Halcrow Pacific Pty Ltd

August 2009

Report on further analysis of the Efficiency of Capital and Operating Expenditure by Water Corporation

Final Report

Prepared for the Economic Regulation Authority

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Contents Amendment Record

This report has been issued and amended as follows:

Issue	Revision	Description	Date	Prepared by	Checked by	Authorised by
1	0	Final Report	31/08/09	AR/DF	DF	DM

Filename & Path:
W:\Project\Water\KMWHBC - ERA Expenditure Efficiency Review 2008\HBC 32 - Reports\Top 10 Projects Report\KMWHBC - ERA Pricing Review - Further Water Corp Capex-Opex Analysis – Final Report Rev 0.Doc

Contents

Executive Summary

Overview

The Economic Regulation Authority (the Authority) engaged Halcrow over 2008/09 as an expert engineering consultant to provide a report to the Authority, which established the efficiency of capital and operating expenditure by the Water Corporation, AQWEST and Busselton Water Board. The review covered both historical capital and operating expenditure since the 2005 pricing inquiry, and projected capital and operating expenditure.

The Authority has since provided additional information from Water Corporation and requested further analysis capital and operating expenditure involving:

- review adjustments to Water Corporation's base operating expenditure in relation to changes in levels of service;
- review of Water Corporation's top ten capital projects to identify the basis for the project, the efficiency of capital expenditure and to highlight any problems with the application of capital processes; and to
- prepare a memorandum to the ERA outlining the results of our analysis.

Background

The focus of the initial review was to conduct a high-level review of the capital and operating planning and delivery processes of Water Corporation, AQWEST and Busselton Water to gain an understanding of the adequacy, and robustness of these processes. We conducted a high-level review of the historical capital and operating expenditure of Water Corporation and compared it to the projected expenditure at the time of the 2005 pricing inquiry conducted by the Authority. We also reviewed the proposed capital and operating expenditure over the next five year period.

This report, provides a more detailed analysis of capital and operational expenditure for Water Corporation. Specifically, the further analysis provided:

- analysis of the top 10 capital projects and comment on whether the analysis raises any issues of concern in relation to the Water Corporation's capital processes;
- our opinion regarding whether the proposed capital expenditure is efficient;
- analysis of increases in operating expenditure over the base of 2004/05; and
- our opinion regarding whether the operating costs that are claimed to increase levels of service are justified and require additional funding or whether the

costs are not justified (that is, the costs may be more appropriately funded by reallocating base operating costs).

At completion of the analysis, a report is to be provided to the Economic Regulation Authority to summarise key findings.

Information available

The Authority provided us with the following information from Water Corporation:

- detailed Investment Business Cases (IBC) and some supporting documentation for the top 10 projects including various memoranda justifying expenditure, and attachments to the IBC documents such as risk assessments, financial impact statements, design information, etc.
- spreadsheet of operating costs claimed to increase levels of services detailing what the costs relate to, for example, desalination project, capital expenditure projects, external drivers, corporate initiatives, or other services.

We reviewed the information available and based on previous detailed reviews of capital expenditure we requested further information including previous Planning Business Cases, details cost estimate spreadsheets in support of the finance reports, design review and Target Out-turn Cost reports, the latest project financial summary information, and specific scheme information where available or referenced in the IBC as an attachment.

Our Approach

For capital expenditure, we reviewed a number of aspects of each of the top 10 projects including:

- Project description and background – brief details on the project.
- Key drivers and obligations – how the project fulfils business obligations including, for example, regulatory requirements, corporate objectives, security of supply, etc.
- Options analysis – alternative options assessed
- Deliverability – current project progress/stratus, and the planned delivery timeframe
- Proposed capital expenditure – the basis for cost estimates and whether the proposed costs are efficient

For operating expenditure, we reviewed the following aspects:

- Increases in base operating expenditure from 2004/05

- Correlation between increases in expenditure and increases in service levels
- Whether it is possible to provide the proposed service levels within the existing base operating expenditure

Our Methodology

The process undertaken for our involved the following steps:

- Project Initiation
- Information Collection and Review
- Review of Capital Expenditure for Top 10 Projects
- Review of Operating Expenditure
- Preparation of Draft Report
- Submission of Draft Report
- Preparation of Final Report
- Submission of Final Draft Report

Our Findings

Analysis of Capital Expenditure for Top 10 Projects

We have reviewed five of the top 10 capital projects to provide an assessment of their efficiency, deliverability and the reasonableness of their cost estimates, as follows:

1. Ravenswood Transfer Pump Station
2. Beenyup WWTP Amplification 135ML/day Sludge & Primary
5. Groundwater Replenishment Trial
7. Wungong 1400 Trunk Main
8. Carabooda 60ML tank and DN1200 inlet/outlet

In respect of the five capital projects for which we have conducted a detailed review, we can make the following observations, findings and general comments:

- The drivers of the five projects reviewed have all generally been in line with corporate and strategic objectives, and in other cases Government growth policies or recycled water targets.
- Our assessment of the options considered for the five projects reviewed is that the Corporation has generally undertaken robust analyses to the standard expected with evidence of long term strategic planning options analysis and NPV analysis to determine the most efficient preferred solution with peer review processes also undertaken.

- The deliverability of three of the four projects reviewed was variable and was often delayed when compared with the intended delivery dates. In some cases the Project Progress Reports (PPRs) reported delays which did not appear to be reflected in other reports. We assessed the PPR information provided and deferred the expected delivery dates for three projects by up to 3 to 6 months.
- We identified a number of specific adjustments to capital expenditure for the five capital projects and these are shown in the table following.

Table E-1 Proposed Adjustments to Capital Expenditure

	Previous Years	2007/08 ($,000)	2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Future Years	Total ($,000)
Ravenswood Transfer PS									
PPR Forecast at Completion (2008/09)	2.11	1.15	13.5	41.76	17.68				76.2
Halcrow forecast completion profile	2.11	1.15	12	36.15	12.32	4.87			68.6
Proposed adjustments	**0**	**0**	**-1.5**	**-5.61**	**-5.36**	**4.87**	**0**	**0**	**-7.6**
Beenyup WWTP Amplification									
PPR Forecast at Completion (2008/09)	4.37	2.57	20.9	54.8	32.97				115.61
Halcrow forecast completion profile	4.37	2.57	19	37.81	33.24	8.24			105.23
Proposed adjustments	**0**	**0**	**-1.9**	**-16.99**	**0.27**	**8.24**	**0**	**0**	**-10.38**
Groundwater Replenishment Trial									
Forecast at Completion (2007/08)	1.96	3.22	15.26	12.82	7.25	3.12		0.57	44.2
Halcrow forecast completion profile	1.96	3.22	8.63	9.575	7.195	5.18		2.13	37.89
Proposed adjustments	**0**	**0**	**-6.63**	**-3.245**	**-0.055**	**2.06**	**0**	**1.56**	**-6.31**
Wungong 1400 Trunk Main									
PPR Forecast at Completion (2008/09)	1.14	6.39	31.85	6.92	0	44	16.46	0	106.76
Halcrow forecast completion profile	1.14	1.15	18	23.71	2.3	0	44	16.46	106.76
Proposed adjustments	**0**	**-5.24**	**-13.85**	**16.79**	**2.3**	**-44**	**27.54**	**16.46**	**0**
Carabooda 60ML Tank & DN1200 Inlet/Outlet Main									
Forecast at Completion (May 2009)	1.78	4.73	7.47	11.68	11.75	0	0	0	37.41
Halcrow forecast completion profile	1.78	4.73	7.47	8.76	11.73	2.94	0	0	37.41
Proposed adjustments	**0**	**0**	**0**	**-2.92**	**-0.02**	**2.94**	**0**	**0**	**0**
Total Capital Expenditure Reviewed									
Total Capital Forecast	**11.36**	**18.06**	**88.98**	**127.98**	**69.65**	**47.12**	**16.46**	**0.57**	**380.18**
Total Capital Recommended	**11.36**	**12.82**	**65.1**	**115.625**	**66.405**	**21.23**	**44**	**18.59**	**355.13**
Total Adjustments	**0**	**-5.24**	**-23.88**	**-12.355**	**-3.245**	**-25.89**	**27.54**	**18.02**	**-25.05**

In relation to the general capital planning and implementation processes, we make the following comments:

- There was some inconsistency in progress reporting for projects. This implies that there may be a lack of integration in the Corporation's finance and reporting systems. We therefore recommend that improvements are made to the progress reporting of project delivery delays.
- There were significant differences between initial definition cost and the forecast completion cost estimates highlighting problems in developing robust planning cost estimates. We recommend that the Corporation seeks to improve its planning cost estimates to better reflect the likely actual costs of their capital projects.
- Our experience in receiving information from the Corporation from which we could conduct our detailed analysis and review has in many cases been very slow. While we acknowledge the Corporation's explanation that their staff were busy with other regulatory reporting matters, we would have expected that the information we requested would have been more easily available.
- We recommend that in future regulatory reviews, detailed reviews of capital schemes should be conducted for projects valued greater than between $50 million to $100 million. We suggest that the detailed reviews will necessitate the advance request of detailed cost estimates and breakdowns, planning business cases, engineering design reports, project progress reports, independent reports, Board approvals etc and other relevant information as appropriate.

Analysis of Operational Expenditure

We undertook a detailed review of proposed increases to the Water Corporation's base operating expenditure. We requested detailed supporting information on a number of projects and received a variety of documents including Action Briefs, memorandums, project management plans, and business cases. In addition, the Corporation provided more up-to-date funding requests from the 2009/10 Strategic Development Plan and we have included these figures in our analysis.

Our review identified some issues with the proposed increases in operating expenditure and we have suggested some adjustments to the proposed operating expenditure that are presented in the following tables.

Table 0-2 Recommended Operating Expenditure for Major Operating Expenditure Increases

Project		2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
ACA GAP Treatment Management Program	Total Expenditure Requested	3,716	6,216	11,216	11,216	11,216	43,580
	Recommended Operating Expenditure	**3,716**	**6,216**	**11,216**	**11,216**	**11,216**	**43,580**
Water mains cleaning	Total Expenditure Requested	1,110	1,110	1,110	1,110	1,110	5,550
	Recommended Operating Expenditure	**1,110**	**1,110**	**1,110**	**1,110**	**1,110**	**5,550**
Backflow Prevention	Total Expenditure Requested	1,600	2,400	6,100	6,700	7,300	24,100
	Recommended Operating Expenditure	**1,600**	**2,400**	**6,100**	**6,700**	**7,300**	**24,100**
Overflow Risk Management Project (WORM)	Total Expenditure Requested	1,999	2,131	2,151	2,151	2,151	10,583
	Recommended Operating Expenditure	**1,999**	**2,131**	**2,151**	**2,151**	**2,151**	**10,583**
Sustainability Strategy	Total Expenditure Requested	424	452	301	304	280	1,761
	Recommended Operating Expenditure	**424**	**452**	**301**	**304**	**280**	**1,761**
Water Cycle Strategy	Total Expenditure Requested	2,259	2,259	2,259	2,259	2,259	11,295
	Recommended Operating Expenditure	**300**	**300**	**-**	**-**	**-**	**600**
WP WD - TM & Nicholson Rd PS	Total Expenditure Requested	1,900	1,900	1,900	1,900	1,900	9,500
	Recommended Operating Expenditure	**1,900**	**1,900**	**1,900**	**1,900**	**1,900**	**9,500**
NFIS Woodman Pt Odour Ctl Stg 1 &2	Total Expenditure Requested	1,879	2,544	2,606	2,606	2,606	12,241
	Recommended Operating Expenditure	**1,879**	**2,544**	**2,606**	**2,606**	**2,606**	**12,241**
NFIS PS Desal: Sludge Treat & Ops	Total Expenditure Requested	1,490	1,490	1,490	1,490	1,490	7,450
	Recommended Operating Expenditure	**1,490**	**1,490**	**1,490**	**1,490**	**1,490**	**7,450**
Provision for Capital Expensing	Total Expenditure Requested	3,000	3,000	3,000	3,000	3,000	15,000
	Recommended Operating Expenditure	**3,000**	**2,000**	**1,000**	**1,000**	**1,000**	**8,000**
Fatigue Management	Total Expenditure Requested	1,465	4,550	1,400	1,400	1,400	10,215
	Recommended Operating Expenditure	**1,465**	**4,550**	**1,400**	**1,400**	**1,400**	**10,215**
Compliance (Welder Observation & Ocean Outlet Monitoring)	Total Expenditure Requested	2,127	2,238	2,353	2,475	2,475	11,668
	Recommended Operating Expenditure	**960**	**960**	**960**	**960**	**960**	**4,800**

Project		2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
Bridgetown Regional Water Source	Total Expenditure Requested	61	96	96	96	96	445
	Recommended Operating Expenditure	**61**	**96**	**96**	**96**	**96**	**445**
Disposal of Surplus Assets	Total Expenditure Requested	2,144	-	-	-	-	2,144
	Recommended Operating Expenditure	**2,144**	**-**	**-**	**-**	**-**	**2,144**
TOTAL	**Total Expenditure Requested**	**25,174**	**30,386**	**35,982**	**36,707**	**37,283**	**165,532**
	Recommended Operating Expenditure	**22,048**	**26,149**	**30,330**	**30,933**	**31,509**	**140,969**
	Reduction in Operating Expenditure	**-3,126**	**-4,237**	**-5,652**	**-5,774**	**-5,774**	**-24,563**

Table 0-3 Recommended Operating Expenditure for Other Operating Expenditure Increases

Project	Operating Expenditure	2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
Collie River Diversion	Total Expenditure Requested	0	6,600	8,400	-	-	**15,000**
	Recommended Operating Expenditure	**0**	**6,600**	**8,400**	**-**	**-**	**15,000**
Costs offset by additional revenue	Total Expenditure Requested	0	0	0	0	0	**0**
	Recommended Operating Expenditure	**0**	**0**	**0**	**0**	**0**	**0**
Harvey Water Trade	Total Expenditure Requested	2,156	2,210	2,265	2,394	2,394	**11,419**
	Recommended Operating Expenditure	**2,156**	**2,210**	**2,265**	**2,394**	**2,394**	**11,419**
TOTAL	**Total Expenditure Requested**	**2,156**	**8,810**	**10,665**	**2,394**	**2,394**	**11,419**
	Recommended Operating Expenditure	**2,156**	**8,810**	**10,665**	**2,394**	**2,394**	**11,419**
	Reduction in Operating Expenditure	**0**	**0**	**0**	**0**	**0**	**0**

We also encountered a number of issues in the process of undertaking this review including:

- An extended timeframe required to receive supporting information from the Water Corporation potentially exacerbated by the timing of this review (during the end of financial year reporting period), the reporting systems in place at the Water Corporation (which do not generally facilitate the reporting of base operating expenditure), and the relative uncertainty, on the part of the Water Corporation, in relation to the type of supporting information required and the detail required. We recommend that a process be developed, in consultation with the ERA and the Water Corporation, which outlines the

specific requirements of these regulatory reviews including the information required to support the proposed expenditure.

- The quality of the supporting information provided for the proposed increases in operating expenditure was, in the majority of cases, initially quite poor. The documentation provided typically included action briefs for the proposed expenditure or supporting memorandums by Corporation staff. In a number of cases the supporting documentation initially provided appeared to have no relevance to the requested increase in expenditure and in fact, usually identified a much lower increase in expenditure. Significant further information requests were required to explain the requested increases.
- A number of supporting documents provided were dated from 2005 and appeared to be significantly out of date. Subsequent information requests identified that the Corporation had significantly adjusted the programs of work relating to the increases in expenditure including major changes to assumptions made in determining the operating cost of the program. However there was no record of these changes and in most circumstances, given the time restrictions, the changes had to be taken on face value. Future reviews will need to investigate any such changes in much more detail to ensure that the process followed by the Corporation was appropriate and that there is a clear trail of documents highlighting the changes to each program of works.

1 Introduction

1.1 Background

The Economic Regulation Authority (the Authority) was established on 1 January 2004 and is the independent economic regulator for Western Australia. The Authority regulates monopoly aspects of the gas, electricity and rail industries and licenses providers of gas, electricity and water services.

The Authority also inquires into matters referred to it by the Western Australian Government. These matters can relate to regulated and non-regulated industries in the areas of pricing, quality, business practices and compliance costs.

A previous inquiry by the Authority in 2005 examined the water and wastewater pricing of the Water Corporation and the water pricing of the Bunbury and Busselton Water Boards. It is our understanding that this review focussed more on the development of the regulatory frameworks for the three service providers rather than the quantum of the capital and operating expenditure proposed.

The Authority's functions are designed to maintain a competitive, efficient and fair commercial environment for the benefit of the Western Australian community, particularly where businesses operate as natural monopolies.

The Authority received a Terms of Reference from the Western Australian Government to conduct an inquiry into the tariffs of the Water Corporation, AQWEST (Bunbury Water Board) and Busselton Water Board.

To assist in addressing matters raised in the Terms of Reference, the Authority engaged Halcrow as an expert engineering consultant to provide a report to the Authority, which assesses the efficiency of capital and operating expenditure by the Water Corporation, AQWEST and Busselton Water Board. The review covered both historical capital and operating expenditure since the 2005 pricing inquiry, and projected capital and operating expenditure. The report recommended further analysis involving a detailed review of the Top 10 Capital projects and a detailed assessment of operating expenditure with respect to enhanced service levels and base opex.

The Authority has engaged Halcrow to undertake this detailed review of the Water Corporation.

1.2 Scope of Services

1.2.1 *Objective*

The objective of this review is to:

- Provide a report to the Economic Regulation Authority on the efficiency of capital and operating expenditure by the Water Corporation.

1.2.2 *Project Tasks*

The following tasks are required:

Desk top review of the information to assess sufficiency of information to undertake the detailed review and request further information if required.

1. Review of Capital expenditure
   - Analyse project details for the top 10 capital projects including description, drivers, options analysis, efficiency of cost estimates, project scope and cost change from preliminary business case to implementation;
   - Analyse the current project financial summary and project status to provide insight on deliverability in conjunction with project risks identified;
   - Indicate whether the analysis raises any issues of concern in relation to the Water Corporation's capital processes; and
   - Assess whether the proposed capital expenditure is efficient

2. Operating expenditure
   - Review operating cost spreadsheet;
   - Correlate cost increases with service level increases over the base of 2004/05;
   - Review reallocation of base operating costs; and
   - Assess whether the operating costs attributable to increased levels of service are justified, that is whether additional funding is required or whether the costs are not justified, whereby they may be more appropriately funded by reallocation to base operating costs.

3. Reporting
   - A report is to be provided that comprehensively documents the findings of the review conducted, addressing the project tasks listed above.

1.2.3 *Review Process*

The process undertaken for our detailed review of Water Corporation involved the following steps:

- Project Initiation
- Information Collection and Review
- Review of Capital Expenditure for Top 10 Projects
- Review of Operating Expenditure
- Preparation of Draft Report
- Submission of Draft Report
- Preparation of Final Report
- Submission of Final Draft Report

2 Review of Capital Expenditure

2.1 Scope of Review

This section provides a summary of our analysis and review of the top 10 capital projects as nominated by the Water Corporation. These are:

1. Ravenswood Transfer Pump Station
2. Beenyup WWTP Amplification 135ML/day Sludge & Primary
3. Murray DN1400 Stirling Dandalup Trunk Main 4
4. Wellington Dam Remedial Works
5. Groundwater Replenishment Trial
6. Woodman Point Sludge Treatment Amplification
7. Wungong 1400 Trunk Main
8. Carabooda 60ML tank and DN1200 inlet/outlet
9. Alkimos WWTP Stage 1 and Effluent Disposal
10. Picton WTP Stage 1

While it was intended to review the full list of ten projects, the Water Corporation was unable to provide sufficient information on most of these projects in time for this report. In the first instance we reviewed, in detail, three of the top 10 projects:

2. Beenyup WWTP Amplification 135ML/day Sludge & Primary;
5. Groundwater Replenishment Trial; and
8. Carabooda 60ML tank and DN1200 inlet/outlet.

The outcomes of our review of the three capital projects listed above, identified some concerns over the quality of the information supplied by the Water Corporation and the level of justification of the proposed cost estimates, the level of contingency and escalation factors applied to the cost estimates, and the deliverability of the projects (that is, the likelihood of the project being completed within the nominated schedule and hence the capital costs actually being incurred in the proposed timeframes).

In consultation with the Authority we determined that a detailed review of an additional two projects was required to determine whether the issues we identified were specific to the three projects, or were also common to the other major capital projects. We reviewed a further two of the top 10 projects:

1. Ravenswood Transfer Pump Station; and

7. Wungong 1400 Trunk Main

The outcomes of our review of five of the Water Corporation's top 10 capital projects are presented in the following sections.

2.2 Ravenswood Transfer Pump Station

2.2.1 *Project Description*

The Ravenswood Transfer Pump Station project is designed to enable the transfer of water from the Southern Seawater Desalination Plant (or SSDP) and existing sources including the Stirling and Samson Dams to the southern sources transfer system (SSTS) forming part of the overall integrated water supply scheme (IWSS). The two main components of the project are:

- installation of a pumping station at Ravenswood near Pinjarra
- upgrade of the capacity of the Stirling trunk main

The project scope will be phased as follows:

1. Stage 1a) Purchase freehold land for Ravenswood Transfer pumping station - purchase completed in 2007
2. Stage 1b) Construct Ravenswood Transfer pump station
3. Stage 1c) Construct new Stirling Dandalup trunk main
4. Stage 2) Upgrade pump station to take increased flows from the expanded desalination plant

Works in Stage 1b) have been arranged to minimise supply disruptions during Stage 2 by sizing the pump station pipework and pumps for peak flows.

2.2.2 *Key Drivers & Obligations*

According to the documentation provided by Water Corporation, the Ravenswood Transfer Pump Station project is a 100 per cent supply demand project funded from the Metropolitan Integration Program and is related to the bulk water Integrated Water Supply Scheme (IWSS). This project is driven by both demand and climate change necessitating the development of additional water sources under the Integrated Water Supply Scheme. The Corporation states that the need for the Ravenswood Transfer Pump Station exists irrespective of the source of additional water. The strategic planning concept plan identifies Ravenswood pump station as a key asset for the IWSS bulk transfer system up to 2050, transferring the new source yields from the desalination plant and the Harvey Water trading scheme.

2.2.3 *Options analysis*

The Implementation Business Case refers to an options analysis undertaken during the preliminary design review. The analysis assessed six pumping station configuration options and provided stakeholders with a Net Present Value (NPV) analysis of these options for their review. This determined the option with the most efficient capital expenditure and future operational and maintenance costs. Consultation with stakeholders led to agreement over the pump selection and pump station layout which informed the engineering design and ultimately the detailed design specifications.

2.2.4 *Efficiency Measures*

A value management workshop identified a financial saving of 15.3 per cent (or close to $14 million of the approximate cost of $90 million predicted at the time) through the staging of the pumping station in two stages with the second stage planned to be implemented in 2017 when the upgrade to the desalination plant is forecast.

We note that the project team gave serious consideration to the final choice of pump type to ensure that they would operate at the best efficiency point over the majority of their operating life. Similarly, pump drive systems were designed to use the most efficient electrical equipment to minimise power costs.

2.2.5 *Deliverability [over the regulatory period]*

A risk workshop was held in February 2007, identifying that planning approval delays were believed to be the highest risk for delivery of the project. A delay to the delivery of the stage 2 of the Ravenswood Pump Station project could cause the full output from the Southern Seawater Desalination Plant into the IWSS to be deferred. Delays could also impact on the delivery of dependent projects including the new Stirling trunk main.

According to the Implementation Business Case (IBC), the complexity of integrating the pumping station into the IWSS has taken longer than forecast, causing a prolonged planning stage and hence delays to the project design of around three months. This appeared to be limited to one and a half months according to the May 2009 Project Progress Report. The two stage contracting strategy discussed previously has been adopted through the engineering design review process:

- EDR Phase 1 – civil, structural, mechanical and SCADA design
- EDR Phase 2 – electrical design scheduled for February 2009

We note in the May 2009 Project Progress Report that the Engineering Design Report (volume 1) was scheduled for delivery in March 2009, which is close to the

IBC forecast. Groundwater issues were also deemed likely to cause delays for external contractors when constructing the foundations for the pumping station.

The contracting strategy adopted has therefore been phased in two parts:

- Construction works have already started by the Corporation (in November 2008) on preliminaries such as the concrete slab and walls for the pump station, including earthworks, site access, fencing, power connection and dewatering. These were completed by the end of October 2008.
- The second phase will deliver the remaining works on the pumping station by way of an external contractor appointed through a Registration of Interest (ROI) pre-qualification panel tender process. Five contractors of the twelve who submitted ROIs were selected to tender for the work. Contract award was scheduled for July 2009, but in fact the work was split into three contracts, two being awarded in March and May 2009, with the third forecast to be awarded in September 2009.

According to the Implementation Business case, the required Project Practical Completion (PPC) date was 1st September 2011, however the most current forecast PPC date is 12th December 2011.

Our review of the Project Progress Reports for August/November 2008 and February/May 2009 has identified that there was a delay to the award of the pumps supply and related equipment of six months, while the issue of final structural and architectural drawings is forecast to be delayed nine and a half months.

We also identified the following delays to the project between August 2008 and May 2009:

- Engineering design was delayed by 2 months due to scope changes imposed. While this delay was ultimately reduced by two weeks, we note that volume 1 of the EDR was delivered at the end of March 2009, leaving the electrical design report no. 2 still to complete. As volume 2 of the EDR was already one month late at that stage, we envisage that it will ultimately run at least three months late in total;
- The award of the pumps supply (Dandalup and Tamworth) and the Motors/VSDs/transformers contracts in May 2009 represented a delay of six months;
- The issue of the final structural and architectural drawings was delayed 9.5 months;
- Approval to implement was delayed a total of 5.5 months;
- Final delivery of detailed design has been delayed by upwards of three months

- Project Practical Completion (PPC) has been delayed by a total of 6.5 months
- The intended completion of the project is forecast one year after the PPC date and has been delayed a total of 9.5 months.

In summary, at the very least the progress of the project will be delayed by 3 to 6 months and up to a maximum of almost 10 months. Theses delays are in addition to the planning delays referred to in the Implementation Business Case.

2.2.6 *Cost estimate*

We have reforecast the cost estimate for the Authorised Budget (budget released in PPR) according to the delays identified above. In our revised cost profile in Table 2-1, we accounted for actual expenditure to date and the delays of three months to the issue of the EDR and six months to the PPC. We have assumed that project completion remains the same as forecast (i.e. one year after the PPC date), however on balance we believe that there will be some carryover of expenditure into the 2011/12 financial year.

Table 2-1: Ravenswood Transfer Pumping Station forecast cost profile comparison ($m, Real)

Financial Year	Short PBC Activation Estimate	ATD Estimate (2006/07)	ATI Estimate (2008/09)	IBC Forecast at Completion (2008/09)	PPR Forecast at Completion (2008/09)	Actual - PPR Aug 08	Actual - PPR Nov 08	Actual - PPR Feb 09	Actual - PPR May 09	Halcrow forecast completion profile
Previous Years	2.11	2.11	0	0	2.11	2.11	2.11	2.11	2.11	2.11
2007-08	1.00	1.00	3.26	3.26	1.15	1.15	1.15	1.15	1.15	1.15
2008-09 (current year)	12.50	12.50	13.50	13.50	13.50	0.42	1.15	4.53	10.66	12.00
2009-10	35.39	56.89	45.09	45.09	41.76					36.15
2010-11	8.00	10.00	14.35	14.35	17.68					12.32
2011-12										4.87
Future Years										
Total	59.00	82.50	76.21	76.21	76.21	3.67	4.41	7.79	13.92	68.60

We have also assumed that there will be no realisation of the $7.61 million worth of contingency removed from the most recent forecast at completion project cost. This revises the total down from $76.21 million to $68.60 million which is consistent with the authorised budget released cost. We note that this contingency relating to the supply contracts for the pumping station was deemed to be large by the Corporation, and was removed from the budget released, subject to revision following the value of the contracts awarded. From the most recent project progress report, it does not appear that the contingency allowance will be required.

We recommend that the Corporation funds any shortfall for the duration of the regulatory period and then informs the ERA to recoup the additional costs, if required, at the next price review.

We have reviewed the basis of the total out-turn cost (TOC) estimates for the project. The majority of the contingency (74 per cent) has been removed, leaving only $2.74 million within the total cost. When adding the $1.45 million allowance for indexation over the construction period in future years to the residual contingency amount authorised, the combined total equates to just 6.1 per cent of the proposed total scheme cost of $68.60 million.

Looking into the detail of the cost estimates, we can see that the estimates were derived from a combination of contractor rates and estimates, historical data, supplier quotes or estimated rates using industry benchmarks such as Rawlinsons 2008. Quantities are also referenced to a consulting partner. This demonstrates that an appropriate methodology has been applied to provide the basis for estimating costs for a project of this nature. The quotes and estimates have generally been input as single values, excluding quantities and rates, so we have not been able to assess whether they are reasonable. Where such details are available however, we believe that the cost estimates are reasonable.

The main concern overall with the project relates to the contingency included within the total project cost, which we have confirmed has been removed from the approved budget at the approval stage. While the substantiation of the total cost provided in the TOC is thorough and the cost estimates appear reasonable, we are unable to comment on why the cost has increased by 16.3 per cent from $59 million at activation to an approved budget of $68.6 million at implementation. It is likely that this is related to a combination of additional scope items and greater cost certainty following further analysis.

We requested cost information for the earlier planning estimates and received a copy of the Planning Business Case. It details the net present value analysis of options and the cost build up for the ATD estimate of $82.5 million included within Table 2-1. As this value is higher than the TOC, we have not sought to reconcile it as it does not explain the difference between the lower activation estimate and the approved final amount. It appears from the commentary that the Value Management Study identified savings which were included within the revised lower total cost figure. This process of review represents good engineering practice and we note from documentation that there was pressure to reduce the cost even at the planning business case stage.

While contingency was the main concern, the difference in cost between the activation estimate and the final approved amount highlights that the Corporation should seek to improve the accuracy of its planning cost estimates in order to give

the capital planning team greater certainty over forward capital expenditure forecasts and budgets. We recommend that the total project cost as approved at the Implementation Business Case stage is left unchanged and that any revision upward of the total cost should require justification during the next regulatory review.

Our assessment has been in the context of our experience with similar reviews of this nature such as the review of capital expenditure for Melbourne Water for the Essential Services Commission, Victoria.

2.2.7 *Findings*

- The Ravenswood Transfer Pump Station project is a supply demand project that supports the bulk water Integrated Water Supply Scheme (IWSS) strategy.
- The investment need is required in planning terms up to 2050 irrespective of the option chosen for the new water source/sources under the strategy.
- We found that options analysis was undertaken assessing six pumping station configuration options and providing Net Present Value (NPV) analysis for each to determine the most efficient solution. The preferred solution was agreed in consultation with stakeholders.
- We believe that the delivery of project practical completion is likely to be delayed from the end of 2011 to the end of the 2011/12 financial year. Project delays are forecast to vary for different milestones from between 3 to 6 months at a minimum up to maximum of 9.5 months. Although the project practical completion date may slip a further six months, we have not revised the project completion date beyond December 2012. We have however reforecast the project expenditure profile over 2008/09 to 20011/12 to reflect both the actual rate of expenditure in the current year and the forecast expenditure according to the delays noted.
- We found that the cost basis for the TOC that derived the total cost for the project was reasonable and appropriately costed in detail. We have recommended that the total cost of the project remain unchanged from the $68.60 million approved at the implementation stage. Any revision of the cost above this should be subject to review and consideration for inclusion in the asset base during the next regulatory review.
- The differences between the activation cost estimate ($59million), the planning business case cost estimate ($82.50 million) and the final approved amount ($68.60 million) highlights that the Corporation should seek to improve the accuracy of its planning cost estimates in order to give the capital planning team greater certainty over forward capital expenditure forecasts and budgets.

2.3 Beenyup WWTP Amplification 135 ML/d Sludge & Primary

2.3.1 *Project Description*

The Beenyup WWTP amplification project involves the upgrade of the primary and sludge streams from a nominal output of 120 ML/day up to 135 ML/day. The major scope items of the project may be broken up into two parts as follows:

Primary Treatment Amplification

- Preliminary process upgrade
- Primary process upgrade

Sludge Treatment Amplification

- Sludge Thickening systems
- Sludge Treatment systems
- Sludge Dewatering upgrade
- Sludge Out-loading / disposal system upgrade
- Odour Control plant

The Beenyup WWTP Amplification 135 ML/d Sludge & Primary project gained approval for implementation in December 2008 and is currently at the detailed design stage of the project cycle. Preliminary site works including earthworks and foundations/wall construction, have already commenced according to the May 2009 Project Progress Report.

2.3.2 *Key Drivers & Obligations*

The key driver for the project is supply demand which is being driven by growth in the North West Corridor development area in the Beenyup catchment. The timing of the need to upgrade Beenyup WWTP is deemed by the Corporation as a risk mitigation measure to planning delays associated with the Alkimos WWTP.

Results from a process gap analysis show that many of works processes are currently running at or exceeding their design capacity. The combined effect of these process units operating above their intended capacity leads to process inefficiency.

A risk analysis of various treatment processes shows that the high risk areas include preliminary treatment, primary treatment, sludge treatment, sludge dewatering, biosolids reuse and disposal and odour control systems. Areas of extreme risk include inadequate sludge digestion capacity and inadequate odour control systems. The Corporation cites six Business (Service) Impacts, three Financial risks, four People-related risks (staff & local community), four Environmental impacts, and four Reputation risks to the Corporation. The

methods for mitigating the impact of these potential risks have been clearly identified and we expect them to be accounted for at the detailed design stage.

The Corporation's State Wide Planning Program (SWPP) risk assessment also identified that Beenyup WWTP would represent a high risk if the appropriate treatment processes not upgraded by 2008/09 to meet new flow and load demands.

The drivers for the project are in line with the risks identified from the Corporation's State Wide Strategic Planning Program and the upgrade specification is consistent with Infrastructure Planning upgrade requirements for the plant.

2.3.3 *Options Analysis*

The Implementation Business Case provides a summary of the options considered at the Preliminary Business Case, Preliminary Design Report and the Engineering Design Report stages including results of NPV analysis where relevant, with the EDR subject to a Value Management Study. On this basis, we believe that the project has been subject to a rigorous consideration and peer review of options including a financial analysis of the net present costs to determine the most efficient solution.

2.3.4 *Efficiency measures*

The options considered generally deliver an efficient use of resources by reusing existing decommissioned process units, improving biosolids processing which reduces costs per unit output, and other improvement upgrades which assist in making more efficient use of existing capital. Making provision for future upgrades with certain process units/assets by prudent planning and design is to be commended and should ensure the minimisation of costs for future upgrades at Beenyup WWTP.

The delivery of the scheme through the existing Alliance arrangement as part of bundle of WWTP capital works within the Metropolitan area of Perth should provide overhead and delivery efficiencies through economies of scale and the minimisation of non-productive time through effective cross-project resource management.

Other benefits from the delivery of the project include reducing the odour impact on local residents, minimising the impact on the recreational fishery from effluent discharge and the rehabilitation of two hectares of degraded land within the perimeter of the works to compensate for the clearing of 0.6 hectares during construction works.

2.3.5 *Deliverability [over the regulatory period]*

The Beenyup WWTP amplification project will be delivered by the W2W Alliance which is supported by resources inter-state or internationally where necessary. The ability to access such diverse pool of resources, we believe, should provide the basis for project milestones to be met.

A Commissioning Plan is proposed to be developed to verify and test that asset performance and operability is consistent with design objectives. This is to be done prior to handover of the assets to Operations and is designed to provide a high chance of successful and timely delivery.

Approval to implement was planned for 10th October 2008, however final sign-off was granted in December 2008, a slippage of two months which may delay the expected completion of detailed design reports by the same length of time. As already mentioned, some work has already commenced to prepare the site for construction while detailed design is in progress.

While such action is both positive and proactive, we note that the latest project progress report highlights a delay in obtaining draft works approval from the Department of Environment and Climate (DEC). This is now impacting on the delivery of the odour upgrades, which may in turn impact on the critical path of the project. We believe that this delay is likely to impact on the program by at least 3 months.

The Project Practical Completion (PPC) date was forecast in the IBC as 4th September 2010 with progressive commissioning of assets from both streams planned for the 27th August and 29th October 2009. The latest project progress report indicates that the PPC is forecast to be the 28th October 2010. The project is tracking as forecast in the IBC, however, we believe that delivery timeframes may need to be extended at least three months and possibly up to six months due to delays in obtaining environmental works approval. We also noted in the recent project progress reports (PPRs) that the detailed design forecast completion dates have slipped from mid-December 2009 to mid-March 2010.

The Corporation should have an improved understanding of the forecast PPC delivery date within the next three to six months. With the combination of design and approval delays, it is likely that the project will be delayed by up to six months overall.

2.3.6 *Cost estimate*

The project costs have escalated from the original 2005 Definition Estimate of $19.23 million (figures reported in the May Progress report to $91 million in the Engineering Design Report (EDR) in August 2006. We have not been provided the EDR or the basis for the original ATD cost estimates (Table 2-2 below) in order to assess the reasons for the significant cost increase of 211 per cent.

The IBC further indicates that the original sludge volume design assumptions have been shown to be 30 per cent understated. The cost has therefore escalated by $48.47 million (or 53 per cent) from $91 million to a total of $139.47 million at Implementation approval stage. The basis of the cost increase was related to expanded odour extraction assets and the design requirement to size certain key assets (critical pipework, pumps etc.) at the upgrade capacity of 150ML/day for stage 2. We accept this as prudent planning due to the growth forecasts indicating that the upgrade would be require 5 years after the stage 1 works were completed.

The table below provides a comparison of the cost profiles at different stages of the project as it has developed from definition through to implementation and including the latest project progress report forecasts.

Table 2-2: Beenyup WWTP Amplification 135 ML/d Sludge & Primary forecast cost profile comparison ($m, Real)

Financial Year	ATD Estimate (2007/08)	ATI Estimate (2008/09)	IBC Forecast at Completion (2008/09)	PPR Forecast at Completion (2008/09)	Actual - PPR May 08	Actual - PPR Jan 09	Actual - PPR Apr 09	Actual - PPR May 09	Halcrow forecast completion profile
Previous Years	14.38	0.00	9.69	4.37	4.37	4.37	4.37	4.37	4.37
2007-08	4.85	6.94		2.57	2.11	2.57	2.57	2.57	2.57
2008-09 (current year)		20.00	25.79	20.90		5.25	7.36	16.98	19.00
2009-10		59.00	73.36	54.80					43.00
2010-11		29.67	30.64	32.97					38.43
2011-12									8.24
Future Years									
Total	19.23	115.61	139.47	115.61	6.48	12.20	14.30	23.92	115.61

Based on our assessment of current progress and delivery risks, we believe that the project will be delayed by six months and we have reforecast the capital costs to reflect this. We note however, that the total cost forecast currently only accounts for the sludge stream and odour extraction works ($115.61 million). The forecast cost does not appear to include the additional cost of the primary treatment upgrade of $23.87 million.

We have reviewed a copy of the Total Out-turn Cost (TOC) spreadsheet which contains construction and alliance related cost estimates developed by the Alliance consultants. While no mention of an independent/peer review of the cost estimates was evident, we note in the PPR that Value Management and Risk Workshops were held to confirm the scope prior to the Engineering Design Report and development of the TOC.

The majority of the costs were developed by consultants from the Alliance with oversight and review of the rates used and cost build up from EDR through to TOC and Detailed Design provided by the Project Management Branch. Final approval was given in accordance with the Corporation's capital investment approval processes.

The total costs in the TOC tie with the Implementation Business Case figures for both the Sludge process and Primary treatment upgrades. We were not provided with the EDR cost estimates to compare with the TOC, however our review of the cost elements within the TOC identified the following:

- The estimated allowance of 4 per cent (for Water Corporation staff costs) of the construction and provisional item costs is acceptable and efficient in our experience of similar schemes of this size and complexity being implemented by other water companies through an Alliance approach.
- Without sight of the EDR cost estimates, we are unable to comment on the escalation factors used, other than the margins and provisional sums identified in the TOC as detailed below.
- Contingencies including provisional sums total $10.39 million. A margin of 11 per cent has been applied to this amount, totalling $1.14 million. As some provisional items may not be required or others may be necessary only in part, we recommend that only half of the value ($5.77 million) of these items and associated margins be allowed now in the total scheme cost for the regulatory period. Subject to confirmation of their value and implementation at the next regulatory review, their total value (up to a maximum of $5.77 million) may be included within the value of the asset base. We base this assessment on the approach adopted during our recent expenditure review of Melbourne Water Corporation for the Essential Services Commission in Victoria.
- The margin allowed in the TOC for contractor profit of 10.9 per cent for design and construction costs is comparably efficient (within 1 per cent to 2 per cent) to the approach adopted by other water companies and their alliance partners. We base this assessment on our recent experience from the expenditure review of Melbourne Water for the Essential Services Commission in Victoria.
- The risk/opportunity element of the TOC amounting to $2.15 million or 2.5 per cent of the design and construction costs (before provisional,

management, design and margin costs are added to the overall TOC) is a reasonable amount. However, we recommend that it is included as a provisional item totalling half the amount ($1.075 million) that would be payable in full subject to successful/early delivery of the project by the contractor. The remaining $1.075 million (or a proportion of it depending on the pain/gain share) can then be approved in the next regulatory price review subject to confirmation that the project was delivered on time, contract obligations were met and the payment was made. We base our approach adopted in this instance on our recent expenditure review of Melbourne Water for the Essential Services Commission in Victoria.

We were unable to reconcile the Strategic Asset Plan (SAP) budget amounts for Alliance and non-Alliance costs (total versus actuals) that are added onto the Total project budget for release to give the total project cost estimate or TOC. Our review of the TOC spreadsheets could not determine whether there was double counting of pre-TOC actual costs, and so we recommend that these costs are removed from the total project cost subject to further substantiation from Water Corporation. The total of these unsubstantiated SAP costs for the sludge ($4.296 million) and primary treatment ($1.38 million) streams amounts to $5.68 million.

Accounting for the cost elements identified above, we recommend that total Beenyup WWTP Amplification 135 ML/d Sludge & Primary project cost be reduced by $12.52 million, adjusting the total cost to a total of $126.96 million. The proportional change for the sludge stream and odour extraction works is shown in Table 2-3 below and is shown reprofiled in section 2.12 following.

Table 2-3: Recommended changes to the cost of the Beenyup WWTP Amplification 135 ML/d Sludge & Primary project ($m, Real)

Expenditure Item	Original Cost Estimate	Recommended Cost Estimate	Net change	Sludge Stream & Odour Extraction Works Only (82.9% of total works)
Provisional sums & associated margins	11.53	5.77	-5.77	-4.78
Risk/Opportunity cost included within total construction costs	2.15	1.075	-1.075	-0.89
Unsubstantiated SAP costs	5.68	0	-5.68	-4.71
Sub-totals	19.36	6.84	-12.52	-10.38
Total Project Cost	139.48			115.61
Halcrow Recommended Total Project Cost	**126.96**			**105.23**

2.3.7 Findings

Our findings for the Beenyup WWTP Amplification 135 ML/d Sludge & Primary project are as follows:

- The drivers for the project are in line with the Government policy and projected growth in the North West Corridor. The project also mitigates the strategic risks relating to planning delays for Alkimos WWTP, and process risks requiring upgrades to certain plant processes.
- The project has been subject to a rigorous consideration and peer review of options including a financial analysis of the net present costs to determine the most efficient solution.
- We identified some efficiency measures inherent in the scheme design and delivery method chosen for the preferred solution option. Other benefits for local residents (reduced odour impact) and a recreational fishery (reduced impact from effluent discharge) and improvements to local land degradation through rehabilitation will result.
- The combination of design and approval delays, will most likely lead to a delay to the current project forecast of up to six months in total. We have reforecast the current Forecast at Completion project cost profile to reflect the expected delay.
- Our review of Total Out-turn Cost estimates identified $10.38 million of expenditure that we believe to be inefficient and unjustified for inclusion within the total project cost estimate. We recommend that the current project cost estimate is therefore reduced by this amount, to a total of $105.23 million. We believe that some of these costs should be removed subject to further substantiation from Water Corporation (SAP actual costs). The remainder will require confirmation at the time of the next regulatory review to determine whether full inclusion in the value of the asset base is justified. It should not be standard practice to allow the full risk/reward payments in advance of these payments being realised.
- We recommend that the reduced total project cost of $105.23 million is reprofiled according to our revised forecast completion profile. The profile should keep the same capital values recommended up to and including the current year (2008/09) and then it should proportionally allocate the remaining capital costs over the last three years of the profile.

2.4 Murray DN1400 Stirling Dandalup Trunk Main 4

Not reviewed.

2.5 Wellington Dam Remedial works

Not reviewed.

2.6 Groundwater replenishment trial

2.6.1 *Project Description*

The Groundwater Replenishment Trial (GWRT) is a research and development project to investigate the viability of developing Managed Aquifer Recharge as an alternative full-scale water source that is relatively independent of climate impacts. The project will be undertaken at the existing wastewater treatment works site at Beenyup, which has been reviewed in section 2.3.

The project is planned to occur in a number of stages:

- Business Case
- Planning – approvals
- Implementation – procurement of assets including injection and monitoring bores and an advanced treatment plant
- Operate & Maintain Trial assets – over a period of three years with groundwater monitoring undertaken at defined intervals
- Operations testing and monitoring – analysis of monitoring samples, research and development on impacts to groundwater, benchmarking with other similar programs.
- Communications – stakeholder consultation
- Outputs – development of progress reports and a final outcomes report

The project consists of a MF/RO/UV treatment plant, one injection bore, and 27 monitoring bores grouped as five assets with an estimated yield rate 68 ML/day, which is equivalent to 35 per cent of the current wastewater flows. The project is part funded by a Federal Government Grant of $19.4 million through the National Water Council. The source option report resulting from the trial is intended to provide a detailed assessment for the option of possibly implementing a full-scale alternative future source by 2014/15.

2.6.2 *Key Drivers & Obligations*

The groundwater replenishment trial (GWRT) is a supply demand Research & Development (R&D) project that depends on the Beenyup WWTP amplification project to provide quality effluent (raw input) for recycling through a Managed Aquifer Recharge (MAR) scheme.

In 2005, the Corporation's Board agreed to the scheme consistent with the State Water Strategy which, in 2003, set a Government target for recycling 20 per cent of treated wastewater in Western Australia by 2012. This project is also consistent with the Corporation's "Source Development Plan for the Integrated Water Supply Scheme" released in April 2005.

In October 2005, the Environmental Protection Authority (EPA) supported the concept of exploring the potential for developing a Managed Aquifer Recharge resource using treated wastewater in the Swan Coastal Plain. Further investigations were encouraged so long as a precautionary approach was adopted, ensuring that a staged approach of low risk trial projects would be conducted prior to the implementation of a large scale MAR scheme.

2.6.3 *Options Analysis*

This is a Research and Development project designed to explore new technology applications and develop a new resource not currently viable on a large scale. No alternative options for this project were investigated in the Implementation Business Case. The engineering design, operations requirements, and operating and maintenance costs are based on a similar plant operated by Industrial Operations in Kwinana, Western Australia.

One additional item was considered during the project definition phase involving the collection and distribution of a relatively small volume of infiltrated water from a nearby area to supplement the scheme however it was deemed to carry too high a risk for the trial and was deferred pending further discussions with regulators.

The location for the GWRT project at Beenyup WWTP is consistent with the Corporation's strategic objectives, particularly in respect of the IWSS, and it compliments the upgrade works already taking place at the WWTP. The Engineering Design Reports for the treatment processes and bore headworks were reviewed and approved during scope endorsement workshops held by the Corporation (minutes cited in IBC).

2.6.4 *Efficiency measures*

The contracting strategy and procurement plans are comprehensive for this project, possibly due to the inherent uncertainties with the project deliverables.

The Corporation maintains that delivery savings can be achieved through reduced preliminary/establishment contractor costs as part of the established procurement process however we have been unable to quantify the saving from the information provided. We note therefore that the saving assumed to be achieved from the method of procurement and delivery adopted. .

No other efficiency measures were identified apart from costs that we identified for which we believe there is little basis for their inclusion. Section 2.6.6 details the results of this analysis.

2.6.5 *Deliverability [over the regulatory period]*

The intended project phasing and scope requirements for the trial by 2014/15 can be summarised from the December 2007 Implementation Business Case (IBC) as follows:

Table 2-4: GWRT - planned project delivery phasing and scope

Timing	GWRT project phase	Scope requirements
Feb – Sep 2007	Business Case	Prepare Business Case for Implementation Approval
Sep 2007 – Nov 2008	Planning	Obtain project approvals from all internal & external stakeholders. Develop and define requirements for approvals plan
Sep 2007 – Oct 2009	Implementation	Procure, design, construct & commission treatment plant assets (MF, RO & UV) including injection bore facilities and headworks, a network of monitoring bores and related infrastructure
Sep 2007 – Dec 2012	Operate & Maintain Trial assets	Operate and maintain assets for 3 years, and develop operating manuals and maintenance plans. Collect samples defined in Sampling and Analysis Plan (SAP).
Aug 2008 – Dec 2012	Operations testing and monitoring	Research, analysis and modelling of SAP data. Information gathering and integration of data from other projects. Collect and analyse core samples, and undertake geotechnical surveys.
Sep 2007 – Aug 2012	Communications	Stakeholder, community and regulator consultation
Sep 2007 – Apr 2013	Outputs	Regular progress reporting, Source Options Report (Dec 2012) and close-out reporting

The intended approval for the Implementation Business Case was planned for September 2007, yet Board approval for the project funding was given in October 2007 and sign-off for the implementation business case was not obtained until February 2008 at which time the procurement phase was intended to have been completed.

The IBC document refers to capital constraints in 2008/09 capital program which have delayed the delivery of the treatment plant by nine months. Traditional

delivery methods were intended to be employed using existing panel contracts and alliance partners. A Contracting Strategy Workshop held in June 2007 decided that given the risk profile of the project, the most appropriate way to deliver it was as follows:

- treatment plant and bore headworks to be delivered through an existing alliance agreement; and
- boreholes to be delivered via the existing Panel providers and project managed by a specialist drilling consultancy; and
- Water quality monitoring and Sampling & Analysis Plan (SAP) to be delivered under an alliance arrangement by a resourced laboratory or scientific institution;

A Capital Investment Planning Committee meets quarterly and acts as the steering group for the project, with reporting accountability to the Board. This is a positive step to formally monitor project performance, delivery and accountability.

The delivery strategy and other memoranda documents supporting the IBC identify the timing constraints for the project related to the Federal grant funding conditions. In order to receive the grant, it is expected that:

- Drilling of the injection and monitoring bores will be completed by 30th September 2008
- Construction of the treatment plant and headworks will be complete by 31st December 2009.

Clearly this is a major risk to the project financially, but also for the reputation of the Corporation with its stakeholders and the community if these project deadlines are missed. This was identified in the project risk assessment as a key risk that will be managed through the delivery strategy.

When reviewing the comments and supporting text in the Project Progress Reports, it was identified that the tender selection process was approved by the Board in May 2008, causing the project to become two months behind schedule. Proactive steps were taken to identify ways to compress the asset delivery period in order to meet the project timeframes, particularly the commencement of trial operations on the 1st of October 2009. At that stage, the Total Out-turn Cost for the project was planned to be finalised in June 2008, as was the finalisation of the Engineering Design Report. According to the Implementation Business Case, the drilling of the boreholes and injection well was supposed to have been completed by the end of June 2008, with the headworks construction following soon after in August.

Similarly, delivery of the treatment plant was to have started in April 2008 but fell behind. By September 2008, there was significant underspend noted in the PPR for expenditure related to the delivery of the treatment plant and headworks. Procurement and design finalisation activities were progressing however and the placing of orders was seen to be important in aligning the expenditure and cash flows for the year. Interestingly, despite this action and the expenditure delays identified, we could see no deviation in any of the annual cash flow graphs which compared budget with monthly forecast spend and the year to date (actuals). For example, the YTD Actual expenditure for September 2008 totalled approximately $2.5 million, yet the actual spend was $0.766 million according to the September 2008 PPR figures (see Table 2-5 below).

This discrepancy suggests that there is a lack of integration in the Corporations systems resulting in a lag between actual capital spend updates from Finance to the Capital Investment Program. Where the Project Progress Reports state that project delivery was delayed, we would expect that the annual cash flow graphs would reflect the same actual capital cost estimate values reported from Finance.

While it was reported that some of the delay associated with the awarding of the contract had been mitigated by September 2008, we note that the project milestones remained unchanged with the commencement of trial operation still forecast for October 2009.

2.6.6 *Cost estimate*

We have not been supplied with any supporting documentation detailing the cost basis for the ATD or Definition Estimate of $20 million. We have traced these figures back to the May 2005 Project Progress Report (PPR) when the project was forecast to be complete by 2009. The ATD Estimate in the May 2007 PPR used the same figures and included an updated Forecast at Completion cost total of $42.27 million. The expenditure was profiled over 2005 to 2011 and future years (not shown in the table below). Again we have found no basis for this cost estimate, which represents a 206 per cent increase on the original Definition (ATD) estimate, with an associated 2-3 year extension to the program implementation period to at least 2011.

The January 2008 Forecast at Completion cost of $44.20 million was approved as the Implementation cost estimate in February 2008, representing a 221 per cent increase on the initial Definition estimate as indicated in Table 2-5 below. Subsequent PPRs all indicate that the Implementation cost became the Approved Estimate with the same profile (see the ATI Estimate profile in the table below). That same total cost ($44.20 million) was carried forward for all subsequent Forecast at Completion cost figures in the PPRs from September 2008 until April 2009. We note though that these costs were re-profiled slightly by the time of the

April 2009 PPR, although the difference was not material. When comparing the Implementation estimate profile to the Forecast at Completion cost in the table below, it appears that delivery of the program overall has slipped from 2012 to 2013.

Table 2-5: Groundwater Replenishment Trial forecast cost profile comparison ($m, Real)

Financial Year	ATD Estimate (2004/05)	ATI Estimate (2007/08)	Forecast at Completion (2007/08)	Actual - PPR May 08	Actual - PPR Sep 08	Actual - PPR Jan 09	Actual - PPR Apr 09	Halcrow forecast completion profile
Previous Years	8.32	1.96	1.96	1.96	1.96	1.96	1.96	1.96
2007-08	11.00	6.89	3.22	2.00	3.22	3.22	3.22	3.22
2008-09 (current year)	0.68	17.17	15.26	0	0.776	3.89	7.19	8.63
2009-10	0	9.61	12.82	0	0	0	0	13.04
2010-11	0	3.89	7.25	0	0	0	0	10.03
2011-12	0	4.68	3.12	0	0	0	0	5.18
Future Years	0	0	0.57	0	0	0	0	2.13
Total	20.00	44.20	44.20	3.96	5.96	9.07	12.37	44.20

We have therefore taken a view on the impact of delays on the projected capital expenditure profile. In Table 2-5 above we reforecast the Forecast at Completion estimated cost estimate, accounting for the average rate of spend in 2008/09 and adjusting the current financial year accordingly. We deferred $6.63 million from 2008/09 into the following year and then deferred half of all expenditure in each year from 2009/10 until 2012/13. The implementation delays amount to a total of six months overall and we have modified the expected capital expenditure profile accordingly.

We have reviewed a copy of the EDR (May 2007) cost spreadsheet which is similar to the cost estimates provided for the Implementation Business Case, except that the base cost was revised upwards and contingency amounts were not included for the line items for the Treatment Plant. The contingency in the IBC cost estimate amounted to an additional 17 per cent ($1.61 million) for the Treatment Plant over the base cost of $9.43 million. Commissioning (5 per cent), contractor's non-direct costs (15 per cent) and a Provisional sum of $0.85 million were also added to the base cost, including a contingency allowance for the treatment plant, increasing the total asset cost to $13.84 million. The IBC cost estimates for the borefield assets were revised to a higher value costing based on an email which detailed increased drilling rates (not cited). We note also that the contingency allowance of 23 per cent for the monitoring and injection bores was proportionally higher than for the contingency included for the treatment plant.

The costs were developed by consultants from the Alliance and hence can be deemed to be independent estimates with respect to the Water Corporation. We managed to trail the IBC cost estimate figures (including the asset, project attributable and non-direct costs) to the Quest database project estimates included within an appendix of the IBC document.

One contentious cost element identified relates to the total of $10.59 million attributed to contingency, which according to the IBC is a combination of escalation and further contingency provisions including:

- Escalation provision of $6.8 million made to account for the delivery cost in current market environment over the 5 year delivery timeframe of the project
- Contingency provision of $3.7 million ($0.8 million of which is related to risks in drilling the boreholes for the borefield)

We note that the contingency amount of $10.6 million was set aside from the project management function of the project, subject to approval from the Chief Operating Officer. However, as over 60 per cent of the contingency amount relates to escalation (indexation only), then less than 40 per cent would be discretionary/contingent expenditure requiring approval.

Given the 17 per cent and 23 per cent contingency allowances over base already identified in the EDR, we do not believe that the full amount of additional contingency is warranted for this scheme. The current financial crisis has lead to depressed demand and cheaper commodities prices, and in this context we recommend that the contingency amount be reduced. The actual value of contingency funding required can then be reviewed at the time of the next price review. On this basis we would recommend that the $6.8 million (indexation for market delivery environment due to the boom) be halved to $3.4 million.

In respect of the remaining contingency amount of $3.7 million, we recommend that only the borefield contingency cost of $0.8 million be allowed (due to greater uncertainties around drilling boreholes and obtaining the yield). We believe that sufficient contingency provision has already been included for in the costing over and above the base cost estimates that derived the IBC cost estimate. Therefore the implementation cost estimate should not attract the additional contingency amount of $2.9 million.

Despite our assessment above, we acknowledge that final approval of the Implementation Business Case was given in accordance with the Corporation's capital investment approval processes.

Accounting for the cost elements identified above, we recommend that the total cost for the Groundwater Replenishment Trial project could be reduced by $6.3 million, adjusting the total cost to $37.9 million, as shown in Table 2-6. This revised amount is shown reprofiled in section 2.12.

Table 2-6: Recommended changes to the cost of the Groundwater Replenishment Trial project ($m, Real)

Expenditure Item	Original Cost Estimate	Recommended Cost Estimate	Net change
Escalation provision	6.8	3.4	-3.4
Contingency provision	3.7	0.8	-2.9
Sub-totals	10.5	4.2	-6.3
Total Project Cost	44.195		
Halcrow Recommended Total Project Cost	37.90		

2.6.7 *Findings*

- The project drivers are consistent with the State Water Strategy and the Corporation's "Source Development Plan for the Integrated Water Supply Scheme" released in April 2005. The benefit achieved will go towards meeting the Western Australian Government's target for recycling 20 per cent of treated wastewater by 2012.
- No alternative options for this project were investigated, apart from one additional input to the project which was considered to carry too high a risk. We gained some assurance from the fact that the engineering design, operating requirements and O&M costs for this project were based on a similar plant operated in Western Australia.
- We were unable to identify quantifiable efficiency savings in our review of this project. Delivery savings were suggested to result from reduced preliminary/establishment contractor costs, but could not be quantified and can only be regarded as inherent within the procurement process utilised.
- The appointment of the Capital Investment Planning Committee as the steering group for the project is a positive step that formalises the monitoring of project performance and delivery, providing accountability to the Board.
- Based on the Project Progress Reports provided, we have taken the view that the impact of delays on the projected capital expenditure profile amount to a 6 month deferral of expenditure in each year from 2009/10. We revised the Forecast at Completion cost estimate to account for the average rate of spend in 2008/09 and reforecast future years accordingly in the capex profile to reflect the six month delay to project delivery.

- It is not certain whether the delivery delays already experienced by the project will result in the deadlines in 2009 for the handover to Operations to commence the trial will be missed causing a breach of the conditions for the Federal grant. Although the latest project progress report indicates that the delivery milestones will be met, we feel that the project delivery milestones relating to grant funding remain at risk of not being met due to the project delivery delays already experienced.
- We identified that the annual cash flow graphs did not seem to reflect the delays in expenditure identified in the actual expenditure profiles from the project progress reports. This implies that there may be a lack of integration in the Corporation's finance and reporting systems. We therefore recommend that improvements are made to the progress reporting of project delivery delays.
- We were provided with no basis or explanation for the cost increase of over 200 per cent between the initial definition cost and the forecast completion cost estimates. We can only assume that the planning cost estimate at the definition stage was undervalued and was subject to change as a result of the risks and solution options identified. We recommend that the Corporation seeks to improve its planning cost estimates to better reflect the actual cost of future capital projects such as this.

2.7 Woodman Point Sludge Treatment Amplification

Not reviewed

2.8 Wungong 1400 Trunk Main

2.8.1 *Project Description*

The project obtained implementation approval in October 2008 and is currently in construction. The project which primarily involves the construction of a long pipeline in the order of 25km in length is split into three parts as follows:

- Part A – Nicholson Road Pump Station to Mitchell Street PRV complex
- Part B – Mitchell Street PRV complex to Connell Manning PRV complex
- Part C – Wungong Dam to Mitchell PRV complex

The three parts of the project are to be delivered in three stages:

1. Early works construction of a relatively short length of pipeline from Wungong Dam to Wungong Tunnel. Construct a short length of pipeline in Armadale in conjunction with redevelopment works being undertaken there by the local authority.
2. Construct over 10km of 1400mm diameter pipeline from Mitchell Street Pressure Reducing Valve (PRV) site to Nicholson Road Pump Station. Also

implement the links to Wungong Tunnel West Portal. This completes parts A and C.

3. Construct over 12km of 1400mm diameter pipeline from Mitchell Street Pressure Reducing Valve (PRV) to Connell Manning PRV site. This completes Part B and connects the pipe to the link built during the Stage 1 works.

The project is being delivered through alliance partners. An engineering consultant undertook the preliminary design and engineering design work, having been selected from the submissions tendered from the panel of consultants. On the quality of their work, they were awarded the detailed design contract.

Construction is being undertaken by one of the pre-qualified contractors invited to tender under the panel.

2.8.2 *Key Drivers & Obligations*

The key driver for the Wungong project is supply demand. The project is designed to facilitate the operating strategy of the Integrated Water Supply Scheme (IWSS) by providing bulk water transfer capability between major sources (including the desalination plant in Perth, Harvey Water trading scheme and Logue Brook) and the Wungong Dam storage that is separate from the existing distribution system. Security of supply benefits are also possible, allowing independent transfers between the Canning, Wungong and Victoria dam storages to optimise the water storage potential of the whole system. This satisfies the long term strategy of the Corporation outlined in the IWSS. Operationally, the main benefit is that the strategic water storage and supply system can be operated independent of the distribution system. Implementing the project will enhance the security of supply benefit afforded by the desalination plant, which was commissioned over 2 years ago.

From a planning perspective, the delivery timeframe was based on the prediction that the Wungong dam will overflow in 2010, and so the new pipelines were necessary to enable strategic bulk water transfers in order to conserve the water resource. This was considered important at the planning stage given the public concerns over the future yield from water supplies in the context of the climate change debate and recent source yields that have been much lower than the long-term average.

2.8.3 *Options Analysis*

The Implementation Business Case indicates that from a strategic perspective, there was only one viable solution option available to implement the scheme. The objective of this solution was to provide bulk water transfer capacity between major sources and storages according to the IWSS. Alternative options with

respect to the pipeline routes were considered though through multi-criteria analysis, in order to avoid environmental impacts. The potential for traffic disruption and landowner issues were also minimised in the selection of pipeline routes.

The final three pipelines as indicated in parts A to C in the project description were the result of this analysis prior to the at the Engineering Design stage. These routes were further refined by liaison with stakeholders such as Armadale Redevelopment Authority, thereby minimising construction and future planning risks.

Although no net present value financial analysis of route options was apparent, we believe that the project pipeline route alignments has been subject to a sufficient options analysis and consideration by stakeholders to determine the least risk and hence most efficient solutions.

2.8.4 *Efficiency measures*

As mentioned in the section above, multi-criteria analysis of the environmental and planning risks was used in conjunction with stakeholder engagement to mitigate the potential risks. Stakeholder engagement lead to early works in Green Avenue and Wungong Road to install part of the length of the pipeline simultaneously with works being undertaken by the Armadale Redevelopment Authority. This saved the reinstatement costs for this section. Other favourable alignment considerations were suggested by the Authority and incorporated into the design. This provided the benefit of avoiding intersections with high traffic volumes and brining the alignment in line with future redevelopment and road works related to a railway crossing.

As discussed below, we note also that the stage 2 contract award identified $8 million to $10 million in savings as a result of the tendering process.

2.8.5 *Deliverability [over the regulatory period]*

Required & Forecast PPC dates – changes from Planning BC to IBC?

The Implementation Business Case detailed that the project was planned to be delivered in three stages, with the first two being planned for completion by June 2009. The third stage was to follow soon after, with completion planned for June 2010. We compared these planned practical completion dates with the latest project progress report as follows:

Project Stage – Practical Completion	Planned Start	Planned to Complete	Actual / Forecast Completion (May 2009)	Delay / deferral time (months)
Stage 1	01/Mar/08	30/Jun/08	18 Jul 08	0.5
Stage 2	01/Oct/08	30/Jun/09	29/Sep/09	3.0
Stage 3	01/Oct/09	30/Jun/10	28/Apr/13	34

Although the PPC date for stage 3 was scheduled for July 2010, the IBC notes that stage 3 of the project was to be deferred three years from completion over 2011/12 and 2012/13. The commentary at the implementation approval stage indicates that due to capital constraints, the Corporation would only able to fund stages 1 and 2 of the project. This deferral of expenditure was due to a reprioritisation of the five year capital program in September 2008 (three weeks before approval to implement was granted) due to cost increases in other projects and new projects being included within the program. We note that the deferral was the minimum time recommended and therefore could be deferred further in future should funds not be available.

We reviewed the Project Progress Reports (PPRs) provided covering the period from April 2008 to May 2009 to se how the project was tracking to date. Stage 1 was delivered only two weeks later than was originally planned. Stage 2 appears to be slipping on average four months, possibly upwards of five months due to the combination of delays relating to detailed design, implementation approval and the award of contracts. The May 2009 PPR explained that the delay of the construction of stage 2 was due to the compounding effects of delays with obtaining statutory approvals. Progress in May showed that pipe laying was 30 per cent complete with the completion of construction forecast for September 2009, representing a delay of three months. For the purposes of our capital expenditure reforecast in the next section, we have assumed that the project at stage 2 will be delayed overall by four months, and that stage 3 will be deferred by three years.

The risks identified from the deferral of stage 3 appeared to be mainly financial, notwithstanding the security of supply risks arising from delayed implementation. At the IBC approval stage, taking the decision to defer Stage 3 impacted on the total project cost by increasing it by $6 million from $108.60 million to $114.60 million. The Net Present Value (NPV) of the increase in cost equated to $2 million overall, with the cost increase being attributed mainly to not purchasing the pipes for Stage 3 under the existing contract with the supplier set to expire in mid-2010. We note that the impact could be greater if steel prices increase by 2011/12,

however the prospect of this risk has probably diminished somewhat as a result of the future impact from the current financial crisis.

The main operational risk that the Corporation will face as a result of deferring works for stage 3 is that flexibility in security of supply options for shifting storage volumes between Canning and Wungong dams will be unavailable. Limiting this facility has implications for maximising the production from the Southern Seawater Desalination Plant and realising the full potential of the integrated water supply strategy (IWSS). It appears that this risk in conjunction with the financial downside arising from deferring stage 3 was not sufficiently great for the scheme to be completed as originally planned. We note that no mention has been made of the risk of the Wungong dam overflowing in 2010, which would therefore mean that that volume would be wasted in the even that the scheme was incomplete at that date.

We note the comments in the May PPR summarising the financial impact of the delays which will result in forecast expenditure for 2008/09 not being achieved; funding will be rolled over into 2009/10, and that significant construction cost variations are anticipated that will potentially require additional funding in 2009/10. These may be related to the delay, but we noted that cost increases were also expected for addressing the impact of acid sulphate soils; an additional boring length required to protect an environmentally sensitive area; and other construction constraints and site conditions (unspecified). We note too that the progress has been slow with a land acquisition and may impact on delivery milestones.

2.8.6 *Cost estimate*

We were not provided with a copy of the Planning Business case or the costs relating to it in order to make a comparison to explain the differences. However, Table 2-7 below shows that the activation cost estimate increased almost 400 per cent from $29 million to $114.60 million at the implementation stage. We cannot explain this and believe that the increase is far too great to be explained by scope change alone. We recommend that the Corporation seek to improve their planning cost estimates and project definition processes to close this gap.

We believe that since the original cost estimate was proposed, the Corporation will have a greater understanding of the cost of constructing, delivering and implementing water infrastructure and non-infrastructure assets due to the large capital program currently being implemented.

We would expect that these costs are being captured and that internal unit cost data bases are being updated to ensure that future planning cost estimates are as

accurate as possible. This should provide a solution to the problem, providing that the original scope included is appropriately assigned.

Accounting for the deliverability issues, existing project delays and the stage 3 deferral as discussed in the previous section, we have re-profiled the total cost of the project. Our profile is based on the latest forecast cost estimate of $106.76 million from the May PPR, and accounts for the actual rate of expenditure expensed in 2008/09 and subsequent carryovers of expenditure in future years as outlined Table 2-7 below:

Table 2-7: Wungong 1400 Trunk Main cost profile comparison ($m, Real)

Financial Year	ATD Estimate (2006/07)	ATI Estimate / IBC Forecast at Completion (2007/08)	PPR Forecast at Completion (2008/09)	Actual - PPR Sep 08	Actual - PPR Oct 08	Actual - PPR Jan 09	Actual - PPR May 09	Halcrow forecast completion profile
Previous Years	0.15	1.14	1.14	1.14	1.14	1.14	1.14	1.14
2007-08	4.00	6.39	6.39	6.39	6.39	6.39	6.39	1.15
2008-09 (current year)	20.85	43.61	31.85	0.76	1.28	3.30	15.73	18.00
2009-10	4.00	3.00	6.92					23.71
2010-11		0	0					2.30
2011-12		44.00	44.00					0
2012-13		16.46	16.46					44.00
Future Years		0	0					16.46
Total	29.00	114.60	106.76	8.29	8.82	10.83	23.26	106.76

We have assumed that the expenditure profile will be the same in the final two years of the project. As it was in the previous forecast, but we are not confident that the project will be completed by mid-2013 and we believe that it will continue into the following year. From our reading of the constraints affecting this scheme, this deferral of expenditure is likely to be driven by constraints with the capital program and not from the ability to deliver within the revised timeframe expected.

We note that at the stage 2 contract award, there was an $8 million to $10 million saving gained. This appears to have been carried over in the hope that stage 3 works can be started earlier than forecast. The current forecast at completion cost is $7.84 million less than was forecast in the IBC (following the $6 million increase due to the deferral of stage 3) and this difference may be explained by the stage 2 contract saving. We cannot however find an explanation in the progress reports to confirm this. We would expect that this saving would be used to fund the potential cost risk pressures identified in the May PPR mentioned previously, keeping the final out-turn cost within the current forecast completion cost estimate of $106.76 million.

We reviewed the Target Out-turn Cost estimates provided in support of the Implementation Business Case. As noted in the IBC, we concur that the unit rates for the pipelines are reasonable in comparison with the cost of other 1400mm diameter pipes in recent schemes. The unit costs for bulk water distribution pipes with a similar diameter in Melbourne were of a similar rate (in the order of $3,000 to $4,000 per metre) or much more expensive in some cases. In this regard we believe that the unit rates used for such a long length of pipe (upwards of 25km) over three stages is reasonable, even allowing for additional escalation due to the deferral of stage 3.

The use of escalation factors provided by the Department of Housing and Works is a valid assumption, with the total percentage escalation amounting to 13.5 per cent or $11.61 million within the original TOC estimate. Contingencies of 10.3 per cent were the applied to the escalated total cost, which in percentage terms is not unreasonable from our experience of similar sized projects undertaken by other water companies. Providing greater certainty to the total, the costs in the TOC for stage 1 were based on actual tender rates. Cost estimates for stages 2 and 3 were based on estimates from consultants, from internal sources or industry standards such as Rawlinsons. Greater contingency percentages were applied as appropriate to these preliminary estimates where cost uncertainties were higher.

Overall, the cost basis appears robust and the contingencies and escalations allowed appear reasonable. We therefore do not recommend any reduction to the total scheme cost on the basis of the cost estimates. We do recommend however that the final out-turn cost should not exceed the current total forecast completion cost of $106.76 million. We have based this assessment on the identification of substantial efficiencies in the order of $9 million during the award of the stage 2 contract, which should also help to mitigate the future cost pressures forecast during the stage 2 construction phase. Any increase in the total cost above $106.76 million will need to be justified at the time of the next regulatory review for inclusion within the price base.

2.8.7 Findings

Our findings for the Wungong 1400 Trunk Main project are as follows:

- The drivers for the project satisfy long term strategy of the Corporation's Integrated Water Supply Scheme (IWSS), providing security of supply benefits by allowing source water including from the desalination plant to be transferred to and between major dam storages. The timing of scheme delivery was based on the prediction that the Wungong dam will overflow in 2010 and so implementation was necessary by then to conserve the water resource
- There was only one viable strategic solution available for the implementation of the bulk water transfer elements of the scheme. We believe that the project

pipeline route alignments have been subject to sufficient multi-criteria options analysis and stakeholder consultation to determine the least risk and hence most efficient solutions.

- We noted that there were some efficiency measures identified through the engagement of stakeholders which lead to early works to install part of the length of one of the pipelines simultaneously with works being undertaken by one local authority, thereby saving the reinstatement costs for this section. Other favourable alignment considerations were also suggested by stakeholders and incorporated into the design.
- Our analysis of the progress of project delivery to the planned implementation dates identified that the project will be delayed at stage 2 by four months, and that the project will be late overall due to the decision to defer stage 3 by three years. We made these assumptions in our reforecast of the capital expenditure profile.
- As a result of deferring the project, the Corporation will face the risk of reduced security of supply due to a lack of operational flexibility in their bulk water transfer capability. There was also a financial impact from the deferral of stage 3 resulting in the total capital cost of the scheme to increase by $6 million. We note that the lack of funding in the capital program is the driver behind the deferral of stage 3 by three years. This decision therefore seems to out-weigh the risk of wasting the water that is likely to overflow in Wungong Dam from 2010, which was the original planning driver for the timing of the scheme.
- Not being provided with a copy of the Planning Business case and its cost basis, we were unable compare and explain the difference of almost 400 per cent between the activation cost estimate and the cost estimate forecast at the implementation stage. We believe that the increase is far too great to be explained by scope change alone.
- We recommend that the Corporation seek to improve their planning cost estimates and project definition processes to close this gap. With such a large capital program, the Corporation has the opportunity to capture many capital out-turn costs for various asset types to update their unit cost databases. We would expect that this would lead to more accurate planning cost estimates in future providing that the original scope included is appropriately assigned.
- Overall, we found that the cost basis for the Wungong Trunk Main project appears robust and the contingencies and escalations allowed appear reasonable. We therefore do not recommend any reduction to the total scheme cost on the basis of the cost estimates.
- We recommend that the final out-turn cost of the scheme should not exceed the current total forecast completion cost of $106.76 million. We have based this assessment on the identification of substantial efficiencies in the order of $9 million during the award of the stage 2 contract, which should also help to

mitigate the future cost pressures forecast during the stage 2 construction phase. Any increase in the total cost above this will need to be justified at the time of the next regulatory review for inclusion within the price base.

2.9 Carabooda 60ML tank and DN1200 inlet/outlet

2.9.1 *Project Description*

The original planning scope of the Carabooda 60ML Tank and DN1200 Inlet/Outlet Main (stage 1) project involved the combination of two related projects to save on project management costs as follows:

- C-W00310 – 5500mm of DN1400/1200 pipe
- C-W00181 – 120ML earth embankment reservoir

However, following the definition phase at the preliminary design stage, the scope was altered to include a steel tank reservoir of half the capacity in stage 1 as follows:

- 60ML Steel Tank reservoir at Carabooda Hill, including site pipework, valves & flow meters
- Temporary re-chlorination facility on tank outlet for maintaining disinfection during initial low flow conditions before Stage 2
- Installation of two isolation valves plus chlorine monitoring points
- Installation of an automatic inlet control valve at Neerabup reservoir
- Lay 6km of 1200mm diameter Inlet/Outlet Trunk Main connecting the new tank reservoir to the distribution system at Connolly Drive.
- Land acquisition (mainly related to easements for the pipeline route)

2.9.2 *Key Drivers & Obligations*

The project driver for the Carabooda 60ML Tank and 1200mm IL/OL trunk main project is purely supply demand. The increased water demand in the Carabooda-Neerabup groundwater [source] treatment plant (GWTP) and Neerabup reservoir supply system is due to new residential developments in the area as a result of the progressive implementation of the North West Corridor growth strategy. The water supply system was reviewed in 1996, again in 2000 and in 2004 the planning business case was formulated by The Corporation.

The Implementation Business Case predicted that by 2009, the Corporation would be at risk of failing to maintain the minimum pressures during peak demand periods, and therefore not be able to service the full extent of growth in demand on the supply system. This would lead to non-compliance with the Water Licence conditions, thereby necessitating the provision of an enhancement solution such as a new reservoir to maintain pressures at peak demand.

Demand growth in water supply was predicted in 2003 to increase by 17,000 new housing lots between 2005 and 2020. The Planning Business Case stated that by 2007/08 land will be developed with higher elevation, thereby extending the existing water supply system beyond its capability to maintain minimum pressures unless it is upgraded.

We have seen evidence in the planning report of system hydraulic performance and water quality (disinfection) modelling simulations, including an analysis of past and future peak day and average yearly water demands accounting for the sprinkler ban and water restrictions. This assessment provided the basis for capacity of the existing infrastructure to meet both existing and future demands. The need for additional infrastructure to service the shortfall or gap was then identified.

This project clearly fits within the Corporation's long term strategic objectives in meeting the growth in demand and servicing new customers. This system forms part of the Perth Metropolitan Water Supply Scheme while ensuring that existing service obligations for current customers are maintained. On this basis we are satisfied that the driver for the project is appropriately assigned.

2.9.3 *Options Analysis*

The Corporation owns a freehold parcel of land at Carabooda Hill which is well positioned for the construction of a major water storage to provide the necessary water pressures required during peak demand particularly to service the Butler area. We note that this solution option has been planned for at least two decades and compliments the sequence of growth and development of the existing source and water distribution system since the Neerabup reservoir was constructed in 1995/96 to service the Kinross area. Other water source, treatment and network distribution infrastructure has since been implemented, for which the solution options for the proposed Carabooda 60ML Tank and 1200mm IL/OL trunk main project are complimentary in scope.

The long term planning and staging considerations of the 2004 water supply system planning review were similar to those of the planning review undertaken in 1996 demonstrating consistency in the long term planning approach. The planning reviews identified that the long-term water supply system requirements for the region consist of:

- Two groundwater water treatment plan (GWTP) sources – at Neerabup (already developed in the 1990s) and Eglington (future source)
- Two 120 ML reservoirs at Neerabup (already developed in the 1990s) and Eglington (future source)
- Water distribution mains for water supply within the system

Using this long term planning as the basis for the 2004 planning review, we saw evidence of the consideration of four main system enhancement solution options that satisfy the long term water supply strategy. A range scope and timing considerations were assessed to recommend the preferred solution as follows:

- Option 1A – Construction of a reservoir at Carabooda at full capacity (120ML), and the inlet/outlet main by 2008/09, deferring the Eglington GWTP until 2013

The preferred solution (option 1A) was found to have the lowest net present value (NPV) of $55 million, accounting for capital, operational and maintenance costs. The preferred solution was only $0.2 million less than the next cheapest option (option 3). We note though the security of supply advantage that the recommend option (1A) provides by way of a gravity reservoir rather than the alternative pumping solution options considered.

Following the planning decision to progress with option 1A, the Engineering Design Report recommended the staging of the long term water supply system as follows:

- Stage 1 (2009) – 60ML steel tank reservoir and 6,000m 1200mm diameter outlet main
- Stage 2 (2013) – Eglington (future) groundwater source and treatment plant implementation and system integration through a 1200mm diameter inlet main connection to the existing Carabooda storage. Duplicate Stage 1 200mm diameter main providing twin distribution mains
- Stage 3 (2025) – Duplicate 60ML storage tank reservoir at Carabooda

The preliminary design review (PDR) examined the appropriateness of various types of reservoir for the preferred option (1A) including different sizes, shapes and construction materials, including steel tanks and concrete lined reservoirs for various operating scenarios. NPV analysis of the various tank options (five in total) demonstrated that the short [steel] tank option (option 2), similar to the reservoir installed at Neerabup, was the most cost effective over the life of the asset.

The inlet/outlet main diameter of 1200mm was sized according to flow and pressure requirements resulting from network modelling of existing and future demand figures. We note that booster pumps were not considered to be viable due to the size of the large growth area to be serviced.

While we did not review the PDR, it detailed the assessment of various trunk main routes by multi-criteria analysis, in consideration of the construction delivery risks associated with rail/road crossings and other factors or potential impacts. The

implementation business case referred to this analysis and we believe that the results of this work explain why the trunk main length at the planning stage increased from 5,500m to approximately 6,000m. We also note that an NPV financial analysis was not conducted for the routes considered. We infer therefore that route selection was based on an analysis of multiple qualitative delivery risk factors that would inherently reduce the financial risk of the preferred option through promoting a least risk delivery outcome.

2.9.4 *Efficiency measures*

One of the financial risks identified in the implementation business case is the cost of steel, which in 2007 the Corporation envisaged during the market boom from the mining sector in particular could increase the project cost should it be delayed. We believe that this risk may have been a problem for the procurement of steel during 2007/08 when commodity prices were relatively high until the second half of the year.

The procurement costs would have decreased rather that increased as a result of the financial crisis that has impacted on the economy. This is particularly true in Western Australia which has a large mining sector. The pipes have already been purchased though (sections 1 & 2 have been completed - PPR May 2009), and therefore it will not be possible now to realise this saving. The project is being delivered by panel agreements that have already been established and has relatively tight timeframes for delivery. We believe that while some savings could be generated by the select tender process (competition between prequalified contractors), they have probably already been realised. It is therefore unlikely that further construction labour cost savings would be achieved due to the increased engineering competition resulting from the downturn in the economy.

Our review of the contracting strategy outlined in the implementation business case using existing panel arrangements and a select tender process appears to be geared towards efficient delivery outcomes. We note also the need to construct one rail crossing could present a challenge to the fairly tight delivery timeframe of the project. The delivery risk relates to the complexity and time-consuming nature of the interaction with operational railway assets and the extensive safety procedures and delivery protocols generally expected by railways agencies.

2.9.5 *Deliverability [over the regulatory period]*

Given the supply demand driver of this scheme and the need to enhance the system to meet service obligations and prevent reputational risk, we agree with the Corporation that there is no choice but to implement the scheme. The only question over the need for implementation relates to timing, which may be influenced by actual growth rates, network and resource modelling forecasts, timely planning/land acquisition approvals. Project delivery may be affected by the

discovery of site environmental risks, availability of contractor resources and the provision of funding to progress the scheme. These potential project risks have been identified by the Corporation, including a few others such as construction safety and community opposition to the proposed asset location; which are common to projects of this nature.

The implementation business case proposed the timing of key milestones for the project as follows:

Milestone	Baseline dates	Current dates	Months slippage
Activation	05/05/2005	05/05/2005	0
Defnition	21/07/2005	21/07/2005	0
Implementation	03/08/2007	20/02/2008	6
Project Practical Completion	18/08/2009	08/01/2010	5
Handover	27/10/2009	19/03/2010	5
Close-out	27/04/2010	09/04/2010	0

As indicated in the table above, we note that the project milestones for implementation, PPC and handover have slipped by 5 to 6 months, however the project close-out date in April 2010 remains unchanged. Putting the physical/approval related delivery risks aside, we note in the implementation business case that there is a hand-written comment indicating that the milestones may need to be deferred because the approved project PPC date was for October 2010 (not January 2010). The caveat on this occurring was that that the PPC date would be brought forward to January 2010 subject to funding approval for additional funds in 2008/09, which was to be assessed during the mid-year review in November 2008.

The four project progress reports provided from June 2008 to May 2009 indicate that currently, project delivery has been delayed into 2010/11. Completion of detailed design was delayed by seven months, while the PPC was consequently delayed by eight months in total, representing a significant change to the progress of project delivery over the last two months. Based on this recent shift in forecast milestone dates, we believe that there is a real risk that delivery may be delayed by a further three months into the start of the 2011/12 financial year.

The current progress of delivery appears to be consistent with the forecast delivery dates reported in the implementation business case as outlined in the table above. The commentary in the implementation business case indicated that that the

project could be deferred by upwards of nine months (subject to funding approval being granted). It is not clear from the commentary in the PPRs whether the delays experienced to date were driven by the need to obtain funding approval or whether they have been more dependent on project delivery issues. On balance it appears to be the latter, for which no early funding approval was therefore required.

If delays were caused by funding limitations, then we would expect that a project prioritisation process had occurred within the Capital Investment Program to provide a program-level basis for the delay. We would expect to see that another scheme required implementation ahead of this project as it was of higher priority. We would also expect this process to have considered the risks associated with the deferral of each scheme affected by the need to constrain capital budgets within the annual funding envelope of the overall capital program. If this step has not occurred, then by deferring this scheme ahead of another with a lesser service risk, The Corporation may fail compliance requirements (pressure failures at peak demand) by 2009.

No mention of this risk being realised was mentioned in the PPRs, so we assume that Operations are managing the risk operationally while the delayed project is finally implemented in the order of 18 months after the delivery date originally planned. It may be that development growth rates have tapered off in the last 12 months, easing the risk of breaching service levels as a result of project implementation delays.

2.9.6 *Cost estimate*

We note that there is a discrepancy in the implementation business case with the final length of the 1200mm inlet/outlet trunk main that is to be constructed. The original length of the trunk main in the planning business case was 5500m, which was increased by 500m to 6,000m in length in the definition estimate. However, we found other values such as 6,411m in the Quest database project description field that relates to the cost estimates, 6,280m taken from the Tyco supply contract as referenced in the contracting strategy, and 6,611m referred to in the project description in the 30th April 2008 Memorandum (from the GM Planning and Infrastructure to the COO) requesting project implementation approval. Further, the Engineering Design Report (August 2007) cost estimate spreadsheets were based on two stages of pipeline construction with a pipeline length totalling 6,950m.

Despite the longer length noted in the EDR compared with the figures in IBC, the unit rates and contingencies used appear to be reasonable in their building up of the cost estimates. We note in the memorandum that accompanies the IBC (30th April 2008), details an internal query over the rates used for pipeline and tank cost

estimates. The rates compared favourably with similar type capital works, supporting our assessment that the cost estimates are reasonable.

Cost estimate forecasts from the Project Progress Reports show changes to the Forecast at Completion capex profiles in the first five months of 2009. The changes indicate that expenditure has been deferred due to the increase in project delivery timeframes outlined previously. Table 2-8 outlines these changes below.

Table 2-8: Carabooda 60ML Tank & DN1200 Inlet/Outlet Main forecast cost profile comparison ($m, Real)

Financial Year	ATD Estimate (2007/08)	ATI Estimate (2008/09)	Forecast at Completion (Jan 2009)	Forecast at Completion (May 2009)	Actual - PPR Jun 08	Actual - PPR Jan 09	Actual - PPR Mar 09	Actual - PPR May 09	Halcrow forecast complet-ion profile
Previous Years	2.05	1.78	1.78	1.78	1.79	1.79	1.79	1.79	1.78
2007-08	8.50	3.87	4.73	4.73	4.73	4.73	4.72	4.72	4.73
2008-09 (current year)	7.45	12.10	7.15	7.47	-0.82	4.36	4.72	6.26	7.47
2009-10	0	19.66	23.75	11.68	0	0.00	0	0	8.76
2010-11	0	0	0	11.75	0	0	0	0	11.73
2011-12	0	0	0	0	0	0	0	0	2.94
Future Years	0	0	0	0	0	0	0	0	0
Total	18.00	37.41	37.41	37.41	5.70	10.87	11.23	12.77	37.41

On the basis that the build up of the cost estimates and the overall contingency percentage allowed (13 per cent) both appear reasonable, we do not recommend any changes to the total cost for this scheme. We have however recommended in Table 2-8 that the capital expenditure profile be modified to reflect the likely project delivery delay of three months overall during the years 2009/10 to 2011/12.

2.9.7 *Findings*

- The project driver (supply demand) has been appropriately assigned to this project.
- The project fits within the Corporation's long term strategic objectives in meeting the growth in demand from new customers while ensuring that service obligations for existing customers are maintained. On this basis we are satisfied that the driver for the project is appropriately assigned.
- We have reviewed the planning business case and implementation business case documents and we believe that the options analysis has been comprehensive and forms a sound and robust basis from which to propose the implementation of the preferred solution.

- We found that the solution option chosen fits within a long term water supply strategy for the area.
- Based on the recent shift in forecast milestone dates, we believe that there is a real risk that delivery may be delayed by a further three months into the start of the 2011/12 financial year.
- The unit rates and contingencies used in the Engineering Design Report appear to be reasonable in their build up of the cost estimates for the Implementation Business Case
- We therefore have not recommended any changes to the total cost for this scheme. However, the capital expenditure has been re-profiled by three months over the years 2009/10 to 2011/12 to better reflect the expected delivery delays.

2.10 Alkimos WWTP Stage 1 & Effluent Disposal

Not reviewed.

2.11 Picton WTP Stage 1

Not reviewed.

2.12 Summary of recommendations/adjustments

	Previous Years	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	Future Years	Total
Ravenswood Transfer PS									
PPR Forecast at Completion (2008/09)	2.11	1.15	13.5	41.76	17.68				76.21
Halcrow forecast completion profile	2.11	1.15	12	36.15	12.32	4.87			68.6
Proposed adjustments	**0**	**0**	**-1.5**	**-5.61**	**-5.36**	**4.87**	**0**	**0**	**-7.61**
Beenyup WWTP Amplification									
PPR Forecast at Completion (2008/09)	4.37	2.57	20.9	54.8	32.97				115.61
Halcrow forecast completion profile	4.37	2.57	19	37.81	33.25	8.24			105.23
Proposed adjustments	**0**	**0**	**-1.9**	**-16.99**	**0.28**	**8.24**	**0**	**0**	**-10.38**
Groundwater Replenishment Trial									
Forecast at Completion (2007/08)	1.96	3.22	15.26	12.82	7.25	3.12		0.57	44.20
Halcrow forecast completion profile	1.96	3.22	8.63	9.58	7.20	5.18		2.13	37.89
Proposed adjustments	**0**	**0**	**-6.63**	**-3.24**	**-0.05**	**2.06**	**0**	**1.56**	**-6.31**
Wungong 1400 Trunk Main									
PPR Forecast at Completion (2008/09)	1.14	6.39	31.85	6.92	0	44	16.46	0	106.76
Halcrow forecast completion profile	1.14	1.15	18	23.71	2.31	0	44	16.46	106.76
Proposed adjustments	**0**	**-5.24**	**-13.85**	**16.79**	**2.31**	**-44**	**27.54**	**16.46**	**0**
Carabooda 60ML Tank & DN1200 Inlet/Outlet Main									
Forecast at Completion (May 2009)	1.78	4.73	7.47	11.68	11.75	0	0	0	37.41
Halcrow forecast completion profile	1.78	4.73	7.47	8.76	11.73	2.94	0	0	37.41
Proposed adjustments	**0**	**0**	**0**	**-2.92**	**-0.02**	**2.94**	**0**	**0**	**0**
Total Capital Expenditure Reviewed									
Total Capital Forecast	**11.36**	**18.06**	**88.98**	**127.98**	**69.65**	**47.12**	**16.46**	**0.57**	**380.18**
Total Capital Recommended	**11.36**	**12.82**	**65.1**	**116.00**	**66.79**	**21.23**	**44**	**18.59**	**355.89**
Total Adjustments	**0**	**-5.24**	**-23.88**	**-11.98**	**-2.86**	**-25.89**	**27.54**	**18.02**	**-24.29**

3 Review of Operational Expenditure

3.1 General

Our previous review of the Water Corporation's operational processes found two main concerns with the process in place to manage the approval and justification for new Opex as follows:

- We believe there is significant scope for improvement in the quality of funding requests by requiring Divisions to undertake a formal review of Divisional requests before submission to the Evaluation Committee
- We recommend that the Corporation should seek to improve the level of information and detail provided by process owners in the Action Briefs to better inform the macro budget process

We also recommended that the Corporation continue to seek to continue their 2 per cent year-on-year operational cost efficiency target as they have been successfully achieving this target in the recent past. This target was adopted by the Water Corporation Board prior to the release of our final report.

We note that the Corporation has already commenced improving the level of information and detail of operating expenditure funding requests. Work has commenced on replacing the one-size-fits-all Action Brief with an Operating Business Case (OBC) which will align the funding request process for operating expenditure more closely with the process already in place in relation to capital expenditure. The OBC will have two main templates – a short-form or long-form, which are used depending on the quantum of funding requested. There will be independent assessment of the OBCs prior to submission and it is expected that the OBC will enhance the level, quality and consistency of information provided. We expect that this form of supporting information will greatly assist in the regulatory review process.

For this detailed review, we analysed the Water Corporation's proposed increases to base operating expenditure, as set in 2004/05, and requested supporting information for a number of the major operational expenditure increases. Table 3-1 following identifies the projects for which we sought supporting information. We have not, however, sought detailed information or made any comments regarding operating expenditure directly related to the two desalination plants.

Table 3-1 Water Corporation Proposed Operating Expenditure Increases above Base for Selected Projects

	2008/09	2009/10	2010/11	2011/12	2012/13	
	$000s	$000s	$000s	$000s	$000s	Total
Desalination 1 Opex	21,796	23,091	26,126	27,651	28,343	**127,007**
Desalination 2 Opex				35,200	31,373	**66,573**
ACA GAP Treatment Management Program	2,500	5,000	10,000	10,000	10,000	**37,500**
Water mains cleaning	3,430	4,150	5,370	6,590	6,590	**26,130**
Backflow Prevention - Retrofit to High Risk Existing Services	1,200	5,500	5,500	5,500	5,500	**23,200**
Desalination 2 Opex Renewable Energy Premium	-	-	-	11,000	11,352	**22,352**
Bridgetown Regional Water Source	61	3,797	3,797	3,797	3,892	**15,344**
Provision for capital project expensing.	3,000	3,000	3,000	3,000	3,000	**15,000**
Collie River Diversion Project	10,000	5,000	-	-	-	**15,000**
Overflow Risk Management Project (WORM)	1,999	2,655	3,174	3,478	3,565	**14,871**
Sustainability Strategy	1,390	2,080	2,700	3,330	3,330	**12,830**
ACA – Gap Treatment Management Program	2,432	2,432	2,432	2,432	2,432	**12,160**
Compliance(Ocean outlet monitoring, Welder Observation)	2,127	2,238	2,353	2,475	2,537	**11,730**
NFIS Woodman Pt Odour Ctl Stg 1 &2	1,749	2,414	2,476	2,476	2,476	**11,591**
Harvey water trade	2,156	2,210	2,265	2,394	2,454	**11,478**
Water Cycle Strategy	2,259	2,259	2,259	2,259	2,259	**11,295**
Disposal of Surplus Assets	2,144	2,144	2,144	2,144	2,144	**10,720**
WP WD - TM & Nicholson Rd PS	1,900	1,900	1,900	1,900	1,948	**9,548**
NFIS PS Desal: Sludge Treat & Ops	1,490	1,490	1,490	1,490	1,527	**7,487**

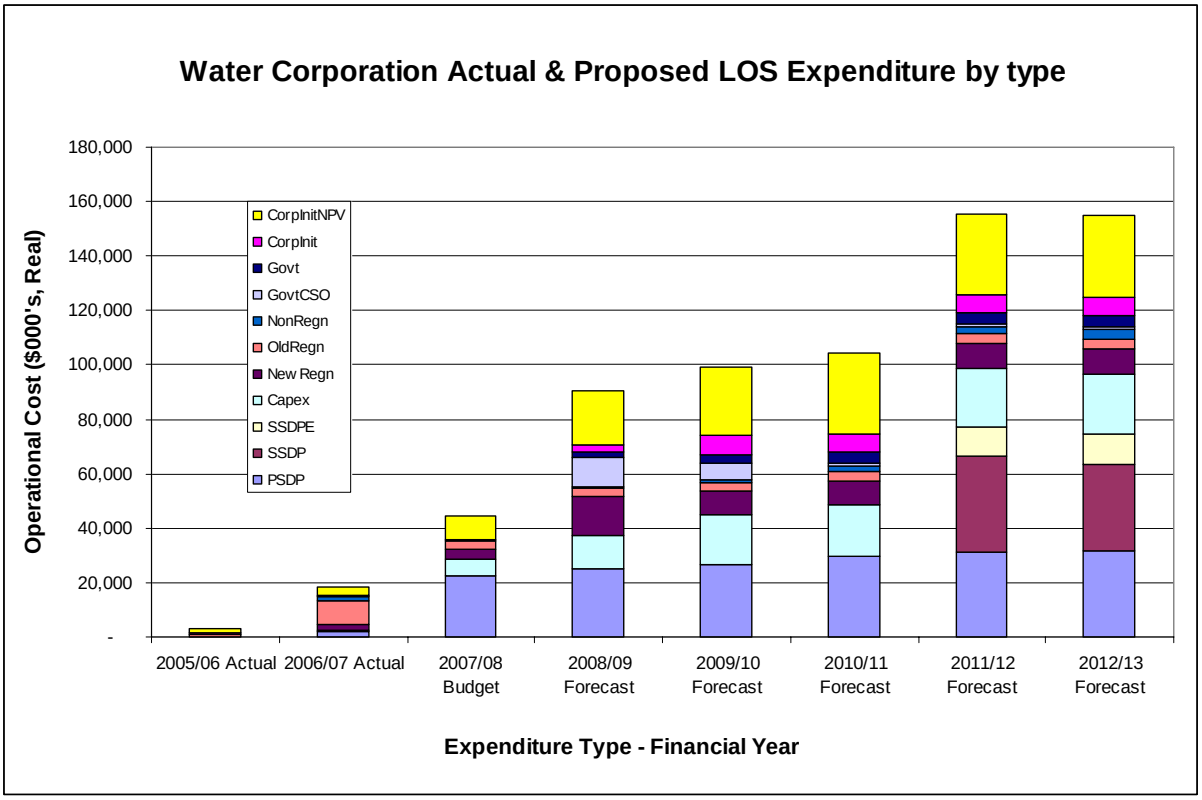
The Corporation provided supporting information based on its final 2008/09 Strategic Development Plan (SDP). This information was updated from our original review, which was based on the draft 2009/10 SDP. In response to our requests for further information, the Corporation have provided the most up-to-date operating expenditure requests based on the final 2009/10 SDP.

We based on draft findings on the final 2008/09 SDP figures provided and have updated our final findings, where relevant, to account for the changes made in the final 2009/10 SDP.

In general, we have not been able to make specific comments on whether the operating expenditure increases proposed by the Water Corporation could be funded out of the existing base operating expenditure. The reason for this is that the Water Corporation has been generally unable to provide details of the base operating expenditure related to the specific projects we have reviewed. The Corporation has advised that their financial systems are not set up to report on an activity basis but rather on a group or team basis. As a result, it is difficult to extract information related to specific projects. The Corporation indicates that this can be done but would be on a case-by-case basis. Depending on the proposed scope of future regulatory reviews, this issue will need to be taken into account prior to commencing such reviews.

Figure 3-1 below shows the overall change in operational expenditure over the base level as set in 2004/05.

Figure 3-1 Water Corporation Actual and Proposed LOS Expenditure by type ($000's, Real)



3.2 Major Increases in Operational Expenditure

3.2.1 ACA Gap Treatment Management Program

The proposed funding increase for this program is shown in the table below:

Program	Project	Source	Driver	2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
ACA GAP	ACA GAP Treatment Management Program	2008/09 SDP	CorpInitNPV	2,500	5,000	10,000	10,000	10,000	**37,500**
	ACA – Gap Treatment Management Program	2008/09 SDP	CorpInitNPV	2,432	2,432	2,432	2,432	2,432	**12,160**
	ACA – Gap Treatment Management Program	2009/10 SDP	CorpInitNPV	3,716	6,216	11,216	11,216	11,216	**43,580**

The Water Corporation defines the first component of this expenditure as relating to a:

"*program to address lack of planned corrective maintenance to prevent shortening of asset lives. This would prevent accelerated deterioration of asset condition, avoid premature asset replacements, prevent increase in unplanned failures and unplanned maintenance and, prevent disruption to customers. High priority assets targeted include bores and air valves.*"

The second component of expenditure relates to a:

"*centrally coordinated, regionally executed Gap Treatment Program to manage existing backlog of outstanding operational treatments. This will ensure assets will deliver required level of service and reach optimal life, prevent early life loss of assets leading to unplanned investment decisions, improve knowledge of asset performance and condition and prevent operational failures. This in turn will decrease service disruption to customers and prevent adverse publicity.*"

The Water Corporation provided detailed supporting information outlining the need for this program. In our understanding, this expenditure relates to a maintenance program based on maintaining the life of the asset to reach the predicted asset life. This is standard basic asset management planning and it is a critical component of asset management.

Expenditure for this type of work program should be part of the base operating expenditure and the fact that the Water Corporation is both asking for a lump sum amount of $37.5 million over five years and a permanent increase to the base operating expenditure of over $2.4 million per annum leads us to a number of potential assumptions:

- That the asset maintenance program has been the subject of historical cost cutting;

- That the Water Corporation has not accurately estimated their expected asset lives and as a result has not allowed sufficient expenditure for asset maintenance
- That there has been a deficiency in the risk assessment and prioritisation process for determining operating expenditure funding

While we note the issues identified above with the Water Corporation's operational planning process for this project, we accept that this is a critical project for the Water Corporation and, if not undertaken, could result in more significant funding requirements to replace assets rather than continue to maintain them.

This additional expenditure is required and is not currently able to be covered within the base operating expenditure.

Recommended Operating Expenditure Increase

Project	Source	Driver	2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
ACA – Gap Treatment Management Program	2009/10 SDP	CorpInitNPV	3,716	6,216	11,216	11,216	11,216	**43,580**
Total Expenditure Requested			3,716	6,216	11,216	11,216	11,216	**43,580**
Recommended Operating Expenditure			**3,716**	**6,216**	**11,216**	**11,216**	**11,216**	**43,580**

3.2.2 Water Mains Cleaning

The proposed funding increase for this program is shown in the table below:

Program	Project	Source	Driver	2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
Water Mains Cleaning	Water Mains Cleaning	2008/09 SDP	CorpInitNPV	3,430	4,150	5,370	6,590	6,590	**26,130**
	Water Mains Cleaning	2009/10 SDP	CorpInitNPV	1,110	1,110	1,110	1,110	1,110	**5,550**

The Water Corporation describe this program as:

"*Clean, using air scouring, the reticulation mains in the Perth Region in 6 years and thereafter clean on an eight year cycle. Initial cycle costs will incorporate funding for locating and repairing scours, hydrants, flushing points and stop taps where required. This process will result in improved drinking water quality and reduced customer complaints.*"

The supporting documentation provided by the Water Corporation outlines a request for a once-off increase in funding of $0.5 million in 2008/09 to give a total program of $1.0 million in 2008/09. The documentation indicates that previous spending at this level had resulted in a significant decline in water quality complaints. The supporting documentation appears to have been a request for a

permanent change to the base expenditure of $0.5 million per year however the request has been manually adjusted to the once off increase described above.

The Water Corporation's 2009/10 SDP updates the funding request to similar levels as those discussed in the supporting documentation. The Corporation has indicated that the base level of operating expenditure in 2004/05 for this program was about $0.1 million per annum. So the proposed increase in the funding levels brings the total expenditure for this program to $1.2 million, which is consistent with the supporting documentation.

We note that undertaking activities such as water mains cleaning by flushing where there is required wastage of water may be, in the current conditions (that is, a significant long term drought and associated restrictions on water use), considered by the community to be inappropriate. While the total volumes of water may be a fraction of the total supplied, the public perception of such activities within a period of water restrictions may be of more concern.

We recognize that water main flushing seems to be the most appropriate method of reducing water quality complaints in the Water Corporation's specific circumstances, however we would recommend that public perceptions be monitored and actions taken, if required, to demonstrate the benefits achieved from this method of mains cleaning.

At minimum, we would recommend that the Water Corporation investigate either alternative means of managing water quality complaints including source management (treatment or control), or undertaking works on the highest priority areas only, where there is a clear and immediate need, that is, a targeted response to customer complaints.

Recommended Operating Expenditure Increase

Project	Source	Driver	2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
Water Mains Cleaning	2009/10 SDP	CorpInitNPV	1,110	1,110	1,110	1,110	1,110	**5,550**
Total Expenditure Requested			1,110	1,110	1,110	1,110	1,110	**5,550**
Recommended Operating Expenditure			**1,110**	**1,110**	**1,110**	**1,110**	**1,110**	**5,550**

3.2.3 *Backflow Prevention*

The proposed funding increases for this program of works are shown in the table below:

Program	Project	Source	Driver	2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
Backflow Prevention	Backflow Prevention - Retrofit to High Risk Existing Services	2008/09 SDP	CorpInit	1,200	5,500	5,500	5,500	5,500	**23,200**
	Backflow Prevention - New Services	2008/09 SDP	NewRegn	400	600	600	600	600	**2,800**
	Backflow Prevention - Retrofit to High Risk Existing Services	2009/10 SDP	CorpInit	1,600	2,400	6,100	6,700	7,300	**24,100**

This program of works is a combination of projects described by the Water Corporation as:

"*A mandatory requirement for all new and redeveloped commercial and industrial services to have containment backflow prevention was introduced from 1 July 2007. This would provide improved levels of protection to Corporation assets and interests at a time when risk levels are known to be increasing (such as increasing levels of non-potable schemes, effluent and greywater reuse, increasing use of groundwater bores and high levels of chemical use by industry). Project would also involve retrospective fitting of backflow prevention devices on high risk properties.*"

The two key components of the project are the retrofit of devices to high risk existing services and support for the implementation of backflow devices for new services. The project documentation provided to support this program is consistent with the requested funding increase for the retrofit program. Further information supplied by the Corporation indicates that there are approximately 10,869 services to be replaced under this program including low risk services larger than 50 mm in size and high risk services larger than 25 mm in size. Estimated costs of retrofits were received from an external supplier and have been used in the determination of funding required however no specific details of unit rates have been provided.

Available data indicates that the costs of retrofitting backflow prevention could be of the order of $5,500 for a DN150 high risk unit. At this unit rate, the funding requested by the Water Corporation represents the retrofit of about,880 properties per year and over 4,300 properties over the period to 2012/13.

We note that the requirement to do this work is a relatively new regulatory requirement having come into force on 1 July 2007. We suggest, however, that there may be some flexibility in the retrofit program given that there was originally a two year delay between the requirement coming into force and the first works commencing. The 2009/10 SDP updated funding request assumes a lead in period with the majority of expenditure not commencing until 2010/11. In addition, the regulatory requirement appears to relate more to new services rather than existing services.

Despite the issues we identified above, we recommend that the funding request be granted given the importance of the program to managing risks to water quality.

Project	Source	Driver	2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
Backflow Prevention - Retrofit to High Risk Existing Services	2009/10 SDP	CorpInit	1,600	2,400	6,100	6,700	7,300	**24,100**
Total Expenditure Requested			1,600	2,400	6,100	6,700	7,300	**24,100**
Recommended Operating Expenditure			**1,600**	**2,400**	**6,100**	**6,700**	**7,300**	**24,100**

3.2.4 Overflow Risk Management (WORM)

The proposed funding request for this program is shown in the table below:

Program	Project	Source	Driver	2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
Overflow Risk Management	Overflow Risk Management Project (WORM)	2008/09 SDP	NewRegn	1,999	2,655	3,174	3,478	3,565	**14,871**
	Overflow Risk Management Project (WORM)	2009/10 SDP	NewRegn	1,999	2,131	2,151	2,151	2,151	**10,583**

Supporting documentation provided outlines a request for funding covering one (1) additional full time equivalent at the rate of $0.13 million per annum for four years from 2008/09 to 2011/12. The documentation also indicates that funding for a communications strategy of around $0.2 million may be required however this doesn't appear on the request for funding. The supporting documentation further states that all other operational funding will be covered within existing operational or initiatives budgets.

Additional information supplied by the Water Corporation did not provide any more specific information on the proposed funding, however a basic breakdown of costs for the 2006/07 financial year was provided. This breakdown identified the components of expenditure as shown in the following table:

Budget Submission	$000s
Labour	110
Materials	277
Plant & Equipment	362
Alliance Contractors	228
I.T.	103
Infrastructure Maintenance	863
Total	**1,943**

This is similar to the level of funding included in 2008/09 and we note that the increase in funding from 2008/09 to 2009/10 represents about $0.13 million. This increase is similar to the increase justified in the supporting documentation and we have assumed, therefore, that the commencement of the additional FTE requested in the original supporting action brief has been delayed until 2009/10.

The Corporation has provided additional information on the maintenance component of the operating expenditure. No further supporting information on the other components of the operating expenditure has been provided and these remaining components form a significant proportion (56 per cent) of the expenditure.

While we have some concerns over the level of information provided to justify the operating expenditure for this program, we note that the program is important to meet regulatory requirements and reduce potential impacts to the public and the environment. We also note that this expenditure has already been spent and that the program of capital works to which it relates has been stopped. We therefore recommend that the additional funding requests be allowed.

Project	Source	Driver	2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
Overflow Risk Management Project (WORM)	2009/10 SDP	NewRegn	1,999	2,131	2,151	2,151	2,151	**10,583**
Total Expenditure Requested			1,999	2,131	2,151	2,151	2,151	**10,583**
Recommended Operating Expenditure			**1,999**	**2,131**	**2,151**	**2,151**	**2,151**	**10,583**

3.2.5 Sustainability Strategy

The proposed funding request for this program is shown in the table below:

Program	Project	Source	Driver	2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
Sustainability Strategy	Sustainability Strategy	2008/09 SDP	CorpInitNPV	1,390	2,080	2,700	3,330	3,330	**12,830**
	Leadership in Sustainability - Implementation Program	2008/09 SDP	CorpInitNPV	424	452	301	304	280	**1,761**

	Sustainability Strategy	2009/10 SDP	CorpInitNPV	424	452	301	304	280	**1,761**

This program of works is a combination of projects described by the Water Corporation as:

"*Build organisation's capacity for sustainability. Phase 1 of the strategy involved conducting gap analysis. Subsequently 17 programs were developed to address identified gaps of the organisation. These programs focussed on process change, organisational education and awareness, business principles for decision making and responding to compelling sustainability issues such as climate change.*"

The project documentation provided to support this funding request provides background to the development of the Sustainability Strategy. It describes the outcomes of Phase 1 of the strategy (already completed) and identifies the general requirements of Phase 2, which we presume is the subject of this additional funding.

The documentation outlines funding requirements for a total of approximately $3.7 million over the period from 2008/09 to 2012/13. However there is no justification or explanation for the total funding listed in the table above of $12.8 million.

The required $3.7 million in funding covers the employment of three additional full time equivalents to assist in the implementation of the Sustainability Strategy. There is no additional evidence provided to support expenditure for consultancy time or significant materials costs.

We note that the Water Corporation has revised its funding request in the 2009/10 SDP to cover only the smaller of the two original funding requests, that is, the $1.7 million. No explanation has been provided as to why the funding requested has been decreased. A breakdown of the funding request for 2009/10 indicates that it is made up of $0.23 million for labour and $0.22 for consultants costs.

We support the updated 2009/10 SDP funding request and recommend it be allowed.

Project	Source	Driver	2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
Sustainability Strategy	2009/10 SDP	CorpInitNPV	424	452	301	304	280	**1,761**
Total Expenditure Requested			424	452	301	304	280	**1,761**
Recommended Operating Expenditure			**424**	**452**	**301**	**304**	**280**	**1,761**

3.2.6 *Water Cycle Strategy*

The proposed funding request for this program is shown in the table below:

Program	Project	Source	Driver	2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
Water Cycle Strategy	Water Cycle Strategy	2008/09 SDP	CorpInitNPV	2,259	2,259	2,259	2,259	2,259	11,295
	Water Cycle Strategy	2009/10 SDP	CorpInitNPV	2,259	2,259	2,259	2,259	2,259	11,295

The Water Corporation defines this expenditure as relating to works to:

"*Carry out actions to deliver State Water Strategy objectives including development and implementation of strategies for water efficiency, water recycling, water cycle management and water education. Benefits include reduction in water source development, increase state capital available for alternative allocation, greater understanding and support within the community of the drying climate and the need for sustainable water use, enhanced environmental water provision and reduced demand on limited water resources.*"

The original project documentation provided by the Water Corporation outlines a specific funding request for $0.6 million in funding as two once off increases to the base operating expenditure; $0.3 million in 2008/09 and $0.3 million in 2009/10. The Corporation has clarified that this supporting information relates to specific initiatives for which the Water Efficiency Branch have applied for funding, over and above the base funding required to operate the group.

Further information supplied by the Corporation indicates a funding request which relates to the requirement to permanently fund a group that has been in operation since around 2005/2006. It is understood, however, that the staff required to form this group were consolidated from within existing groups. This is generally supported by the October 2006 Action Brief provided as supporting information for this new branch with the response that the project would be delivered using existing resources and the lack of permanent FTEs identified.

The use of existing resources does not impose any new costs on the Corporation merely the transfer of costs between groups. No evidence has been provided that demonstrates the vacancies left by the transfer of staff have been filled with new employees.

The Corporation provided additional information supporting the base costs for the group including the following breakdown of the requested funding levels:

Budget Item	Actual Costs 2008/09 $'000
Labour Costs	1,109.8
Materials	15.0
Vehicle, Plant & Equipment	5.9
Information Technology	4.5
Property Expenses	39.1
Infrastructure Maintenance	65.4
Consultancy	378.1
Corporate Charges	53.4
Employee Expenses	73.8
Internal Services	630.2
TOTAL	**2,375.1**

While the actual costs for 2008/09 are generally consistent with the funding requested, as stated previously, the supporting information provided indicates that these are not new costs; they are existing costs reallocated to this new branch. We have not received any supporting information indicating that this funding request relates to new expenditure which is not already included in the base operating expenditure. As such, we recommend that this funding request not be included in the operating expenditure.

Our recommended expenditure is shown in the table below.

Project	Source	Driver	2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
Water Cycle Strategy	2009/10 SDP	CorpInitNPV	2,259	2,259	2,259	2,259	2,259	**11,295**
Total Expenditure Requested			2,259	2,259	2,259	2,259	2,259	**11,295**
Recommended Operating Expenditure			**300**	**300**	**0**	**0**	**0**	**600**

3.2.7 WP WD – TM & Nicholson Road PS

The proposed funding request for this program is shown in the table below:

Program	Project	Source	Driver	2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
Water Cycle Strategy	WP WD - TM & Nicholson Rd PS	2008/09 SDP	PSDP	1,900	1,900	1,900	1,900	1,948	9,548
	WP WD - TM & Nicholson Rd PS	2009/10 SDP	PSDP	1,900	1,900	1,900	1,900	1,900	9,500

The Water Corporation defines this expenditure as relating to works to:

"*Carry out actions to deliver State Water Strategy objectives including development and implementation of strategies for water efficiency, water recycling, water cycle management and water education. Benefits include reduction in water source development, increase state capital available for alternative allocation, greater understanding and support within the community of the drying*

climate and the need for sustainable water use, enhanced environmental water provision and reduced demand on limited water resources."

The Water Corporation provided supporting documentation for this project which consists of a Financial Impact Statement showing the breakdown of operating expenditure, for the period from 2003/04 to 2009/10. The breakdown of operating expenditure identifies that approximately 81 per cent of the operating expenditure required is related to the energy supply to the pump station. The other components of the operating expenditure relate to maintenance of the trunk main, the pump station, and major components and other asset maintenance.

The additional funding is a result of a new capital project so it is a new expenditure requirement that is currently covered within the existing based operating expenditure. We have not been able to review the base expenditure for general trunk main maintenance or pump station maintenance, for example, and as such we are unable to determine if the additional maintenance requirements can be undertaken within the existing base expenditure.

We recommend that the additional expenditure associated with this project be allowed as a permanent increase to the base operating expenditure. We note that the Water Corporation has made a slight adjustment to the funding request in the 2009/10 SDP removing the additional $0.05 million in 2012/13.

Project	Source	Driver	2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
WP WD - TM & Nicholson Rd PS	2009/10 SDP	PSDP	1,900	1,900	1,900	1,900	1,900	**9,500**
Total Expenditure Requested			1,900	1,900	1,900	1,900	1,900	**9,500**
Recommended Operating Expenditure			**1,900**	**1,900**	**1,900**	**1,900**	1,900	**9,500**

3.2.8 NFIS Woodman Point Odour Control Stage 1 & 2

The proposed funding increases for this complete program of works are shown in the table below.

This program of works is a combination of projects described by the Water Corporation as:

"*The Woodman Pt WWTP is designed to treat 160 ML/d. The current wastewater flow at the plant is 120 ML/d. The hydraulic capacity of the plant is anticipated to reach 160 ML/d by 2016 and the catchment growth rate is 3 per cent pa. Recent monitoring and odour modelling has indicated that the existing facilities are not achieving the required odour levels at the buffer boundary. Odour control is a requirement of the DoE operating license. The odour control stage 1 upgrade works target the plant's inlet, primary, secondary, sludge management and tanker receival facilities to improve the extraction, cleaning and discharge of odorous gases. The three staged*

odour control program of works will confine the treatment plants odour impacts to within the plant's existing buffer zone."

Program	Project	Source	Driver	2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
Backflow Prevention	NFIS Woodman Pt Odour Ctl Stg 1 &2	Revised (May 2009)	Govt	1,749	2,414	2,476	2,476	2,476	**11,591**
	AFIS Woodman Pt WWTP Odour Control 1	Revised (May 2009)	Govt	-	668	1,403	1,403	1,438	**4,912**
	NFIS Woodman Pt Odour Ctl Stg 1&2	Revised (May 2009)	Govt	130	130	130	130	130	**650**
	Sub Total			**1,879**	**3,212**	**4,009**	**4,009**	**4,044**	**17,153**
	NFIS Woodman Pt Odour Ctl Stg 1 &2	2009/10 SDP	Govt	1,879	2,544	2,606	2,606	2,606	**12,241**

The project documentation provided by the Water Corporation to support the proposed increases in operating expenditure consisted of a Financial Impact Statement showing the breakdown of operating expenditure for the period from 2007/08 to 2012/13, asset listing and depreciation reports, asset valuations and a project / appropriation request summary report. However, the latter three supporting documents provided by the Corporation do not appear to relate specifically to the operating expenditure in the Financial Impact Statement.

The Financial Impact Statement provides a breakdown of the components of operating expenditure showing costs for materials, IT & telecom, property expenses, alliance maintenance, consultants, energy, chemicals, media replacement, testing and optimisation, component replacement, decommissioning and crane hire. The three largest components of the total operating expenditure are chemicals (55 per cent), energy (23 per cent) and alliance maintenance (15 per cent).

The component of operating expenditure allocated to alliance maintenance appears to be at the high end of the range of 12-15 per cent, which is based on our experience in reviewing other alliance contracts in Victoria. It is also unknown what this payment represents, for example, reward or retainer payments to the contractor, or Water Corporation staff time to manage the alliance (the quantum of expenditure requested suggests this would be 3-4 full time staff). Further information on this component would clearly identify the basis for this expenditure.

The total operating expenditure outlined in this supporting documentation is:

Financial Impact Statement	2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)

Operating Expenditure	1,879	2,415	2,621	2,686	2,753	**12,354**

The total operating expenditure from the Financial Impact Statement, as shown in the table above, is significantly different from the funding request in the 2008/09 SDP which totalled over $17 million. The Water Corporation provided updated funding request from the 2009/10 SDP indicating a total of just over $12.2 million. This funding request is consistent with the supporting documentation provided.

We recommend operating expenditure as per the requested funds in the 2009/10 SDP as shown in the table below.

Project	Source	Driver	2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
Woodman Pt Odour Ctl Stg 1 &2 (Total Program)	2009/10 SDP	Govt	1,879	2,544	2,606	2,606	2,606	**12,241**
Total Expenditure Requested			1,879	2,544	2,606	2,606	2,606	**12,241**
Recommended Operating Expenditure			**1,879**	**2,544**	**2,606**	**2,606**	**2,606**	**12,241**

3.2.9 NFIS Pump Station Desal – Sludge Treatment and Operations

The proposed funding request for this program is shown in the table below:

Program	Project	Source	Driver	2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
Desalination Plant	NFIS PS Desal: Sludge Treat & Ops	2008/09 SDP	PSDP	1,490	1,490	1,490	1,490	1,527	**7,487**
	NFIS PS Desal: Sludge Treat & Ops	2009/10	PSDP	1,490	1,490	1,490	1,490	1,490	**7,450**

The supporting documentation provided by the Water Corporation includes a Notional Financial Impact Statement and some further breakdowns of the operating expenditure included in the statement including a Direct Opex Estimate prepared by the desalination plant alliance. The project documentation is generally consistent with the requested operating expenditure shown in the table above.

A number of additional changes were made to the original supporting documents including a doubling of costs associated with sludge thickening. Water Corporation has provided supporting information detailing the required increase in sludge thickening costs.

There is also an increase of approximately 2.5 per cent in 2012/13 which is outside the period covered by the Financial Impact Statement. We assume, however, that this increase is merely an inflationary increase.

The proposed operating expenditure is related to significant new capital works and as such would not generally be covered within the base operating expenditure.

The recommended operating expenditure for this project is shown in the table following. We note that the funding requested in the 2009/10 SDP is a minor update on the previously provided information, removing the additional $0.04 million from 2012/13.

Project	Source	Driver	2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
NFIS PS Desal: Sludge Treat & Ops	2009/10 SDP	PSDP	1,490	1,490	1,490	1,490	1,490	**7,450**
Total Expenditure Requested			1,490	1,490	1,490	1,490	1,490	**7,450**
Recommended Operating Expenditure			**1,490**	**1,490**	**1,490**	**1,490**	**1,490**	**7,450**

3.2.10 Provision for Capital Expensing

The proposed funding increase for this program is shown in the table below:

Program	Project	Source	Driver	2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
Provision for Capital Expensing	Provision for capital project expensing.	Revised (May 2009)	Capex	3,625	3,776	3,685	3,377	3,000	**17,463**
	Provision for capital project expensing.	2009/10 SDP	Capex	3,000	3,000	3,000	3,000	3,000	**15,000**

This allowance is a general provision created to allow for expensing of capital projects that are not completed through to the creation of an asset. The projects are expensed due to:

- A decision being made not to proceed with the project;
- Accounting requirement to expense projects relating to early stage definition works where there is reasonable doubt as to whether the project may proceed;
- Capital funds relating to service standard documentation and protocols, that are more appropriately treated as operating expenses; or
- Expenses identified as being more appropriately classified as repairs and maintenance.

The supporting documentation provided included an Action Brief and a breakdown of historical capital project expensing levels. The documentation details a requested funding level of $3 million in 2008/09 reducing to $2 million in 2009/10 and $1 million in 2010/11 and 2012/13 (a total of $8 million). It is noted however that the documentation describes these funding levels as "a highly speculative guess" based on a tightening of the capital systems and better identification of projects.

Funding levels listed in the 2009/10 SDP provided by the Corporation are more conservative at approximately $3 million per annum.

We would expect that the provisions allowed for capital expensing should be decreasing over time. We assessed the Corporation's capital planning process and found them to be robust and if properly implemented then they should not result in a high number of capital projects that are not subsequently completed.

Comments provided by the Corporation stated that the basis for the cost estimates included in the Action Brief was a "highly speculative guess" however this is the supporting information provided by the Corporation to justify the level of expenditure requested. The supporting information is a formal Action Brief and as such we have given the information provided the same level of importance as any other Action Brief. If the funding request was based on a "highly speculative guess" that the Corporation gives no credence, then perhaps it should not have been used in the Action Brief.

The proposed funding levels justified in the supporting documentation should be sufficient to manage any one-off projects if sufficient rigour is applied to the normal capital program. If a significant number of one-off projects are expected throughout the upcoming five year period, this does not give a good impression of the rigour of implementation of the Corporation's capital planning processes.

We recommend that a total allowance of $8 million over the five year period, as per the supporting documentation provided, be included in the operating expenditure.

Recommended Operating Expenditure Increase

Project	Source	Driver	2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
Provision for Capital Expensing	2009/10 SDP	CorpInitNPV	3,000	3,000	3,000	3,000	3,000	**15,000**
Total Expenditure Requested			3,000	3,000	3,000	3,000	3,000	**15,000**
Recommended Operating Expenditure			**3,000**	**2,000**	**1,000**	**1,000**	**1,000**	**8,000**

3.2.11 Fatigue Management

The proposed funding increase for this project is shown in the table below.

Program	Project	Source	Driver	2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
Fatigue Management	Fatigue Management	2008/09 SDP	NewRegn	1,400	1,400	1,400	1,400	1,400	**7,000**
	Fatigue Management	2008/09 SDP	NewRegn	65	-	-	-	-	**65**
	Fatigue Management	2009/10 SDP	NewRegn	1,465	4,550	1,400	1,400	1,400	**10,215**

The Water Corporation defines this program as follows. "*Fatigue management associated with extended working hours for the Perth Metro Operational Alliances. This issue surfaced when Worksafe published a Working Hours Code of Practice in May 2006. The Code of Practice provides guidance in assessing the risk posed by working excessive hours. The exact resource impacts of implementing a process that attempts to manage down the risks and meet our regulatory requirements is somewhat undecided. The initial approach is to try and minimise the impact of putting in place a layer of resources to control the workflow to field staff. The Corporation is responsible for delivering a 24 x 7 service under the conditions of its operating license. The proposed solution is to move to a shift pattern that provides the resources to respond to faults and emergency work 24 x 7.*"

This program of work is designed to ensure that the Water Corporation and its contractors comply with a WorkSafe Code of Practice released in May 2006 relating to the risk posed by working excessive hours. The program is aimed to move the Corporation to a system of work that provides the ability to limit working hours and ensures compliance with the duty of care obligations to employees.

The Corporation provided supporting documentation for this program consisting of an Action Brief and slideshow presentation on the project. The Action Brief outlines a request for funding of $1.4 million in 2008/09 which includes an additional six permanent FTEs. The original supporting documentation provided also stated that "*It is envisaged that the costs of any change to working practices will be, for the most part, offset by savings in after hours costs*". This implies that no further funding of this program is required beyond the requested one-off increase of $1.4 million.

Our calculations, based on the Corporation's standard FTE cost of $75,000 per annum, indicates that the ongoing labour cost would be approximately $0.45 million. No further breakdown of the additional $1.0 million requested was initially provided nor was any information provided indicating that this funding request is required beyond 2008/09.

The Corporation subsequently provided a breakdown of actual costs showing that $1.4 million was split equally between the two maintenance alliance partners. Details were provided on the $0.7 million budgeted for one of the alliance partners and this indicated that the majority of costs were related to the engagement of a project manager with the remaining costs allocated to new supervisors, increases in payments to existing staff and payments for staff vehicles.

The Water Corporation has provided details of the breakdown of two one-off programs, a request from the Water Technologies Division for about $1.2 million and a request for the CSD Country Regions for $2.0 million. The funding for these programs are one-off requests for 2009/10. The documentation indicates that the precise allocation of funds to new staff, materials or changes to practices is as yet unclear.

The requested funding in the 2009/10 SDP now generally reflects the figures provided in the most recent supporting documentation, however it is likely that additional funding will be required to continue the one-off programs discussed above. The Corporation has indicated that an Operating Business Case submission will be made in 2009/10 to support such an extension of funding.

Our recommended operating expenditure is shown in the table below however it does not include the potential extension of funding described above.

Recommended Operating Expenditure Increase

Project	Source	Driver	2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
Fatigue Management	2009/10 SDP	NewRegn	1,465	4,550	1,400	1,400	1,400	**10,215**
Total Expenditure Requested			1,465	4,550	1,400	1,400	1,400	**10,215**
Recommended Operating Expenditure			**1,465**	**4,550**	**1,400**	**1,400**	**1,400**	**10,215**

3.2.12 Compliance (Welder Observation)

The proposed funding request for this program is shown in the table below:

Program	Project	Source	Driver	2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
Compliance Welder Observation & Ocean Outlet Monitoring	Compliance	2008/09 SDP	NewRegn	2,127	2,238	2,353	2,475	2,537	**11,730**
	Compliance	2009/10 SDP	CorpInitNPV	2,127	2,238	2,353	2,475	2,475	**11,668**

The supporting documentation provided for these two programs included two Action Briefs and a memorandum.

The documentation for the welder observation program detailed a funding request for six FTEs including two full time staff and eight part time staff to act as observers for field welding works. These observers were required to comply with new Occupational Safety and Health regulations. The estimated cost for the additional FTEs was identified, in the Action Brief, as $0.39 million per annum.

Water Corporation provided additional supporting documentation outlining the requirement for a total of 11 full time equivalent staff including seven full time and 8 part time staff. The total estimated cost of these new staff is $0.72 million. This estimate is based on an average FTE cost of around $65,000 per annum. This appears to be quite a high cost for staff that are probably going to be at apprentice level. A salary range of around $15,000 – $25,000 per annum would be a general range for an apprentice in the building industry which, with on-costs of around 50 per cent, would give a maximum cost of around $38,000 per annum. Applying this figure to the total of 11 FTEs gives a likely funding requirement of about $0.42 million.

The documentation for the ocean outlet monitoring program detailed funding requests for three sub-programs. The funding was to cover the costs of consultants to undertake monitoring required due to changes in operating licence requirements. The estimated cost for the consultants over the three programs was $0.54 million per annum.

The total funding requests identified from the original supporting documentation amount to $0.93 million per annum. Water Corporation's additional supporting information indicates an updated total yearly funding requirement of almost $1.2 million. No further documentation has been provided to support the remaining average $1.1 million yearly funding requirement over the five year period. In addition, we have identified costs associated with the welder observation program that appeared to be too high and we have recommended a reduction in operating expenditure.

In the absence of any supporting information, we recommend that the proposed operating expenditure be set at the level supported by the documentation provided by the Water Corporation. This is shown in the table below.

Recommended Operating Expenditure Increase

Project	Source	Driver	2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
Compliance	2009/10 SDP	CorpInitNPV	2,127	2,238	2,353	2,475	2,475	**11,668**
Total Expenditure Requested			2,127	2,238	2,353	2,475	2,475	**11,668**
Recommended Operating Expenditure			**960**	**960**	**960**	**960**	**960**	**4,800**

3.2.13 *Bridgetown Regional Water Supply Scheme*

The proposed funding increase for this project is shown in the table below.

Program	Project	Source	Driver	2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
Bridgetown Regional Water Supply Scheme	Bridgetown Regional Water Source	2008/09 SDP	Capex	61	3,797	3,797	3,797	3,892	**15,344**
	Bridgetown Regional Water Source	2009/10 SDP		61	96	96	96	96	**445**

The Water Corporation identify this expenditure as a "*climate change response - restoring the security of supply*".

The Corporation provided supporting documentation for this project in the form of an Implementation Business Case dated August 2008. Our review of this document, however, indicated that it was incomplete with a number of sections missing. In addition there was no information on proposed operating expenditure requirements in the document apart from a reference to a Financial Impact Statement which was not included in the documentation provided.

The Corporation has provided an updated funding request as part of the 2009/10 SDP and this funding represents a significant decrease in the requested expenditure. The Corporation indicated that the revised estimates reflect the operating costs of the Nannup transfer Main project and are predominantly pumping costs.

In the absence of any further information, we accept the Corporation's revised funding request and recommend the following operating expenditure.

Project	Source	Driver	2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
Bridgetown Regional Water Source	2009/10 SDP	Capex	61	96	96	96	96	**445**
Total Expenditure Requested			61	96	96	96	96	**445**
Recommended Operating Expenditure			**61**	**96**	**96**	**96**	**96**	**445**

3.2.14 *Disposal of Surplus Assets*

The proposed increase in funding for this program is shown in the table below.

Program	Project	Source	Driver	2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
Disposal of Surplus Assets	Disposal of Surplus Assets	2008/09 SDP	Capex	2,144	2,144	2,144	2,144	2,144	**10,720**
	Disposal of Surplus Assets	2009/10 SDP		2,144	0	0	0	0	**2,144**

The Water Corporation define this project as follows. "*Comprehensive disposal program spanning 8 years to progressively dispose of 530 surplus assets that ensures the Corporation reduces its exposure to ongoing environmental, OSH, heritage and public liability risks. These are assets that have reached the end of their economic lives or have become redundant due to other reasons.*"

The Corporation provided supporting documentation for this program in the form of an Action Brief. This document provided a breakdown of the individual assets to be decommissioned and disposed of each year and the expected costs of doing so. The expected costs are consistent with the funding requests identified above.

Further information provided by the Corporation, however, indicates that the funding request for 2008/09 was the only funding categorised as a Level of Service initiative. The Corporation indicated that the funding for each year of the program would be assessed on a case-by-case basis to determine if it fits the Level of Service criteria. It is potentially likely that further funding will be required for this program, however we have not included it in our recommendations.

Our recommended expenditure is outlined in the following table.

Project	Source	Driver	2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
Disposal of Surplus Assets	2009/10 SDP	Capex	2,144	0	0	0	0	**2,144**
Total Expenditure Requested			2,144	0	0	0	0	**2,144**
Recommended Operating Expenditure			**2,144**	**0**	**0**	**0**	**0**	**2,144**

3.2.15 Water Efficiency Program

The proposed funding for this program is shown in the table below, which includes an updated project estimate.

Program	Project	Source	Driver	2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
Water Efficiency Program	Water Sensitive Cities	2009/10 SDP	Capex	-	-	3,000	7,000	13,000	**23,000**
	Water Efficiency Program	2009 Current project estimates		-	-	3,000	4,000	6,000	**13,000**

The Water Corporation describe this as a program designed to save 50 gigalitres over the next 20 years complementing proposed source augmentation projects of 70-100 gigalitres in order to meet the projected supply-demand gap of 120-150 gigalitres by 2030. The Corporation outline that there are five major components to the program:

1. "*Engagement - Waterwise programs, schools program, community education, behavioural change programs, mass media and marketing.*

2. *Regulation - Compliance with current permanent water efficiency measures including the 2 day a week sprinkler roster system. Use of temporary water efficiency measures including the current trial winter sprinkler ban. Influencing national regulation and codes including WELs and Smart Water Mark and state regulation including strategic land planning to support increased urban density and Building Codes to reduce water use in commercial developments.*
3. *Incentives - managing state based programs such as Waterwise Rebates and retrofitting water efficient appliances in commercial, industrial, institutional and residential premises.*
4. *Management - This includes investment in accurate master and customer metering, leak detection and response, own use in wastewater treatment plants and pressure management to reduce system water losses.*
5. *Information - Ongoing reporting on key performance indicators to assess actual water use in residential, non residential and non-revenue sectors. It also includes the evaluation of projects completed to ascertain actual savings and their cost effectiveness, measuring customer leakage and the development of end use models to support integrated resource planning and the development of targeted water efficiency projects.*"

The program is expected to save up to $1.1 billion in avoided capital costs in the water supply system for a total investment of around $110 million over the next 20 years.

Water Corporation provided a number of sources of information relating to this program including an Additional Funding Request, a number of emails from the Manager Water Policy, a supporting consultants report prepared in June 2005 and an updated draft paper on the program.

The key supporting document, a consultants report reviewing water efficiency programs in Western Australia, recommends a program of measures be put in place to improve water efficiency at a present value cost of $280 million (including costs to Water Corporation, the State Government and the customers).

Water Corporation has re-estimated the investment required only by the Corporation and has reduced the targeted water savings to 50 gigalitres for a present value cost of $110 million or around $8 million per annum. Water Corporation has further identified 15 gigalitres of the total water savings that can be achieved with no investment required.

This review of the program resulted in a revised target of 35 gigalitres however the expected funding requirements have not been equally adjusted to reflect the revised lower target. Given a 30 per cent reduction in the savings target, we would expect an equivalent reduction in the requested funding, that is, a reduction from $8 million per annum to around $5.5 million per annum. The level of funding requested over the period from 2008/09 to 2012/13 is relatively consistent with

the expected total of $5.5 million per annum however we note that the requested funding increases to $8 million in 2013/14. In our opinion, this higher level is inconsistent with the information provided.

The supporting information provided makes reference to a number of existing programs the Water Corporation had in place prior to this program; however it is currently unclear whether these programs are being rolled into the new Water Efficiency Program and as such whether there is already allowance in the base operating expenditure for such programs. Confirmation of this is being sought from Water Corporation.

While there is little detail at present on the exact nature of measures to be included in this Water Efficiency Program, Water Corporation has stated that a full program business case is being prepared and has indicated that consultants have recently been engaged to prepare this business case.

Our recommended operating expenditure is presented in the table below

Project	Source	Driver	2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
Water Efficiency Program	Current Project Estimates	Capex	-	-	3,000	4,000	6,000	**13,000**
Total Expenditure Requested			-	-	3,000	4,000	6,000	**13,000**
Recommended Operating Expenditure			**-**	**-**	**3,000**	**4,000**	**6,000**	**13,000**

3.2.16 *Summary of recommendations*

Our analysis of the major operating expenditure increases has resulted in a number of proposed adjustments, which are presented in Table 3-2 following.

Table 3-2 Recommended Operating Expenditure for Major Operating Expenditure Increases

Project		2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
ACA GAP Treatment Management Program	Total Expenditure Requested	3,716	6,216	11,216	11,216	11,216	43,580
	Recommended Operating Expenditure	**3,716**	**6,216**	**11,216**	**11,216**	**11,216**	**43,580**
Water mains cleaning	Total Expenditure Requested	1,110	1,110	1,110	1,110	1,110	5,550
	Recommended Operating Expenditure	**1,110**	**1,110**	**1,110**	**1,110**	**1,110**	**5,550**
Backflow Prevention	Total Expenditure Requested	1,600	2,400	6,100	6,700	7,300	24,100
	Recommended Operating Expenditure	**1,600**	**2,400**	**6,100**	**6,700**	**7,300**	**24,100**

Overflow Risk Management Project (WORM)	Total Expenditure Requested	1,999	2,131	2,151	2,151	2,151	10,583
	Recommended Operating Expenditure	**1,999**	**2,131**	**2,151**	**2,151**	**2,151**	**10,583**
Sustainability Strategy	Total Expenditure Requested	424	452	301	304	280	1,761
	Recommended Operating Expenditure	**424**	**452**	**301**	**304**	**280**	**1,761**
Water Cycle Strategy	Total Expenditure Requested	2,259	2,259	2,259	2,259	2,259	11,295
	Recommended Operating Expenditure	**-**	**-**	**-**	**-**	**-**	**-**
WP WD - TM & Nicholson Rd PS	Total Expenditure Requested	1,900	1,900	1,900	1,900	1,900	9,500
	Recommended Operating Expenditure	**1,900**	**1,900**	**1,900**	**1,900**	**1,900**	**9,500**
NFIS Woodman Pt Odour Ctl Stg 1 &2	Total Expenditure Requested	1,879	2,544	2,606	2,606	2,606	12,241
	Recommended Operating Expenditure	**1,879**	**2,544**	**2,606**	**2,606**	**2,606**	**12,241**
NFIS PS Desal: Sludge Treat & Ops	Total Expenditure Requested	1,490	1,490	1,490	1,490	1,490	7,450
	Recommended Operating Expenditure	**1,490**	**1,490**	**1,490**	**1,490**	**1,490**	**7,450**
Provision for Capital Expensing	Total Expenditure Requested	3,000	3,000	3,000	3,000	3,000	15,000
	Recommended Operating Expenditure	**3,000**	**2,000**	**1,000**	**1,000**	**1,000**	**8,000**
Fatigue Management	Total Expenditure Requested	1,465	4,550	1,400	1,400	1,400	10,215
	Recommended Operating Expenditure	**1,465**	**4,550**	**1,400**	**1,400**	**1,400**	**10,215**
Compliance (Welder Observation & Ocean Outlet Monitoring)	Total Expenditure Requested	2,127	2,238	2,353	2,475	2,475	11,668
	Recommended Operating Expenditure	**960**	**960**	**960**	**960**	**960**	**4,800**
Bridgetown Regional Water Source	Total Expenditure Requested	61	96	96	96	96	445
	Recommended Operating Expenditure	**61**	**96**	**96**	**96**	**96**	**445**
Disposal of Surplus Assets	Total Expenditure Requested	2,144	-	-	-	-	2,144
	Recommended Operating Expenditure	**2,144**	**-**	**-**	**-**	**-**	**2,144**
Water Efficiency Program	Total Expenditure Requested	-	-	3,000	4,000	6,000	13,000
	Recommended Operating Expenditure	**-**	**-**	**3,000**	**4,000**	**6,000**	**13,000**
TOTAL	**Total Expenditure Requested**	**25,174**	**30,386**	**38,982**	**40,707**	**43,283**	**178,532**
	Recommended Operating Expenditure	**21,748**	**25,849**	**33,330**	**34,933**	**37,509**	**153,969**
	Reduction in Operating Expenditure	**-3,426**	**-4,537**	**-5,652**	**-5,774**	**-5,774**	**-25,163**

3.3 Other Operating Expenditure Increases

3.3.1 *Review of other projects*

We have reviewed a number of projects where additional operating expenditure, over and above the base operating expenditure, was requested. In our review, we assessed the increases in expenditure by reviewing supporting documentation provided by the Water Corporation. However there are a number of other projects, where supporting information was not provided. We have briefly reviewed these projects on the basis of the very limited information provided. We have also used information previously supplied to us in a previous review, that is, the 2007/08 Strategic Development Plan (SDP) operating expenditure estimates. We compared the operating expenditure requested at the time of the 2007/08 SDP submission with the currently requested operating expenditure, for the same period, but updated as at May 2009.

Our brief project analysis is presented in the following points.

- Collie River Diversion – the requested operating expenditure for this project is $15 million. The Water Corporation describe this project as follows. "*The salinity in the Wellington Dam has increased steadily over the past 40 years. Agricultural clearing, subsequent rising groundwater tables and salinity within the Collie Catchment have caused this. Due to the salinity of the water in the dam it has become marginal for irrigation use in the Collie Irrigation District. This project is jointly funded by the federal and state governments as part of the National Action Plan for water ($15m each). The purpose of the project is to improve the water quality in Wellington Dam to enable its use within the Collie irrigation district and as a possible potable water source.*" It is unclear what the total cost of the project is and whether it is fully funded by the State and Federal contributions. It is noted that this project is listed as a Government Community Service Obligation.
- Costs offset by additional revenue – the additional expenditure requested for this project is $2.6 million which is a significant reduction in the expenditure request of $21.8 million in the 2007/08 SDP. We note that this expenditure is categorised as non-regulatory in nature.
- Harvey Water Trade – Harvey Water is a co-operative of irrigators in three irrigation districts in the State's southwest. Harvey Water and the Water Corporation agreed to a water trade where the Corporation paid $72 million over three years in return for a progressive transfer of 17.1GL of water entitlement. Harvey Water is using the $72 million to fund the piping of irrigation channels. Farmers will get the benefit of a pressurised water supply that will allow further operating and water efficiency gains. The additional 17.1 GL will improve supply security, as part of the Corporation climate response initiatives. The annual $2.1 million identified in the operating schedules for the Harvey Water Trade represents the operating cost of delivering water from the trade, made up of pumping and treatment costs

averaging approximately 12c/kL. The 17.1 GL trade included 5 GL from the Logue Brook Dam. As part of the recent state election, the Government made a commitment to reopen the dam for recreational use, thus preventing its use. This 5 GL is therefore currently stranded. The Corporation is in negotiation with Harvey Water to determine whether additional trading is possible.

3.3.2 Summary of recommendations

Our analysis of a number of additional operating expenditure increases has resulted in a number of recommendations to adjust the requested operating expenditure. Our proposed adjustments are summarised in Table 3-3 following.

Table 3-3 Recommended Operating Expenditure for Other Operating Expenditure Increases

Project	Operating Expenditure	2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
Collie River Diversion	Total Expenditure Requested	0	6,600	8,400	-	-	**15,000**
	Recommended Operating Expenditure	**0**	**6,600**	**8,400**	**-**	**-**	**15,000**
Costs offset by additional revenue	Total Expenditure Requested	0	0	0	0	0	**0**
	Recommended Operating Expenditure	**0**	**0**	**0**	**0**	**0**	**0**
Harvey Water Trade	Total Expenditure Requested	2,156	2,210	2,265	2,394	2,394	**11,419**
	Recommended Operating Expenditure	**2,156**	**2,210**	**2,265**	**2,394**	**2,394**	**11,419**
TOTAL	**Total Expenditure Requested**	**2,156**	**8,810**	**10,665**	**2,394**	**2,394**	**26,419**
	Recommended Operating Expenditure	**2,156**	**8,810**	**10,665**	**2,394**	**2,394**	**26,419**
	Reduction in Operating Expenditure	**0**	**0**	**0**	**0**	**0**	**0**

4 Summary Findings / Recommendations

4.1 Overview

This section provides a summary of our key findings in each of the areas covered by the review.

4.2 Review of Capital Expenditure

We undertook our review of capital expenditure in two stages, as described in section 2.1. The following sections summarise our findings for the five projects reviewed.

We have reviewed five of the top 10 capital projects to provide an assessment of their efficiency, deliverability and reasonableness of their cost estimates. The projects reviewed and analysed in detail are as follows:

3. Ravenswood Transfer Pump Station
4. Beenyup WWTP Amplification 135ML/day Sludge & Primary
6. Groundwater Replenishment Trial
9. Wungong 1400 Trunk Main
10. Carabooda 60ML tank and DN1200 inlet/outlet

In respect of the five capital projects for which we have conducted a detailed review, we can make the following observations, findings and general comments:

- The drivers of the five projects reviewed have all been in line with corporate and strategic objectives, and in other cases Government growth policies or recycled water targets. We have seen therefore that the need for the projects reviewed has been justified on a strategic basis.
- Our assessment of the options considered for the five projects reviewed is that the Corporation has generally undertaken robust analyses to the standard expected. We have seen evidence of the consideration of long term strategic planning options in conjunction with lowest cost principles by way of NPV analysis to determine the most efficient preferred solution. These options and the preferred solution have also been approved at the study stage through a peer review process.

- The deliverability of three of the four projects reviewed was variable and was often delayed when compared with the intended delivery dates set out in the Implementation Business Plan. In some cases the Project Progress Reports (PPRs) reported delays to the project in the commentary, which did not appear to be reflected in other forecast delivery dates. We assessed the PPR information provided and deferred the expected delivery dates for three projects by up to 3 to 6 months.
- In the case of the Groundwater Replenishment Trial project, it appears possible, from our understanding of the latest PPRs, that the handover to Operations in October 2009 to commence the trial will be missed causing a breach of the conditions for the Federal grant. This represents a significant potential financial impact to the project which will need to be managed.
- We identified, from the total out-turn cost estimates for the Beenyup scheme, $10.38 million of expenditure related to the alliance contract's risk/reward scheme that, in our opinion, is unjustified for inclusion within the total cost estimate. We recommended that some of these costs should be removed, with the remainder requiring confirmation at the time of the next regulatory review to determine whether full inclusion in the value of the asset base is required. The recommended total cost for the project was reduced to $105.23 million. We followed standard practice by other regulators in our assessment by not to allowing the full alliance reward payments in advance. The revised total cost was also re-profiled according to our assessment of project deliverability
- We were unable to quantify efficiency savings in our review of the Groundwater Replenishment Trial project. Delivery savings were suggested to result from reduced preliminary/establishment contractor costs, but could not be quantified and can only be regarded as inherent within the procurement process utilised. We therefore recommended that the total cost for the Groundwater Replenishment Trial project be reduced by $6.3 million, adjusting the total cost to $37.9 million
- We found that the cost estimates for the Carabooda tank and trunk main scheme were reasonable and therefore we did not recommend any revision to the total cost proposed.

The following table shows the impact of our recommendations on the capital expenditure profiles for each project reviewed.

Table 4-1 Proposed Adjustments to Capital Expenditure

	Previous Years	2007/08 ($,000)	2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Future Years	Total ($,000)
Ravenswood Transfer PS									
PPR Forecast at Completion (2008/09)	2.11	1.15	13.5	41.76	17.68				76.2
Halcrow forecast completion profile	2.11	1.15	12	36.15	12.32	4.87			68.6
Proposed adjustments	**0**	**0**	**-1.5**	**-5.61**	**-5.36**	**4.87**	**0**	**0**	**-7.6**
Beenyup WWTP Amplification									
PPR Forecast at Completion (2008/09)	4.37	2.57	20.9	54.8	32.97				115.61
Halcrow forecast completion profile	4.37	2.57	19	37.81	33.24	8.24			105.23
Proposed adjustments	**0**	**0**	**-1.9**	**-16.99**	**0.27**	**8.24**	**0**	**0**	**-10.38**
Groundwater Replenishment Trial									
Forecast at Completion (2007/08)	1.96	3.22	15.26	12.82	7.25	3.12		0.57	44.2
Halcrow forecast completion profile	1.96	3.22	8.63	9.575	7.195	5.18		2.13	37.89
Proposed adjustments	**0**	**0**	**-6.63**	**-3.245**	**-0.055**	**2.06**	**0**	**1.56**	**-6.31**
Wungong 1400 Trunk Main									
PPR Forecast at Completion (2008/09)	1.14	6.39	31.85	6.92	0	44	16.46	0	106.76
Halcrow forecast completion profile	1.14	1.15	18	23.71	2.3	0	44	16.46	106.76
Proposed adjustments	**0**	**-5.24**	**-13.85**	**16.79**	**2.3**	**-44**	**27.54**	**16.46**	**0**
Carabooda 60ML Tank & DN1200 Inlet/Outlet Main									
Forecast at Completion (May 2009)	1.78	4.73	7.47	11.68	11.75	0	0	0	37.41
Halcrow forecast completion profile	1.78	4.73	7.47	8.76	11.73	2.94	0	0	37.41
Proposed adjustments	**0**	**0**	**0**	**-2.92**	**-0.02**	**2.94**	**0**	**0**	**0**
Total Capital Expenditure Reviewed									
Total Capital Forecast	**11.36**	**18.06**	**88.98**	**127.98**	**69.65**	**47.12**	**16.46**	**0.57**	**380.18**
Total Capital Recommended	**11.36**	**12.82**	**65.1**	**115.625**	**66.405**	**21.23**	**44**	**18.59**	**355.13**
Total Adjustments	**0**	**-5.24**	**-23.88**	**-12.355**	**-3.245**	**-25.89**	**27.54**	**18.02**	**-25.05**

In relation to the general capital planning and implementation processes, we make the following comments:

- We identified that the annual cash flow graphs did not seem to reflect the delays in expenditure identified in the actual expenditure profiles from the project progress reports. This implies that there may be a lack of integration in the Corporation's finance and reporting systems. We therefore recommend that improvements are made to the progress reporting of project delivery delays.
- For the capital schemes reviewed, we were not provided with the basis for cost increases of up to 200 per cent between the initial definition cost and the forecast completion cost estimates. We can only assume that the planning cost estimates at the definition stage were undervalued and were subject to change as a result of the risks and solution options identified. However, even this seems to be to great a stretch to fully explain the difference. We recommend that the Corporation seeks to improve its planning cost estimates to better reflect the actual cost of future capital projects.
- Our experience in receiving information from the Corporation from which we could conduct our detailed analysis and review has in many cases been very slow. While we acknowledge the Corporation's explanation that their staff were busy with other regulatory reporting matters, we would have expected that the information we requested would have been more easily available.
- We recommend that in future regulatory reviews, detailed reviews of capital schemes should be conducted for projects valued greater than between $50 million to $100 million. We suggest that the detailed reviews will necessitate the advance request of detailed cost estimates and breakdowns, planning business cases, engineering design reports, project progress reports, independent reports, Board approvals etc and other relevant information as appropriate.
- The Water Corporation provided comments on our review of some of the top 10 capital projects indicating that the capital program is run as a program not a series of individual projects. Any cost overruns or efficiencies on individual projects are essentially incorporated into the overall capital program, balancing the capital expenditure / funding required. While this might have been the norm previously, our review was structured around the review of individual projects not the total program. Prices for water and wastewater services are increasingly significantly and the Corporation's customers have a right to expect that the capital expenditure proposed will provide a certain increase in the levels of service based on a specific program of works. Major adjustments to the cost of this program of works or the composition of projects could have significant impacts on the levels of service delivered by the program.

4.3 Review of Operational Expenditure

We undertook a detailed review of proposed increases to the Water Corporation's base operating expenditure. We requested detailed supporting information on a number of projects and received a variety of documents including Action Briefs, memorandums, project management plans, and business cases. In addition, the Corporation provided more up-to-date funding requests from the 2009/10 Strategic Development Plan and we have included these figures in our analysis.

Our review identified some issues with the proposed increases in operating expenditure. The key issue identified was that the some of the supporting information provided did not directly support the proposed increase in operating expenditure but rather suggested significantly lower increases in expenditure.

We have suggested some adjustments to the proposed operating expenditure and these are presented in the following tables. Table 4-2 shows the proposed adjustments for the projects where we received supporting information while Table 4-3 shows the proposed adjustments for some of the remaining projects.

Table 4-2 Recommended Operating Expenditure for Major Operating Expenditure Increases

Project		2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
ACA GAP Treatment Management Program	Total Expenditure Requested	3,716	6,216	11,216	11,216	11,216	43,580
	Recommended Operating Expenditure	**3,716**	**6,216**	**11,216**	**11,216**	**11,216**	**43,580**
Water mains cleaning	Total Expenditure Requested	1,110	1,110	1,110	1,110	1,110	5,550
	Recommended Operating Expenditure	**1,110**	**1,110**	**1,110**	**1,110**	**1,110**	**5,550**
Backflow Prevention	Total Expenditure Requested	1,600	2,400	6,100	6,700	7,300	24,100
	Recommended Operating Expenditure	**1,600**	**2,400**	**6,100**	**6,700**	**7,300**	**24,100**
Overflow Risk Management Project (WORM)	Total Expenditure Requested	1,999	2,131	2,151	2,151	2,151	10,583
	Recommended Operating Expenditure	**1,999**	**2,131**	**2,151**	**2,151**	**2,151**	**10,583**
Sustainability Strategy	Total Expenditure Requested	424	452	301	304	280	1,761
	Recommended Operating Expenditure	**424**	**452**	**301**	**304**	**280**	**1,761**
Water Cycle Strategy	Total Expenditure Requested	2,259	2,259	2,259	2,259	2,259	11,295
	Recommended Operating Expenditure	**300**	**300**	**-**	**-**	**-**	**600**

Project		2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
WP WD - TM & Nicholson Rd PS	Total Expenditure Requested	1,900	1,900	1,900	1,900	1,900	9,500
	Recommended Operating Expenditure	**1,900**	**1,900**	**1,900**	**1,900**	**1,900**	**9,500**
NFIS Woodman Pt Odour Ctl Stg 1 &2	Total Expenditure Requested	1,879	2,544	2,606	2,606	2,606	12,241
	Recommended Operating Expenditure	**1,879**	**2,544**	**2,606**	**2,606**	**2,606**	**12,241**
NFIS PS Desal: Sludge Treat & Ops	Total Expenditure Requested	1,490	1,490	1,490	1,490	1,490	7,450
	Recommended Operating Expenditure	**1,490**	**1,490**	**1,490**	**1,490**	**1,490**	**7,450**
Provision for Capital Expensing	Total Expenditure Requested	3,000	3,000	3,000	3,000	3,000	15,000
	Recommended Operating Expenditure	**3,000**	**2,000**	**1,000**	**1,000**	**1,000**	**8,000**
Fatigue Management	Total Expenditure Requested	1,465	4,550	1,400	1,400	1,400	10,215
	Recommended Operating Expenditure	**1,465**	**4,550**	**1,400**	**1,400**	**1,400**	**10,215**
Compliance (Welder Observation & Ocean Outlet Monitoring)	Total Expenditure Requested	2,127	2,238	2,353	2,475	2,475	11,668
	Recommended Operating Expenditure	**960**	**960**	**960**	**960**	**960**	**4,800**
Bridgetown Regional Water Source	Total Expenditure Requested	61	96	96	96	96	445
	Recommended Operating Expenditure	**61**	**96**	**96**	**96**	**96**	**445**
Disposal of Surplus Assets	Total Expenditure Requested	2,144	-	-	-	-	2,144
	Recommended Operating Expenditure	**2,144**	**-**	**-**	**-**	**-**	**2,144**
TOTAL	**Total Expenditure Requested**	**25,174**	**30,386**	**35,982**	**36,707**	**37,283**	**165,532**
	Recommended Operating Expenditure	**22,048**	**26,149**	**30,330**	**30,933**	**31,509**	**140,969**
	Reduction in Operating Expenditure	**-3,126**	**-4,237**	**-5,652**	**-5,774**	**-5,774**	**-24,563**

Table 4-3 Recommended Operating Expenditure for Other Operating Expenditure Increases

Project	Operating Expenditure	2008/09 ($,000)	2009/10 ($,000)	2010/11 ($,000)	2011/12 ($,000)	2012/13 ($,000)	Total ($,000)
Collie River Diversion	Total Expenditure Requested	0	6,600	8,400	-	-	**15,000**
	Recommended Operating Expenditure	**0**	**6,600**	**8,400**	**-**	**-**	**15,000**
Costs offset by additional revenue	Total Expenditure Requested	0	0	0	0	0	**0**
	Recommended Operating Expenditure	**0**	**0**	**0**	**0**	**0**	**0**
Harvey Water Trade	Total Expenditure Requested	2,156	2,210	2,265	2,394	2,394	**11,419**
	Recommended Operating Expenditure	**2,156**	**2,210**	**2,265**	**2,394**	**2,394**	**11,419**
TOTAL	**Total Expenditure Requested**	**2,156**	**8,810**	**10,665**	**2,394**	**2,394**	**11,419**
	Recommended Operating Expenditure	**2,156**	**8,810**	**10,665**	**2,394**	**2,394**	**11,419**
	Reduction in Operating Expenditure	**0**	**0**	**0**	**0**	**0**	**0**

We encountered a number of issues in the process of undertaking this review including:

- An extended timeframe required to receive supporting information from the Water Corporation. This issue was potentially exacerbated by the timing of this review (during the end of financial year reporting period), the reporting systems in place at the Water Corporation (which do not generally facilitate the reporting of base operating expenditure), and the relative uncertainty, on the part of the Water Corporation, in relation to the type of supporting information required and the detail required. We recommend that a process be developed, in consultation with the ERA and the Water Corporation, which outlines the specific requirements of these regulatory reviews including the information required to support the proposed expenditure.
- The quality of the supporting information provided for the proposed increases in operating expenditure was, in the majority of cases, initially quite poor. The documentation provided typically included action briefs for the proposed expenditure or supporting memorandums by Corporation staff. In a number of cases the supporting documentation initially provided appeared to have no relevance to the requested increase in expenditure and in fact, usually identified a much lower increase in expenditure. Significant further information requests were required to explain the requested increases.

- A number of supporting documents provided were dated from 2005 and appeared to be significantly out of date. Subsequent information requests identified that the Corporation had significantly adjusted the programs of work relating to the increases in expenditure including major changes to assumptions made in determining the operating cost of the program. However there was no record of these changes and in most circumstances, given the time restrictions, the changes had to be taken on face value. Future reviews will need to investigate any such changes in much more detail to ensure that the process followed by the Corporation was appropriate and that there is a clear trail of documents highlighting the changes to each program of works.

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