of operation of sites; - Risk of unsafe access for operations; - Risk to public safety; - Closure of key recreational facilities; - Non-compliance with insurer over future damage claims through failure to maintain assets; - Non-compliance with DERM Dam Safety Management Guidelines (2002). 	None		Item 1A, 5A Business Case
<p>Were/are non-capex options considered (such as operational solutions)?</p>	YES	<p>A Construction Report by Entura was provided and details the design process including Concept, Stage 1, Stage 2 and IFC design stages. Based on the depth of information provided in this report, the technical, design and construction requirements appear to be consistent with current industry standards. The relevant Australian Standards were referred to in the Technical Specification.</p>	None		Item 6,9,10 Construction Report Item 4B Technical Specification
<p>Does the standard of the works conform with technical, design and construction requirements in legislation, industry and other standards, codes and manuals?</p>	YES	<p>The drawings provided in the Construction Report demonstrate consideration of existing and adjacent infrastructure with remediation works.</p>	None		Item 6,9,10 Construction Report
<p>Is the standard of works compatible with existing and adjacent infrastructure or modern engineering equivalents?</p>		N/A			
<p>Outline any considerations relating to technological change, process redundancy and/or cost associated with improving general business performance.</p>					

Was/is the incurred/proposed cost reasonable for the scope of the project?	YES	<p>The estimated cost for Option 3 was recorded in the Business Case as being \$12,849,500 (incl. contingency of ~20% and accurate to +/- 30%). The cost for Wilson Weir was estimated at \$1,792,948.</p> <p>According to Item 11 A – Project Close Out Report, the actual costs at Wilson Weir were \$2,015,844. The overspend was attributed to the variations from Doval, which were appropriately documented and justified. The overspend would be covered by underspend on other components of the overall flood damage remediation program. The documentation provided on the Wilson Weir was of high quality, and the project appears to have been delivered to an efficient standard, scope and cost.</p> <p>The total insurance claim for 2011 was \$23,115,447 according to Item 13 – Share of insurance deductible. Of this, \$1,572,047 was attributed to Wilson Weir. This CAPEX project is for the flood costs not covered under the insurance claim and includes:</p> <ul style="list-style-type: none"> •\$315,777 for the FY14 share of the \$5M insurance excess for the total flood claim (all sites) attributed to Wilson Weir (as a percentage of Wilson Weir costs to total costs) •\$412,965 for the FY14 costs not included in the insurance claim on Wilson Weir <p>It also included \$121,007 for the FY14 costs for the Jordan 1 Weir, Jordan 2 Weir, and Clarendon Weir remediation works from the 2013 flood damages. From, Item 13 – Share of insurance deductible, it appears that no insurance claim was made for these damages from the 2013 flood.</p>	None		
Was/is the cost of the defined scope and standard of works consistent with conditions prevailing in the markets for engineering, equipment supply and construction? Nominate relevant interstate or international benchmarks, and other information sources.	YES	A competitive tender process was undertaken for the flood damage remediation works (ref FDRW-AD-2012). Doval Constructions (QLD) PTY LTD was awarded the works under Seqwater's Formal Instrument of Agreement for a contract sum pf \$6,505,585.90 incl. GST.	None		Item 7C AS4000 Contract - Doval
If not, why?					
Was/is the allowance for indirect costs reasonable for the scope of the project?	Insufficient information	Based on the figures reported in Item 13 – Share of insurance deductible, indirect costs were not documented or were zero.	None		
Were/are suitable approaches taken for managing risk and uncertainty regarding projects at an early stage of development?	YES	A detailed project specification was completed for this project, which clearly demonstrates consideration of risk management and uncertainty. Given the large scope of works and complexity of works across sites, the project specification suitably addresses the project management strategies required to effectively deliver and manage the project.	None		Item 4A Project Specification
Are the proposed cost escalation methods appropriate? (e.g. consistent with prevailing market conditions and historical trends)	Insufficient information	There is not enough detailed cost information to determine whether cost escalation was required for this project.	None		
Were options considered in determining the least cost or preferred option?	YES	Despite having the highest capital cost, the preferred option was chosen based on the risk reduction and benefits the remediation would provide.	None		Item 1A, 5A Business Case
Were the procedures/approach used for determining the preferred option appropriate in terms of determining efficient and least cost outcomes?	YES	The MCA used for assessment of the options appears reasonable.	None		Item 1A, 5A Business Case

Did the project consider whole of life costs, including future maintenance and operating costs?

YES

Whole of Life Considerations were documented in Section 5 of the Business Case. It was noted that operational costs to meet minimum level of service is difficult to predict, in part due to high risk of further damage following future flood events (of which the timing is unknown). Due to the uncertainty surrounding the value and associated timing of operational costs these options do not lend themselves to a NPV analysis. Instead, the options have been compared based on the capital expenditure required.

None

Item 1A, 5A Business Case

Have any potential efficiency gains been identified?

NO

None documented

None

Comment on Efficiency

Based on the information provided for the overall Flood Damage Remediation Works project and the Wilson Weir component, adequate project management processes were demonstrated to ensure effective project delivery. Three options were considered at the scoping phase, with the preferred option chosen based on risk mitigation and overall benefits provided. The quality of work delivered under this project appears to be consistent with current industry standards and clear consideration for suitability of remediation works with existing or adjacent structures evident. A competitive tender process was documented, with the preferred contractor, Doval, quoting a price within the estimated budget as documented in the Business Case. The CAPEX claim is significantly less than the estimated project cost, as the CAPEX claim only represents FY14 costs for flood damage rehabilitation costs not funded by the insurance claim. It is noted that \$728,742 of the claim is for Wilson Weir. \$120,007 of the claim is for 2013 flood damage remediation works for Jordan 1 Weir, Jordan 2 Weir, and Clarendon Weir. Given the information provided on the 2011 flood damage remediation works program and the Wilson Weir works, this project is considered efficient.

Efficient

YES

Documentation Quality

High

Appendix D

Assessment Forms for
Transitional and
Forward Renewals

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Project Name	Air Valve Replacements at Pie Creek Main Channel
Project Number	N/A
Project Description	Air Valve Replacements at Pie Creek Main Channel
Asset Type	Irrigation Scheme
Year(s) to be Delivered	2023
Cost	\$380,000

Assessment Notes
<ul style="list-style-type: none"> - Your assessment must take into account the project timing, specifically the uncertainty around projects within the longer term planning horizon. - Consider if any issues you find are project specific or systemic

Prudency Assessment

For expenditure to be prudent, there must be an identified need or cost driver, e.g. if it:

- is required to deliver agreed service levels
- results from a legal or compliance obligation
- is required to fulfil regulatory obligations such as those specified in a water management protocol, resource operation plan, resource operation licence or interim resource operations licence.

Please complete the following	Response	Comment	Impact on Value	Recommended Adjustment	Information assessed
Prudency Were/are the works reasonably required to continue to deliver agreed service levels? Were/are the works reasonably required to address a legal or compliance obligation with safety, environmental or other legislative requirements? Were/are the works reasonably required to fulfil regulatory obligations such as those specified in a water management protocol, resource operation plan, resource operation licence or interim resource operations licence? Is the proposed timing of the expenditure appropriate (i.e. based on lowest whole-of-life costs)? Should the expenditure be delayed or brought forward?	YES	<p>Air valves are installed at high point in pipelines to allow for escape of free air from within the pipeline. They may be automatic, or manually operated. In sealed water pipelines, a build-up of free air forms a physical barrier, which will decrease the hydraulic efficiency of the pipeline. There are 19 air valve replacements proposed under this project. While the document QCA RFI 2-Renewals 2019-20 to 2053-54, (tab "2 Data"), confirmed a total of 19 valves on the Pie Creek Main Channel, there were only 14 air valves. The others were comprised of three slide gates, one gate valve, and one air vent. Each have been assigned a replacement cost of \$20,000. The title of this project refers to air valve replacements, but it has been assumed the title is in error, and the intention is for the replacement of all types of valves. Seqwater manages each of these valves under the same renewal strategy.</p> <p>No information was provided on the regulatory or service requirements for the valve replacements, but it can be reasonably assumed the valves are required for continued operation of the Pie Creek Main Channel and Pipeline to maintain service levels.</p>	None		Valve and Actuator Assets - Asset Class Plan RFI 13 Supporting Information
	Insufficient information	No information was provided on the compliance requirement for the valve replacements.	None		Valve and Actuator Assets - Asset Class Plan
	Insufficient information	No information was provided on the regulatory requirement for the valve replacements.	None		
	YES	Seqwater's estimated lives of materials in valves and actuators is provided in the Valves and Actuator Assets Class Plan with fittings and bodies predicted to last 50 years. This decreases depending on material type. The decay curve shows replacement is done at condition score 4, which is expected to occur at 38 years for a non-plastic valve.	None		Valve and Actuator Assets - Asset Class Plan

	Is the assessed (risk adjusted) asset life consistent with standard run-to-failure asset life expectancy? Explain any material variations.	YES	Refer above. Given the Pie Creek pipeline and air valves were acquired in 1972, the proposed replacement date of 2023 is reasonable based on the estimated lives of materials in valves and actuators.	None		Valve and Actuator Assets - Asset Class Plan QCA RFI 2 - Renewals 2019-20 to 2053-54
	Do the results of the most recent condition assessment support the proposed works? Is the frequency of condition assessment appropriate?	YES	Despite the condition assessment indicating the air valves are in condition 2 (good / fair condition), it is a risk to Seqwater to operate air valves past their serviceable life. A condition assessment closer to FY23 may lead to the project being delayed.	None		Valve and Actuator Assets - Asset Class Plan QCA RFI 2 - Renewals 2019-20 to 2053-54
Comment on Prudency			There is sufficient evidence to conclude the valve replacements are prudent to support the continued operation of the pipeline. This is based on the asset class plan and the age of the valves. That said, the condition score (date unknown) shows renewal is not yet needed. Pending a future condition assessment in the year prior to the replacements, there may be an opportunity to delay the replacements.			
Prudent			YES			
Documentation Quality			Medium			

Efficiency Assessment

For expenditure to be efficient, it must represent the least-cost means of providing the requisite level of service within the relevant regulatory framework.

Please complete the following:	Response	Comment	Impact on Value	Recommended Adjustment	Information assessed
Efficiency Were/are alternatives evaluated (including an option analysis undertaken) as part of the scoping process?	YES	As part of Seqwater's Valves and Actuators - Asset Class Plan, three standard Maintenance and Renewals Options are considered: - Option 1: Do nothing and operate valve and actuator to failure; - Option 2: Preventative action and corrective maintenance; - Option 3: Routine maintenance and renewal option.	None		Valves and Actuators - Asset Class Plan
Is the scope of the works the best means of achieving the desired outcomes after having regard to the options available?	Insufficient information	There were no scope of works provided.	None		
Were/are non-capex options considered (such as operational solutions)?	YES	A "do nothing" option was considered.	None		Valves and Actuators - Asset Class Plan
Does the standard of the works conform with technical, design and construction requirements in legislation, industry and other standards, codes and manuals?	YES	In the Asset Class Plan, Seqwater have several Policies and Strategies including external guidelines (referring to Australian Standards and WSAA) and internal specifications (referring to Seqwater technical standard specifications, hazard identification and risk management, and environment policy statement).	None		Valves and Actuators - Asset Class Plan

<p>Is the standard if works compatible with existing and adjacent infrastructure or modern engineering equivalents? Outline any considerations relating to technological change, process redundancy and/or cost associated with improving general business performance.</p>	Insufficient information	There were no scope of works provided.	None		
		None identified	None		
<p>Was/is the incurred/proposed cost reasonable for the scope of the project?</p>	YES	<p>The Valves and Actuators - Asset Class Plan states that renewal costs are based estimated adapted from Rawlinson's Construction Handbook, with allowance for design, project management and contingency. Further cost information was referenced in the Appendix E of the document, but the appendix was not included in the document.</p> <p>The document also provides typical renewal costings from past FY16 valve and actuator projects. The two projects most similar to air valve replacements were the \$13,000 scour and drain valve replacement and \$24,000 scour and non-return valve replacement. Both were at a water treatment plant, so are expected to be less than a valve replacement on the Pie Creek Main Channel pipeline due to access and location.</p> <p>While there was no specific information provided to support the \$20,000 allowance per valve for this project, it appears to be within range the values stated in the Valves and Actuators - Asset Class Plan, and the proposed capital expenditure appears to be reasonable.</p>	None		Valves and Actuators - Asset Class Plan
<p>Was/is the cost of the defined scope and standard of works consistent with conditions prevailing in the markets for engineering, equipment supply and construction? Nominate relevant interstate or international benchmarks, and other information sources.</p> <p>If not, why?</p>	N/A	This is a forward project and procurement process has not been undertaken. There is no information to assess prevailing market conditions.	None		
<p>Was/is the allowance for indirect costs reasonable for the scope of the project?</p>	Insufficient information	No cost estimate was provided to assess the amount of indirect costs.	None		
<p>Were/are suitable approaches taken for managing risk and uncertainty regarding projects at an early stage of development?</p>	YES	<p>A high-level risk assessment was completed for the three options considered, with the following noted:</p> <ul style="list-style-type: none"> - Option 1: this option carries high levels of safety and operational risks to Seqwater; - Option 2: this option allows for increased preventative/corrective maintenance to the asset being programmed as identified in routine inspections. This option will be selected where detailed condition assessment confirms that the asset can be rehabilitated back to a condition that the asset can safely meet its operational performance requirements. This option carries a level of risk that maintenance works will fail to render the asset back to an acceptable condition; - Option 3: this option allows for proactive renewal of the asset when the condition assessment of the asset is assessed as condition 4; and a detailed condition assessment confirms that increased corrective maintenance is unlikely to render the asset back to condition 1 or 2. 	None		Valves and Actuators - Asset Class Plan
<p>Are the proposed cost escalation methods appropriate? (e.g. consistent with prevailing market conditions and historical trends)</p>	N/A	Likely to be a single year project.	None		

	Were options considered in determining the least cost or preferred option?	N/A	There were no design options completed yet as the project is still in the forward planning process.	None		
	Were the procedures/approach used for determining the preferred option appropriate in terms of determining efficient and least cost outcomes?	N/A	There were no design options completed yet as the project is still in the forward planning process.	None		
	Did the project consider whole of life costs, including future maintenance and operating costs?	YES	The maintenance and renewal options consider the future maintenance and operating costs regarding the safety and operational risks to Seqwater.	None		
	Have any potential efficiency gains been identified?	N/A	None identified	None		

Comment on Efficiency	This project cannot be fully assessed for its efficiency as no supporting information for the cost estimate, the scope of work, or the type, material, or size of valve were provided. The asset class plan for valves and actuators appears to set a strong foundation for assessing assets, and costing maintenance, inspections and renewals. For this reason, the project has been assumed as efficient.
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Efficient	YES
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Documentation Quality	Low
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Project Name	Air Valve Type 1 Replacements
Project Number	N/A
Project Description	Air Valve Type 1 Replacements
Asset Type	Pipe
Year(s) to be Delivered	2047
Cost	\$860,000

Assessment Notes
<ul style="list-style-type: none"> - Your assessment must take into account the project timing, specifically the uncertainty around projects within the longer term planning horizon. - Consider if any issues you find are project specific or systemic

Prudency Assessment

For expenditure to be prudent, there must be an identified need or cost driver, e.g. if it:

- is required to deliver agreed service levels
- results from a legal or compliance obligation
- is required to fulfil regulatory obligations such as those specified in a water management protocol, resource operation plan, resource operation licence or interim resource operations licence.

Please complete the following	Response	Comment	Impact on Value	Recommended Adjustment	Information assessed
Prudency Were/are the works reasonably required to continue to deliver agreed service levels? Were/are the works reasonably required to address a legal or compliance obligation with safety, environmental or other legislative requirements? Were/are the works reasonably required to fulfil regulatory obligations such as those specified in a water management protocol, resource operation plan, resource operation licence or interim resource operations licence? Is the proposed timing of the expenditure appropriate (i.e. based on lowest whole-of-life costs)? Should the expenditure be delayed or brought forward?	YES	<p>Air valves are installed at high point in pipelines to allow for escape of free air from within the pipeline. They may be automatic, or manually operated. In sealed water pipelines, a build-up of free air forms a physical barrier, which will decrease the hydraulic efficiency of the pipeline. There are 19 air valve replacements proposed under this project. While the document QCA RFI 2-Renewals 2019-20 to 2053-54, (tab "2 Data"), confirmed a total of 43 valves on the Moreton Vale Pipeline, there were only 21 type 1 air valves. The others were comprised 14 type 2 air valves, two type 3 air valves, and one isolating valve. Each have been assigned a replacement cost of \$20,000. The title of this project refers to air valve replacements, but it has been assumed the title is in error, and the intention is for the replacement of all types of valves. Seqwater manages each of these valves under the same renewal strategy.</p> <p>No information was provided on the regulatory or service requirements for the valve replacements, but it can be reasonably assumed the valves are required for continued operation of the Morton Vale Pipeline to meet service levels in the Central Lockyer Valley water supply scheme.</p>	None		Valve and Actuator Assets - Asset Class Plan RFI 13 Supporting Information
	Insufficient information	No information was provided on the compliance requirement for the valve replacements.	None		Valve and Actuator Assets - Asset Class Plan
	Insufficient information	No information was provided on the regulatory requirement for the valve replacements.	None		
	YES	Seqwater's estimated lives of materials in valves and actuators is provided in the Valves and Actuator Assets Class Plan with fittings and bodies predicted to last 50 years. This decreases depending on material type. The decay curve shows replacement is done at condition score 4, which is expected to occur at 38 years for a non-plastic valve.	None		Valve and Actuator Assets - Asset Class Plan

	Is the assessed (risk adjusted) asset life consistent with standard run-to-failure asset life expectancy? Explain any material variations.	YES	Refer above. Given the Morton Vale Pipeline valves were installed in 1997, the proposed replacement date of 2047 is reasonable based on the estimated lives of materials in valves and actuators.	None		Valve and Actuator Assets - Asset Class Plan
	Do the results of the most recent condition assessment support the proposed works? Is the frequency of condition assessment appropriate?	YES	Despite the condition assessment indicating the air valves are in condition 2 (good / fair condition), it is a risk to Seqwater to operate air valves past their serviceable life. A condition assessment closer to FY47 may lead to the project being delayed.	None		
Comment on Prudency			There is sufficient evidence to conclude the valve replacements are prudent to support the continued operation of the pipeline. This is based on the asset class plan and the age of the valves. That said, the condition score (date unknown) shows renewal is not yet needed. Pending a future condition assessment in the year prior to the replacements, there may be an opportunity to delay the replacements.			
Prudent			YES			
Documentation Quality			Low			

Efficiency Assessment

For expenditure to be efficient, it must represent the least-cost means of providing the requisite level of service within the relevant regulatory framework.

Please complete the following:	Response	Comment	Impact on Value	Recommended Adjustment	Information assessed	
Efficiency	Were/are alternatives evaluated (including an option analysis undertaken) as part of the scoping process?	YES	As part of Seqwater's Valves and Actuators - Asset Class Plan, three standard Maintenance and Renewals Options are considered: - Option 1: Do nothing and operate valve and actuator to failure; - Option 2: Preventative action and corrective maintenance; - Option 3: Routine maintenance and renewal option.	None		Valves and Actuators - Asset Class Plan
	Is the scope of the works the best means of achieving the desired outcomes after having regard to the options available?	Insufficient information	There were no scope of works provided.	None		
	Were/are non-capex options considered (such as operational solutions)?	YES	A "do nothing" option was considered.	None		Valves and Actuators - Asset Class Plan
	Does the standard of the works conform with technical, design and construction requirements in legislation, industry and other standards, codes and manuals?	YES	In the Asset Class Plan, Seqwater have several Policies and Strategies including external guidelines (referring to Australian Standards and WSAA) and internal specifications (referring to Seqwater technical standard specifications, hazard identification and risk management, and environment policy statement).	None		Valves and Actuators - Asset Class Plan

<p>Is the standard if works compatible with existing and adjacent infrastructure or modern engineering equivalents?</p> <p>Outline any considerations relating to technological change, process redundancy and/or cost associated with improving general business performance.</p>	Insufficient information	There were no scope of works provided.	None		
		None identified	None		
<p>Was/is the incurred/proposed cost reasonable for the scope of the project?</p>	YES	<p>The Valves and Actuators - Asset Class Plan states that renewal costs are based estimated adapted from Rawlinson's Construction Handbook, with allowance for design, project management and contingency. Further cost information was referenced in the Appendix E of the document, but the appendix was not included in the document.</p> <p>The document also provides typical renewal costings from past FY16 valve and actuator projects. The two projects most similar to air valve replacements were the \$13,000 scour and drain valve replacement and \$24,000 scour and non-return valve replacement. Both were at a water treatment plant, so are expected to be less than a valve replacement on the Morton Vale Pipeline due to access and location.</p> <p>While there was no specific information provided to support the \$20,000 allowance per valve for this project, it appears to be within range the values stated in the Valves and Actuators - Asset Class Plan, and the proposed capital expenditure appears to be reasonable.</p>	None		Valves and Actuators - Asset Class Plan
<p>Was/is the cost of the defined scope and standard of works consistent with conditions prevailing in the markets for engineering, equipment supply and construction? Nominate relevant interstate or international benchmarks, and other information sources.</p> <p>If not, why?</p>	N/A	This is a forward project and procurement process has not been undertaken. There is no information to assess prevailing market conditions.	None		
<p>Was/is the allowance for indirect costs reasonable for the scope of the project?</p>	Insufficient information	No cost estimate was provided to assess the amount of indirect costs.	None		
<p>Were/are suitable approaches taken for managing risk and uncertainty regarding projects at an early stage of development?</p>	YES	<p>A high-level risk assessment was completed for the three options considered, with the following noted:</p> <ul style="list-style-type: none"> - Option 1: this option carries high levels of safety and operational risks to Seqwater; - Option 2: this option allows for increased preventative/corrective maintenance to the asset being programmed as identified in routine inspections. This option will be selected where detailed condition assessment confirms that the asset can be rehabilitated back to a condition that the asset can safely meet its operational performance requirements. This option carries a level of risk that maintenance works will fail to render the asset back to an acceptable condition; - Option 3: this option allows for proactive renewal of the asset when the condition assessment of the asset is assessed as condition 4; and a detailed condition assessment confirms that increased corrective maintenance is unlikely to render the asset back to condition 1 or 2. 	None		Valves and Actuators - Asset Class Plan
<p>Are the proposed cost escalation methods appropriate? (e.g. consistent with prevailing market conditions and historical trends)</p>	N/A	Listed as a single year project.	None		

Were options considered in determining the least cost or preferred option?

Were the procedures/approach used for determining the preferred option appropriate in terms of determining efficient and least cost outcomes?

Did the project consider whole of life costs, including future maintenance and operating costs?

Have any potential efficiency gains been identified?

N/A	There were no design options completed yet as the project is still in the forward planning process.	None		
N/A	There were no design options completed yet as the project is still in the forward planning process.	None		
YES	The maintenance and renewal options consider the future maintenance and operating costs regarding the safety and operational risks to Seqwater.	None		
N/A	None identified	None		

Comment on Efficiency

This project cannot be fully assessed for its efficiency as no supporting information for the cost estimate, the scope of work, or the type, material, or size of valve were provided. The asset class plan for valves and actuators appears to set a strong foundation for assessing assets, and costing maintenance, inspections and renewals. For this reason, the project has been assumed as efficient.

Efficient

YES

Documentation Quality

Low

Project Name	Allowance for Long Term Renewals at Pie Creek Pump Station
Project Number	N/A
Project Description	Allowance for Long Term Renewals at Pie Creek Pump Station
Asset Type	Pump Station
Year(s) to be Delivered	2026 and 2036
Cost	\$1,820,000

Assessment Notes
<ul style="list-style-type: none"> - Your assessment must take into account the project timing, specifically the uncertainty around projects within the longer term planning horizon. - Consider if any issues you find are project specific or systemic

Prudency Assessment

For expenditure to be prudent, there must be an identified need or cost driver, e.g. if it:

- is required to deliver agreed service levels
- results from a legal or compliance obligation
- is required to fulfil regulatory obligations such as those specified in a water management protocol, resource operation plan, resource operation licence or interim resource operations licence.

Please complete the following	Response	Comment	Impact on Value	Recommended Adjustment	Information assessed	
Prudency		Were/are the works reasonably required to continue to deliver agreed service levels?	YES	No context is provided for the raw water pump station and the role it plays within the Crowley Vale water system. Although, it has been assumed as critical for the delivery of raw water from the Mary River into the Pie Creek delivery system.	None	
		Were/are the works reasonably required to address a legal or compliance obligation with safety, environmental or other legislative requirements?	Insufficient information	No information was provided on the compliance requirements for the pump station.	None	
		Were/are the works reasonably required to fulfil regulatory obligations such as those specified in a water management protocol, resource operation plan, resource operation licence or interim resource operations licence?	Insufficient information	No information was provided on the regulatory requirements for the pump station.	None	
		Is the proposed timing of the expenditure appropriate (i.e. based on lowest whole-of-life costs)? Should the expenditure be delayed or brought forward?	YES	The Seqwater Pumps Asset Class Plan describes the recommended asset life cycle management strategy to be implemented for pumps. The asset strategy varies depending on the type of pump. No information was provided to identify the type of pumps used at the Pie Creek Pump Station; however, the Asset Class Plan states that raw water pumps are typically centrifugal dry mount pumps, and can be single stage, multistage or submersible. Assuming the pumps are dry mount centrifugal pumps, they are to be refurbished based on condition that typically occurs on 7.5 year cycles. Their adjusted effective life is 45 years. The pump station appears to have a start-up date of 1972, which would make the assets 54 in FY26 and 64 in FY36. Based on this, FY26 appears to be appropriate and could even be brought forward.	None	Pumps Asset Class Plan
		Is the assessed (risk adjusted) asset life consistent with standard run-to-failure asset life expectancy? Explain any material variations.	Insufficient information	There is insufficient information in the QCA RFI 2 - Renewals 2019-20 to 2053-54 to determine which assets fall under the intended long term renewal plan. The pump wet wells were acquired in 1972, and by extension it has been assumed all assets at the pump station are of the same age. Pumps are not run-to-fail assets. They are refurbished based on condition, then replaced after a set number of refurbishments.	None	QCA RFI 2 - Renewals 2019-20 to 2053-54

Do the results of the most recent condition assessment support the proposed works? Is the frequency of condition assessment appropriate?

Insufficient information

No condition information supplied. Scope of works is also unclear what assets are included in the renewal.

None

Comment on Prudency

There is insufficient information in the QCA RFI 2 - Renewals 2019-20 to 2053-54 document to determine which assets at the pump station fall under the intended long-term renewal plan for FY26 and FY36. According the asset start-up date for the pump station pump wells, the pump station appears to have started up in 1972, which may support pump replacement based on the 45-year effective life reported in the Pumps Asset Class Plan. While the project has been considered prudent, the level of documentation is very poor. Further information on the scope of the planned renewal, including the asset types as a minimum, should be available. The project outlook is only 6 years.

Prudent

YES

Documentation Quality

Low

Efficiency Assessment

For expenditure to be efficient, it must represent the least-cost means of providing the requisite level of service within the relevant regulatory framework.

Please complete the following:

Please complete the following:	Response	Comment	Impact on Value	Recommended Adjustment	Information assessed
<p>Efficiency</p> <p>Were/are alternatives evaluated (including an option analysis undertaken) as part of the scoping process?</p> <p>Is the scope of the works the best means of achieving the desired outcomes after having regard to the options available?</p> <p>Were/are non-capex options considered (such as operational solutions)?</p> <p>Does the standard of the works conform with technical, design and construction requirements in legislation, industry and other standards, codes and manuals?</p> <p>Is the standard if works compatible with existing and adjacent infrastructure or modern engineering equivalents?</p> <p>Outline any considerations relating to technological change, process redundancy and/or cost associated with improving general business performance.</p> <p>Was/is the incurred/proposed cost reasonable for the scope of the project?</p>	YES	There have been no options or no scope of work identified for this project. It has been assumed that pumps are part of the renewal project, of which the asset class has undertaken options analysis to establish he Asset Class Plan.	None		
	Insufficient information	The scope of works has not been defined.	None		
	Insufficient information	Only assessed at high level in the Asset Class Plan	None		Pumps Asset Class Plan
	Insufficient information	No information was provided on the scope of works, or standards used in establishing them. The Pump Asset Class Plan does reference any technical standards.	None		Pumps Asset Class Plan
	Insufficient information	Refer above	None		
		None identified	None		
	Insufficient information	<p>From the Seqwater 2009 Strategic Asset Management Plan, obtained from the flood commission website, the Pie Creek Pump Station has two 112 kW pumps that provide 27 ML/d. From the Pumps Asset Class Plan, a dry mount centrifugal pump, in the range of 101 kW to 250 KW, has a total replacement cost of \$187,500.</p> <p>Considering the proposed costs per renewal are in the \$900,000 range, it can be assumed that the proposed scope of renewals is for more than the pumps. The scope is likely to include all mechanical and electrical assets at the pump station including but not limited to pumps, valves, motors, switchboards, and controls equipment.</p> <p>Based on information in the document QCA RFI 2- Renewals 2019-20 to 2053-54, there does not appear to be any other renewal projects planned for this pump station. It is assumed this project is a placeholder and as such is considered reasonable; although, Seqwater's asset management systems should be improved to improve the granularity of forecast by asset type since different asset types will have different renewal timing, frequency and costs.</p>	None		Pumps Asset Class Plan

Was/is the cost of the defined scope and standard of works consistent with conditions prevailing in the markets for engineering, equipment supply and construction? Nominate relevant interstate or international benchmarks, and other information sources.

If not, why?

Was/is the allowance for indirect costs reasonable for the scope of the project?

Were/are suitable approaches taken for managing risk and uncertainty regarding projects at an early stage of development?

Are the proposed cost escalation methods appropriate? (e.g. consistent with prevailing market conditions and historical trends)

Were options considered in determining the least cost or preferred option?

Were the procedures/approach used for determining the preferred option appropriate in terms of determining efficient and least cost outcomes?

Did the project consider whole of life costs, including future maintenance and operating costs?

Have any potential efficiency gains been identified?

Insufficient information	Procurement processes to test market conditions have not yet been undertaken.	None		
N/A	No information provided on scope of works or cost estimate breakdown.	None		
N/A	No information provided on scope of works or cost estimate breakdown.	None		
N/A	No information provided on scope of works or cost estimate breakdown.	None		
YES	Least cost approach described in Pump Asset Class Plan.	None		
Insufficient information	While it appears a process was undertaken in the Asset Class Plan to determine the preferred option, the specific details of the comparison methodology was not provided.	None		Pumps Asset Class Plan
YES	Standard intervention cost models are provided in Seqwater's Pump Asset Class Plan for a variety of pumps which are separated into asset sub-classes and duties. The Asset Plan Class considers whole of life costs in the establishment of the preferred strategy.	None		Pumps Asset Class Plan
N/A	None identified	None		

Comment on Efficiency

Assessment of project efficiency is not possible as there was no specific information provided on the planned scope of renewal at the pump station. Based on the cost of pump replacements in the Pumps Asset Class Plan, it has been deduced that the proposed scope includes more than just pump replacement. It likely includes all mechanical and electrical renewals at the pump station. The expenditure of \$1,820,000 has been assumed as a placeholder. While it has been assumed as efficient, Seqwater should have a more refined process for identifying specific renewals by asset type, and the individual assets should have individual replacement costs documented in an asset register.

Efficient

YES

Documentation Quality

Low

Project Name	Atkinson Dam Buildings Renewals
Project Number	N/A
Project Description	Atkinson Dam Buildings Renewals
Asset Type	Dam
Year(s) to be Delivered	2051
Cost	\$13,050,000

Assessment Notes
<ul style="list-style-type: none"> - Your assessment must take into account the project timing, specifically the uncertainty around projects within the longer term planning horizon. - Consider if any issues you find are project specific or systemic

Prudency Assessment

For expenditure to be prudent, there must be an identified need or cost driver, e.g. if it:

- is required to deliver agreed service levels
- results from a legal or compliance obligation
- is required to fulfil regulatory obligations such as those specified in a water management protocol, resource operation plan, resource operation licence or interim resource operations licence.

Please complete the following	Response	Comment	Impact on Value	Recommended Adjustment	Information assessed	
Prudency		Were/are the works reasonably required to continue to deliver agreed service levels?	YES	The buildings provide shelter for critical operational equipment and serve as functional space for personnel at Atkinson Dam. Considering many of these buildings house equipment / assets, it is likely that the renewals fulfil regulatory obligations regarding the water management protocol of Atkinson Dam.	None	QCA RFI 2 - Renewals 2019-20 to 2053-54
		Were/are the works reasonably required to address a legal or compliance obligation with safety, environmental or other legislative requirements?	Insufficient information	Insufficient context provided to confidently assess the compliance obligations of the buildings. The renewals will likely address safety requirements.	None	QCA RFI 2 - Renewals 2019-20 to 2053-54
		Were/are the works reasonably required to fulfil regulatory obligations such as those specified in a water management protocol, resource operation plan, resource operation licence or interim resource operations licence?	Insufficient information	Refer above. The buildings identified as part of this project based on QCA RFI 2 are the main building, core sample storage shed, piezometer huts 1 and 2, workshop, and residence. Considering many of these buildings house equipment/assets, it is likely that the renewals fulfil regulatory obligations regarding the water management protocol of Atkinson Dam.	None	QCA RFI 2 - Renewals 2019-20 to 2053-54
		Is the proposed timing of the expenditure appropriate (i.e. based on lowest whole-of-life costs)? Should the expenditure be delayed or brought forward?	YES	The proposed expenditure appears to be appropriately timed based on the life of the assets considered.	None	
		Is the assessed (risk adjusted) asset life consistent with standard run-to-failure asset life expectancy? Explain any material variations.	YES	The buildings at Atkinson Dam were acquired in 1970 and are scheduled to be replaced in January 2052. In the Buildings Asset Class Plan is a building decay curve (applicable to concrete, timber and steel), which indicates the service life of buildings deteriorate from condition 1 (new) to condition 4 (poor) after approximately 40 years before being refurbished back to condition 1. This renewal forms part of Seqwater's condition management strategies. The buildings in question have already surpassed the expected serviceable life based on this decay curve.	None	QCA RFI 2 - Renewals 2019-20 to 2053-54

	Do the results of the most recent condition assessment support the proposed works? Is the frequency of condition assessment appropriate?	YES	The construction material is recorded as concrete/brick on slab and has an existing condition assessment rating of 2 (good condition).	None		QCA RFI 2 - Renewals 2019-20 to 2053-54
Comment on Prudency		Based on the information provided, the buildings at Atkinson Dam will likely reach the end of their serviceable life by 2051 and will require renewal. The typical serviceable life for concrete/brick is approximately 80 years, which means the proposed intervention date is in line with standard run-to-failure asset life expectancy.				
Prudent		YES				
Documentation Quality		Low				

Efficiency Assessment

For expenditure to be efficient, it must represent the least-cost means of providing the requisite level of service within the relevant regulatory framework.

Please complete the following:		Response	Comment	Impact on Value	Recommended Adjustment	Information assessed
Efficiency	Were/are alternatives evaluated (including an option analysis undertaken) as part of the scoping process?	Insufficient information	The proposed works are outside the Renewal Program time frame for development of a Business Case, therefore no options analysis is required at this stage.	None		RFI 13 Main Response
	Is the scope of the works the best means of achieving the desired outcomes after having regard to the options available?	Insufficient information	Refer above.	None		
	Were/are non-capex options considered (such as operational solutions)?	Insufficient information	Refer above.	None		
	Does the standard of the works conform with technical, design and construction requirements in legislation, industry and other standards, codes and manuals?	Insufficient information	There are currently no detailed works proposed under this project, so it is not possible to comment on the standard of works or compatibility with existing standards.	None		RFI 13 Main Response
	Is the standard if works compatible with existing and adjacent infrastructure or modern engineering equivalents?	Insufficient information	Refer above.	None		
	Outline any considerations relating to technological change, process redundancy and/or cost associated with improving general business performance.					
	Was/is the incurred/proposed cost reasonable for the scope of the project?	YES	The proposed budget for this project is \$13,500,000 which is a blanket estimate to refurbish the buildings at Atkinson Dam. It is not clear how this estimate was derived. There are standard costs detailed in the intervention trigger cost model of the Building Asset Class Plan which provide dollar values for renewal/maintenance of a variety of building components in \$ / m ² . While no scope of work, bill of materials, or detailed cost estimate breakdown has been provided, the asset class plan appears to set a strong foundation for assessing assets and costing maintenance, inspections and renewals. For this reason, the project has been assumed as efficient.	None		Buildings Asset Class Plan
	Was/is the cost of the defined scope and standard of works consistent with conditions prevailing in the markets for engineering, equipment supply and construction? Nominate relevant interstate or international benchmarks, and other information sources.	N/A		None		
	If not, why?					
	Was/is the allowance for indirect costs reasonable for the scope of the project?	N/A	No information provided on scope of works or cost estimate breakdown.	None		
Were/are suitable approaches taken for managing risk and uncertainty regarding projects at an early stage of development?	N/A	No information provided on scope of works or cost estimate breakdown.	None			

Are the proposed cost escalation methods appropriate? (e.g. consistent with prevailing market conditions and historical trends)

N/A

No information provided on scope of works or cost estimate breakdown.

None

Were options considered in determining the least cost or preferred option?

Insufficient information

The proposed works are outside the Renewal Program time frame for development of a Business Case, therefore no options analysis is required at this stage.

None

Were the procedures/approach used for determining the preferred option appropriate in terms of determining efficient and least cost outcomes?

Insufficient information

The proposed works are outside the Renewal Program time frame for development of a Business Case, therefore no options analysis is required at this stage.

None

Did the project consider whole of life costs, including future maintenance and operating costs?

YES

The project is based on whole of life costs for the buildings at Atkinson Dam, noting that they will likely require refurbishment based on the building decay curve provided in the Buildings Asset Class Plan.

None

Buildings Asset Class Plan

Have any potential efficiency gains been identified?

N/A

None identified

None

Comment on Efficiency

This project cannot be fully assessed for its efficiency as no supporting information for the cost estimate, the scope of work, or building construction types were provided. The asset class plan appears to set a strong foundation for assessing assets and costing maintenance, inspections and renewals. For this reason, the project has been assumed as efficient.

Efficient

YES

Documentation Quality

Low

Project Name	Crowley Vale Weir Inlet Works - Raw Water Pump
Project Number	N/A
Project Description	Crowley Vale Weir Inlet Works - Raw Water Pump
Asset Type	Weir
Year(s) to be Delivered	2040
Cost	\$100,000

Assessment Notes
<ul style="list-style-type: none"> - Your assessment must take into account the project timing, specifically the uncertainty around projects within the longer term planning horizon. - Consider if any issues you find are project specific or systemic

Prudency Assessment

For expenditure to be prudent, there must be an identified need or cost driver, e.g. if it:

- is required to deliver agreed service levels
- results from a legal or compliance obligation
- is required to fulfil regulatory obligations such as those specified in a water management protocol, resource operation plan, resource operation licence or interim resource operations licence.

Please complete the following

Response	Comment	Impact on Value	Recommended Adjustment	Information assessed
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Response	Comment	Impact on Value	Recommended Adjustment	Information assessed
Insufficient information	No context is provided for the raw water pump and the role it plays within the Crowley Vale water system. Although, it has been assumed as critical for the delivery of raw water from the Laidley Creek.	None		
Insufficient information	No information was provided on the compliance requirements for the pump station.	None		
Insufficient information	No information was provided on the regulatory requirements for the pump station.	None		
YES	<p>The Seqwater Pumps Asset Class Plan describes the recommended asset life cycle management strategy to be implemented for pumps. The asset strategy varies depending on the type of pump. No information was provided to identify the type of pump used at the Crowley Vale Weir; however, the Asset Class Plan states that raw water pumps are typically centrifugal dry mount pumps, and can be single stage, multistage or submersible. Assuming the pumps are dry mount centrifugal pumps, they are to be refurbished based on condition that typically occurs on 7.5 year cycles. Their adjusted effective life is 45 years.</p> <p>The document QCA RFI 2-Renewals 2019-20 to 2053-54, (tab "2 Data"), identifies a pump start-up date of 1995, which would make the asset 45 in FY40. Based on this, the project timing appears to be appropriate. It has a criticality score of 1 but does not have any condition information. A condition assessment closer to the proposed time of renewal may bring forward or delay the pump replacement.</p>	None		Pumps Asset Class Plan
YES	A condition assessment for the existing pump was not provided in QCA RFI 2. Given the pump's acquisition in 1995 and the typical serviceable life of mechanical equipment, it is likely pump will require replacement in 2040.	None		QCA RFI 2-Renewals 2019-20 to 2053-54

Do the results of the most recent condition assessment support the proposed works? Is the frequency of condition assessment appropriate?

Insufficient information

No condition information supplied. Scope of works is also unclear what assets are included in the renewal.

None

Comment on Prudence

There is sufficient evidence to conclude the pump replacement is prudent to continue to provide service levels under the Central Lockyer Valley Water Supply Scheme. This is based on the asset class plan and the age of the pump. Pending a future condition assessment in the years closer to the replacement year, there may be an opportunity to delay the project.

Prudent

YES

Documentation Quality

Low

Efficiency Assessment

For expenditure to be efficient, it must represent the least-cost means of providing the requisite level of service within the relevant regulatory framework.

Please complete the following:

		Response	Comment	Impact on Value	Recommended Adjustment	Information assessed
Efficiency	Were/are alternatives evaluated (including an option analysis undertaken) as part of the scoping process?	N/A	According to RFI 13 Main Response, this project is outside the Renewal Program timeframe need for the development of a Business Case, which would include an options assessment.	None		
	Is the scope of the works the best means of achieving the desired outcomes after having regard to the options available?	Insufficient information	The scope of works has not been defined.	None		
	Were/are non-capex options considered (such as operational solutions)?	Insufficient information	Only assessed at high level in the Asset Class Plan	None		
	Does the standard of the works conform with technical, design and construction requirements in legislation, industry and other standards, codes and manuals?	Insufficient information	No information was provided on the scope of works, or standards used in establishing them. The Pump Asset Class Plan does reference any technical standards.	None		
	Is the standard if works compatible with existing and adjacent infrastructure or modern engineering equivalents?	Insufficient information	Refer above	None		
	Outline any considerations relating to technological change, process redundancy and/or cost associated with improving general business performance.		None identified	None		
	Was/is the incurred/proposed cost reasonable for the scope of the project?	YES	The Pumps Asset Class Plan lists replacement costs for different sizes of dry mount centrifugal pump. The 51 kW to 100kW range has a replacement cost of \$100,000. While no information was provided to identify the size of the raw pump at Crowley Vale Weir, it has been assumed to be in this range as the proposed expenditure is \$100,000.	None		Pumps Asset Class Plan
	Was/is the cost of the defined scope and standard of works consistent with conditions prevailing in the markets for engineering, equipment supply and construction? Nominate relevant interstate or international benchmarks, and other information sources.	Insufficient information	Procurement processes to test market conditions have not yet been undertaken.	None		
	If not, why?					
	Was/is the allowance for indirect costs reasonable for the scope of the project?	N/A	No information provided on scope of works or cost estimate breakdown.	None		
	Were/are suitable approaches taken for managing risk and uncertainty regarding projects at an early stage of development?	N/A	No information provided on scope of works or cost estimate breakdown.	None		
	Are the proposed cost escalation methods appropriate? (e.g. consistent with prevailing market conditions and historical trends)	N/A	No information provided on scope of works or cost estimate breakdown.	None		
	Were options considered in determining the least cost or preferred option?	YES	Least cost approach described in Pump Asset Class Plan.	None		Pumps Asset Class Plan
	Were the procedures/approach used for determining the preferred option appropriate in terms of determining efficient and least cost outcomes?	Insufficient information	While it appears a process was undertaken in the Asset Class Plan to determine the preferred option, the specific details of the comparison methodology was not provided.	None		

Did the project consider whole of life costs, including future maintenance and operating costs?

YES

Standard intervention cost models are provided in Seqwater's Pump Asset Class Plan for a variety of pumps which are separated into asset sub-classes and duties. The Asset Plan Class considers whole of life costs in the establishment of the preferred strategy.

None

Pumps Asset Class Plan

Have any potential efficiency gains been identified?

N/A

None identified

None

Comment on Efficiency

This project cannot be fully assessed for its efficiency as no supporting information for the cost estimate, the scope of work, or the type or size of pump were provided. The asset class plan for pumps appears to set a strong foundation for assessing assets, and costing maintenance, inspections and renewals. For this reason, the project has been assumed as efficient.

Efficient

YES

Documentation Quality

Low

Project Name	Meter Replacement 35 meters in 2020, 2021 and 2022
Project Number	N/A
Project Description	Meter Replacement 35 meters in 2020, 2021 and 2022
Asset Type	Meter
Year(s) to be Delivered	2020, 2021, 2022
Cost	\$1,020,000

Assessment Notes
<ul style="list-style-type: none"> - Your assessment must take into account the project timing, specifically the uncertainty around projects within the longer term planning horizon. - Consider if any issues you find are project specific or systemic

Prudency Assessment

For expenditure to be prudent, there must be an identified need or cost driver, e.g. if it:

- is required to deliver agreed service levels
- results from a legal or compliance obligation
- is required to fulfil regulatory obligations such as those specified in a water management protocol, resource operation plan, resource operation licence or interim resource operations licence.

Please complete the following	Response	Comment	Impact on Value	Recommended Adjustment	Information assessed
Prudency	YES	<p>The Central Lockyer Irrigation Scheme provides for the supply of bulk untreated water to irrigation and commercial customers. Customers are entitled to take an allocation of water through works that are subject to a Development Approval Process. Customers in the scheme are metered so as to record the volume of water taken. This metering is required for management, reporting and billing purposes.</p> <p>Seqwater have identified inaccurate flow measurement and WHS issues which must be resolved to enable the sites to meet the compliance requirements.</p>	None		RFI 10 - ICL - PID02801 Business Case
	YES	<p>Safe access to the meters has highlighted as a safety risks due to slips, trips, and falls, and its location in long grass snake habitat. The Work Health and Safety Act (2011) requires elimination of risks to health and safety, so far as is reasonably practicable; and if it is not reasonably practicable to eliminate risks to health and safety, to minimise those risks so far as reasonably practicable.</p>	None		RFI 10 - ICL - PID02801 Business Case
	YES	<p>Seqwater's meter replacement is driven by renewal and compliance requirements. The Central Lockyer Irrigation Scheme has an associated Resource Operations License (ROL) or Interim Resource Operations License (iROL) issued by the regulator. Seqwater is the license holder in each case. The ROLs requires the license holder to undertake monitoring and reporting in accordance with the Resource Operations Plan (ROP). The ROPs require the license holder to record the total volume of water taken by each water user.</p>	None		RFI 10 - ICL - PID02801 Business Case

	Is the proposed timing of the expenditure appropriate (i.e. based on lowest whole-of-life costs)? Should the expenditure be delayed or brought forward?	YES	The January 2017 PID02801 Business Case also stated as a result of the dry period preceding 2008, many irrigators abandoned their works and the assets, including the meters, had fallen into a state of disrepair. Furthermore, due to their installation arrangement and technology (mechanical paddle wheel), the meters cannot provide accurate flow measurement irrespective of condition. The project is a continuation of a meter replacement program stated in 2013 with the aim to replace all meters within a 12-year period. The project involves the replacement of 35 water meters with expenditures of \$340,000 in each of FY20, FY21 and FY22 for a total project cost of \$1,020,000.	None		QCA RFI 2 - Renewals 2019-20 to 2053-54 RFI 13 Main Response
	Is the assessed (risk adjusted) asset life consistent with standard run-to-failure asset life expectancy? Explain any material variations.	N/A	The Business Case states that current requirements for metering accuracy have rendered the meters inadequate, and must be replaced irrespective of condition. That said, many of the meters are described to be in a state of disrepair.	None		RFI 10 - ICL - PID02801 Business Case
	Do the results of the most recent condition assessment support the proposed works? Is the frequency of condition assessment appropriate?	N/A	Refer above.	None		
Comment on Prudency			Information given in RFI 13 Main Response indicated that these meters fall under the planned renewal of Central Lockyer prioritised meters which are to be replaced through a rolling program planned to be completed in 2020-2022. The PID02801 Business Case for ICL: Central Lockyer – Replace 40 Flow Meters states the meter replacements are part of a greater program that commenced in 2013 with the goal of replacing all meters over a 12-year period. The Business Case stated project drivers of improvement to metering accuracy and safe access, with appropriate references to regulatory and compliance requirements. This three year project appears to be consistent with the overall meter replacement program and has been considered prudent.			
Prudent			YES			
Documentation Quality			Medium			

Efficiency Assessment

For expenditure to be efficient, it must represent the least-cost means of providing the requisite level of service within the relevant regulatory framework.

Please complete the following:	Response	Comment	Impact on Value	Recommended Adjustment	Information assessed
Efficiency Were/are alternatives evaluated (including an option analysis undertaken) as part of the scoping process?	YES	Two options were considered: - Option 1: Do nothing; - Option 2: Renewal of Meter.	None		RFI 10 - ICL - PID02801 Business Case
Is the scope of the works the best means of achieving the desired outcomes after having regard to the options available?	Insufficient information	Could not determine prudency of project nor identify which valves required replacement under the planned renewal / rolling program.	None		RFI 13 support - Valves and Actuators - ACP
Were/are non-capex options considered (such as operational solutions)?	YES	A "do nothing" option was considered.	None		RFI 10 - ICL - PID02801 Business Case
Does the standard of the works conform with technical, design and construction requirements in legislation, industry and other standards, codes and manuals?	YES	The recommended meter installation design is per Seqwater's standard details, provided in Appendix C of the Business Case.	None		RFI 10 - ICL - PID02801 Business Case
Is the standard of works compatible with existing and adjacent infrastructure or modern engineering equivalents?	YES	New magflo meters are proposed to replaced the old mechanical paddle wheel. These are described in the Fluid Flow Meters Asset Class Plan.	None		Aecom RFI 9 - Fluid Flow Meters - ACP
Outline any considerations relating to technological change, process redundancy and/or cost associated with improving general business performance.		None identified	None		

Was/is the incurred/proposed cost reasonable for the scope of the project?	YES	The PID02801 Business Case for ICL: Central Lockyer – Replace 40 Flow Meters document included a cost estimate of \$467,000 for the replacement of 40 meters. The cost estimate included investigations, excavation, construction, the flow meter, valving, pipework, installation, and commissioning. It also included a 30% contingency for market fluctuations and brownfield site work, \$20,000 for 20 days of project management, and an additional 15% of contingency. Using this as a basis and scaling to 35 meters, the cost would be \$410,775 per year. The CAPEX claim is \$340,000 per year. Assuming the project involves 35 meters per year, as opposed to 35 across three years, the proposed costs appear reasonable.	None		RFI 10 - ICL - PID02801 Business Case
Was/is the cost of the defined scope and standard of works consistent with conditions prevailing in the markets for engineering, equipment supply and construction? Nominate relevant interstate or international benchmarks, and other information sources.	Insufficient information	No information on procurement methods or approach was provided. The Business Case stated that a Procurement Plan would be developed, but it was not provided.	None		RFI 10 - ICL - PID02801 Business Case
If not, why?					
Was/is the allowance for indirect costs reasonable for the scope of the project?	NO	Indirect costs do not appear to have been included; although appear to have been included at ~\$15-\$20k.	Minor		RFI 10 - ICL - PID02801 Business Case
Were/are suitable approaches taken for managing risk and uncertainty regarding projects at an early stage of development?	YES	High level risks were identified in the Business Case which are planned to be developed in the Project Management Plan should the project progress.	None		RFI 10 - ICL - PID02801 Business Case
Are the proposed cost escalation methods appropriate? (e.g. consistent with prevailing market conditions and historical trends)	Insufficient information	No information on escalation was included	Minor		RFI 10 - ICL - PID02801 Business Case
Were options considered in determining the least cost or preferred option?	YES	Refer above.	None		
Were the procedures/approach used for determining the preferred option appropriate in terms of determining efficient and least cost outcomes?	NO	Only one option other than do-nothing was proposed.	Minor		
Did the project consider whole of life costs, including future maintenance and operating costs?	NO	Whole of life costs were not described or quantified.	Minor		
Have any potential efficiency gains been identified?	NO	None identified	None		

Comment on Efficiency	There is insufficient information to fully comment on the efficiency of this project, but the project appears to be related to a greater 12-year program of meter replacements as referenced in the PID020801 Business Case for ICL. The Business Case was not written for this project, but the project drivers, scope, and costs are all transferable to the CAPEX project under review. Based on the assumption that 35 meters will be replaced per year, as opposed to 35 meters across all three years, the CAPEX claim of \$340,000 per year appears reasonable, as it is less than the costs per meter stated in the Business Case.
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Efficient	YES
Documentation Quality	Low

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AECOM Australia Pty Ltd
Level 8, 540 Wickham Street,
PO Box 1307, Fortitude Valley
QLD 4006, Australia

T +61 7 3553 2000
F +61 7 3553 2050

ABN 20 093 846 925