Review of capital and operating expenditure plans of SA Water

Supplementary Report

3604-84

Prepared for
Essential Services Commission of South Australia

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Cardno
Shaping the Future

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1 Introduction

1.1 Background

The Essential Services Commission of South Australia (ESCoSA) is currently in the process of formulating a regulatory determination for the maximum revenue that SA Water will be allowed to earn from the provision of water and sewerage services for the period 1 July 2016 to 30 June 2020. As part of this process, Cardno/Atkins undertook a review of SA Water's capital and operating expenditure plans for this period, which informed ESCoSA's Draft Determination. SA Water has responded to ESCoSA's Draft Determination and, in this response, raised a number of queries regarding the justification for the conclusions drawn by ESCoSA. [redacted]

1.2 Purpose

The purpose of this report is to provide further advice to ESCoSA on a number of the matters raised by SA Water in its [redacted] response. The matters cover both operating expenditure and capital expenditure. The scope set by ESCoSA is detailed in the following section.

1.3 Scope

ESCoSA has requested further advice in the following areas:

Opex

> Ongoing opex efficiency targets – a view on SA Water's push to reinstate its 1% per annum target including:
  - SA Water's claims that it may need to cut core services [redacted] and
  - that the Commission has not accurately taken into account SA Water's 'cost pressures' and 'risk' [redacted]

> Labour costs – a view on SA Water's arguments to reinstate its labour cost escalation allowance

Capex

> Orrorroo
  - A view on the further information that SA Water has provided in section 6 of its [redacted] response.
  - SA Water's prioritisation of its program of water quality improvement projects
  - A view on the reasonableness of the costs proposed in light of the further information provided [redacted] noting that the intention is to lay the pipeline underground.

> Murray Bridge WWTP – a view on the costs for this project, in light of the information provided [redacted]

> Tailem Bend to Keith Pipeline - a view on the costs for this project, in light of the information provided [redacted]

> Water Network Structures Renewal Program - a view on the costs for this program, in light of the information provided [redacted]

1.4 Referencing previous reports

In this document, the Cardno/Atkins report *Review of capital and operating expenditure plans of SA Water* (January, 2016) is referred to as the "Review Report".

2 Operating expenditure

2.1 Ongoing efficiency targets

In our Review Report, we recommended that SA Water's operating expenditure efficiency target of 1% per annum be adopted for the first two years of the RBP2016 period, but that an additional operating cost efficiency target equal to 50% of the general efficiencies identified by SA Water be applied to the last two years of the regulatory period. The purpose of the additional efficiency target is reflect the efficiency gains that we consider SA Water will be able to achieve. The additional efficiency adjustments total $6.0M over the last two years of the regulatory period and represent 0.3% of the total operating expenditure proposed by SA Water.

In its Draft Determination, ESCoSA proposed additional efficiency adjustments for operating expenditure of $9.0M over SA Water's proposed 1% per annum (compounding) efficiency target. That is, an increase of $3.0M over the level recommended in our Review Report. The total of $9.0M over the regulatory period represents 0.5% of the total operating expenditure proposed by SA Water.

In its [redacted] Response, SA Water states that "to meet this additional….savings target will require a reduction in expenditure on core services, increasing the risk that we will not meet the levels of service expected by customers". We note that all of SA Water's regulated activities should be considered "core services", that is there is no meaningful distinction between core and non-core services. SA Water's makes the link between reducing operating expenditure and a risk of not meeting the levels of service expected by customers. This association is appropriate but the important question is not one of whether cause and effect exists but of materiality; that is, whether the $9.0M (0.5% of total proposed operating expenditure) of additional operating efficiency savings will meaningfully impact on service provision. As SA Water met 65 of its 66 service standards in 2013/14 there is little reason to consider that SA Water has consumed its operating headroom now or will do so in achieving these additional efficiency gains in coming years.

We have noted in our Review Report that investigating the links between expenditure, asset performance and service provision is an area for SA Water to develop further in RBP2016. A further distinction is applicable and that is to understand how levels of service impact on the customer experience and in turn, impacts their future expectations for service provision. We do not suggest that these are easy relationships to quantify but we consider that in attempting to do so SA Water will be able to identify areas in which it can reduce operating expenditure without meaningfully impacting customer service.

SA Water is also concerned, in its [redacted], that the additional operating expenditure savings do not adequately reflect the risk of increased input costs that it faces in the RBP2016 period, most notably for electricity. We acknowledge that there is uncertainty over future electricity prices in South Australia. However, our review was based on SA Water's forecast of operating expenditure including estimates for electricity. While the risk of price rises presents itself as a wider expected variance in operating expenditure, SA Water has not proposed that costs will rise and should be incorporated into its future operating expenditure profile. Therefore, we cannot see that there is grounds for adjusting SA Water's efficient level of operating expenditure for the RBP2016 period.

We acknowledge that the operating efficiency targets applied to SA Water should be considered alongside the proposed adjustments to SA Water's labour costs. We discuss this further in the following section.

2.2 Labour cost escalation

ESCoSA's Draft Determination proposes that SA Water's labour costs for the RBP2016 period should be held within CPI. SA Water's [redacted] response (Section 4) argues that allowance for escalation of labour prices above CPI should be reinstated because it considers that labour prices are not controllable within CPI under usual circumstances and because it has limited capacity, following major changes in the first regulatory period, to influence the number of people employed and/or the productivity of its workforce. Further, SA Water notes that not allowing for labour prices above CPI is, in effect, an additional efficiency hurdle and should be considered alongside the additional operating efficiency targets applied by Cardno/Atkins and ESCoSA.

The basis for our proposed adjustment to SA Water's labour costs is not based on relative movements between labour prices and general inflation. As stated in our Review Report, we consider that making a specific allowance for labour cost escalation over general inflation is a disincentive to SA Water managing its overall operating costs efficiently. For a regulated utility such as SA Water, we cannot see that there are grounds for total labour costs to grow more quickly than general inflation. A business operating in a competitive market faces constant pressure to control the affordability of its product relative to overall prices and a regulated business should also.

SA Water states that its ability to increase productivity is limited following its business transformation program during the RBP2013 period. SA Water suggests that its labour productivity will stagnate but also proposes a 1% per annum compounding efficiency target on operating expenditure. SA Water has identified that a driver of operating efficiency in RBP2016 will be information technology and its business cases in this area make clear that it is expected that information technology will increase labour productivity. We infer then that SA Water is suggesting that it has limited ability to increase labour productivity over that already incorporated in its operating expenditure target.

The impact of our adjustment to SA Water's labour price assumption was to reduce our proposed level of efficient operating expenditure by $7.6M over the RBP2016 period, an average reduction of $1.9M per year. This adjustment represents 0.4% of total operating expenditure proposed by SA Water for the RBP2016 period. Together with ESCoSA's additional operating expenditure efficiency savings of $9.0M, the additional proposed reduction to SA Water's operating expenditure over the RBP2016 period is $16.6M, representing 0.9% of the total operating expenditure proposed by SA Water. .

SA Water has proposed its own efficiency target of 1.0% per year compounding. The combined impact of SA Water's own efficiency targets, ESCoSA's additional operating efficiency savings and the labour cost adjustment mean that SA Water would need to reduce operating expenditure by around 1.37% per year compounding[1]. That is, SA Water will need to achieve an additional 0.37% per year compounding over its own estimate to achieve the level of efficiency on operating costs proposed in ESCoSA's Draft Determination. While this figure is marginally higher than that recommended in our Review Report (our recommendations would have resulted in around 0.30% per year compounding additional efficiency savings), we consider that this is an achievable target for SA Water.

As set out in our Review Report, we consider that the largest potential for operating efficiency gains will arise from bedding down of the business transformation program and continual improvement as the organisation focuses on efficient service delivery.

[1] This is a simple calculation assuming a flat profile for all savings. The actual profile of the additional efficiency savings is back-loaded.

3 Capital expenditure

3.1 Orroroo water quality improvement project

3.1.1 Prudence

Our review of the Orroroo water quality improvement project found that, while the water supplied to Orroroo is 'unpalatable' against the Australian Drinking Water Guidelines criterion for Total Dissolved Solids, SA Water does not have a legal obligation to supply water meeting this criterion as it is an aesthetic guideline. The benefit of the expenditure therefore needs to be demonstrated by SA Water, and shown to be acceptable given the proposed cost. We could not find clear customer support for the project, which undermines the expectation of benefits from the project. Further, we felt that the options assessment was lacking in that the cost of the pipeline option was low compared to benchmarks making this potentially appear more a more favourable option than what may be realised if the project was implemented. For these reasons, we concluded that the project was not prudent based on the information provided.

Following completion of our Review Report and ESCoSA's Draft Determination, SA Water and the local authority, the District Council of Orroroo Carrieton, have worked with the local community to better define the community support for this project and the benefits it is expected to realise. The District Council of Orroroo Carrieton has made a submission to ESCoSA which sets out the following:

> A public forum was held to provide more information to the community on the project and in particular, the quality of the water that the project would enable to be supplied.

> An additional community survey was undertaken with 348 responses received. 340 (98%) of respondents replied that they would use the mains supply as the primary drinking water source if water quality was improved.

> There has been significant investment by the community in rainwater capture and supply infrastructure (tanks and pumps) at residential and commercial premises, given the poor quality of the mains water supply

> It is reasonably believed that the poor mains water quality is impacting on the economic development of the town.

We consider that the District Council of Orroroo Carrieton's submission effectively demonstrates the community support for this project, as well as the benefit the community will receive – that is, mains water that is palatable and therefore able to be used for drinking and in domestic and commercial appliances, in preference to less reliable rainwater and the current unpalatable mains water currently supplied.

However, there is a wider question regarding this project, and this is its costs and benefits relative to other water quality improvement projects that SA Water is considering, and relative to the overall capital investment program. This question was not considered by our Review Report, as this specific initiative was not clearly justified so the whole of program perspective was not considered.

SA Water has submitted the following in support of its overall water quality improvement program for country areas:

> A Board paper from September 2005 that sets out a phased approach to improving country areas water quality which commenced in 1997. The objective of the first two phases was to address the microbiological quality of water supplies in large towns. The Board paper sets out a strategy to improve the remaining water quality issues across SA Water's system (both health and aesthetic). The strategies detailed are to address issues in the following order and timeframe:

  - Cryptosporidium in downstream River Murray supplies by June 2008
  - Provide filtration to larger townships supplied from the River Murray by June 2008
  - Provide filtration to smaller townships supplied from the River Murray by June 2010
  - Address specific issues for "Category B" supplies by June 2010

- Improve aesthetics for towns not supplied by the River Murray from 2010 [redacted]

Attachment 2 to the Board Paper provides more detail to the strategies and sets out that the solution proposed for Orroroo at that time was desalination [redacted]

> A Board paper from March 2009 sets out the case for a desalination plant to supplement supplies in the Eyre Region due to both water quality and supply reliability considerations. The Board paper also discussed the Country Water Quality Improvement Program and details the following strategy for four towns:

Town	Number of Services	TDS (mg/L)	EC	Estimated cost	Schedule
Hawker	204	2300	4100	[redacted]	[redacted]
Orroroo	350	1940	3400	[redacted]	[redacted]
Quorn	652	1260	2200	[redacted]	[redacted]
Naracoote	2324	1200	2100	[redacted]	[redacted]

[redacted]

> The South Australian government's state-wide long term water supply plan: Water for Good (2010) which places an action on SA Water to *"Investigate the viability of constructing groundwater desalination plants for regional townships where water quality (i.e. salinity) has been identified as an issue. This will enable improvements to these water supplies by 2025 at the latest"*.

We make the following observations regarding the further information provided by SA Water:

> SA Water's prioritisation appears to be based on the level of salinity (total dissolved solids) recorded at each town. However, this is unlikely to be a meaningful basis on which to prioritise expenditure because it is only a proxy for benefit and does not account for cost. Further, we consider that salinity is not a good proxy for quantifying benefits. This is because over the taste limits (e.g. >1200mg/L is considered "unpalatable"), the dis-benefit is absolute for drinking purposes, not proportional. Some benefits, e.g. scaling of appliances will be proportional to salinity but these dis-benefits are less than the inability to drink the water. A better proxy for benefit would be the number of connections at each town. On a cost per connection basis, the priority order adopted by SA Water is reversed.

> The costs included in the Board Papers differ significantly to the cost proposed for Orroroo. [redacted] are not comparable to the $12.8M proposed by SA Water in 2015 in its Regulatory Business Plan submission. That the estimated cost has increased [redacted] in this time raises further questions over the original prioritisation.

Based on our assessment of the further information provided by SA Water, we cannot conclude that Orroroo represents the most cost beneficial investment (that is, the highest priority) for SA Water for addressing salinity within country towns. We do not suggest that salinity at country towns should not be addressed by SA Water. The Water for Good strategy document places an onus on SA Water to address this issue, albeit by 2025. Our concern is that it cannot be said that this investment is more prudent than investing at another location, based on the information available.

3.1.2 Efficiency

SA Water's estimate of direct costs for this pipeline in its RBP2016 submission was [redacted]. The benchmark cost for this project as set out in our Review Report was [redacted], more than double SA Water's estimate. Our benchmark cost was based on the pipeline being laid above ground, due to our understanding of SA Water's approach from our meetings with SA Water. We acknowledge that the supporting information provided does not refer to the pipeline being laid above ground.

SA Water has reiterated [redacted] that its estimate of efficient direct costs for this project is [redacted]. We have used our cost models to benchmark a below ground pipeline. Assuming the most

favourable conditions (economies of scale, good ground throughout including no acid sulphate soils, no creek or bridge crossings etc.), our benchmark cost estimate is [redacted]. This figure is still [redacted] higher than SA Water's cost estimate. However, given SA Water's knowledge of local conditions and the local market, and the large length of main that will result in economies of scale, we accept SA Water's estimate as being an efficient forecast.

3.2 Murray Bridge WWTP

In its Draft Determination, ESCoSA accepted advice from Cardno/Atkins that SA Water's proposed capital expenditure for the Murray Bridge WWTP project was higher than the expected efficient cost for the given scope of works, and that the capital expenditure allowance for this project should be revised downwards accordingly. SA Water's forecast capital cost for the treatment plant component of the scope is [redacted]. This figure is significantly higher than the benchmark cost detailed in the Cardno/Atkins report of [redacted].

[redacted] SA Water requests that ESCoSA reinstate the full capital estimate for the treatment plant. SA Water's submission states that it acknowledges that there is a significant difference between its cost estimate and the benchmark data but it cannot identify drivers for the variance observed. SA Water has not submitted additional evidence to support its cost estimate, other than to note that its cost estimate has been derived through good practice (i.e. from industry peers and 'independently verified' by Aquenta Consulting), and that the requirement for zero discharge from the plant may mean that the Murray Bridge treatment plant will be built to a higher standard than the plants included in the benchmark data sets.

Considering first the requirement for zero discharge at the treatment plant, we note that the planning basis is for effluent quality of 20mg/L for Biochemical Oxygen Demand, Suspended Solids and Total Nitrogen, and 2mg/L for nitrogen in ammonia form. To achieve this effluent quality, the business case proposes either an oxidation ditch or a MLE biological nutrient removal type plant. Effluent is then pumped to ponds for use by the current customers – [redacted]. The business case notes that SA Water believes that there is currently sufficient demand from these [redacted] customers for the ultimate capacity of the proposed plant (which is around double current demand). We note that:

> The target effluent standard is no more onerous than commonly required at treatment plants across Australia. In fact, it is very likely less stringent than the standard for which many of the plants included in our benchmark data sets were constructed.

> Further, there is currently no target for phosphorous removal. Many plants elsewhere in Australia have a requirement to remove phosphorous, which leads to additional costs. In this respect, the required standard may be considered less stringent than what is included in the benchmark data set.

> The UGL cost estimate, on which SA Water's cost estimate has been based, includes costs for cloth disc filters following secondary clarification. Based on our experience, we consider that cloth filters are unlikely to be necessary to achieve the desired effluent standard[2]. Further, the [redacted] will provide additional treatment and mitigate risk to effluent quality if plant performance was compromised. We note from Section 7.2.12 of the Business Case that the description of the preferred option (conventional activated sludge) no longer includes a cloth disc filter. It may be that the inclusion of cloth filters explains some of the difference between SA Water's cost estimates and the benchmark costs. The cloth filters comprise around [redacted] of direct costs in the original UGL estimate and we cannot see that these are required.

> Effluent is currently pumped to wetlands owned by [redacted] provide benefit to SA Water in that they balance flows and will provide some additional treatment. The business case notes that any effluent not reused is lost to evaporation and seepage. There is therefore a risk that if these [redacted] were not available for disposal, or if [redacted] stopped taking effluent, that higher capital costs would be incurred – up front in planning for this risk or later in mitigating it. However, the business case does not canvas the possibility that the [redacted] will be unavailable and rather notes [redacted]. Appendix D of the business case includes a risk assessment where the risk of losing [redacted] as a customer has been tested. This risk has been rated as low and a

[2] The Business Case also states "Cloth media filters have had a history of not achieving the claimed performance and of not being satisfactorily cleaned by normal backwashing".

mitigating action of leasing or purchasing the piggery land for irrigation has been identified. Therefore, we conclude that the possibility of [redacted] being unavailable for disposal, or loss of [redacted] the current reuse customers, is not a driver of costs for the proposed new Murray Bridge WWTP.

With respect to SA Water's statement that it has adopted costs provided by industry peers (UGL) and had these costs independently verified, we note that:

> The benchmark costs against which SA Water's costs have been compared are actual outturn costs for treatment plants from across Australia from the last 15 years. They are not estimates.

> There can sometimes be a tendency for detailed, bottom-up estimates to overestimate outturn costs where economies of scale, project risk and interdependencies are not adequately accounted for[3].

> UGL, as a construction contractor (and also operations and maintenance service provider) has no incentive at all to provide an efficient cost estimate.

Based on the preceding analysis, we reiterate our conclusion that our forecast of the likely efficient cost of the Murray Bridge WWTP is as set out in our Review Report.

3.3 Tailem Bend to Keith Pipeline

SA Water proposed in its Regulatory Submission a direct capital cost of [redacted] for the 9ML concrete storage for the Tailem Bend to Keith Pipeline project. We benchmarked this cost against our cost models and found that SA Water's forecast cost was significantly higher than the benchmark direct cost of [redacted].

[redacted], SA Water identified a number of non-standard items that mean that the cost for this site is likely to be higher than what would be typical. These include [redacted]

[redacted]

We agree that most of the items identified are atypical for treated water storages, [redacted]. However, we caution that, because of the nature of top-down benchmarking, it is not appropriate to consider the benchmark as resulting from ideal circumstances and, therefore, being a lower

[3] More broadly a common problem of cost estimates is where the uncertainty in assumed rates (or sometimes quantities) is not adequately accounted for. For this reason it is preferable that risk based estimates that incorporate an assumed distribution of the range of input costs is used where data permits.

cost application. The benchmark costs included to greater and lesser degrees atypical items, the variability of which are smoothed in determining a benchmark.

We have reviewed the unit rates used in SA Water's cost build up and found some variances to our cost data, both positive and negative. We have found no one item that is driving SA Water's cost estimate to be above our benchmark cost.

We therefore conclude that, based on the additional site specific information provided, SA Water's forecast for direct capital cost is a reasonable estimate.

3.4 Water Network Structures Renewal Program

We acknowledge that the statement in our review report recommending "removal of $12M of expenditure for the Structures Water Network Renewal program as this was a duplicated contingency" is ambiguous in that it leads to the $12M for "undefined – based on condition assessment" being directly compared with the $10M for "contingency/emerging issues". While this statement is made in the body of the report, the detailed discussion in the project summary at Appendix A states:

> *The included storage facilities were selected for sampling, based upon an initial Level 1 visual inspection. That is, the Level 2 inspections were aimed at the known problem sites. We are therefore minded to conclude that future Level 2 inspections of the remainder of the asset stock will not identify significant numbers of sites with intolerable risk of failure during the RBP2016 period.*

This makes it clear that, based on SA Water's approach of focusing on problem areas, we do not consider that the condition assessment of the remaining two-thirds of the asset base will lead to the identification of a significant number of sites (if any) that require work during the RBP2016 period. We recommend that the RBP2016 period *"be used to complete the survey and identify and justify the scale of future renewal program".* Therefore, the basis of the exclusion of the $12M for undefined issues is not because we consider it duplicates the $10M contingency, but because we consider that on a risk basis, the level of expenditure identified is appropriate for RBP2016 while a more robust renewals program is developed. Our main concerns are around the assignment of asset criticality and the incorporation of mitigation measures into likelihood of failure assessments as set out following:

> *Within the work identified, there needs to be urgent consideration of the criticality of the assets, as potentially offset by mitigation measures. Where network vulnerability is confirmed, operational response plans should be developed to be used in the event of failure before the backlog has been resolved. For the development of future programs, the risk matrix needs to consider mitigation and a full range of options.*

We recommend that the prudent and efficient level of expenditure in the RBP2016 period is as recommended in our Review Report.