
Review of Capital Expenditure, Asset Management, and Operating Expenditure of State Water Corporation

**A report prepared by Marsden Jacob Associates and Cardno MBK
for the Independent Pricing and Regulatory Tribunal
of New South Wales**

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Executive Summary

SUMMARY OVERVIEW:

1. This report documents a review of the efficiency and prudence of State Water Corporation's (State Water) actual and forecast operational and maintenance expenditure (Opex) and capital expenditure (Capex) for the period 2001/02 through 2008/09.
2. The review was undertaken by Marsden Jacob Associates and Cardno MBK (MJA-Cardno) for the Independent Pricing and Regulatory Tribunal of New South Wales (IPART).
3. This is the fourth consultants' review of bulk water delivery undertaken for IPART since 1996. The first, undertaken by GHD Pty Ltd (GHD) in 1996 focussed on a review of asset management practices and processes. In 2000, GHD undertook a further review of asset management practices, while PricewaterhouseCoopers (PwC) undertook a review of Opex and Capex efficiency and prudence.¹
4. The outcome of MJA-Cardno's review is intended to assist IPART undertake the fifth regulatory review of NSW bulk water services since 1996.²

Basic Requirements of a Pricing Proposal:

5. MJA-Cardno's review of Capex and Opex efficiency/prudence was predicated on the assumption that State Water's pricing proposal would contain all of the key elements that reasonably and robustly explained and justified the proposal. This assumption was considered reasonable because, in each previous review, IPART had been directly critical of State Water's (predecessor organisations) ability to explain and justify expenditure proposals and revenue requirements. MJA-Cardno expected that this 'regulatory journey' would have resulted in State Water being sufficiently skilled and comprehending of the regulatory process and its requirements to produce a robust and coherent pricing proposal.
6. In general terms, a pricing proposal can be considered as requiring four related and sequential steps to be undertaken, *viz*:
 - a. identify and define each of the service obligations that State Water is required to meet, which provides the justification for State Water to incur costs and recover revenue from customers for provision of services;
 - b. define and explain the business strategies and actions that have been developed by State Water to achieve and deliver the outcomes required to efficiently discharge State Water's obligations and deliver services to customers;

¹ A third review of State Water's asset management planning process was undertaken by GHD for State Water in 2004.

² IPART published Determinations on bulk water pricing in 1996, 1997, 1998 and 2000.

- c. detail each category of efficient business cost that goes into making up the regulated revenue forecast for the full period of the pricing proposal; and
 - d. translate the revenue requirement, which must be based on prudent and reasonable forecasts of efficient cost, into a price regime to apply for the full period of the pricing proposal.
7. Executing each of the above steps will produce a pricing proposal that contains a reasonable and transparent explanation of business processes that would lead to fair and efficient prices.
8. None of this is materially different to the intent of the corporate planning process described in State Water's recent Annual Reports.
9. The assessment of the efficiency and prudence of State Water's actual expenditure and proposals for the period 2005/06 to 2008/09 involve scrutiny and understanding of all elements required to define the first two steps and scrutiny of those elements of costs associated with Capex and Opex in the third step.
10. As detailed in this report, the proposal that State Water submitted to IPART in early November 2004 did not clearly define any one of the four basic process steps outlined above. The proposal provided very little detail outlining State Water's obligations and little information on the business strategies and decision processes that were used to develop cost forecasts. Crucial data such as actual Opex and Capex for the current regulatory period (from 2001/02), and some of the forecast expenditure data was missing from the proposal. No information was provided to show separation of actual costs for the changes in responsibility and function that occurred with corporatisation; and no information was provided for costs associated with 'ring-fenced' activities that were not subject to review by IPART.
11. Even at the end of the review process, after State Water had considered the criticisms contained in the MJA-Cardno draft report (which are largely retained in this final report), State Water was still not able to satisfactorily explain the links between (substantially higher) forecast costs and achievement of efficient discharge of obligation or service delivery to customers.

Key Components of MJA-Cardno's Approach:

12. The review methodology adopted by MJA-Cardno relied heavily on three key components.
13. The first was to consider service standard, obligations, asset condition and expenditure outcomes and use conclusions drawn from observations of these to inform MJA-Cardno's judgements on 'efficiency' and 'prudence' in the current regulatory period.
14. The second was to consider changes in circumstance faced by State Water in the next regulatory period, most particularly changes in demand for service by customers or compliance with obligations imposed by regulators and their impact on business costs. These are both key drivers of cost in State Water's activities.

15. The third was a ‘top-down’ and ‘high-level’ review and testing of State Water’s operational and asset expenditure decision processes to inform MJA-Cardno’s judgements as to whether or not State Water’s expenditure decisions were likely to produce ‘efficient’ and ‘prudent’ outcomes. Where possible, information provided in State Water’s submission to IPART was tested by comparison with other public domain material. Annual Reports produced by State Water’s predecessor organisations for the period 1999-2000 through 2003-04 were particularly useful in this regard.
16. State Water was given every reasonable opportunity to respond to issues identified by MJA-Cardno as the review progressed. In addition, MJA-Cardno considered in detail issues contained in State Water’s response to the draft report. Details of MJA-Cardno’s response to issues listed in the Executive Summary of State Water’s response are shown in Appendix B of this final report. Other comments on issues in the body of State Water’s response have been submitted to IPART.
17. MJA-Cardno’s approach is founded in regulatory practices developed in the UK and Australia that aim to minimise, as far as practicable, an inherent problem in economic regulation created by ‘information asymmetry’. This problem inevitably arises in consultants’ efficiency reviews through over-reliance on detailed financial and operational information provided by regulated entities that focuses primarily on business activity inputs, rather than outputs and service outcomes.
18. The effect of the ‘information asymmetry’ problem is clearly demonstrated in the outcomes arising from IPART’s 2000 Determination on bulk water prices. IPART’s Determination was based partly on forecasts of ‘efficient’ costs derived from detailed scrutiny of information provided by State Water’s predecessor for the regulatory period commencing 2001/02. This showed that:
 - a. ‘efficient’ Opex would rise from \$26.7 million in 2001/02 to \$28.2 million in 2003/04; whereas actual Opex in 2001/02 (the first year of the current regulatory period) was only \$22.4 million; and total Opex over the period was \$17.3 million (or 21%) below the forecast accepted by IPART; and
 - b. ‘efficient’ Capex costs would rise from around \$24 million in 2001/02 to \$34 million in 2003/04; whereas actual Capex in 2001/02 (the first year of the current regulatory period) was only \$13.1 million; and total Capex over the period was only \$49.8 million (or 43%) below the forecast accepted by IPART.
19. Forecasting of costs (and supply and demand) can never be perfect, and should not be expected to always be within any pre-determined range. However, a ‘prudent’ forecast of ‘efficient’ cost might reasonably be expected to be consistently within a band of $\pm 10\%$ of the actual outcome, and preferably closer than that in the first year of a regulatory period. A significant forecasting error, with outcomes either consistently above or below annual forecast amounts, suggests that utility managers do not understand cost drivers in the business (or their customers). Such forecasts would, by definition, not be based on ‘efficient’ costs and the outcomes may not be ‘prudent’.

Clarifying the Cost of Discharging State Water's Obligations:

20. Analysis undertaken by MJA-Cardno was founded on the expectation that State Water would have integrated experience from the four previous IPART reviews of bulk water delivery. This should have resulted in an expenditure proposal from State Water that provided reliable information on the cost of executing robust, defined business strategies that would enable efficient discharge of legal, regulatory and social obligations, and the efficient delivery of services to customers.
21. However, the proposal that State Water submitted to IPART in November 2004 did not comprehensively identify specific obligations, nor define business strategies that would meet those obligations, nor provide robust information on the cost of doing so, nor comprehensively address impacts on service standards. Nor did State Water's submission adequately explain why forecast costs should rise substantially compared to outcomes of the current regulatory period when there was no equivalent substantial change in obligation or service standard.
22. A reasonable summary of obligations was presented in State Water's submission to IPART's (concurrent) review of the Interim Operating Licence, and an outline of business strategies is presented in State Water's Annual Reports. But no linkage is provided between all obligations, business strategies, costs and service standards in any of these documents, or in all of them combined.
23. Considerable effort was expended in clarifying the obligations that State Water must meet and attempting to identify the costs involved in discharge of those obligations. Despite this effort, MJA-Cardno found that State Water could not identify the costs of meeting some of its obligations. In some cases, State Water was not able to determine clearly whether or not actions it had taken, or proposed to take, would discharge an obligation – generally because State Water's business processes were not satisfactorily implemented across the business or, in some cases, because the obligation was poorly defined.
24. Despite the difficulties these issues presented for this review, MJA-Cardno accept that State Water was not attempting to exercise 'strategic behaviour' (another common problem in economic regulation) so as to avoid legitimate scrutiny of its activities by IPART. State Water managers demonstrated willingness and openness to discuss issues and respond to concerns related to understanding, interpretation and analysis of the pricing proposal. However, it was clear that State Water had not applied sufficient priority or resources to preparation for, or participation in, the IPART review.

Qualification of MJA-Cardno's Conclusions and Recommendations:

25. Conclusions and recommendations presented in the report are based on MJA-Cardno's considered analysis of a range of information relating to State Water's activities. The information sources included State Water's submissions to IPART, State Water's explanations of issues identified as requiring clarification by MJA-Cardno, information provided by IPART relating to previous bulk water reviews and publicly available information relating to the activities of State Water's predecessor organisations. MJA-Cardno has also considered in detail comments provided by State Water and IPART on the MJA-Cardno draft report.

26. The conclusions reached, and recommendations, made in this report are conditional to the extent that MJA-Cardno has significant reservations about the capability of State Water's current financial and management information systems. MJA-Cardno concluded that these systems are not always able to provide robust, reliable and consistently accurate information at an activity level (allocated against State Water's Product Codes) that is suitable for evaluating operational and capital expenditure efficiency or forecasting efficient and/or prudent costs.
27. MJA-Cardno's recommendations are also conditional to the extent that State Water has yet to develop its tactical or strategic business performance to a level that matches its operational effectiveness. MJA-Cardno concluded that State Water's managers had developed and implemented generally efficient operational practices. However, State Water has not yet achieved the same satisfactory performance in its business planning processes, as demonstrated by the substantial difference between actual expenditure during the period 2001-02 through 2003-04 and the forecasts for 2005-06 through 2007-08. Nor did State Water demonstrate that it linked forecast expenditure to coherent business evaluations based on robust estimates of asset condition, customer service, cost or timing – despite this being a stated feature of State Water's business processes.
28. MJA-Cardno accepts that State Water has been under pressure because of drought-induced revenue shortfalls in the recent past. MJA-Cardno also accepts that corporatisation will bring new challenges and revised dam safety obligations will be costly to meet. This may mean that State Water would consume more resources in the short term, than it has in the recent past, should IPART decide to make those resources available.
29. However, State Water has not provided sufficiently detailed explanations to defend the forecast levels of expenditure. Nor has State Water identified or taken into account benefits flowing from corporatisation that should result from clearer commercial focus by managers and its newly appointed skills-based Board. The information and explanations provided by State Water failed, in MJA-Cardno's view, to adequately link increased costs with actions that were necessary to improve generally satisfactory service delivery or actions to address outstanding or new obligations.
30. It is MJA-Cardno's considered view that State Water could continue to operate efficiently and effectively over the next regulatory period if IPART adopts the recommendations in this report. Some additional resources may be required to allow State Water to identify and implement further business improvements. But State Water has provided no credible information that allows MJA-Cardno to make a reasoned and rational recommendation to IPART on the quantum or timing of such resources. If such resources are deemed necessary, the quantum and timing will be matters of judgement that are best made by IPART or State Water's owner.

KEY FINDINGS:

Key Findings - Financial/Asset Management Information Systems

31. State Water relies on a 'legacy' financial reporting system developed (and still operated by) by the Department of Infrastructure, Planning and Natural Resources (DIPNR). While this system appears satisfactory for financial reports relating to overall activities of the total business and may be capable of reporting financial outcomes on a total valley/region basis, it is clearly inadequate for a commercial business subject to regulatory oversight by IPART.
32. Sampling of data from the 'legacy' system, and the State Water operational and asset management reports that rely on data from it, demonstrated that both the financial and management reports are, on occasion, unreliable.
33. Requests for clarification were only made where the data appeared to MJA-Cardno to have 'unusual' characteristics. This was, typically, where it was expected the costs would be largely fixed and not likely to vary substantially year-on-year, or between valleys; or where field observations (and other information) were inconsistent with information in State Water's submission.
34. MJA-Cardno did not attempt to quantify the overall impact of the observed data discrepancies on State Water's reported costs. However, it is noteworthy that 'unusual' characteristics were observed in each of the Opex categories where substantial increases were forecast (such as, PC100 (+\$1.7M), PC200 (+\$1.4M), PC413 (+\$0.6M), PC, 416 (+\$2.1M), PC417 (+\$1.5M) and PC421 (+\$1.7M), which account for 90% of forecast Opex increase in State Water's proposal).
35. MJA-Cardno's reservations about quality of financial data detailed in the report have been reinforced by:
 - a. receipt of data, financial information and financial reporting guidelines from different units in State Water that covered the same activities, functions and time-periods but are obviously different and sometimes inconsistent with information provided in the pricing proposal submitted to IPART in November 2004;
 - b. State Water's advice that existing financial reporting and management information systems do not readily permit tracking of actual costs against planned and approved costs - even for major items of expenditure;
 - c. evidence obtained from sample testing of data, information and processes that individual job cost allocations to specific activities (Product Codes) are, on occasion, inconsistent and/or obviously incorrect - even when significant amounts are involved; and
 - d. State Water's advice that (what are effectively) *ad hoc* procedures may exist in different parts of the business for determining whether and/or where an obligation exists, how the obligation is to be discharged and how costs of meeting obligations are reported and tracked.

36. The need to improve financial and management information systems has been identified by IPART in each of the four previous reviews of State Water's predecessor organisations. This was recognised by State Water's newly-appointed Board. Action has been initiated by State Water to replace the 'legacy' financial management system and State Water is continuing to develop and deploy a Total Asset Management Planning system, a Facilities Maintenance Management System and a Project Delivery System. MJA-Cardno agrees that State Water's business effectiveness will improve when these systems are fully implemented but does not accept that it is 'efficient' for State Water "to identify these savings over the next 3 years" as suggested in State Water's response to the draft report.
37. Overall, the impact of the observed discrepancies in Product Code data has been to place less emphasis on analysis of the (potential) efficiency of individual activities (Product Code line items) in State Water's actual and forecast expenditures. In effect, MJA-Cardno had little option but consider the business as a whole, where a higher level of confidence existed as to the integrity of financial information.

Key Findings - Procedures, Policies and Inter-agency Protocols:

38. There is a lack of clarity and certainty in the way State Water identifies and discharges some of its obligations. For example:
- a. Protocols for identifying and discharging some obligations differ between State Water and NSW Government agencies that monitor compliance with statutory and licence obligations.
 - b. State Water's internal processes for identifying and discharging obligations appear, on occasion, to be *ad hoc* and vary from region to region.
39. This is particularly so in regard to fishways (monitored by the Department of Primary Industries (DPI)). Differences between State Water's and DPI's protocols create uncertainty and potential conflict and leave State Water in doubt as to whether or not it can, will or has complied with its obligations.
40. State Water does not explicitly identify the costs of meeting all its obligations. In the case of occupational health and safety (OHS), which State Water managers take seriously, State Water adopts *ad hoc* procedures that rely on outstanding OHS obligations to trigger significant additional expenditure related to functional enhancement - without undertaking a cost-benefit analysis of the additional expenditure.

Key Findings - Current Operations and Maintenance Practice:

41. Direct observation and discussions with State Water managers and staff demonstrated to MJA-Cardno's satisfaction that State Water's current operations and maintenance practices were generally 'efficient'. State Water managers are clearly able to allocate resources that generally lead to 'efficient' maintenance and operating outcomes. MJA-Cardno observed no obvious 'feather-bedding' in State Water's operations, nor any indication of service failure or decline in standards of service delivery in the current regulatory period.

42. Despite observing generally ‘efficient’ operations, two areas were identified where potential may exist to improve Opex efficiency further. These are:
- a. where significant investment has been undertaken to install Supervisory Control and Data Acquisition systems (SCADA) at river structures.
 - b. the continued permanent manning of major dams, even when storage levels are at historic low levels, where more flexible manual inspections (adopted by dam operators in other jurisdictions) and investment that extends the capability of SCADA systems may provide an equally, or even more, reliable monitoring and communication function.
43. MJA-Cardno agrees with comments in State Water’s response to the draft report that other areas of efficiency gain may be identified once the new management information systems are fully developed and implemented, but does not accept that it is ‘efficient’ for State Water “*to identify these savings over the next 3 years*” as suggested in State Water’s response to the draft report.

Key Findings - Backlog Maintenance:

44. MJA-Cardno accepts there is a need to deal with maintenance issues that were not addressed over the 2001/02 to 2003/04 period because management resources (particularly in the southern region) were directed to other priorities.
45. However, State Water managers demonstrated to MJA-Cardno’s satisfaction that sensible and efficient resource allocation processes had been deployed that allowed maintenance backlogs to be addressed in other valleys/regions during this period by accessing resources intended for the southern valley/regions.
46. This finding is consistent with information contained in recent State Water Annual Reports for the period 1999-2000 through 2003-04, which confirms routine, periodic and incidental maintenance targets were generally being met in all regions. Each Annual Report also says that historic low water levels had allowed ‘backlog’ maintenance to be addressed. In addition, total actual cost levels for all maintenance (including Major Periodic Maintenance) were generally near ‘budget’ (noting the ‘budget’ amounts were lower than forecast amounts allowed by IPART) without adversely impacting on service performance or discharge of State Water’s obligations.
47. The finding is also consistent with information in TAMP2004, which says explicitly that “*identification and progress in undertaking significant ‘backlog’ maintenance*” and “*undertaking of a significant amount of backlog maintenance;*” are ‘specific changes’ and ‘identified effects’ (respectively) of the improvement in State Water’s asset management capability.

Key Findings - DIPNR Stream Gauging Services:

48. MJA-Cardno accepts that additional resources may be required above the ‘efficient baseline’ amount (recommended below) to cover the full cost of stream gauging services to be provided by DIPNR.

49. The Opex increase forecast by State Water for DIPNR 'contract' stream gauging services amounts to \$1.7 million per year (or 77%) above costs recorded in the 2001/02-2003/04 period. Although the final value of this service 'contract' has not yet been confirmed, MJA-Cardno found that State Water had not established an 'efficient' basis for these services. It is MJA-Cardno's view that State Water should have sought preliminary service offers from private service providers or determining its own internal costs to undertake this activity.
50. There are a number of issues that still need to be clarified between State Water and DIPNR, apart from quality of data service provided and unit costs before an estimate of 'efficient' costs can be established. State Water acknowledged some of these in its response to the draft report. Issues identified by MJA-Cardno include:
 - a. the number of gauging stations that State Water actually does need to operate efficiently (bearing in mind that State Water appears to be suggesting it needs more than twice the number of stream gauging stations than SunWater in Queensland requires to operate its regulated river systems);
 - b. the number of DIPNR gauging stations that will be transferred to State Water;
 - c. the number of gauging points that are duplicated by State Water and DIPNR (given that it is not efficient to duplicate investment in stream gauging capability); and
 - d. the number of gauging points that have been, can be, or will be incorporated into State Water's SCADA system (given that it is not efficient to invest in SCADA capability if it does not yield reliable and useful information that will improve operational efficiency).

Key Findings - 'Stand-alone' Capability:

51. It is possible that additional costs above the 'efficient baseline' amount may be required to establish systems and procedures so that State Water can operate on a 'stand-alone' basis as a commercial business.
52. However, State Water did not demonstrate to MJA-Cardno's satisfaction that additional incremental costs included in the forecasts for 2005/06 to 2008/09 period (and 2004/05) are based on efficient 'market rates' or consideration of efficient internal costs (and benefits) to State Water.
53. MJA-Cardno notes, in particular, that the actual Opex forecasting approach described by State Water personnel differs from that described in State Water's submission to IPART, TAMP2004 and recent State Water Annual Reports. Descriptions provided to MJA-Cardno suggest Opex forecasts are:
 - a. strongly influenced by introspective evaluation of the cost base (i.e. filling of vacant positions, etc), expectations that corporatisation will give State Water the opportunity to do things that its former public service managers would not allow, assumptions that all externally-imposed costs should be

accepted as ‘pass-throughs’ and no efficiency gains are possible within the next regulatory period; and

- b. little influenced by consistent consideration of service levels, asset condition, service performance achieved (or not achieved) or ‘efficient’ cost benchmarks – although this is a stated feature of State Water’s business processes.

54. This finding applies to State Water’s forecast of corporatisation costs, which, if accepted by IPART, would result in a net increase in Opex of \$2.7 million (or 12% of the average annual actual Opex in the period 2001/02 to 2003/04). State Water appears to take no account of benefits that will come from corporatisation through a clearer focus on:

- a. ensuring continuation of the efficient operating regime established by predecessor organisations;
- b. implementing the business policy framework articulated in State Water Annual Reports;
- c. harnessing the commercial skills of a service-focussed, professional Board;
- d. achieving further ‘efficient’ commercial outcomes; or
- e. experiences of other Government business enterprises that demonstrate it is possible to achieve significantly, and even dramatically, improved business outcomes from corporatisation and privatisation.

Key Findings - Asset Management Planning and Capex Forecasts:

55. MJA-Cardno accept GHD Pty Ltd’s conclusion (from the 2004 review conducted for State Water) that the basis for planning future Capex demonstrated in TAMP2004 is reasonable, and has improved progressively since 1997.

56. However, MJA-Cardno found that:

- a. The total cost of the 30-year asset management plan increased markedly from \$397.7 million (2001/02 dollars) in TAMP2000 to \$626.8 million (2004/05 dollars) in TAMP2004, even though some \$49.6 million (nominal dollars) of Capex was undertaken in the 2001/02 to 2003/04 period. The basis for this increase is not clearly explained in TAMP2004; nor has it been explained satisfactorily in other material provided by State Water – including State Water’s response to the MJA-Cardno draft report.
- b. The forecast cost of dam safety compliance has increased by approximately \$240 million from TAMP2000 to TAMP2004,³ with \$122.5 million allocated to the 2005/06 to 2008/09 period (or 19.5% of the total amount of \$626.8 million for the 30-year period).

³ No allowance has been made in this figure for changes in base year for the real Capex estimates.

- c. State Water is not able to easily and effectively track, control or manage project costs against budget, which is very likely to lead to inefficient outcomes that could not be identified sufficiently early to be controlled (although this deficiency should be addressed once State Water completes development and implementation of its Project Delivery System and roll-out a new financial reporting system).
 - d. The variation in State Water's estimated construction cost of options for major projects listed in TAMP2004 is too great for the estimated costs to be considered 'efficient'.
 - e. TAMP2004 and State Water's pricing proposal include substantial dam safety upgrades that may not eventuate or maybe reduced in scale if the NSW Government and the State Water Board adopt the draft "*Acceptable Flood Capacity for Dams*" guidelines, which incorporate a risk management approach, proposed by the NSW Dam Safety Committee (DSC) and State Water undertakes robust business evaluations of dam safety upgrade options (rather than implementing 'engineering solutions' that may not take full account of the business impact on State Water or its customers).
 - f. Capex forecasts proposed by State Water do not take into account the fact that Capex outcomes in the 2001/02 to 2003/04 period were substantially below the levels accepted by IPART in its 2000 Decision (which indicates poor, and imprudent, performance in Capex forecasting).
57. MJA-Cardno accepts that State Water must meet dam safety obligations. But changes between TAMP2000 and TAMP2004 demonstrates there is substantial variation in compliance options, substantial changes in estimated annual cost and, therefore, substantial discretion in timing of execution of works required to achieve compliance. MJA-Cardno notes that there appears to be no explicit obligation on State Water to undertake a specific dam upgrade project within any clearly specified timeframe.
58. One of State Water's responses to the above criticisms in the draft report was to reduce Capex overall by some \$40.7 million over the period 2005-06 through 2007-08, by deferring works it implied (in other parts of its response and its initial submissions) were essential and of high priority. State Water's response reinforces MJA-Cardno's conclusions that State Water's Capex forecasts are not sufficiently robust to be considered 'efficient'.

CONCLUSIONS:

Conclusions - Financial/Asset Management Information Systems:

59. State Water's current financial/asset management information systems are not capable of reporting reliable financial information that could be relied upon to determine efficiency at an activity (Product Code) level. This suggests these systems cannot be relied upon by IPART to regulate State Water's activities at a valley/regional level.

60. Deferral of expenditure on activities that have been clearly identified and warranted, such as upgrading of State Water's financial management system, was not 'prudent'. Accordingly, MJA-Cardno endorses State Water's decision to replace the existing financial systems as a high priority.
61. Difficulties encountered by MJA-Cardno with the quality and reliability of data and information provided by State Water could be reduced substantially through introduction of a robust regulatory reporting regime that requires State Water to report on service level performance and financial performance at a valley/region level, at an activity (Product Code) level and against State Water's key obligations. While this is the intent of the existing reporting regime, this regime should be extended to include audit of financial data at a Product Code level if IPART chooses to retain Product Codes as the basis for distributing costs between customer segments.

Conclusions - Procedures, Policies and Inter-agency Protocols:

62. State Water needs to develop robust, formal corporate policies and procedures that apply uniformly across the business (or ensure existing policies and procedures are applied consistently) which define the process for identifying what obligations exist, how those obligations are to be discharged, and how costs of doing so are to be estimated, recorded and reported.
63. Where multiple obligations are involved, State Water should ensure the policies and procedures specify that incremental expenditure not directly linked to discharge of an explicit obligation is subject to a cost-benefit analysis. In particular, where functional enhancement is proposed that is not directly linked to discharge of an obligation, the expenditure involved should be justified by cost-benefit analysis.

Conclusions - Operations and Maintenance Expenditure (OPEX):

64. State Water's predecessor organisations (with the existing managers and staff) developed an operating regime capable of achieving Opex levels well below those judged 'efficient' by IPART in the 2000 Determination while still meeting legal and service obligations.
65. This is demonstrated by comparing actual Opex over the period 2001/02 to 2003/04 to allowances accepted by IPART in its 2000 Determination. Actual annual Opex was at least \$4.3 million below the amounts allowed by IPART in every year of this period; and 'efficiency gains' in Opex (defined as forecast less actual Opex) totalling \$17.3 million were achieved over this three year period.
66. No material change in function, obligation or service standards, post 2003/04 or the next regulatory period, was identified that justifies an increase in total Opex costs in State Water's forecasts.
67. While some costs may increase, for example costs incurred in establishing State Water as a 'stand alone' corporation, MJA-Cardno expect that areas of operational improvement will be identified once State Water's Facility Management and Maintenance System (FMMS), Project Delivery System (PDS) and new financial information system are fully developed and implemented. Such an outcome is

forecast in State Water's current Total Asset Management Plan (TAMP2004) and has been accepted by State Water in its response to the draft report.

68. Forecasts for 2004/05 (used by State Water as the basis for forecasting Opex costs for the 2005/06 to 2008/09 period) have no obvious or logical connection with actual costs for the 2001/02 to 2003/04 period, or to any material change in function, obligation or service standards.
69. The 2004/05 forecasts adopted by State Water are not representative of an 'efficient' cost base. Accordingly, the Opex forecasts proposed by State Water for the 2005/06 to 2008/09 period do not represent 'efficient' costs.
70. Continuation of efficient allocation of resources demonstrated during the 2001/02 to 2003/04 period would allow maintenance backlogs to be addressed over time without compromising service delivery or service standards. This allows the Opex forecast proposed by State Water to be reduced by some \$5 million per year for maintenance allocated to activities PC413 (Buildings), PC416 (Dams) and PC417 (River Structures).
71. Progressive implementation of Water Sharing Plans across all regulated catchments in NSW will impose further obligations, and possibly increased costs, on State Water. State Water was not able to quantify the magnitude and direction of costs required to complete development of the Water Sharing Plans, but the costs are likely to be within potential future 'efficiency gains' that State Water could achieve over the next regulatory period.

Conclusions – Dam Safety and Capex:

72. The estimated cost of meeting dam safety obligations is, by far, the largest component in State Water's Capex forecast.
73. As noted above, the current dam safety requirements are being reviewed by the NSW Government in a process that started with release of a draft guideline in December 2002. MJA-Cardno's view is that implementation of the new guideline will be a major decision. On that basis, MJA-Cardno has concluded it may take some time to finalise State Water's dam safety obligations, possibly 2 years or longer. However, the timing of a decision on the proposed guideline is a matter that IPART may be able to clarify in discussion with the NSW Government and the DSC. If those discussions suggest a firmer timetable for the decision, then IPART could adopt a firmer position on timing.
74. If the draft '*Acceptable Flood Capacity for Dams*' guideline, which incorporate a risk management approach, proposed by the DSC is adopted, actions to achieve compliance may change. Specifically, the proposed guideline could allow State Water greater flexibility in achieving compliance at lower cost.
75. Even if the proposed guideline does not change the assessment criteria for high risk dams, MJA-Cardno believes that State Water should consider more thoroughly options for compliance, such as changes to operating rules, which could deliver a more favourable business outcome than currently assumed in TAMP2004. On that basis, MJA-Cardno has concluded that it is not 'efficient' to forecast expenditure

that may not be required if the draft guideline allow a lower cost solution or a business case evaluation may allow a more favourable business outcome.

76. MJA-Cardno has also concluded that State Water does not have sufficient information to say that lower costs options are certain, or even that its forecast costs are likely to be achieved. Therefore, no recommendation can be made that State Water's dam safety compliance Capex estimates should be modified, other than that Capex should be delayed until 'efficient' Capex allowances of cost and timing can be reasonably estimated.
77. Capex in each year of the 2001/02 to 2003/04 period was substantially below the forecast adopted by IPART in its 2000 Determination; and information provided by State Water shows that Capex in 2004/05 will also be substantially below the forecast shown in the initial submission to IPART – although this was not addressed in State Water's response to the draft report.
78. MJA-Cardno considered this reduction in Capex to be a 'Capex efficiency' gain in the sense that there is no evidence that service standards or service delivery suffered; nor any evidence there was any breach of State Water's obligations.
79. However, MJA-Cardno concluded that the observed Capex 'efficiency gain' was most likely achieved by organisational inertia rather than an explicit management-endorsed business strategy. That is, State Water was not capable of committing Capex at the level forecast - primarily because design and planning of major Capex projects was not sufficiently developed. Such an outcome is deemed 'imprudent' because it occurred each year, demonstrating Capex forecasts are biased by excessive optimism (or excessive caution) that is inconsistent with sound business practice. This outcome is also 'imprudent' because it has the regulatory impact of consistently allocating a higher than necessary cost onto State Water's customers (in this case the NSW Government).

RECOMMENDATIONS:

Recommendations - Financial/Asset Management Information Systems:

80. MJA-Cardno agrees that State Water must improve management information systems urgently because, *inter alia*, State Water –
 - a. cannot readily demonstrate that it is operating efficiently at a valley/region level because of poor financial and management information systems; and
 - b. cannot readily track, control and manage project and/or activity costs in a way that will assure efficient outcomes.
81. State Water's predecessor organisations should have provided resources for development of financial and asset management systems required of a commercial business well before State Water was corporatised. The delay in doing so is not 'prudent' and compromises State Water's ability to operate efficiently and demonstrate it is able to do so. Accordingly, the cost of implementing this system (\$2 million in 2004-05) has been retained in the MJA-Cardno's recommended 'efficient baseline' Capex forecast below.

82. MJA-Cardno also recommends that IPART extend the current valley-based reporting regime for State Water's activities to include costs incurred to discharge State Water's key obligations. The reporting process should be subject to audit against a reporting guideline established by IPART in consultation with State Water and key stakeholders to ensure data is reliably recorded against service level performance and financial performance at an activity (Product Code) level for each valley/region. The financial performance reports should be subject to audit against statutory and tax accounts at a Product Code level should IPART choose to retain Product Codes as the basis for distributing costs between customer segments.

Recommendations - Procedures, Policies and Inter-agency Protocols:

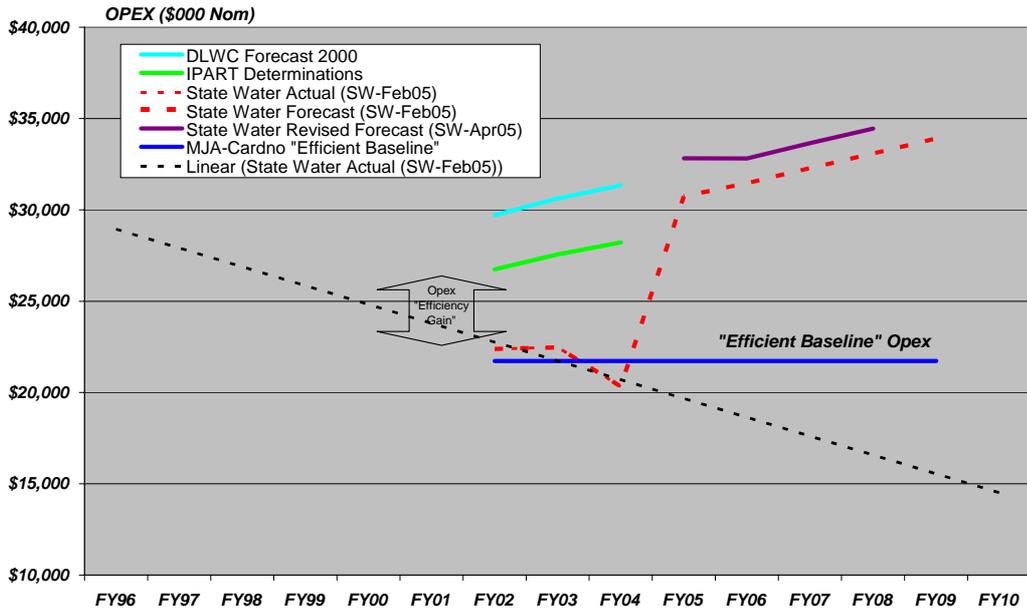
83. MJA-Cardno recommends that IPART require State Water to develop corporate policies and procedures that apply uniformly across the business (or ensure that existing policies and procedures do so) which define the process for identifying what obligations exist, how those obligations are to be discharged, and how costs of doing so are to be estimated, recorded and reported.
84. In addition, where multiple obligations are involved, IPART require State Water to ensure the policies and procedures specify that any incremental expenditure not directly linked to discharge of an explicit obligation be subject to a cost-benefit analysis. In particular, where functional enhancement is proposed that is not directly linked to discharge of an obligation, the expenditure involved is justified by cost-benefit analysis.

Recommendation - 'Efficient Baseline' Opex:

85. A simple (linear regression) analysis of State Water's actual Opex trends over the period 2001/02 to 2003/04 indicates declining costs, which MJA-Cardno considers are, most likely, not sustainable through the period 2004/05 to 2008/09. Accordingly, MJA-Cardno's recommendation for 'efficient baseline' Opex costs for the period 2005/06 to 2008/09 (that is also applicable to 2004/05) is the average of actuals for the 2001/02 to 2003/04 period. This recommendation is based on State Water's demonstrated ability (in the current regulatory period) to effectively deliver customer services and discharge its obligations at the 'efficient baseline' Opex.
86. State Water's response to the draft report provided no new evidence that would support a change to MJA-Cardno's conclusions or recommendations on Opex. The 'efficient baseline' Opex for the 2005/06 to 2008/09 period (and 2004/05) recommended for adoption by IPART is, therefore, retained at \$21.7 million/year (Nominal dollars) as indicated in Chart 1 below.⁴

⁴ Note that Chart 1 also illustrates the effects of the 'information asymmetry' problem outlined above; shows the 'Opex Efficiency' gain achieved by State Water's predecessor organisations in the current regulatory period; and shows the significantly different Opex data provided by State Water for this review.

CHART 1: RECOMMENDED "EFFICIENT BASELINE" OPEX



87. The information in State Water’s response to the draft report did not provide any new information that would enable MJA-Cardno to make a firm recommendation on ‘efficient baseline’ Opex for each valley/region. The information provided by State Water does not permit determination of what, if any, allowance could (or may) be applied to ensure all major activities (Product Codes) are appropriately funded at ‘efficient’ levels.
88. MJA-Cardno also notes that changes in valley total Opex proposed by State Water still differ markedly, with a significant reduction indicated for Border and the largest increases indicated for Lachlan, Gwydir, Peel, Murrumbidgee and South Coast (in ascending order) as shown in Chart 2 below. Accordingly, it is recommended that State Water be required to provide revised information on a valley basis that reconciles with the ‘efficient baseline’ total amount.

CHART 2: AVERAGE ACTUAL VS FORECAST OPEX BY VALLEY (\$ NOMINAL)

Region	Valley	Average actual 2001/02 to 2003/04 (\$)	Average forecast 2005/06 to 2008/09 (\$)	% Change
Central -	Lachlan	3,097	5,185	67
	Macquarie	3,176	4,441	40
Coastal -	Hunter	2,660	4,073	53
	N Coast	448	791	77
	S Coast	429	925	116
North -	Border	1,095	949	-13
	Gwydir	1,932	3,331	72
	Namoi	2,502	3,789	51
	Peel	764	1,418	86
South -	Murray	2,005	2,695	34
	Murrumbidgee	3,616	6,448	78

89. MJA-Cardno notes that State Water's response to the draft report was to forecast an increase in Opex of \$124,000 per year from 2005-06 through 2007-08 for each valley above that advised to MJA-Cardno in February 2005. An additional incremental increase of around \$65,000 per valley was also forecast for 2004-05 only.⁵ No adjustments were included for inflation even though the figures were quoted as Nominal Dollars.
90. This amount was attributed (in State Water's response) to increased expenditure for Product Codes:
- a. PC102 Rural Water Supply Customer and Industry Liaison (\$45,000/valley) for establishing a new, high level, Community Consultation Committee;
 - b. PC105 Regulatory Compliance (\$65,000/valley) for additional costs of legislative, statutory, regulatory compliance, requiring extensive monitoring and reporting of compliance and performance; and
 - c. PC120 Rural Water Supply River Operations Planning (\$15,000/valley) to effect a process of identifying synergies in customer demands and environmental demands and consider implementation in consultation with DIPNR and the customers.
91. MJA-Cardno has no information to assess whether the proposed increase in expenditure for PC102 or PC120 would improve service delivery to customers. However, it is recommended that IPART address these issues directly with customers. If customers express support for the increased expenditure, IPART may care to add these amounts to MJA-Cardno's 'efficient baseline' Opex.
92. In addition, State Water's response to the draft report re-stated brief explanations for increases totalling approximately another \$12 million (from 2003-04 to 2005-06) for other Product Codes. The explanations for these increases had been considered previously by MJA-Cardno. State Water provided no compelling new evidence to support changes to MJA-Cardno's draft recommendations. As noted above, MJA-Cardno identified no material change in function, obligation or service standards, post 2003/04 or the next regulatory period, that justify an increase in total Opex costs. While some costs may increase, MJA-Cardno expect that areas of operational improvement will be identified once State Water's new financial and management information systems are fully developed and implemented⁶ that will enable State Water to operate within the recommended 'efficient-baseline' Opex level.
93. State Water's response to the draft report acknowledged that "*a range of efficiencies should be achievable ...*" (through corporatisation), but proposes only "*to identify these savings over the next 3 years (because State Water has had) little time to streamline its operations*" and asserts that Opex must be increased by more than

⁵ State Water's response provided a summary of differences between 2003-04 and 2004-05 that totalled \$12.5 million, but did not show how that figure was allocated to the different valleys nor how it related to figures for 2005-06 through 2007-08.

⁶ State Water's response to the draft report asserts that the new financial system will be operational by July 2005 and its other systems (facility maintenance, project delivery and asset management) are already operational. MJA-Cardno's view is that State Water has made substantial progress with these systems, but some effort will be required to fully develop and successfully implement these systems.

50% in the interim. MJA-Cardno agree that further work is required to identify further operational efficiencies, but State Water has not provided evidence that demonstrates efficiencies can only be achieved by substantially increasing expenditure across all areas of the business. It is MJA-Cardno's view, gained from working with other corporatised water businesses around Australia, that State Water will be able to identify and achieve further efficiency gains without increases in expenditure by continuing the demonstrated ability (since at least 2001-02) to manage limited resources and operate efficiently.

Recommendation – Stream Gauging Costs:

94. MJA-Cardno recommends that incremental costs for DIPNR services allowed by IPART are based on comparison with costs for similar activities carried out by SunWater in Queensland and/or contract service providers in Victoria. The variation in the cost of stream gauging depends largely on geographic factors, but MJA-Cardno confirmed that costs incurred by Victorian and Queensland irrigation businesses range from \$8,500 to \$12,500 per gauging station per year (including capital/ownership costs).
95. Accordingly, MJA-Cardno recommend that IPART require State Water to:
- a. adopt an 'efficient' Opex cost of \$10,500 per stream gauging station, which is the average of cost range indicated above;
 - b. confirm the number of gauging stations required for operation of its system (bearing in mind that State Water appears to be suggesting it needs more than twice the number of stream gauging stations than SunWater in Queensland requires to operate its regulated river systems);
 - c. confirm the number of gauging stations to be transferred from DIPNR to State Water;
 - d. confirm the number of gauging stations that are duplicated;
 - e. confirm the number of gauging stations accessible through its SCADA network; and
 - f. 'market test' DIPNR service costs prior to 2008/09; and report these costs to IPART .
96. A supplementary recommendation is that IPART require State Water to investigate options for transfer of control of, and primary responsibility for, all gauging stations required for operation of State Water's systems from DIPNR to State Water. An allocation of primary responsibility to State Water for stream gauges and meters needed for operation of its systems would be more-or-less consistent with arrangements in the energy sectors regulated by IPART.

Recommendations – Dam Safety Costs:

97. MJA-Cardno accepts that State Water must meet dam safety obligations. But as noted above, the current dam safety requirements are being reviewed by the NSW

Government. If the draft 'Acceptable Flood Capacity for Dams' guideline, which incorporate a risk management approach, proposed by the DSC is adopted, actions to achieve compliance may change or options to achieve compliance identified that would achieve a more favourable business outcome than currently assumed in TAMP2004.

98. Accordingly, MJA-Cardno recommends that IPART require State Water to defer all major (uncommitted) expenditure on dam safety upgrades until:

- a. a final decision is taken by the NSW Government and the State Water Board on the DSC's draft 'Acceptable Flood Capacity for Dams' guideline;
- b. sound and coherent policies on dam safety consistent with guidelines eventually adopted are developed by the State Water Board and endorsed by the NSW Government;
- c. consistent with the adopted guideline, all dam safety requirements are reviewed;
- d. the most 'efficient' compliance measures are identified through robust business analysis of credible options;
- e. the preferred solution confirmed (from the credible options) through consultation with affected Stakeholders; and
- f. robust estimates of 'efficient' cost prepared that are suitable for incorporation into a revenue process.

99. It is MJA-Cardno's view that the above recommendation would result in deferral of all major dam safety works for a period of at least 2 years. Accordingly, a delay of this duration has been assumed in developing the recommendations of 'efficient baseline' Capex.

100. Specifically, MJA-Cardno recommends that IPART -

- a. require State Water to defer all major (and uncommitted) dam safety expenditure until 2007/08 to allow resolution of the dam safety requirements, refinement of option designs, preparation of 'efficient' cost estimates and robust business case evaluations for major dam safety projects;
- b. allow an amount of 5% (based on total investigation, detailed design and project documentation costs being within 15% of total Capex cost) of the TAMP2004 costs for dam safety to be included in years 2005/06 and 2006/07 to cover the cost of further investigation, option identification and estimating of robust costs of dam upgrade works that will comply with the dam safety procedures eventually confirmed by the NSW Government and the State Water Board; and
- c. include only 57% (the average of the ratio of Capex actual/Capex forecast over the 2001/02 to 2003/04 period) of the forecast Capex proposed by State Water to allow for the Capex forecast errors, the less than robust basis on

which the costs have been estimated and the ‘Capex efficiency’ (or ‘organisational inertia’) observed in the 2001/02 to 2003/04 period.

101. To the extent that State Water has committed to major dam safety works in the current regulatory period that could be avoided under DSC’s draft ‘*Acceptable Flood Capacity for Dams*’ guideline, or robust business evaluation, IPART consider whether or not these costs are ‘prudent’. MJA-Cardno notes that State Water is represented on the DSC. Accordingly, State Water should be expected to take ‘prudent’ decisions to delay major dam safety expenditure until a final decision is taken on the draft guidelines and robust business case evaluation undertaken for ‘efficient’ compliance options.
102. MJA-Cardno note that State Water’s response to the draft report did not identify already committed Capex for 2004/05 though 2008/09, but it did include a substantial revision of Capex forecasts compared to forecasts provided in February 2005. As noted above, this substantial change confirms MJA-Cardno’s reservations about the robustness of State Water Capex forecasts.
103. State Water also asserted that the “*MJA proposal of a 5% of forecast dam upgrade costs to cover investigations will be insufficient. The required amount is estimated at \$4.5m/yr for the determination period*”, but provided no evidence to support the estimate of \$4.5 million/year. MJA-Cardno notes that (using State Water’s latest revised forecast) this amounts to 16% of total forecast Capex in 2005-06 declining to 8% in 2007-08, which appears far too high for investigation of dam safety options.
104. MJA-Cardno’s estimate is based on typical costs incurred in developing large rural water supply projects to the stage where Governments are able to commit funds to the project. Definition of the project scope and cost estimate typically requires substantial engineering input, firm business case evaluation and broad stakeholder consultation. These should be common attributes for State Water’s dam safety projects. Overall investigation cost for major projects, including completion of detailed design and firm business case evaluation, is typically around 3% of the total project cost. There may be economies of scale due to size of some projects, but an allowance for this was made in MJA-Cardno’s estimate of 5% for State Water’s program.

Recommendations – Fishway and Cold Water Pollution Costs:

105. MJA-Cardno has concluded that it is not ‘prudent’ to incur a cost in meeting obligations that cannot be explicitly defined, nor compliance explicitly determined or demonstrated in advance of commitment of resources. Specifically, expenditure committed to fishways and cold water pollution controls that are deemed by the regulatory agency not to satisfactorily discharge State Water’s obligations is not ‘prudent’. Nor is it ‘efficient’ to include in forecast the costs of meeting obligations that cannot be adequately defined. Accordingly, MJA-Cardno recommends that IPART require:
- a. State Water to defer all expenditure on fishways and cold water pollution controls until protocols are developed and agreed with DPI and other

agencies that adequately define how State Water can determine when it has discharged its obligations in these areas;

- b. State Water and DPI develop and agree, through a public consultation process with key stakeholders, a protocol for determining the conditions under which fishways and other thermal environmental remedial actions are to be initiated.

106. It is MJA-Cardno's view that this would result in deferral of all fishway and cold water pollution works for a period of at least 2 years. Accordingly, a delay of this duration has been assumed in developing the recommendations of 'efficient baseline' Capex.

Recommendations – 'Efficient Baseline' Capex Costs:

107. The overall outcome from adopting the recommendations above is summarised in Chart 3 below. MJA-Cardno has not adjusted the recommendations to take account of State Water's latest revised Capex forecast, because this did not include any information for the period 2004-05 and appeared to be no more robust than previous forecasts. However, these amounts are shown on Chart 3 for comparison with other information provided by State Water and the recommended amounts.

108. MJA-Cardno is not able to make a firm recommendation on 'efficient baseline' Capex for each valley/region because insufficient information is available to determine the precise distribution of dam safety and fishway/cold water cost forecasts. Accordingly, it is recommended that State Water be required to provide revised information on a valley basis of that reconciles with the 'efficient baseline' total amount.

CHART 3: ILLUSTRATION OF "EFFICIENT BASELINE" CAPEX

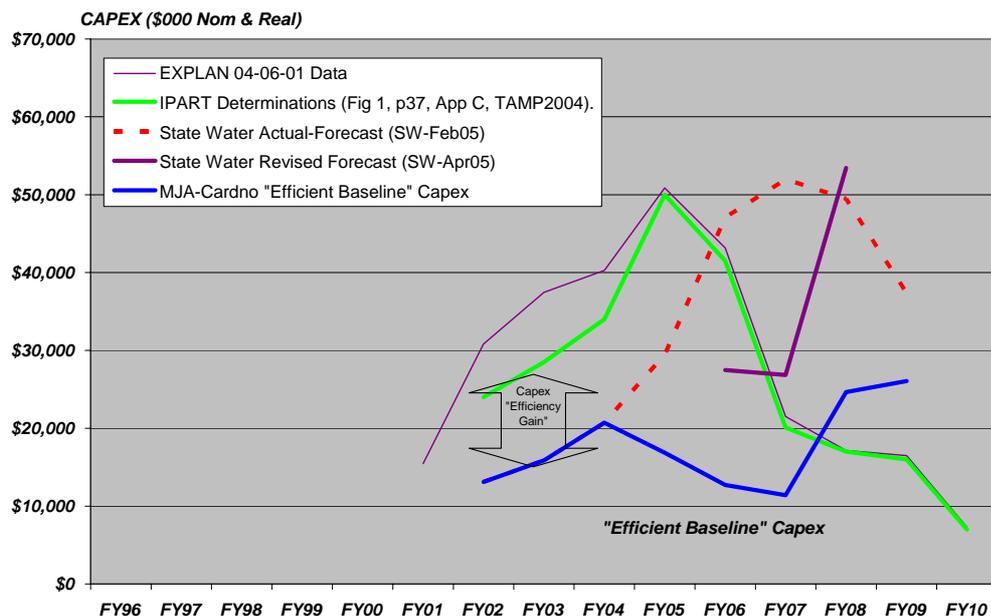


CHART 4: RECOMMENDED "EFFICIENT BASELINE" CAPEX

ITEM	Actual (\$000, Nom)			Forecast (\$000, Real 2004/05)				
	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09
State Water Actual (Feb 05)	13,102	15,866	20,703					
State Water Actual/Forecast (Feb 05)				29,486	47,071	51,954	49,473	37,364
Adjustments								
Delay Dam Safety					-22,395	-31,885	-30,170	-25,020
Reinstate Dam Safety							22,395	31,885
Delay Fishways/Cold Water					-4,387	-2,882	-2,950	-1,515
Reinstate Fishways/Cold Water							4,387	2,882
Dam Safety Investigation					1,120	1,594		
Actual/Forecast Factor				-12,628	-8,689	-7,361	-18,474	-19,528
"Efficient Baseline" Capex	13,102	15,866	20,703	16,858	12,719	11,420	24,661	26,068
State Water Revised Forecast (Apr 05)					\$27,486	\$26,860	\$53,435	

1. Introduction

This report has been prepared by Marsden Jacob Associates (MJA) and Cardno MBK (Cardno) in response to Terms of Reference specified by the Independent Pricing and Regulatory Tribunal of New South Wales (IPART). The report describes the results of an independent expert assessment of the efficiency and effectiveness of expenditure outcomes achieved by State Water Corporation (State Water) and its predecessor organisations for financial years 2001/02 to 2004/05 and expenditure proposals put forward by State Water for financial years 2005/06 to 2008/09.

The outcome of MJA-Cardno's review is intended to assist IPART undertake the fifth regulatory review of NSW bulk water services since 1996.⁷

1.1. Previous Consultants' Reviews

The MJA-Cardno review of operational and capital expenditure efficiency of bulk water service delivery is the fourth consultants' review of bulk water operations undertaken for IPART since 1996. The first review, undertaken by GHD Pty Ltd in 1996 focused on an examination of the process used by the (then) Department of Land and Water Conservation (DLWC) to develop the asset management plan for the Water Administration Ministerial Corporation (WAMC). In 2000, GHD undertook a further review of asset management practices,⁸ while PricewaterhouseCoopers (PwC) reviewed operations and maintenance expenditure (Opex) and capital expenditure (Capex) proposals prepared by DLWC. PwC's recommendations were adopted by IPART for determination of revenue requirements for the three year period 2001/02 to 2003/04.⁹

1.2. Use of "Benchmarking" and Cost Comparators

The assessment of efficiency and prudence of State Water's expenditure proposals is, to the extent that is appropriate and possible, based on consideration of best practice standards for efficient development, maintenance and utilisation of infrastructure assets. In undertaking this assessment, MJA-Cardno has also considered use of relevant industry cost benchmarks and has taken into account all information provided by State Water.

MJA-Cardno notes that there are limits on the usefulness of cost benchmarks in these types of reviews. Such benchmarks are generally of value, and relevant, only in so far as they assist informing qualitative judgements - or where they relate to a narrowly defined activity (such as stream gauging) where the difference between operators and/or operating conditions is minor or can be eliminated (or normalised) by precise definition of the scope of the activity.

⁷ IPART published Determinations on bulk water pricing in 1996, 1997, 1998 and 2000.

⁸ A third review of State Water's asset management planning process was undertaken by GHD for State Water in 2004.

⁹ Pricing and revenue arrangements were extended by Government for 2004/05 by allowing a 2.5% price increase.

No robust industry cost benchmarks exist that are appropriate for making quantitative assessments of State Water's overall efficiency or the relative efficiency of individual activities. As noted in Chart 5 below, State Water's assets, and its principal modes of operation, are significantly different to other irrigation water service providers. This makes it difficult to directly compare cost indicators for State Water with other service providers in such a way that definitive conclusions can be reached.

State Water is the only State-wide water supply entity in Australia that operates at the bulk water supply level and delivers primarily water services (i.e. operations are not dominated by hydropower generation, town water supply or 'retail' irrigation supply). Comparisons of key features of State Water's operations with SunWater and Goulburn-Murray Water (GMW), from the Australian National Committee on Irrigation and Drainage (ANCID) Australian Irrigation Water Provider Benchmarking Report for 2002/03, are provided in Chart 5 (following).

In 2003, State Water initiated an information sharing and benchmarking initiative with other well respected organisations in the bulk water delivery industry. An independent consultant was engaged to identify comparable organisations and formulate potential key performance indicators. However, MJA-Cardno understands that, to date, there have been no outcomes from the initiative.

CHART 5: INDUSTRY COMPARATORS

Indicators	GMW	Sun Water	State Water
Major Dams >100,000 ML (no.)	3	13	14
River and Channel Structures (no.)	6,554 channel regulators	81 river structures 740 channel regulators	282 weirs & regulators
Pumping stations (no.)	4	72	0
Channels and pipelines (km)	6,378	2,500	500
No of water supply schemes	7	27	11
Drains (km) – Constructed and natural	3,162	740	0
Customers	16,672	5,574	6,234
No of employees (FTEs)	601	510	270
Current Replacement Asset value	\$1.851 billion	\$2.3 billion	\$2.9 billion ¹⁰
Deliveries (2002/03) GL	2,252	1,558	3,291

A significant challenge in this assignment has been the lack of continuity in the roles, responsibilities and service performance of State Water. Even now, some of the activities within State Water's remit are undertaken (under non-competitive contractual arrangements) by the Department of Infrastructure, Planning and Natural Resources (DIPNR); and State Water undertakes some activities on behalf of DIPNR.

¹⁰ The current replacement asset value of \$2.2 billion and \$2.3 billion are both quoted in State Water's Annual Report for 2002/03.

The challenge presented by this lack of organisational continuity was significantly compounded by the difficulty that State Water had in providing robust information relating to financial performance. Put bluntly, MJA-Cardno is not confident that State Water's financial and management reporting systems are capable of providing reliable data that is suitable for assessing the operational efficiency of State Water's activities (at a Product Code level). This is indicated in reported (and forecast) financial data by the significant variability year-on-year and between valleys/regions of activities (Product Codes) that would be expected to be reasonably stable and comparable. State Water quite reasonably asserts in various documents that its activities are largely of a fixed cost nature. MJA-Cardno accepts that this is, most likely, generally correct. A high proportion of fixed costs, both Capex and Opex,¹¹ are common features of all irrigation (and water supply) businesses. But at a detailed level, the cost data provided by State Water frequently does not show this characteristic.

Concern about data quality has been a key focus in the MJA-Cardno review. However, completely satisfactory resolution of data quality issues has not been achieved. This affects the robustness of the MJA-Cardno analysis and has an inevitable impact on the firmness of conclusions reached and recommendations made to IPART. These concerns, and their impacts, are discussed in detail throughout the report.

1.3. Background to State Water

The water service delivery (service provider) role of State Water was originally embedded in the former Department of Land and Water Conservation (DLWC) and its predecessors. DLWC also had functions in water resource management and its regulation.

The NSW Government established State Water, as a 'ring-fenced' commercial business unit within DLWC,¹² to provide bulk water delivery services and asset management from 1 July 1998. This move was a response to the Council of Australian Governments (CoAG) Water Reform Framework and the National Competition Policy.

DLWC was abolished in April 2003 and replaced by the Department of Infrastructure, Planning and Natural Resources (DIPNR) under the Minister for Infrastructure and Planning and the Minister for Natural Resources. At the same time, the activities and functions now undertaken by State Water were moved from DLWC to operate as a business unit within the Department of Energy, Utilities and Sustainability (DEUS).

The *State Water Corporation Act 2004* was legislated in June 2004 to enable the creation of State Water from 1 July 2004. State Water is a State Owned Corporation under the provisions of the *State Owned Corporations Act 1989*.

¹¹ The terms "Capex" and "Opex" are used throughout this report for "capital expenditure" and "operations and maintenance expenditure" respectively.

¹² This report contains frequent comments that are critical of State Water's ability to provide consistent and robustly defensible cost data. The difficulty experienced by State Water in responding to straight-forward requests strongly suggests that the "ring-fencing" arrangements implemented by DLWC were far from effective or robust. For example, State Water advised that it was not possible to provide historical cost data going back to the initial IPART review of bulk water services in NSW that was undertaken in 1997. MJA-Cardno believes that an effectively "ring-fenced" arrangement would have allowed such information to be provided readily.

The key objective for the corporatisation of State Water was to separate the NSW Government's commercial water delivery functions from its policy and regulatory functions. This is in line with National Competition Policy requirements. Other key objectives are to increase transparency of cost recovery in water delivery and resource management, and reduce potential conflicts of interest between the roles of policy development and monitoring, technical and economic regulation and operation of the water supply functions assigned to State Water.

The corporatisation of State Water has resulted in significant changes in its relationships with other NSW Government agencies, e.g., Treasury, DIPNR, DEUS, Department of Environment and Conservation (DEC), Department of Primary Industries (DPI) and IPART. Although now legally separated from a Government Department, State Water has been required to enter into contracts with DIPNR for receipt of stream gauging services, and provides meter reading services to DIPNR under another agreement. It is of relevance to this review that neither of these arrangements was subject to market testing. It is also relevant that the final costs of the DIPNR service agreement has not yet been finalised.

In its response to MJA-Cardno's draft report, State Water asserted that:

... its predecessors had always been dispersed as minor branches and sections of Government Departments which had broad policy, regulatory and operating responsibilities. ...

Until July 2004, the commercial imperative had never played a primary role for State Water and its predecessors. Buried deep in the bowels of successive large Departments, State Water and its predecessors were little more than an after thought provided that dams remained intact and water was released in keeping with reasonable demands. The State owes great credit to a handful of talented individuals who were able to secure the advanced position in asset management that State Water Corporation currently enjoys. ...

Upon its formation, State Water Corporation did what any new organisation must do. It recognised very rapidly the shortcomings to be addressed and acted within a short period to start putting in place appropriate systems and procedures. The Corporation takes pride in the advances made in the nine months since corporatisation. Of course there is much more to be done, but observers and critics need to understand the already significant difference between State Water and State Water Corporation.

MJA-Cardno notes that State Water was commercialised from 1 July 1998, and the majority of State Water Corporation managers, who are now responsible for implementing the 'commercial imperative', have been with the predecessor organisations from 1998. MJA-Cardno accepts that different constraints apply to 'public service business enterprises' and commercially-focussed (and legally corporatised) businesses. Information provided by State Water appears to suggest that the new business sees corporatisation as a release from 'public service' constraints that ensured limited resources were applied efficiently. MJA-Cardno does not accept this view. Extensive work with other 'corporatised' clients confirms that commercial discipline and focus on customer services are fundamental to success.

MJA-Cardno is also fully aware that State Water is not the first or only government business unit to be corporatised, some in even more tumultuous circumstances than those applying to

State Water.¹³ It is MJA-Cardno's view that the comments above understate the responsibilities taken on by State Water's managers, and their successes. As documented elsewhere in this report, MJA-Cardno concluded that managers in State Water's predecessor organisations implemented an operating regime that is generally efficient, achieving cost outcomes well below those judged 'efficient' by IPART in its 2000 Decision while ensuring service standards were not compromised or obligations breached. This is an admirable achievement. MJA-Cardno agrees that there is, indeed, much to be done by managers and the Board in the newly 'liberated' State Water. The conclusions and recommendations in this report are (partly) intended to assist State Water's progress to a service-focussed, efficiently-run business enterprise.

1.4. The Role and Functions of State Water

State Water is responsible for the provision of bulk water services to irrigators, towns, industrial users, domestic and stock consumers and environmental stakeholders in the State's extensive and diverse water catchments.

State Water operates in 11 valleys across 4 regions in regional NSW including the NSW section of the Murray-Darling Basin (MDB) as well as a significant number of coastal catchments.¹⁴ State Water's responsibilities include:

- river and infrastructure operations, which covers water delivery for consumptive, environmental and water quality purposes, flood mitigation, hydrologic planning and monitoring;
- asset management, which covers management of dams, weirs, offtakes, foreshores and other related assets and structures;
- customer services, which covers meter reading and usage monitoring, water billing, water ordering, allocation accounting, licence administration, approval and compliance activities, temporary water transfers, customer consultation, information and advice and water allocation announcements; and
- third party services, which covers groundwater bore meter reading and compliance billing in the non-regulated areas on behalf of the DIPNR, operations and maintenance of structures in non-regulated streams, and operations in the River Murray System as the NSW contracting authority under the MDB Agreement.

State Water manages long-lived dam and weir infrastructure assets with a replacement value of approximately \$3 billion, releasing around 5,000 GL of water per year, of which 3,300 GL was distributed to Licensed water users in FY2003.¹⁵

¹³ For example, the restructuring and privatisation of the Victorian electricity sector saw 14 separate government enterprises merged and re-cast as three, then 13 separate corporations that were subsequently privatised within a two-year period. In some cases, the newly corporatised entities had entirely new management teams that were largely replaced after privatisation. This comparison is not intended to suggest that the conditions faced by State Water are insignificant, but it does indicate that State Water is not the only organisation to face the same circumstances.

¹⁴ The 11 State Water operating valleys/regions are: Border, Gwydir, Namoi, Peel, Lachlan, Macquarie, Murray, Murrumbidgee, North Coast, Hunter and South Coast.

¹⁵ *Annual Report 2002-2003*, State Water Corporation, p. 20,

1.5. Bulk Water Pricing and Regulation

State Water recovers a significant proportion of its bulk water operational and asset costs through water charges levied on water customers according to their entitlement holding and volume of usage (through a 'conventional' two-part tariff). Prices are valley/region specific and vary according to the costs incurred in operating and maintaining the bulk water delivery systems and infrastructure in the relevant valley. Additional financial resources are provided directly by the NSW Government to cover substantial costs associated with dam safety upgrades, as well as some costs associated with environmental compliance and services provided to recreational water users.

IPART has had a role in regulating rural bulk water pricing since 1996. In 1996, IPART undertook a major research project to review and reform charges for bulk water services. This review set the overall framework and underlying principles for its regulation of bulk water prices. Since then, IPART has made four price determinations (in 1997, 1998, 1999 and 2000) through which it further developed and refined its regulatory approach.

IPART's 1996 review of bulk water prices recommended how prices should be set to achieve a balance between competing claims within the community. The 1996 Interim Report established the principles that have guided IPART's subsequent determinations. The two key pricing principles relevant to MJA-Cardno's review are that water service prices should reflect:

- efficient economic costs, which means prices for water services should recover the efficient economic costs of bulk water services avoiding untimely or unnecessary expenditure; and
- financial stability and appropriate level of service, which means cost recovery should ensure the financial viability of the entity delivering the service and should provide the appropriate level of water services.

These key principles are not controversial, in the sense that they are entirely consistent with the CoAG water sector reform agenda and are directly comparable to regulatory principles applied to other sectors across all jurisdictions in Australia.

1.6. Objectives of Consultancy

The primary objective of the consultancy specified by IPART was to assess the efficiency of State Water's forecast of expenditure requirements in each of the 11 valleys/regions in which it supplies bulk water services to customers. In assessing the efficiency of the expenditure forecasts, MJA-Cardno was required to take into account that IPART must ensure that State Water's revenue is sufficient to maintain and expand its operations to ensure adequate service delivery while not rewarding inefficient asset investment or operational decisions. MJA-Cardno was also required to consider the major cost drivers, the trade-offs between Capex and Opex, service standards and the sector's future needs. IPART also noted that a range of information sources are relevant to the review, including industry benchmarks and the prudence of State Water's historical expenditure performance (2001/02 to 2004/05).

This report provides an assessment of State Water's regulated business undertakings covering the following areas:

1. to the extent necessary to undertake 2 below, the efficiency of Opex for the period from 2001/02 to 2004/05.
2. the efficiency of the estimates of Opex for the period from 2005/06 through to 2008/09, that is, from 1 July 2005 until 30 June 2009.
3. the prudence of its Capex for the period from 2001/02 to 2004/05.
4. the efficiency of proposed Capex for the period from 2005/06 to 2008/09.

MJA-Cardno notes that IPART distinguishes between efficiency of committed Opex and prudence of committed Capex. IPART advised that:

- ‘efficiency’ in the Opex context refers to ‘productive efficiency’ – or the production of a given output at least cost; and
- ‘prudent’ in the Capex context refers to work that is both necessary and the cost ‘efficient’.

MJA-Cardno has assumed that these terms should be considered in the context that service standard, or asset condition, or discharge of an explicit obligation is not compromised. That is, ‘prudent’ Capex would have a quality of economy and frugality and would be made in a way that sought to avoid unnecessary costs and waste. ‘Prudence’ requires exercise of sound judgement, which in the context of State Water’s operations is about ensuring that Capex in the current period is appropriately targeted and is at a level necessary to avoid higher costs in the future and/or a reduction in quality of service below a desired level.

MJA-Cardno recognises that the definition of ‘prudence’ is important because the draft report recommended that IPART should not accept expenditure on fish ways (and cold water pollution controls) that turned out to be unsatisfactory; and that State Water should not undertake further expenditure unless it knows beforehand whether the expenditure is likely to produce the outcome intended (and discharge State Water’s obligations).

Issues relevant to interpretation of ‘efficiency’ and ‘prudence’ have been dealt with recently in Halcrow Pacific’s Overview Report to IPART on the Metropolitan water businesses¹⁶ and Meritec’s Final Report to IPART on electricity distribution.¹⁷ These precedents were considered in this review, with MJA-Cardno’s view also influenced by interpreting the difference between ‘efficiency’ and ‘prudence’ by:

- comparing common definitions of these terms (as noted above);
- considering what might happen in a competitive market; and
- considering what State Water's customers might think is fair and reasonable, viz:
 - in an efficient, competitive market, a business that invested in an asset that did not do what was intended would bear the cost unless all other competitors made the same (or similar) investment decisions; and
 - customers would consider it fair and reasonable that they pay the full cost of a business doing something right, but not pay for investment mistakes.

¹⁶ NSW Water Agencies Review - Overview Report, Halcrow Pacific Pty Ltd, December 2002.

¹⁷ Review of Capital and Operating Expenditure of the NSW Electricity Distribution Network Service Providers – Final Report, Meritec Ltd, September 2003.

This view has some similarity to the approach that Halcrow and Meritec adopted, but there are subtle differences between the emphasis that Halcrow used in the water sector and Meritec used in the electricity sector.

Halcrow footnoted a definition of ‘prudent’ as *"Discrete or cautious in managing ones activities; practical and careful in providing for the future and exercising good judgement"*¹⁸ and suggested that *"this approach (rolling in all ‘prudent’ Capex) may reduce the incentive for agencies to develop robust asset management procedures and deliver capital efficiencies"*.¹⁹ Halcrow's remaining focus, in the short discussion relating to interpretation of prudence, is on the capital efficiency incentives created by any decision by IPART to roll in all prudent expenditure and the impact that decision has (or should have) on the sharing of risks between customers and shareholders.

Halcrow also noted that *"the only certain thing about forecasts is that they will be wrong. Active management of a capital programme is therefore necessary. However there is a limit to what should be considered reasonable active management of a programme at which point poor planning must be considered."*

Halcrow based its judgements on what expenditure was ‘prudent’ on the presumption that IPART should not, primarily, be concerned if outcomes were different to planned, but should be concerned to create incentives for just the right amount of Capex (not too much or too soon; and not too little or too late) as these incentives were required to produce efficient outcomes. However, Halcrow also argued that IPART should not accept Capex just because it was considered to be ‘discrete’ or ‘cautious’ or even ‘practical and careful’, which appears to be the focus of State Water’s comment that it *"adopted a precautionary approach (in meeting its) safety and environmental obligations"*.²⁰ Rather, Halcrow argued, IPART should only accept Capex if the business does each of these things and the expenditure is based on the *"exercise of good judgement"*.

Meritec referred to the Halcrow approach, and IPART’s advice to electricity distributors in November 2001 (with details of this advice summarised in Meritec’s report²¹), but placed emphasis of identifying criteria that could be applied to assist a decision on whether or not *"good judgement was exercised"* at the time the expenditure decision was made.

In essence, the difference between ‘efficiency’ and ‘prudence’ in Meritec's judgement came down to what information was available at the time the decision was made to commit Capex. This might be rephrased by saying that Meritec judged the expenditure to be ‘prudent’ if:

- all the assumptions underlying the investment decision were based on sound information derived in a robust asset management framework; and
- the expenditure was reasonably likely to produce an outcome that is judged efficient.

It is relevant to note that Halcrow generally accepted as ‘prudent’, expenditure that was either less than or greater than forecast, although reservations were expressed about the

¹⁸ Collins Concise Dictionary; 2nd Australian Edition, 1990.

¹⁹ p8, *NSW Water Agencies Review - Overview Report*, Halcrow Pacific Pty Ltd, December 2002.

²⁰ p6, *State Water Corporation’s Response to Review of Capital Expenditure, Asset Management and Operating Expenditure (Draft) Report*, State Water Corporation, March 2005.

²¹ Section 2.2, pp5-6, *Review of Capital and Operating Expenditure of the NSW Electricity Distribution Network Service Providers – Final Report*, Meritec Ltd, September 2003.

robustness of asset management practices and processes that underpinned such forecasts. Meritec also accepted substantial over-spending by the electricity distributors on the basis that this was a 'prudent' response to unexpected growth in electricity demand, but also raised concerns about the robustness of the distributors' forecasting.

It is particularly relevant to this review that Halcrow expressed concern about two items of expenditure undertaken by the Metropolitan water businesses, viz:

- Hunter Water had purchased land on a potential dam site that was not identified as required in its integrated water resource plan in the foreseeable future; and
- Sydney Water's new billing system that was subject of an enquiry by the Auditor General.

In both cases, the businesses had undertaken expenditure that was either not clearly related to a forecast obligation, or produced an unintended outcome (a billing system that did not work properly).

The relevance of these precedents is that MJA-Cardno might accept that it was 'prudent' for State Water (and DPI) to acknowledge that there was uncertainty in fishway designs and embark on limited trials of alternative designs. But this is not what happened. State Water undertook major expenditure on fishways that turned out to be unsatisfactory; and MJA-Cardno saw no evidence that allowances in forecast expenditure were based on fishway designs that were likely to be satisfactory. Accordingly, this final report retains the recommendation that expenditure be deferred on activities where uncertainty exists about whether compliance with State Water's obligations will be achieved until such time that the issues referred to by State Water are resolved.

In undertaking the study MJA-Cardno has also considered:

- relevant legislation, regulatory requirements and NSW Government policies and initiatives;
- current and projected water storage capacity;
- current asset condition and renewal requirements;
- asset management frameworks, plans and practices;
- existing operational requirements;
- ring-fencing of and cost transfers between regulated and unregulated activities;
- efficient costs of providing the relevant services;
- current and likely future environmental, health and safety standards;
- current and likely future service obligations; and
- comments and additional information contained in State Water's response to the draft report.

State Water's activities are managed and costed on a river valley basis. In so far as it was possible to do so, the assessments undertaken in this review have been reported for State Water as a whole and for each of the river valleys.

This assessment has been based largely on the experience of senior members of the MJA-Cardno team and examination of information provided by, or sourced from, State Water and

IPART. Analysis of this information considered comparison of State Water's activities with activities of other water service providers, including irrigation businesses in Queensland, NSW ("retail" irrigation) and Victoria. Evaluation of State Water's activities has been considered by reference to best practice standards for efficient maintenance and utilisation of infrastructure assets including reference to relevant industry cost benchmarks where appropriate. However, as noted above, MJA-Cardno's assessment of State Water's activities is not based on quantitative benchmarking.

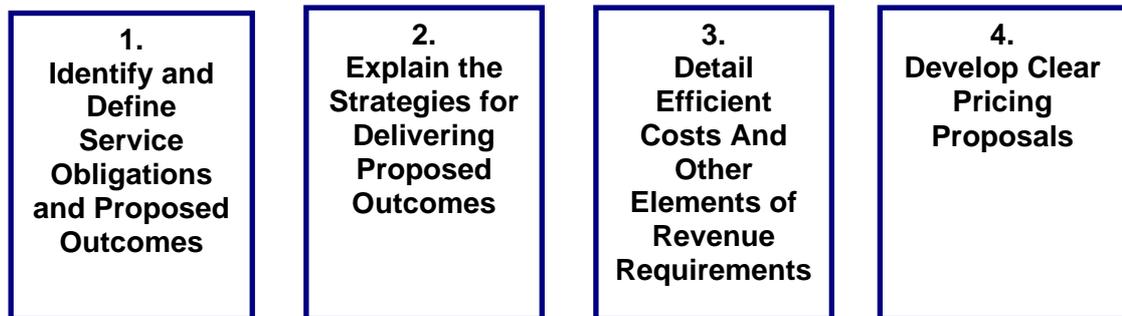
2. Contents of a Pricing Proposal

The proposal presented to IPART by MJA-Cardno to review State Water's Capex and Opex efficiency/prudence was predicated on the assumption that State Water's pricing proposal would contain all of the key elements that reasonably and robustly explained and justified the proposal. This assumption was considered reasonable because IPART has previously undertaken four separate pricing reviews of State Water's predecessor organisations in 1996, 1997, 1998 and 2000. In each of these previous reviews, IPART had been directly critical of the (predecessor) organisations' ability to explain and justify expenditure proposals and revenue requirements. IPART also imposed conditions in each of its Determinations that should have resulted in a more structured approach by State Water to preparation of this current pricing proposal. MJA-Cardno expected that this 'regulatory journey' would have resulted in State Water being sufficiently skilled and comprehending of the regulatory process and its requirements to produce a robust and coherent pricing proposal. For reasons detailed in this report, this assumption was found to be overly optimistic.

The material in this section of the report briefly outlines the key elements that would be expected to be included in any reasonably robust pricing proposal. MJA-Cardno used this as a frame of reference to compare and validate information provided by State Water. The contents of this section are also intended to assist State Water, and other key stakeholders, gain a better and more robust understanding of the regulatory process.

In general terms, a pricing proposal can be considered as requiring four related and sequential steps to be undertaken. These steps are outlined in Chart 6 below.

CHART 6: ELEMENTS OF A PRICING PROPOSAL



Each of these steps is briefly summarised below. The requirements and implications for assessment of the efficiency and prudence of State Water's actual expenditure and proposals for the period 2005/06 to 2008/09 involve scrutiny and understanding of all elements required to define the first two steps and scrutiny of those elements of costs associated with Capex and Opex in the third step. MJA-Cardno was not required to review or comment on other cost elements (such as depreciation, return on capital or asset annuities etc) or make any comment on the approaches that IPART may consider adopting to establish the final revenue requirement.

2.1. Identification of Obligations

The first logical step in the pricing proposal process is to identify and define each of the service obligations that State Water is required to meet. These obligations provide the justification for State Water to incur costs and recover revenue from customers²² for provision of services.

There are two basic categories of obligation that IPART would accept as the basis for legitimate incurring of costs. These are:

- a statutory (or regulatory) obligation defined by an explicit legal process; or
- an obligation defined by clear agreement with customers, with customers indicating informed consent²³ to accept the cost of providing the service where no explicit external obligation exists.

The pricing proposal should identify regulatory obligations that relate to each area of the business and should, *inter alia*, include:

- customer service levels (e.g. water delivery performance);
- environmental obligations and performance (e.g. fishways, cold water pollution);
- water quality (to the extent that State Water has any such responsibility);
- dam safety, public safety etc;
- occupational health and safety;
- heritage protection;
- meter reading, customer billing, etc;
- responding to growth, new developments; and
- financial viability – including achieving shareholder's reasonable expectations of efficient benchmark return on equity.

MJA-Cardno notes that IPART would be expected to accept as 'fair and reasonable' that customers should pay the efficient costs incurred in delivering an obligation that is linked to an outcome that State Water must deliver.

²² State Water has several distinctly different types of customers. Some are end-users of irrigation water services, and some are irrigation retailers who take bulk water supplies from State Water and on-sell irrigation water to end-users. The cost of providing services to customers is intended to be recovered through water pricing charges.

Under the current funding arrangements applying to State Water, services can also be considered to be provided to the NSW Government for dam safety, environment, and recreation uses. The majority of the costs associated with undertaking these activities are met by allocations from NSW Treasury.

MJA-Cardno was not required to distinguish between these different categories of 'customer'; and this report contains no such distinction. However, comment is made, where relevant to analysis of the information provided by State Water, on the possible impact of different forms of scrutiny of State Water's costs by end-users, retailer customers and Government.

²³ IPART has never defined explicitly how informed consent might be determined. But it has accepted that this consent could be indicated through results of consumer willingness to pay surveys. That is, customers are not expected to have to deal with all the detailed information related to service options before indicating acceptance. But if State Water claimed informed consent had been granted, it would be expected to explain the processes used to establish support by its customers for expenditure proposals and service standards.

2.2. Strategies for Discharging Obligations

The second logical step in the pricing proposal process is to define and explain the business strategies and actions that have been developed by State Water to achieve and deliver the outcomes required to discharge State Water's obligations.

The level of detail included in the pricing proposal should be sufficient for IPART to form a view that all activities undertaken by State Water are prudent and reasonably likely to deliver efficient outcomes - in terms of both service standards and cost. The business strategies should, *inter alia*, cover each of the areas listed in State Water's Interim Operating Licence (Licence). For example:

- strategies for meeting long-term demand, which requires explanation of demand and supply forecasting methodologies;
- strategies for managing assets, which requires explanation of operation and maintenance management, asset monitoring, etc;
- the processes and decision criteria used to consider, assess and evaluate different strategy options, which requires explanation of how trade-offs are made between service standards and cost, and between Opex and Capex, etc;
- trade-offs and customer support demonstrated, which would normally be expected (by an economic regulator such as IPART) to require demonstration of "effective consultation" with customers²⁴ where service standards are to be changed, or costs of providing a service altered in any material way; and
- policies for growth/new developments or changes in responsibility or areas where judgement and discretion in significant expenditure amounts is required – such as dam safety (or policies to cope with declining population in small towns or changed irrigation practices if these are relevant).

These business strategies should have been developed in State Water's Corporate Planning Process. Explanation of the strategies in the pricing proposal needs to be consistent with corporate plans and take into account each of the requirements specified in State Water's Interim Operating Licence.

2.3. Revenue Requirements

The third logical step in the pricing proposal process is to detail each category of business cost that goes into making up the regulated revenue forecast for the full period of the pricing proposal. The major requirements of the revenue forecast are that it must:

- ensure financial viability, in the longer term; and
- be based on reasonable forecasts of 'efficient' and 'prudent' costs associated with strategies and actions and likely sales volumes.

Each of these requires provision of robust estimates of cost based on prudent and reasonable forecasts of operating conditions. IPART has made it clear in other sectors that it would only entertain "re-opening" or "adjustment" of the regulated revenue in the event of changes

²⁴ Note that "consultation" with customers is defined as an obligation under Clause 4 of State Water's Interim Operating Licence, but the way in which consultation can be made to be effective is not.

in legal obligation within the regulatory period. Therefore, the forecasts of costs and sales volumes must be sufficient to cover all reasonably likely conditions for the pricing proposal period including such things as extreme climate or weather events. A “common sense” assumption is that the pricing proposal should include costs associated with any activity linked to State Water’s obligations that State Water is best placed to undertake or control.

It should be noted that the IPART Revenue Building Block Model is quite straightforward. It contains only three basic categories of business cost:

- capital financing costs, which could be based on either of two approaches –
 - return on assets, which requires establishment by IPART of a “regulatory asset value”, an efficient Capex forecast for the regulatory period and a weighted average cost of capital (i.e. WACC) for State Water; and return of assets (i.e. regulatory depreciation), which may have a different value to the depreciation amount shown in statutory or tax accounts; or
 - an asset annuity amount that provides sufficient contribution to revenue year on year to cover the reasonable future costs of new assets, asset renewal, and asset replacement;²⁵
- operating, maintenance and administration expenditure; and
- forecast actual tax paid.

However, clarity is needed in the pricing proposal about where revenue comes from. IPART regulates different sources of revenue differently. For example, the Revenue Building Block model determines the forecast revenue that will be derived through tariffs and charges for basic services. Revenue from other sources, such as Miscellaneous Fees and Charges, may still be subject to regulatory oversight - and IPART would be expected to require the pricing proposal to provide full details of the costs associated with these other revenue sources. IPART would also be expected to require details to be provided in the pricing proposal of any revenue derived from unregulated sources, or through non-regulated capital contributions from NSW Government, statutory authorities and other agencies or gifting of assets by (for example) property developers or irrigators. And, finally, IPART has implemented a cost allocation mechanism for State Water that is based on percentage allocation of total costs by activity (Product Code) in each valley – which presumes the costs allocated to the activities (Product Codes) are, in fact, related to those activities.

The implications for the pricing proposal are that it must contain sufficient information for IPART to form a robust and defensible judgement as to the reasonableness, prudence and efficiency of all cost and revenue components, including:

²⁵ Selection of the appropriate approach is a matter for IPART, but MJA-Cardno note that both require that an ongoing ‘efficient/prudent’ Capex profile be established.

Typically, economic regulators would be expected to focus on Capex forecasts for the coming regulatory period in the first approach. Reliable information on longer-term Capex is not essential in this approach unless there is concern about commercial viability in the long-term. General price stability, seen by end-users, regulators and regulated businesses as desirable, is achieved by rolling-in new Capex into a regulated asset base and compensating the business for these costs over time through return on capital (applied to the whole regulatory asset base) and return of capital (or depreciation).

The asset annuity approach generally requires that Capex costs be estimated for a longer period than for the first approach. This allows the lumpiness of Capex profiles to be smoothed and for revenue levels to be established that ensure the regulated entity is able to remain financially viable while it funds the ongoing Capex program.

- Opex – broken down by activity and each major obligation or need;
- Capex - separated into major categories such as renewals, new (or changed) obligations (e.g. environmental and OHS requirements), future capacity, dam safety, etc; and
- Returns - on regulatory asset values; and depreciation - on regulatory asset values – or asset annuity amounts (as required).

However, the approach to be adopted for establishing the future revenue stream (i.e. the value of assets that will be used to determine the return on assets and regulatory depreciation or the asset annuity amount) has yet to be determined by IPART.

Irrespective of the approach adopted, there is only one reliable and practicable source of information that IPART can use to form its recommendation. That is the information supporting the State Water pricing proposal. The same applies to other issues of relevance to existing revenue levels, meaning that the pricing proposal must include information relating to treatment of the NSW Government (and/or customer) contributions and any other sources of funding or revenue.²⁶

2.4. Pricing Policies

The final step in the pricing proposal process is to translate the revenue requirement, which must be based on prudent and reasonable forecasts of efficient cost, into a price regime to apply for the full period of the pricing proposal. This will require definition of clear policies relating to:

- core water services, including
 - initial prices and price paths;
 - tariff designs;
 - differentiation of services and/or products; and
- non-core services, including:
 - dam safety;
 - recreational water use;
 - metering and other miscellaneous fees and charges (to the extent they are applicable to State Water’s functions and obligations).

It is important to note that the pricing proposals must:

- be consistent with regulatory (i.e. pricing) principles specified in the Interim Operating Licence or established by IPART;
- allow IPART to meet its own statutory objectives;

²⁶ MJA-Cardno notes that the State Water pricing proposal would also be expected to identify all revenue and cost sources, even those not subject to regulatory oversight by IPART. This would enable IPART to be satisfied that State Water has appropriately ring-fenced costs and revenues subject to regulatory oversight. It also allows State Water to demonstrate that it is not attempting to double-dip or inappropriately allocate costs to customers.

- of which a primary objective is “*protecting consumers from abuses of monopoly power; standards of quality, reliability and safety of the services concerned; social impact of decisions; effect on inflation*”;²⁷ and, equally importantly -
- facilitating objectives focussed clearly on economic efficiency, financial viability and environmental protection; and
- be based on coherent tariff policies, transparent methodologies and reasonable (and transparent) cost allocations.

2.5. Summary of the Pricing Proposal Process

Executing each of the steps outlined above will produce a pricing proposal that contains a reasonable and transparent explanation of business obligations, business strategies for discharging obligations, business processes based on consistent approaches across all business units, services to be delivered, performance standards achieved and planned, supply-demand forecasts; forecast efficient costs, basis for pricing and tariff proposals.

None of this is materially different to the intent of existing Corporate Plans – except:

- IPART has a legal obligation to insist on compliance with the Interim Operating Licence (which it is concurrently reviewing);
- financial information in the pricing proposal must be consistent with Information Templates issued by IPART to State Water; and
- consultation with customers about the pricing proposal would appear to be required (clause 4 of the Interim Operating Licence).

MJA-Cardno also note that it would be considered prudent that the pricing proposal include historical performance information related both to service volumes delivered, customers served, and costs and service standards achieved. This would be the most effective way for State Water to demonstrate that the proposals for service standards and costs are reasonable, efficient and achievable; and the only way that IPART would be able to reasonably determine that the proposals are based on prudent and efficient forecasts of supply-demand and cost.

2.6. Deficiencies in State Water’s Pricing Proposal

The section above provides a brief outline of the contents of a pricing proposal that would be expected to satisfy IPART’s requirements.

Such a proposal would also be expected to contain much of the information required by MJA-Cardno to undertake the scope of work commissioned by IPART. In addition, the analysis and preparation that would have been undertaken by State Water to prepare such a submission would have allowed State Water to readily provide information required for MJA-Cardno to complete the scope of work specified by IPART in accordance with the proposal and methodology defined by MJA-Cardno.

²⁷ p 3, *Bulk Water Prices from 2005/06 - Issues Paper*, IPART Discussion Paper DP78, September 2004.

However, as detailed in this report, the proposal that State Water submitted to IPART in early November 2004 did not clearly define any one of the four basic process steps outlined above. The proposal provided very little detail outlining State Water's obligations and little information on the business strategies and decision processes that were used to develop cost forecasts. Crucial data such as actual Opex and Capex for the current regulatory period (from 2001/02), and some of the forecast expenditure data was missing from the proposal. No information was provided to show separation of actual costs for the changes in responsibility and function that occurred with corporatisation; and no information was provided for costs associated with "ring-fenced" activities that were not subject to review by IPART.²⁸

Considerable effort was expended by MJA-Cardno (in addition to the scope of work outlined in the proposal to IPART) in seeking clarification and additional information from State Water. MJA-Cardno attempted to define the fundamental basis for State Water's pricing proposal consistent with the description above to define the actual Capex and Opex costs for the current regulatory period and to consolidate a reasonable and coherent forecast of Capex and Opex costs to 2008/09.

In various discussions with senior State Water managers, MJA-Cardno was advised that difficulties were encountered in providing this information because:

- State Water has been in existence as a legal entity only since 1 July 2004;
- difficulty was experienced in allocating priority to preparation of the IPART submission because of conflicting demands on managers' time flowing from the corporatisation process;
- financial information came from 'legacy' financial systems operated by DIPNR;
- it was not possible to readily identify expenditure from historical financial reports during the current regulatory period (or earlier years going back to IPART's 1997 review) that fully aligned with State Water's actual obligations; and
- substantial effort was required to translate financial reports from the legacy systems into meaningful valley/region reports; and this was done by transfer of information from legacy system reports to spreadsheets.

In addition, State Water senior managers advised that some issues arose because:

- the State Water Board was not fully constituted until late 2004;
- the NSW Government had only recently endorsed State Water's newly drafted Statement of Corporate Intent; and
- most importantly, State Water has not yet developed a Corporate Plan, or corporate policies that had been endorsed by the State Water Board and accepted by the NSW Government.

MJA-Cardno accept that these issues would contribute to difficulties in preparing a coherent pricing proposal and responding to reasonable requests; but does not accept any as a reasonable excuse for not preparing a coherent pricing proposal. Similar difficulties face all

²⁸ In addition to these fundamentally important deficiencies, MJA-Cardno note that the State Water proposal contained deficiencies that indicated lack of effective editorial scrutiny and quality assurance. For examples, some tables presented data in non-date order, there were obvious arithmetic errors in summation totals and data was presented in (obviously) incorrect columns.

regulated businesses that have been transformed through industry reforms over the last decade. It is also clear that similar issues have arisen in all previous IPART reviews of bulk water supplies in NSW since 1997. In each of its Determinations, IPART has expressed concern about the robustness and suitability of information provided by State Water's predecessor organisations. IPART has also repeatedly made specific and explicit recommendations to address these deficiencies that appear to have been ignored.

However, despite the difficulties these issues present for this review, MJA-Cardno accepts that State Water was not attempting to exercise strategic behaviour so as to avoid legitimate scrutiny of its activities by IPART. On all occasions, State Water managers demonstrated willingness and openness to discuss issues and concerns with information related to interpretation and analysis of the pricing proposal.

Each of the above issues has been considered in this review of the efficiency and prudence of State Water's expenditure. Further issues impacting on data quality were also identified as the review progressed. As noted throughout the report, these issues have an impact on the assessment and the robustness of conclusions formed and recommendations made in the report.

State Water's response to the draft report acknowledged that the *"information made available to IPART and MJA could have been better managed and structured. The timing for this Determination is unfortunately during a period of great change for SWC, following on immediately after corporatisation and before appointment of the senior management. SWC has attempted to be completely transparent and this may have resulted in 'information overload'."*²⁹

MJA-Cardno understands the burdens placed on regulated entities and acknowledge in this report that State Water managers made every effort to cooperate with the review. But the fact remains that insufficient resources and priority was assigned to the IPART review by State Water.

²⁹ p4, *State Water Corporation's Response to Review of Capital Expenditure, Asset Management and Operating Expenditure (Draft) Report*, State Water Corporation, March 2005

3. Approach and Methodology

The review methodology adopted by MJA-Cardno relied heavily on three key components:

- The first was to consider service standard, obligations, asset condition and expenditure outcomes, and use conclusions drawn from observations of these to inform MJA-Cardno's judgements on 'efficiency' and 'prudence' in the current regulatory period.
- The second was to consider changes in circumstance faced by State Water in the next regulatory period, most particularly changes in demand for service by customers or compliance with obligations imposed by regulators and their impact on business costs. Changes in demand and regulatory obligation are both key drivers of cost in utility businesses where much remains to be understood and addressed by utilities, consultants and regulators in Australia.
- The third was 'top-down' and 'high-level' review and testing of State Water's operational and asset expenditure decision processes to inform MJA-Cardno's judgements as to whether or not State Water's expenditure decisions were likely to produce 'efficient' and 'prudent' outcomes. Where possible, information provided in State Water's submission to IPART was tested by comparison with other public domain material. Annual Reports produced by State Water's predecessor organisations for the period 1999-2000 through 2003-04 were particularly useful in this regard.

State Water was given every reasonable opportunity to respond to issues identified by MJA-Cardno as the review progressed. In addition, MJA-Cardno considered in detail issues contained in State Water's response to the draft report.

This approach was intended to overcome difficulties arising from over-reliance on detailed financial and operational information provided by regulated entities that focuses primarily on business activity inputs, rather than outputs and service outcomes.

MJA-Cardno undertook an assessment of the quality and soundness of State Water's procedures and approaches to asset management and operations, and business decision-making, rather than a purely benchmarking exercise or a detailed, line-by-line review of State Water's expenditure proposals. A key part of this assessment was a form of tested audit of State Water's asset management and expenditure decision-making processes that sought to assess whether or not expenditure decisions are likely to represent those of a prudent, professionally-managed and efficient business organisation. However, the team also used relevant data on operational and cost performance to inform the inevitable judgements that must be made with a view of providing a robust evidential base to support input to IPART's Determination.

In undertaking this assignment MJA-Cardno followed a structured, systematic process of review, investigation, sampling and reporting across the relevant themes and issues under consideration. The assignment was organised by tasks described below.

3.1. Inception Meeting and Review Preparation

An Inception Meeting between MJA-Cardno and the relevant IPART officers clarified the scope and expectations from the study, and provided background and understanding of major issues involved in development of the assignment.

This meeting took place on 9 November 2004 and was attended by Dr Jeff Washusen and Mark Nayar of MJA, Bevan Faulkner of Cardno and IPART's program managers responsible for execution of the State Water review.

3.2. Documentation Review and Analysis

This task involved a comprehensive review and analysis of relevant documents and other information provided by State Water and IPART as a prelude to, and in conjunction with, the fieldwork tasks. A complete list of the information request presented to State Water in early December 2004 is shown in Appendix A. MJA-Cardno notes that State Water was not able to, or did not, provide all the information requested.

Documentation of interest provided by (or sourced from) State Water and considered in this review included:

- the pricing proposal submitted to IPART in early November 2004;
- dam safety reports:
 - Portfolio Risk Analysis (PRA) Major Dams and Minor Dams Summary Report
 - Burrendong Dam, Chaffey Dam and Keepit Dam PRA – Risk Analysis documents;
- regulatory reporting and financial models:
 - Asset Register
 - Valley financial spreadsheets for 2001/02 to 2003/04
 - Opex forecasting spreadsheets
 - Capex and Opex spreadsheets for 2001/02, 2002/03, 2004/05 and 2008/09
 - Financial Reporting Structure Manual, July 1997;
- asset management program documentation:
 - EXPLAN files (i.e. capital works database) underpinning the TAMP2000 and TAMP2004 documents
 - TAMP2000 and TAMP2004 documents³⁰
 - 30-year Capex forecasts from TAMP2000 and TAMP2004;
- procedure manuals:
 - Project Delivery System (PDS) User Manual
 - Facilities Maintenance Management System (FMMS) User Manual
 - EXPLAN User Manual;

³⁰ TAMP is an acronym used by State Water for Total Asset Management Plan. The number suffix indicates the year the TAMP was published.

- program reports including Keepit Dam Summary to NSW Treasury;
- Capital Works program 2003/04 spreadsheet;
- State Water submission to IPART's review of the Interim Operating Licence;
- Interim Operating Licence; and
- the 1999/2001 State Water Annual Report, the 2002/03 State Water Annual Report and the 2003/04 State Water Annual Report.³¹

In addition, MJA-Cardno obtained from IPART relevant information relating to the 2000 pricing determination.

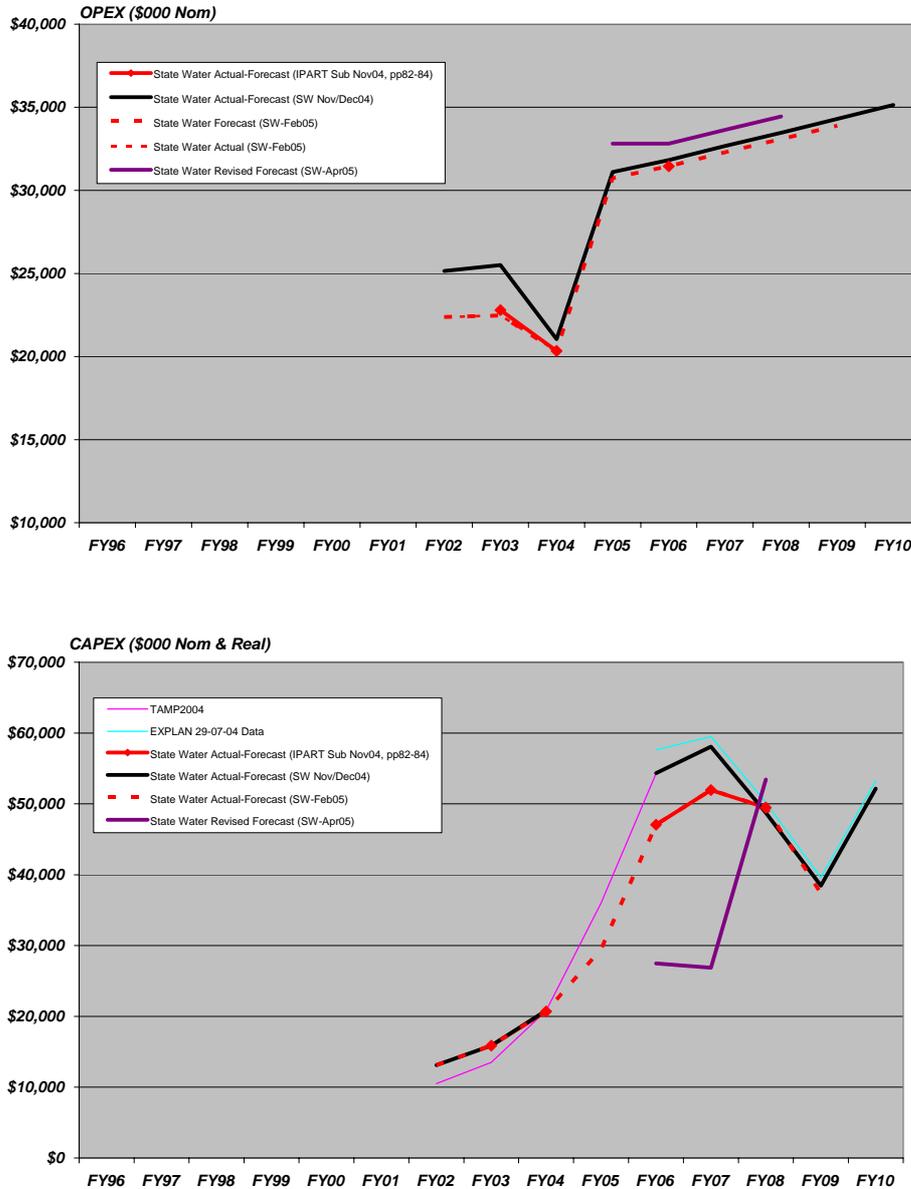
On the basis of MJA-Cardno's initial review of this information, the team members identified reported costs and cost forecasts from State Water's pricing submission that required clarification and identified key tasks to be undertaken in the review, relevant State Water personnel, and management issues relevant to their discipline area. This information was used to structure further information requests and frame the fieldwork and site visit program described below. A key output from this activity was a schedule of personnel to be interviewed and issues to be reviewed, which provided the basis for detailed consultation with State Water.

The initial information request was supplemented by other requests as points of interest were clarified, and further issues identified in the information provided. A number of repeat requests were required to address some issues, particularly those arising from discrepancies in different versions of cost information provided by State Water. It is notable that no two versions of what was meant to represent the same information (for example Opex actuals and Capex Forecasts) obtained at different times or from different parts of State Water were identical. In some cases, the observed differences were minor, but some were markedly different. The impacts of this are illustrated in Chart 7 below.

The revised forecasts provided by State Water as part of the response to MJA-Cardno's draft report are shown on Chart 7 for reference to other data provided by State Water.

³¹ MJA-Cardno anticipated it would have access to the statement of corporate intent, corporate plan, business plan, general customer standards, other operating policies and procedures early in the review process. MJA-Cardno obtained copies of the interim operating licence and 2002/03 Annual Report; and was advised in late January 2005 that Government had only recently endorsed the statement of corporate intent. MJA-Cardno was also advised a Customer Service Charter was still being developed, although the 2002/03 Annual Report says (on p.18) that a Customer Service Charter was adopted in February 2003.

CHART 7: ILLUSTRATION OF DATA QUALITY ISSUES - OPEX AND CAPEX COSTS



It was not until detailed discussions were held with State Water senior executives, in late January, that MJA-Cardno was able to obtain what was advised to be a final version of cost data under-pinning the pricing proposal originally submitted to IPART in early November 2004. Even then, some of the financial data required interpretation (for example, ‘filtering’ of Product Codes to obtain sub-totals and valley totals aligned with other data provided in State Water’s pricing proposal). Moreover, no explicit assurance was offered that all financial information provided to MJA-Cardno had been endorsed by the State Water Board.

3.3. Fieldwork and Site Visits

The review visits extended over a two-month period (through December 2004 and January 2005) covering State Water’s Dubbo head office, the asset management team at the Parramatta office as well as senior managers from relevant regional offices. The field visits

involved targeted and structured discussions with State Water management and operational staff and included review and exploration of:

- the way in which State Water implements Government policy, environmental obligations, health and safety standards and other compliance requirements that define services and service standards;
- State Water's approach to asset management, project planning and development, operations and service delivery;
- staff and managers' knowledge of existing assets, particularly in relation to asset condition and performance including the criticality of individual assets and/or sub systems;
- the quality and reliability of the supporting information systems, including the maintenance management system and the financial management system;
- infrastructure and operations risk management processes and practices in place in the business;
- the methodology used to optimize maintenance, renewals and service levels;
- how capital expenditure needs for both new works and renewals are identified;
- how this capital expenditure contributes to the strategic objectives of the business;
- the quality of the business cases in justifying expenditure;
- the process for reviewing business cases and the process for prioritizing expenditure;
- the level of confidence that management has that these capital expenditure needs exist.
- exploration of the estimating processes for capital and operating expenditure and the supporting information systems including unit cost estimation and tendering processes and risk management;
- review of the methodology for reviewing infrastructure standards and design criteria to ensure that each asset and/or sub system is "fit for purpose";
- random sampling of a representative number of State Water's completed capital projects following an audit trail from the planned expenditure through to the actual on-ground asset condition; with the number of capital projects sampled determined in consultation with State Water;
- verification of the accuracy, completeness and reliability of the expenditure forecasts and related information published in State Water's submission to IPART on Capex and Opex; and
- during the closing stages, meetings with senior staff to discuss matters outstanding and to follow up any matters emerging from the field review.

Site visits undertaken by MJA-Cardno for the purposes of this review included:

- 2 day workshop with the Assets Services personnel at Parramatta;
- 1 day workshop with financial staff to review State Water submission and supporting material at Dubbo;
- 1 day workshop with Customer Services Managers and Asset Engineers at Dubbo; and

- Site inspections at Burrendong Dam, Blowering Dam, Hume Dam, Hay Weir, Berenbed Weir, Tombullen Storage, Colligen Creek Weir, Edward River Offtake Regulator, Stevens Weir, Yallakool Creek Weir and Wakool River Offtake Regulator.

Site visits to other regional offices including Moree, Leeton and Muswellbrook were considered but not undertaken as the completed site visits were considered to provide a representative sample of State Water's practices and operations.

A meeting was held in MJA's office with senior State Water managers in late January to discuss issues arising from discrepancies in data provided by State Water, and issues arising from the "audit review" of State Water's management information, planning and businesses processes that impacted on data quality.

3.4. Analysis and Report Preparation

Following the review of State Water documentation and the field work visits, MJA-Cardno considered information provided by State Water at both the corporate and discipline level in order to assess the soundness of State Water's regulated water business undertaking and the prudence and efficiency of its capital and operating expenditure.

The result of the review is contained in this report. Given the findings from the review, it is inevitable that the report focuses on characteristics, strengths and limitations of State Water's business undertakings, the quality of the asset management frameworks and methods and – most importantly – concerns as to the robustness of information provided to MJA-Cardno.

4. Key Findings

An essential element of assessing the efficiency and prudence of State Water's expenditure is to establish whether or not expenditure should be incurred. As noted in Section 2, expenditure should be linked explicitly to either an obligation that State Water must discharge or to a service that customers have agreed should be provided. If either of these criteria cannot be satisfied, IPART would be likely to conclude that the costs should not be passed onto customers. This does not mean State Water should not undertake a specific activity that does not meet one of these criteria. But it would be a matter for State Water's owner (as the shareholder) to meet the cost of any such activity.

As stated in the concluding comments in section 2, State Water's pricing proposal contained relatively little information on obligations and provided few links between these obligations and actual or forecast Capex and Opex. This meant that it was essential for MJA-Cardno to focus attention on confirming the obligations imposed on State Water and seeking further detailed information that linked these obligations to costs incurred in the period 2001/02 through 2004/05; and the costs forecast for the period 2005/06 through 2008/09.

Information on State Water's obligations was collated from different prime sources. These included:

- State Water's pricing submission, which as noted above contains very little detail about obligations and their cost impact;
- State Water's submission to IPART's (concurrent) review of the Interim Operating Licence, which provides a reasonable, but by no means complete, list of the obligations specified in the Licence.

The commentary in this submission focuses on the impacts of the relationship with DIPNR, but provides no detail on cost impacts of discharging obligations;

- State Water's recent Annual Reports; and
- State Water's response to requests for clarification of issues as these arose in MJA-Cardno's review.

As noted throughout this report, State Water has been unable to provide information that clearly identifies what costs have been incurred or are proposed to discharge some specific obligations. In some cases, State Water appears to have inadequate policies and systems in place (or no consistent application of policies it has established) to define how the obligations should be discharged, or to confirm the obligations have been met. In some cases, there is no process in place to allocate the cost of meeting the obligation, even if it is a prime driver in the decision to incur a cost.

An issue to be resolved by IPART is how State Water's obligations are translated into the service standards. If a nexus cannot be clearly established between obligations to provide service, service standard and the cost associated with discharge of the obligation and delivery of service (and the required standard) it may not be meaningful to make any quantitative assessment of 'efficiency' or 'prudence'.

4.1. Cost Efficiency Obligations

Under its operating licence, State Water is required to operate as efficiently as possible consistent with sound commercial practice. MJA-Cardno examined State Water's operations and found State Water attempted to discharge this obligation via a range of asset management initiatives:

- improving the maintainability and operability of assets e.g. saving on operating costs by remote operation through Supervisory Control and Data Acquisition systems (SCADA), designing hydraulic equipment to minimise the blockages and damage from periodic minor floods;
- optimising the life cycle costs of assets to strike the optimum balance between Capex expenditure and long term Opex expenditures, eg replacing drop boards on river structures with remotely operated gates ;
- reducing the maintenance backlog on river structures that threatens to increase long term costs; and
- retiring and disposing of redundant assets especially those with high Opex costs.

No information was provided to MJA-Cardno about how State Water seeks efficiencies in the operational side of its business. For example, MJA-Cardno is unaware of any initiatives by State Water to test the market for the provision of contract services for asset operations and routine maintenance.

MJA-Cardno identified the significant investment in SCADA at river structures as a potential area to achieve further efficiency gains. MJA-Cardno understands that investment in these systems has not been subject to cost benefit analysis. Yet there is potential for Opex efficiency savings because the functionality provided by SCADA systems is still sometimes replicated by manual processes (including stream gauging) that the SCADA system could replace.

State Water commented on potential efficiencies that may be derived from investment in SCADA in its response to MJA-Cardno's draft report by stating:

SWC has a SCADA system at the majority of its dams and also at major river structures. Its use ranges from data gathering functions to the ability to operate structures remotely and/or automatically. All major regulators and outlet valves equipped with SCADA are used remotely, either from operations offices or the dam site offices. SWC has not identified compelling arguments to extend the use of SCADA particularly in the light of the extensive capital program that would be required to update the minor river structures to allow for remote operations. Even now, if after due analysis, this conclusion was reversed it would take a minimum of 3 years, the determination period, to introduce such systems and undertake the required modifications to river and dam structures. In future, there may be some additional unregulated river assets and hydrometric stations that may be transferred to SWC.³²

and slightly later in the document:

³² p7, *State Water Corporation's Response to Review of Capital Expenditure, Asset Management and Operating Expenditure (Draft) Report*, State Water Corporation, March 2005.

With the introduction of Water Sharing Plans, environmental contingency allowances and water trading, the operational releases are far more specific and variable, requiring 24/7, 365-day operations. The staffing levels are subject to these requirements.³³

In the first quote above, State Water appears to be arguing that it already accesses the benefits from its investment in SCADA, but in the second it is arguing that it cannot (readily) reduce staffing levels because it is required to operate more flexibly. MJA-Cardno acknowledges that there are practical limits to automation and remote operation benefits of SCADA, particularly with manually operated weirs that would be expensive to automate. However, it is not clear that State Water has examined the full potential benefits that SCADA may create for the business.

MJA-Cardno also expect that areas of operational improvement will be identified once State Water's Facility Management and Maintenance System (FMMS), Project Delivery System (PDS) and new financial information system are fully developed and implemented. Such an outcome is also forecast in State Water's current Total Asset Management Plan (TAMP2004); and is partially acknowledged in State Water's response to MJA-Cardno's draft report (although State Water proposes only that it "*identify these savings over the next 3 years*"³⁴).

4.2. Financial/Asset Management Information Systems

Reliable information on the cost of discharging obligations and delivering service is crucial to evaluation of 'efficiency' and 'prudence', and essential for effective regulation of any utility business. This section of the report addresses issues of concern that were encountered in this review.

4.2.1. Cost Accounting and Reporting System

State Water utilises a SAP-based financial accounting system operated by DIPNR for recording, monitoring and maintaining all accounting and financial transactions. The system provides cost accounting functions and reports that are meant to be used for operational tasks. State Water has used data from this system to provide information for its submission to IPART.

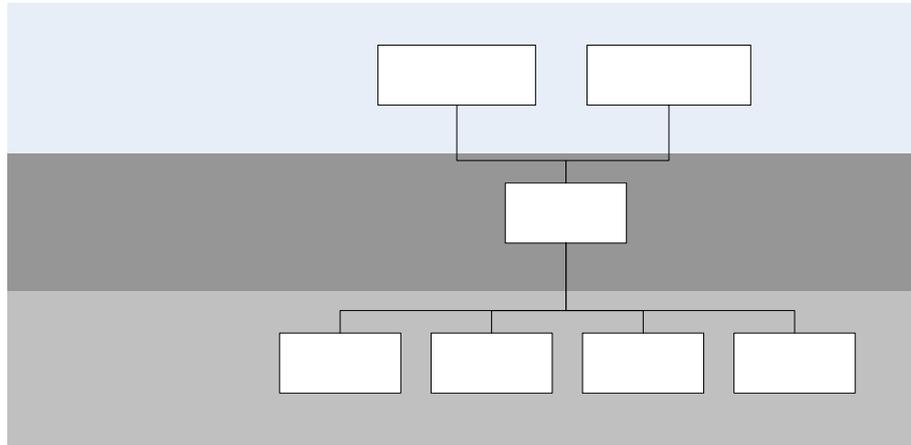
For reporting purposes, a special sub-system was developed by DIPNR to ring fence the activities now assigned to State Water (as well as unregulated rivers and groundwater) from the remainder of DLWC's functions and activities. The ring-fenced reporting sub-system is based on Product Codes or categories linked to activities performed by State Water at a river valley and water source level. Each of State Water's job orders - the lowest level of discreet activity for which financial transactions are recorded - is assigned a Product Code. Transactions for individual job orders are then rolled up to provide aggregate reports by Product Code at the valley and source level and for the overall business.

³³ *Ibid.*

³⁴ p10, *Op Cit.*

The cost allocation framework provides the basis for organising the actual and forecast expenditure summary tables provided in State Water's submission to IPART. The structure of the framework is illustrated in Chart 8.

CHART 8: COST ALLOCATION FRAMEWORK



Allocation of specific costs to Product Codes is a key step in the process of identifying the costs attributed to regulated activities because the costs incurred by State Water are not exclusively related to the provision of regulated services. In past pricing determinations, IPART established a cost sharing arrangement which sets out the relative proportions of each cost code to be recovered from customer charges and the general Government (budget) sector.

In the 1996 Determination, IPART referred to the importance of a comprehensive and accurate division of costs for cost sharing purposes and noted that DLWC did not have a totally reliable system of cost reporting.³⁵ In the 2000 Determination, IPART drew attention to inconsistencies in how bulk water costs were allocated to the areas of renewals, compliance and enhancements and remarked on the need for further work to ensure the integrity of the cost accounting database.

As part of the current review, MJA-Cardno examined a sample of recorded transactions with particular focus on the allocation of individual job orders to Product Codes. Individual requests for clarification were generally triggered by ambiguous changes from year-to-year in the value of expenditure reported against categories. For example:

- PC430 'Water infrastructure rehabilitation and development' with \$0.009 million in 2003, \$5.7 million in 2004 and \$0 for all other years;
- an amount of \$2.0 million for the forecast cost of replacing the legacy DIPNR financial accounting system allocated to PC402 (TAMP);
- inconsistencies in the allocation of individual jobs to product codes PC431/PC435 (rehabilitation) and PC432/PC436 (major periodic maintenance - MPM);³⁶ and

³⁵ p 69 *Bulk Water Prices - An Interim Report*, IPART, October 1996.

³⁶ The rehabilitation Product Code is, according to the ACIL definition used by State Water, an item for legacy costs that arise from a backlog of maintenance that accrued in the 1990s. However MJA-Cardno's scrutiny of State Water's job list for 2006 to 2009 suggests that the allocation of jobs between the rehabilitation Product

- field inspections of a sample of works completed in the current regulatory period identified works that appear not to have been correctly attributed to the appropriate Product Code.

For example a personnel winch installed in the gate house at Blowering to replace a winch declared unsafe by Occupational Health and Safety (OHS) inspectors. TAMP2004 states that this expenditure occurred in 2002/03.³⁷ Yet according to State Water's submission to IPART there was no expenditure against the category PC451 (Dam Compliance OHS) in 2002/03.

These outcomes were supplemented by findings that State Water's cost allocation process lacks consistent use of documented business rules to guide the coding of job orders and there appear to be few quality checks or formal internal controls. The lack of Quality Assurance in data entry to the system is compounded by the fact that MJA-Cardno was provided with three different and obviously inconsistent versions of the Product Code listing:

- Financial Reporting Structure Manual 1997;
- ACIL version Appendix A5, 2001; and
- Sub-product matrix – pg 75 of TAMP2004 document.

MJA-Cardno was unable to confirm which of these versions is current. At the time the information was sought, all versions were considered to be current by the providers, but they contain different Product Code specifications from each other.

State Water's Customer Service Managers also reported a number of issues with the Corporation's project costing system. MJA-Cardno was advised that the financial system cannot effectively track project costs. This is an essential omission in an organisation where resources must be allocated between several hundred projects at any given time. State Water managers confirmed that the financial reporting system, which was developed and is still operated by DIPNR, cannot provide information for project management. The financial system is designed for high level reporting by valley and administrative units.

MJA-Cardno also examined the Project Delivery System (PDS) being developed by the Risk Management Branch in Sydney. This new system should provide a strong project management capability once it is fully developed and implemented. However, MJA-Cardno notes that the PDS will not be effective unless it contains accurate cost information. State Water has commenced implementation of the PDS system. However, the new financial reporting system is not scheduled to commence until 2005/06 – and it will take some time to fully implement. This suggests the sequence of scheduling roll-out of PDS and a new financial reporting system is occurring in a less than optimum order. Ideally, implementation of the new financial reporting system should be completed before PDS is fully deployed. This is likely to mean that a fully functional financial, management and project delivery capability will not be achieved until at least 2006/07; and inefficient costs may be incurred if cost information in PDS has to be replaced or extensively updated once the new financial reporting system is implemented.

Code and the MPM Product Code is arbitrary. MJA-Cardno's review also suggested the possibility of a preference within State Water to assigning job orders to MPM rather than rehabilitation. As the cost sharing arrangements applying to MPM and rehabilitation are different, this is an important bias.

³⁷ p150, TAMP2004.

4.2.2. Valley Accounts

State Water's Customer Service Committees are provided with an annual report on Capex and Opex for each river valley. MJA-Cardno noted that State Water's Valley Accounts for past years differ slightly from the figures for actual expenditure presented in the State Water's submission to IPART. In response to queries about this discrepancy, State Water responded with an example reconciliation for 2003/04, which showed the Valley Accounts include items such as depreciation which are not part of the Opex or Capex costs relevant to MJA-Cardno's review.

MJA-Cardno has formed a view that the Valley Accounts may well report total valley costs reasonably, but it is not clear that costs reported at the activity (Product Code) level are reliable. The arguments supporting this view are detailed elsewhere in this report. However, MJA-Cardno is also aware that IPART relies on the Product Codes to regulate cost allocations between different customer segments. If the Product Code amounts are not robust, the basis for regulating cost allocations may not be appropriate. Accordingly, it has been recommended that the existing valley-based accounts be subject to regulatory audit if IPART chooses to continue the practice of regulating cost allocation by Product Code.

4.2.3. Deficiencies in 'Legacy' System

The DIPNR 'legacy' financial reporting system appears satisfactory for financial reports relating to overall activities on a total business and may be capable of accurately reporting total valley/region basis (MJA-Cardno understands the total business results are subject to external audit). However, the system is clearly inadequate for a commercial business subject to regulatory oversight by IPART.

MJA-Cardno was advised that State Water managers still translate reports from the 'legacy' system by transcribing information into spreadsheets or written documents, collating costs from the Product Codes used to define and monitor State Water's operational activities. These reports are the primary information used by managers to monitor cost performance.

State Water provided a significant number of reports containing financial information in response to queries raised by MJA-Cardno. In many cases, significant effort was required to filter, sort and collate report records so that the information could be gathered in a form that was useful for MJA-Cardno's analysis. On some occasions, different members of MJA-Cardno's team derived conflicting output from the same source. For example, comparison of dam safety upgrade costs in the EXPLAN files underpinning TAMP2000 and TAMP2004 yield different results depending on whether data is filtered by Product Code or coded description. This is because the Product Codes are different for coded descriptions that appear directly related (although even the coded descriptions use different words in each file).

It is MJA-Cardno's considered view that lack of a robust financial reporting system raises serious doubt about whether cost information provided by State Water is suitable for the task MJA-Cardno was required to undertake. Put bluntly, MJA-Cardno is not confident that State Water's financial and management reporting systems are capable of providing reliable data that is suitable for assessing the operational efficiency of State Water's activities (at the Product Code level). As noted elsewhere in this report, MJA-Cardno even has doubts about whether total cost information can be accurately collated at the valley level.

MJA-Cardno notes that the need to improve financial and management information systems has been identified by IPART in each of the four previous reviews of bulk water services. MJA-Cardno accepts that State Water understands the deficiencies in the 'legacy' system, and note that high priority has been placed on establishing financial and management reporting systems that will allow operational performance to be adequately monitored and reported. State Water is currently assessing options for the provision of a new financial system. This new system will be operated by State Water and, when combined with the Project Delivery System being developed and implemented by the Risk Management Branch, will provide the full functionality required by a commercial business to manage Capex projects.

The difficulties created by deficiencies in State Water's financial/asset management information systems can be simply illustrated. State Water quite reasonably asserts in various documents that its activities are largely of a fixed cost nature. MJA-Cardno accepts that this is, most likely, generally correct. A high proportion of fixed costs, both Capex and Opex, are common features of all irrigation (and water supply) businesses. But at a detailed level, the cost data provided by State Water frequently does not show this characteristic.

For example, the cost of river gauging (Product Code PC100) is forecast by State Water to rise by 77% (or \$1.7 million/year) between 2003/04 (actual) to 2005/06.³⁸ But the percentage cost increase in individual valleys is dramatically different (from -11% to +168%).³⁹ MJA-Cardno accepts that individual and/or average costs for stream gauging will not be identical in each valley. The cost would vary because each valley has different numbers of stations or different distances between stations (for example). However, it is reasonable to expect that the costs would be of largely fixed nature – because the capital cost component and calibration costs, which represent a substantial portion of stream gauging costs, would not change substantially between stations. If overall Opex costs attributed to stream gauging are expected to increase by 77%, then it would reasonably be expected that costs in each valley would increase; and the increase would be of a similar order (but not necessarily identical) in each valley. It would certainly not be expected that costs would drop in one valley and rise by nearly twice the forecast total in another. Yet this is precisely what is shown in State Water's submission.

It is also noteworthy that similar characteristics can be observed for other Opex activities where substantial increases are forecast, even though the cost base would be expected to be more-or-less 'fixed' (see Chart 9 below).

³⁸ MJA-Cardno notes that DIPNR's submission to IPART says stream gauging costs will rise to \$4.3 million/year.

³⁹ MJA-Cardno notes that it is not possible to undertake any more detailed analysis of stream gauging costs using information in State Water's submission because there are marked difference in the number of gauging stations (in different State Water documents and between State Water's and DIPNR's submissions to IPART).

**CHART 9: MAJOR ANNUAL OPEX COST INCREASES 2003/04 TO 2005/06
(\$'000 NOMINAL AND %)**

Product Code	Activity	Total Increase	Valley										
			Border	Gwydir	Namoi	Peel	Macquar	Lachlan	Murrumb	Murray	North	Hunter	South
PA100	Surface Water Quantity Data	1,709	32	230	259	38	267	367	408	-15	94	14	15
		77%	32%	76%	90%	35%	100%	168%	76%	-11%	44%	93%	60%
PC200	Regulated river operations	1,400	106	77	104	-3	40	182	498	171	155	29	41
		46%	63%	26%	35%	-2%	7%	34%	96%	66%	92%	97%	93%
PC413	Maintenance of land & buildings	624	-9	-9	53	88	-37	16	-5	-2	377	51	101
		32%	-16%	-5%	37%	166%	-15%	8%	-2%	-4%	81%	54%	85%
PC416	Dam Maint Works	2,096	0	233	232	106	333	566	253	5	196	96	76
		52%	n/a	56%	31%	65%	54%	79%	61%	4%	31%	102%	64%
PC417	River structure maintenance	1,534	-82	284	57	0	208	83	794	190	0	0	0
		136%	-100%	290%	38%	n/a	170%	44%	183%	388%	n/a	n/a	n/a
PC421	Storage surveill data colln	1,710	-177	105	395	165	203	263	313	119	247	22	55
		114%	-69%	107%	n/a	239%	107%	128%	123%	425%	107%	20%	90%

Note: MJA-Cardno has transposed data in columns for Hunter and North for 2005/06 – because these were clearly not related to data for 2003/04.

This is particularly the case for PA100, PC200 and PC421 and, given:

- the explicit statements in State Water’s Annual Reports and TAMP2004 that ‘backlog maintenance’ is being addressed in each region; and
- the ‘capitalisation rules’ (see below) adopted by State Water require most significant expenditure to be capitalised;

more-or-less fixed costs would be reasonably expected for PC413, PC417 and even PC416.

As noted above, MJA-Cardno generally only sought clarification of issues where the data appeared to MJA-Cardno to have ‘unusual’ characteristics (typically, where it was expected the costs would be largely fixed and not likely to vary substantially year-on-year, or between valleys). MJA-Cardno did not attempt to quantify the overall impact of the observed data discrepancies on State Water’s reported costs. But the forecast increase in Opex in the 6 activities listed in Chart 9 above account for \$9.1 million (or 90%) of total forecast increase in Opex.

MJA-Cardno’s reservations about quality of financial data detailed in this report have been reinforced by:

- receipt of data, financial information and financial reporting guidelines from different units in State Water that covered the same activities, functions and time-periods but are obviously different and sometimes inconsistent with information provided in the pricing proposal submitted to IPART in November 2004;
- State Water’s advice that existing financial reporting and management information systems do not readily permit tracking of actual costs against planned and approved costs - even for major items of expenditure;
- evidence obtained from sample testing of data, information and processes that individual job cost allocations to specific activities (Product Codes) are, on occasion, inconsistent and/or incorrect - even when significant amounts are involved; and

- State Water’s advice that (what are effectively) ad hoc procedures may exist in different units for determining whether and/or where an obligation exists, how the obligation is to be discharged and how costs of meeting obligations is reported and tracked.

Overall, the impact of these discrepancies has been to place less emphasis on analysis of the (potential) efficiency of individual activities (Product Code line items) in State Water’s actual and forecast expenditures. In effect, MJA-Cardno had little option but consider the business as a whole, where a higher level of confidence existed as to the integrity of financial information.

4.2.4. Capitalisation Rules

Capex is conventionally defined as expenditure that results in the creation, replacement or enhancement of an asset. All other expenditure is conventionally defined as Opex. In response to a request to clarify its policy on the capitalisation of expenditure, State Water advised that:

- prior to corporatisation, expenditure funded by Treasury was capitalised irrespective of the size or nature of the expenditure (but this would have very little impact on Opex amounts as most Opex is allocated to end-use customers); and
- in 2004, State Water adopted a revised policy requiring expenditure that exceeds a \$10,000 threshold for infrastructure and \$5,000 for buildings, and occurs once every five or more years, to be defined as major periodic maintenance (MPM) and capitalised.

However, examination of the EXPLAN file underlying TAMP2004 shows that it does not reflect the new capitalisation definition. The EXPLAN file contains hundreds of entries with total cost below \$10,000, many with descriptions that appear related to maintenance activities (e.g. repair of rip-rap, erosion control, minor patch painting, minor repairs to concrete structures, etc). The descriptions used in the EXPLAN file suggest the jobs should be classed as Opex, not Capex.

MJA-Cardno note that widespread use of allocations not aligning with State Water’s recently adopted policy raises concern about using estimates in EXPLAN to establish forecast cost streams in a revenue determination process. However, MJA-Cardno made no attempt to undertake a detailed audit of EXPLAN to establish the quantum of these misallocations.

4.2.5. Ring-fencing

State Water undertakes a number of activities for third parties, such as provision of groundwater meter reading services for DIPNR. State Water advised MJA-Cardno that these were activities not subject to regulatory oversight by IPART. Accordingly, the costs and revenues from these activities were excluded from the State Water pricing proposal submitted to IPART; and no information was provided to MJA-Cardno by State Water on these activities.

MJA-Cardno note that provision of financial information for ‘whole-of-business’, with clear identification of regulated costs, could have clarified some issues arising from interpretation of financial information provided by State Water (e.g. this may explain observed differences in total Capex derived from difference sources). Given that no information was provided to

MJA-Cardno on other ring-fenced costs, it is not possible to comment on the reliability of reporting of these other 'ring-fenced' costs. However, this is a matter that IPART may need to examine.

4.3. Procedures, Policies and Inter-agency Protocols

Environmental standards and obligations for State Water's primary function of flow regulation are defined by the Water Sharing Plans (WSP) and regulated by DIPNR.

Department of Primary Industries (former NSW Fisheries - DPI) monitor State Water's compliance with environmental obligations, specifically those associated with the impacts on aquatic life (fishways and cold water pollution) that contribute to significant costs.

4.3.1. Cold Water Pollution

Water released from State Water storages has the potential to alter water temperatures downstream of the storage and affect the amount of oxygen available for aquatic life. In addition, the temperature change itself may impact on aquatic life. Some State Water dams have the capacity to draw water from different levels to release warmer oxygenated water. At other dams, the release is from the bottom of the storage where the water is colder.

Key operational issues for State Water are the need to balance the risk of deoxygenating the storage resulting in a possible fish kill and the risk of releasing warm water possibly laden with blue-green algae, against the benefits of warmer in-stream temperatures.

In response to concerns of cold water pollution, the NSW Government has established a Cold Water Pollution Strategy with input from State Water, the Department of Environment and Conservation (DEC) and DPI. State Water plans to meet the requirements of the strategy through the implementation of cold water mitigation measures such as multi-level offtakes and modified operating protocols. Changes to offtakes are costly.

It is expected that the amendments to the *Water Management Act 2004* will nominate DIPNR as the principal regulator for cold water mitigation.

MJA-Cardno concluded that State Water does not have a firm business strategy for dealing with this issue but appears to take a project by project approach to addressing cold water pollution.

4.3.2. Fishways

Section 218 of the *Fisheries Management Act 1994* states that a public authority that proposes to construct, alter or modify a dam, weir or reservoir on a waterway must notify the Minister for Fisheries of the proposal, and must, if the Minister requests, include a suitable fishway or fish by-pass as part of the works.

For the purposes of compliance with environmental obligations, State Water has defined 'modification' to occur if any of the following is changed as a consequence of its works:

- the flow regime (height/depth, quality, velocity, path, direction, timing);

- water quality (physical and chemical pH, EC, N, P, DO); and
- instream or riparian zone (bed and bank stability, fish habitat/passage).

State Water and the former NSW Fisheries developed a Memorandum of Understanding (MoU) covering State Water's relevant environmentally related obligations. A draft MoU with Department of Primary Industries (DPI) has also been developed based on the existing (State Water – NSW Fisheries) MoU.

However, State Water senior managers advised that differences still exist between internal protocols defining the conditions where fishways would be incorporated into maintenance and asset rehabilitation activities and protocols considered acceptable to DPI. In addition, difficulties arise for State Water because a project by project approach to addressing fishway issues is taken, which appears to be influenced by differing approaches of regional DPI officers.

During discussions with MJA-Cardno, State Water Asset Engineers also remarked on the problems they face in dealing with the uncertainties in fishway design, which are largely determined by DPI. Asset Engineers indicated there was a clear trend to increasingly elaborate fishway designs, reportedly driven by an improved understanding by DPI of fish ecology. Many existing fishways are of dated design and DPI has indicated to State Water that most of the existing fishways need to be upgraded to a modern standard.

These observations suggest that State Water lacks clear obligations in terms of fishway compliance. This is a matter that MJA-Cardno considers should be taken up by IPART with DPI. State Water is unable to determine prior to committing expenditure to fishways, whether or not the proposed action will discharge its obligations. In addition, DPI clearly faces little constraint in changing fishway designs that it developed, but later considers unsatisfactory. It appears large sums are being proposed for the construction of fishways in the State Water Capex program without any clear indication as to whether the investment will satisfy DPI and discharge State Water's obligations.

It is MJA-Cardno's view that it is not 'prudent' for State Water to undertake expenditure when it cannot determine beforehand if such action will definitely discharge an obligation. Nor is it 'efficient' to include such costs in Capex forecasts.

4.3.3. Environment

The Department of Environment and Conservation (DEC) is responsible for auditing and reporting on the water quality in the river systems. The concern of DEC for large dam releases is principally temperature, with secondary issues being dissolved solids, salinity, turbidity, blue-green algae and heavy metals.

Construction Sites and Maintenance Activities

In carrying out construction and maintenance works in rivers, State Water is obliged to minimize the disturbance of the flow regime, water quality and the in-stream/riparian zone. This is consistent with State Water's general environmental management approach and with the requirements of the *Occupational Health and Safety Act 2000*. However, MJA-Cardno note that compliance has been interpreted by State Water engineers as requiring total

elimination of environmental impact, even though the cost of achieving this outcome can be very high and the environmental impact of some maintenance activities may be low.

For example, State Water's procedures require total enclosure of gate structures during re-painting (to achieve 100% containment of paint contaminants). This is clearly a very costly approach. MJA-Cardno note that State Water provided no information to demonstrate that the approach is explicitly required to comply with environmental obligation; nor was any information provided to demonstrate the cost effectiveness of alternative approaches had been considered.

Water Sharing Plans

The NSW water sharing plans (WSP) mandate total annual shares for extractive users, environmental flow rules, operating rules for providing access, and the measures by which variations are managed. Under the WSPs, State Water has non-discretionary obligations to release environmental flows from dams and weirs.

DIPNR is responsible for the development, implementation and auditing State Water's performance against the WSP obligations. DIPNR ensures that State Water delivers the environmental flows stipulated in the WSP.

State Water asserted in its response to MJA-Cardno's draft report that:

As approximately 64% of total costs are staff related, SWC is committed to ongoing review of its risk management strategy, human resource strategy and operational practices, in the light of its corporate obligations and objectives. The changing operational requirements due to the roll-out of Water Sharing Plans is critical in assessing opex requirements. The Water Sharing Plans require year-round operations, whereas prior to the plans there was an 'off-season' for delivery of water to customers. ECA releases require overtime and weekend work, which adds to opex

MJA-Cardno notes that Water Sharing Plans exist in seven of the eleven State Water valleys. The Water Sharing Plans that exist and the date the Plans were gazetted are shown below. All these Water Sharing Plans commenced from 1 July 2004.

- Gwydir Regulated River Water Source 2002 - 21 February 2003
- Hunter Regulated River Water Source 2003 - 1 July 2004
- Lachlan Regulated River Water Source 2003 - 21 February 2003
- Macquarie and Cudgegong Regulated Rivers Water Source 2003 - 21 February 2003
- Murrumbidgee Regulated River Water Source 2003 - 27 December 2002
- Murray and Lower Darling Regulated Rivers Water Sources 2003 - 26 February 2003
- Upper and Lower Namoi Regulated River Water Sources 2003 - 21 February 2003

The *Water Management Act 2000* was proclaimed in late December 2000. Sections 20 and 21 deal with Water Sharing Plans so the general requirements have been known for over four years (and probably longer, because State Water would have had access to the draft legislation as it was being prepared).

The first Water Sharing Plan to be released for Regulated Streams in NSW was released in late December 2002. State Water had around eighteen months to work out the requirements of the Water Sharing Plans prior to their commencement on 1 July 2004. While there will be subtle differences in the Water Sharing Plans for each of the eleven State Water valleys, the operational requirements of each of the plans will be similar.

MJA-Cardno also notes that State Water's Customer Service Managers advised that they did not know the impact of the Water Sharing Plans because they had not been issued for all valleys. The four valleys where Water Sharing Plans do not exist are Boarder Rivers, Peel, North Coast and South Coast. From an expenditure perspective, the North Coast and South Coast are small compared to the other valleys. Water Sharing Plans exist in the major valleys and yet the CSMs advised they do not know what their impact will be on their business.

The cost of implementation of the operational aspects in the valleys where Water Sharing Plans exist should have been included in the operational expenditure for the 2004-05 year. MJA-Cardno's view is that a prudent CSM would have flagged expected costs in the other valleys where the plans do not exist yet, just in case they were introduced during the 2004-05 year.

It is MJA-Cardno's view that State Water provided no compelling evidence that the advent of the Water Sharing Plans would cause significant changes to Opex costs. Given the relatively low technology levels of State Water's operations, MJA-Cardno does not expect the cost impacts to be significant although there may be significant improvements in service performance.

Progressive implementation of Water Sharing Plans across all regulated catchments in NSW will impose further obligations, and possibly increased costs, on State Water. State Water was not able to quantify the magnitude and direction of costs required to complete development of the Water Sharing Plans, but the costs are likely to be within potential future 'efficiency gains' that State Water could achieve over the next regulatory period.

Bed and Bank Protection

Currently, State Water is not responsible for river bed and river bank protection down stream of its large dams. DIPNR or the Department of Lands currently undertake this work, maintaining works crews to repair erosion caused by discharge from dams.

Catchment Protection

There are two major issues relating to management of catchments; activities impacting on inflows to storages and activities impacting on water quality. DIPNR and Catchment Management Authorities (CMAs) have indicated that these two issues are the responsibility of DIPNR and CMAs. However, both are required to consult with State Water on any developments that may impact on its operations.

Other Water Quality Issues

As noted above, DEC is responsible for auditing and reporting on the water quality in the river systems.

4.3.4. Occupational Health and Safety

MJA-Cardno notes that State Water does not explicitly identify the costs of meeting all its occupational health and safety (OHS) obligations.

In the case of OHS, which State Water managers take seriously, State Water adopts *ad hoc* procedures that appear to frequently rely on outstanding OHS obligations to trigger significant additional expenditure related to functional enhancement - without undertaking a cost-benefit analysis of the additional expenditure.

This suggests that State Water needs to develop a consistent procedure (or ensure existing procedures are implemented uniformly) for dealing with OHS issues, tracking the compliance cost and identifying the business benefits of any additional expenditure incurred while addressing OHS issues.

Through discussions with State Water staff, MJA-Cardno understands that State Water complies with the principles, regulations and codes of practice under the *Occupational Health and Safety Act 2000* as well as relevant industry safety standards. Moreover, under the proposed performance based standards, compliance with OHS requirements at all work sites is a key objective.

For hazard identification purposes, State Water undertakes regular safety audits at its dams and river structures. MJA-Cardno sighted one example of a safety audit. It was noted that this audit covered only geotechnical, structural and mechanical safety and did not consider OHS issues.

State Water staff repeatedly referred to OHS as an important cost driver of both Capex and Opex at river structures and dams. However, MJA-Cardno noted that the amounts allocated in cost forecasts specifically for remedial OHS activities or achieving OHS compliance is relatively small, as were amounts recorded as actual expenditure. In discussions with State Water senior managers, it was made clear that State Water places considerable effort on ensuring OHS hazards are designed out when structures are replaced or rehabilitated. MJA-Cardno observed that State Water is also very active in enclosing or isolating hazards through the use of guards, improved handling techniques and access methods.

Despite the fact that State Water appears to fully comply with its OHS obligations, the organisation does not have a documented business-wide strategy for dealing with OHS issues or a strategy for prioritizing resource allocation across competing OHS hazards. In some cases, it appears this lack of formality may lead to inefficient outcomes. For example:

- Examination of individual Capex expenditure amounts showed that \$94,000 was committed in 2001/02 for installation of a monorail and gantry crane on the hoist deck at three weirs on the Gwydir River to address OHS issues that occurred infrequently. The 2002/03 Annual Report indicates this work was completed during 2002/03. Previously, lifting activities that could not be done manually were undertaken using a hired mobile crane, which is the practice still followed in the Murrumbidgee valley.

No evidence was provided by State Water to demonstrate that the decision to install the monorail and gantry crane had been subject to a robust cost-benefit analysis. Rather, the decision to construct the gantry crane was based on avoiding the inconvenience of dewatering the weir holding basin and difficulties associated with locating an equipment hire firm that was prepared to transport a mobile crane to a remote site.

- State Water senior managers also advised that, in some instances, the need to address an OHS issue may trigger additional expenditure to increase technical function (e.g. replacing a manually operated gate with a fully-automated, remotely controlled gate).

Again, no evidence was presented to demonstrate that such decisions to enhance the technical capability had been subject to a robust cost-benefit analysis, with the decision to proceed with a higher cost option based on improving ease of operation.

MJA-Cardno is of the opinion that dealing with OHS issues on a case by case basis, relying on the judgment of the Area Asset Engineers to determine works priorities and the allocation of resources may lead to inefficient outcomes. As a minimum, State Water needs to develop clear Occupational Health and Safety guidelines that incorporate a cost-benefit analysis of any expenditure in excess of that required to deal with OHS issues, where the OHS issue triggers the expenditure.

4.3.5. Public Safety Standards and Obligations

MJA-Cardno's review of State Water's on-ground practices indicates that State Water is diligent in taking measures to protect the general community from hazards at its dam, river structure and related asset facilities. This includes the installation of safety signage at bridges and structures and the fencing of hazardous areas at river structures and dams to preclude public access.

However, it appears that investment decisions to address public safety issues are again dealt with on a case by case basis and that State Water lacks a comprehensive and coordinated public safety strategy. Moreover State Water is unable to coherently link the discharge of public safety obligations to future Opex and Capex. Accordingly, it was not possible for MJA-Cardno to form a view on whether or not the costs of meeting these obligations were reasonable, efficient or prudent.

4.4. Current Operations and Maintenance Practice

The terms of reference for this review required MJA-Cardno to examine efficiency of Opex costs for 2001/02 to 2004/05 and the efficiency of Opex forecasts for the period 2005/06 to 2008/09.

State Water's operating expenditure relates primarily to the operation of dams and river structures and the provision of bulk water delivery services to customers.

As noted throughout this report, State Water was unable to provide MJA-Cardno with robust information on the cost of discharging its obligations. In addition, MJA-Cardno has outlined why it has reservations about the quality of cost data allocated by State Water to discrete (Product Code) activities.

Overall, MJA-Cardno has not been able to form a robust or defensible view on the efficiency of discrete operating or maintenance functions. However, based on information available to MJA-Cardno, it is likely that State Water's predecessor organisations have developed an Opex regime that is relatively efficient overall. This view is supported by evidence of achievement of actual Opex outcomes for the period 2001/02 to 2003/04 that are significantly below the levels accepted by IPART in its 2000 Determination.

In view of the above reservations about robustness of information provided to MJA-Cardno, this section provides a summary of comments received from State Water in response to queries about Opex costs and MJA-Cardno findings related to individual Opex activities (Product Codes). The summary is solely based on MJA-Cardno's interpretation of the information provided by State Water.

A comparison of actual and forecast Opex costs, including a summary of State Water's explanation for changes in forecast cost are summarised in Chat 10 below. MJA-Cardno note that the total increase in Opex is around 50% (average from current regulatory period to next regulatory period), with virtually all of this increase occurring in Product Codes PA100, PC200, PC221, PC413, PC416, PC417 and PC421.

MJA-Cardno has considered each of the activities (Product Codes) showing significant cost increases, or areas where some change in obligation has been indicated. A summary of these considerations is incorporated in the discussion below.

CHART 10: SUMMARY OF OPEX COST FORECASTS

Product Code	Description	Expenditure (Average)			Primary Drivers	Changed or Additional Responsibilities
		Actual 2001/02 to 2003/04	Forecast 2004/05	Forecast 2005/06 to 2008/09		
PA100	Surface Water Quantity Data Collection & Archiving	2,042	3,828	4,073	Contracted to DIPNR	DIPNR seeking full cost recovery
PA120	Surface Water Quality Data Collection & Archiving	347	478	506	Water quality obligations.	Some responsibilities transferred from DIPNR to State Water
PC100	Rural Water Supply Strategies State river operation policies	104	6	6	Input to state-wide strategic planning	None
PC102	Rural Water Supply Custom & Ind Liaison	362	415	443	Customer service	None
PC120	Rural Water Supply River operation plans	79	41	41	Input to annual planning	None
PC200	Regulated River Operations	3,292	4,306	4,582	Bulk water delivery	Increased WSP responsibilities. Increased pressure to run river efficiently
PC220	Regulated Water Billing	275	380	405	Bulk water delivery Customer service	State Water now responsible for billing functions
PC221	Regulated Water Metering	2,933	3,753	3,994	Bulk water delivery	Proposed new standards on water metering.
PC300	Flood airspace policy	0	9	9	Flood management	None
PC310	Flood operation plans	13	113	119	Flood management	None
PC405	Dam Safety Emergency Plans	81	13	13	Dam safety	None
PC408	Water Infrastructure Insurance	2,774	2,004	2,135	Bulk water delivery	None
PC410	Rural Water Infrastructure Maintenance	120	188	201	No information provided	No information provided
PC412	Rural Water Infrastructure Storage Maintenance Audit	170	22	20	Asset management	Most audits completed
PC413	Rural Water Infrastructure Land & Building Maintenance	1,828	2,506	2,658	Asset management Accommodation standards	Decommissioning of redundant buildings

Product Code	Description	Expenditure (Average)			Primary Drivers	Changed or Additional Responsibilities
		Actual 2001/02 to 2003/04	Forecast 2004/05	Forecast 2005/06 to 2008/09		
PC416	Dam Maintenance Work	3,714	6,000	6,388	Asset management	Some necessary work may have been deferred due to expenditure constraints. Manning levels at storages to remain constant
PC417	River Structure Maintenance	1,258	2,590	2,761	Asset management	Some necessary work may have been deferred due to expenditure constraints
PC419	River Channel Maintenance	56	8	8	Water Delivery Efficiency	None
PC420	Rural Water Infrastructure Surveillance	433	760	803	Safety Emergency Management	None see TAMP2004
PC421	Rural Water Infrastructure Storage Surveillance Data Collection.	1,432	3,165	3,359	Dam Safety Emergency Management	Decommissioning and SCADA may reduce costs Manning levels at storages to remain constant No change to DSC requirements
PC423	Reg River Structure Surveillance	235	151	159	Safety Emergency Management	None see TAMP2004

4.4.1. Opex Planning

State Water advised MJA-Cardno that it is implementing a Facility Maintenance Management System (FMMS) at all large dams and Customer Service Areas. FMMS will hold all maintenance plans, maintenance history and frequencies for periodic maintenance.

State Water's predecessor organisations had maintenance programs for each structure on a card system. These procedures have been transferred to the computerised maintenance system and the system is being used at all the major dams and most of the river structures, with the exception of the southern region.

FMMS is a software application for managing regular site maintenance work. FMMS contains a maintenance asset register, and lists maintenance tasks and maintenance schedules for each asset. The system records maintenance costs for completed tasks and provides a mechanism for tracking movements of mobile and rotatable assets.

MJA-Cardno understands implementation of FMMS is 90% complete, although only a proportion of maintenance jobs are currently recorded in the system. The system is centrally located in Parramatta and each site has access via a dial-in modem. Effective use of the system is hampered by poor telecommunications in regional areas of NSW.⁴⁰

⁴⁰ MJA-Cardno notes that one solution to the telecommunication problem would be to deploy the system locally at each site and update the "central system" by CD-Rom, say, once a fortnight.

Information provided by State Water suggests that completion of development and effective implementation of FMMS will allow continuing improvements in the efficiency and effectiveness of its operations and maintenance planning, which should also assist in achieving future Opex efficiencies. This observation supports MJA-Cardno's view that State Water has developed an operating and maintenance regime that is capable of achieving future Opex efficiency gains.

However, MJA-Cardno notes that the Opex forecasts in State Water's submission to IPART were not prepared using information in, or output from, FMMS.

4.4.2. Opex Forecasting

State Water Customer Service Managers advised that Opex budgets are generally prepared using an incremental approach from the previous year.⁴¹ The base scenario is to review the previous year costs at a job level. Total staffing requirements are reviewed including the need to fill any vacant positions. Wages and salaries are reviewed to take into account expected pay increases and any other adjustments that might need to be included (e.g. changes in positions etc).

For each job, the previous year staff hours and operation costs are used as a basis for the coming year budget. For operation or routine works, the program is adjusted to accommodate the coming year requirements. Staff hours are adjusted up or down depending on the extent of work planned for a particular job and operation costs are similarly adjusted to take into account each particular jobs' requirements for the year. At this time, allowance is made for inflation/increases in material costs etc. Staff salary and on-costs are then allocated to a particular job in accordance with the estimated hours.

MJA-Cardno notes that this description, while rational, is markedly different to that indicated in State Water' submission to IPART, TAMP2004 and the 2003/04 Annual Report – each of which refer to consideration of asset condition and service delivery as prime drivers of Opex.

State Water also provided MJA-Cardno with a spreadsheet⁴² which MJA-Cardno understands provides the basis for the Opex forecasts for the period 2005/06 to 2008/09. From examination of this spreadsheet, MJA-Cardno notes that:

- the Opex forecasts for 2005/06 to 2008/09 are extrapolated from 2004/05, using an escalation factor of 2.5% per annum; and
- there is no indication of how the forecast for 2004/05 base year was developed.

MJA-Cardno also notes that State Water advised that Opex expenditure for 2004/05 is expected to be less than the amount forecast; but had not established the magnitude of the shortfall.

⁴¹ Which is why long-run time series data can be very useful for determine whether an Opex cost forecast is reasonable – providing consideration is given to whether or not service levels can (or have been) achieved.

⁴² OPEX Summary for IPART Consultants 11-11-04.xls.

MJA-Cardno's view is that Opex forecasting methodology described by State Water personnel does not provide a robust or appropriate basis for forecasting 'efficient' costs. Specific flaws with the approach described to MJA-Cardno are that it:

- is strongly influenced by introspective evaluation of the cost base (e.g. seeks to ensure vacant positions are filled, etc);
- does not link Opex to corporate objectives, service requirements or service outcomes over the regulatory period;
- depends on forecasting from a base year that (in this case) is itself a forecast which has no obvious connection to actual Opex;
- assumes that all externally imposed costs (i.e. DIPNR's stream gauging services) should be accepted as pass-throughs; and
- does not include any consideration of Opex efficiency gains that should be possible within the next regulatory period.

4.4.3. Backlog Maintenance

MJA-Cardno accepts there is a need to deal with maintenance issues that were not addressed over the 2001/02 to 2003/04 period because management resources (particularly in the southern region) were directed to other priorities.

However, State Water managers demonstrated to MJA-Cardno's satisfaction that sensible and efficient resource allocation processes had been deployed that allowed maintenance backlogs to be addressed in other valleys/regions during this period by accessing resources intended for the southern valley/regions.

This finding is consistent with information contained in recent State Water Annual Reports for the period 1999-2000 through 2003-04, which confirms routine, periodic and incidental maintenance targets were generally being met in all regions - and that historic low water levels had allowed "backlog" maintenance to be addressed - at total actual cost levels near "budget" (noting the "budget" amounts were lower than forecast amounts allowed by IPART) without adversely impacting on service performance or discharge of State Water's obligations.

The finding is also consistent with information in TAMP2004, which says explicitly that "*Identification and progress in undertaking significant 'backlog' maintenance;*" and "*undertaking of a significant amount of backlog maintenance;*"⁴³ are 'specific changes' and 'identified effects' (respectively) of the improvement in State Water's asset management capability.

⁴³ p120 and p126, *State Water Total Asset Management Plan (TAMP 2004)*, State Water Corporation, October 2004.

4.4.4. DIPNR Stream Gauging Services

River gauging is a key activity for bulk water delivery. The PA100 cost category is for the operations and maintenance of river gauges in each of the major regulated catchments. The majority of river gauges are operated and maintained by DIPNR. This category also includes costs for gauges maintained and operated by State Water.

MJA-Cardno notes that there is considerable discrepancy between the numbers of gauging stations required for operation of State Water's systems. For example:

- TAMP2004 refers to "18 key storage level recorders"⁴⁴ that have been transferred from DIPNR to State Water (which MJA-Cardno assumes are located at State Water dam sites) and "this number may increase to approximately 100 key gauging stations including upstream and downstream stations at weirs and dams"⁴⁵.
- TAMP2004 also says that "SCADA systems have been utilised in a number of asset and operational areas for ... Data collection/polling from river gauges, weirs and regulators"⁴⁶.
- State Water's pricing proposal says "State Water's regulated river operations only require 399 gauging stations" (of the 818 stations operated by DIPNR across NSW) and "that 100% of the full cost of hydrometric services for the 399 stations be recovered from water users by State Water ... at a projected hydrometric costs (of) \$3.9M per annum"⁴⁷.
- The DIPNR submission to IPART refers to "some 800 river gauging stations, including 300 on regulated and 500 on unregulated rivers throughout NSW" and that the "total contract fee is estimated to be \$4.3M ... for hydrometric services supplied by DIPNR to SWC for its regulated river operations"⁴⁸ (which MJA-Cardno assumes relates to 300 stations on regulated rivers).

DIPNR costs are subject to an as yet unsigned service level agreement with State Water. State Water advised it is continuing to negotiate with DIPNR to get this agreement finalised. State Water also advises that, historically, DLWC Regions did not all charge full costs. Some only charged cash costs, others cash plus non cash costs and others charged overheads as well. State Water generally accepts the base costs proposed by DIPNR; however State Water is negotiating on what happens should DIPNR fail to provide the required information.

MJA-Cardno accepts that additional resources may be required above the 'efficient baseline' amount (recommended below) to cover the full cost of stream gauging services to be provided by DIPNR.

⁴⁴ p16 and p34, *Op Cit.*

⁴⁵ *Ibid.*

⁴⁶ p71, *Op Cit.*

⁴⁷ p33, *Pricing Submission to the Independent Pricing and Regulatory Tribunal*, State Water Corporation, October 2004.

⁴⁸ p33, *Submission to IPART to set Bulk Water Resource Management Charges from 1 July 2005*, NSW Department of Infrastructure, Planning and Natural Resources, February 2005.

The Opex increase forecast by State Water for DIPNR ‘contract’ stream gauging services amounts to \$1.7 million per year (or 77%) above costs recorded in the 2001/02-2003/04 period. Although the final value of this service ‘contract’ has not yet been confirmed, MJA-Cardno found that State Water had not established an ‘efficient’ basis for these services (by seeking preliminary service offers from private service providers or determining its own internal costs to undertake this activity).

There are a number of issues that will need to be clarified between State Water and DIPNR, apart from quality of data service provided and unit costs. These include:

- the number of gauging stations that State Water actually does need to operate efficiently;
- the number of DIPNR gauging stations that will be transferred to State Water;
- the number of gauging points that are duplicated by State Water and DIPNR (given that it is not efficient to duplicate investment in stream gauging capability); and
- the number of gauging points that have been, can be, or will be incorporated into State Water’s SCADA system (given that it is not efficient to invest in SCADA capability if it does not yield reliable and useful information that will improve operational efficiency).

State Water’s response to the MJA-Cardno draft report included a comment that:

“SWC has made the assessment of the gauging stations required and preliminary costs have been based upon the number of stations at a unit rate of \$12,000 as specified by DIPNR. This is within the cost range proposed by MJA.

SWC agrees that DIPNR and SWC need to clearly identify the needs and responsibilities for gauging. Based on this, a review of costs will be undertaken to determine efficient costs.”

State Water also advised that its revised Opex forecast included an amount of \$3.923 million for PC100 Surface Water Quantity Data Collection & Archiving. MJA-Cardno notes that, based on \$12,000 per station, the revised budget figure of \$3.923 million equals the cost of operating 327 stations.

Uncertainty about the number of gauging stations required by State Water is compounded by the fact that SunWater has 112 gauging stations in its network across Queensland. This strongly suggests there is scope for rationalisation of the number of gauging stations and consequent reduction in operating costs. If State Water needs these gauging stations for management purposes, the gauging stations should be on SWC’s asset register and not on DIPNR’s asset register.

State Water’s response to the draft report also indicates that a review will be held to determine efficient costs. But no mention is made of a review of the need for the number of gauging stations. In the absence of any more detailed information, MJA-Cardno’s Final Report retains the recommendation that IPART allow a unit cost of \$10,500/gauging station per year – subject to confirmation by State Water and DIPNR of the number of gauging stations actually required for State Water’s operations and subject to market testing of gauging station costs by State Water.

4.4.5. 'Stand-alone' Capability

MJA-Cardno also accepts that it is possible that additional costs may be required to establish systems and procedures so that State Water can operate on a 'stand-alone' basis as a commercial business.

However, State Water has not demonstrated to MJA-Cardno's satisfaction that additional incremental costs included in the forecasts for 2005/06 to 2008/09 period (and 2004/05) are based on efficient 'market rates' or consideration of efficient internal costs (and benefits) to State Water.

MJA-Cardno notes, in particular, that the actual Opex forecasting approach described by State Water personnel differs from that described in State Water's submission to IPART, TAMP2004 and the 2002/03 State Water Annual Report. Descriptions provided to MJA-Cardno suggest Opex forecasts are:

- strongly influenced by introspective evaluation of the cost base (i.e. filling of vacant positions, etc), expectations that corporatisation will give State Water the opportunity to do things that its former public service managers would not allow, assumptions that all externally-imposed costs should be accepted as 'pass-throughs' and no efficiency gains are possible within the next regulatory period; and
- little influenced by consistent consideration of service levels, asset condition, service performance achieved (or not achieved) or 'efficient' cost benchmarks— although this is a stated feature of State Water's business processes.

4.4.6. Corporatisation Costs

The findings in regard to Opex forecasting outlined in section 4.4.2 also apply to State Water's forecast of 'corporatisation' costs, which, if accepted by IPART, would result in a net increase in Opex of \$2.7 million (or 12% of the average annual actual Opex in the period 2001/02 to 2003/04).

MJA-Cardno notes that an issue in this review is whether State Water can demonstrate that the corporate costs will increase value in the business (or in the terms of this review – achieve continually improving 'efficient' outcomes).

State Water has identified "*savings from discontinued services from DIPNR*" amounting to \$1.4 million in its corporatisation cost estimate, but no cost savings have been identified that would (inevitably in MJA-Cardno's view) flow from the \$2.0 million investment in improved financial reporting systems, the roll-out of FMMS and PDS, or improved business focus resulting from corporatisation.

It is MJA-Cardno's view that it is not 'efficient' to accept a significant increase in corporate overheads. Corporatisation should be accompanied by a coherent business strategy focussed on delivering 'efficient' services to customers, which is consistent with State Water's (interim) licence obligations to operate efficiently.

MJA-Cardno would expect State Water's senior managers and Board to focus clearly on identifying business strategies (or developing and implementing the business strategies outlined in various State Water documents) that will deliver efficient outcomes. However, as noted elsewhere in this report, State Water has not provided evidence that it has effectively

implemented such business strategies – even though managers have been responsible for developing the operating regime that achieved substantial ‘efficiency gains’ in the current regulatory period.

It is MJA-Cardno’s view that clearer commercial focus possible with corporatisation can be used to identify further ‘efficiency gains’ that should aim to at least offset the incremental increase in corporate overheads. State Water’s forecast of corporatisation costs should account for benefits that will come from corporatisation through a clearer focus on:

- ensuring continuation of the efficient operating regime established by predecessor organisations;
- implementing the business policy framework articulated in the State Water Annual Reports;
- harnessing the commercial skills of a service-focussed, professional Board;
- achieving further ‘efficient’ commercial outcomes; or
- experiences of other Government business enterprises that demonstrate it is possible to achieve significantly, and even dramatically, improved business outcomes from corporatisation and privatisation.

In its response to the MJA-Cardno draft report, State Water commented that:

SWC acknowledges that, like other businesses that have been corporatised, a range of efficiencies should be achievable however, unlike the majority of such businesses, SWC has not been long commercialised and therefore, little time to streamline its operations. SWC proposes to identify these savings over the next 3 years.

MJA-Cardno notes that State Water was commercialised from 1 July 1998 and State Water’s predecessor organisations have demonstrated an ability to manage limited resources and operate efficiently. MJA-Cardno agrees that further work is required to identify further operational efficiencies. But State Water has not provided evidence that demonstrates such efficiencies can only be achieved by substantially increasing expenditure across all areas of the business. It is MJA-Cardno’s view, gained from working with other corporatised water businesses around Australia, that commercial discipline provided by a skills-based Board will allow State Water to identify and achieve further efficiency gains without substantial increases in expenditure.

4.5. Asset Management Planning and Capex Forecasts

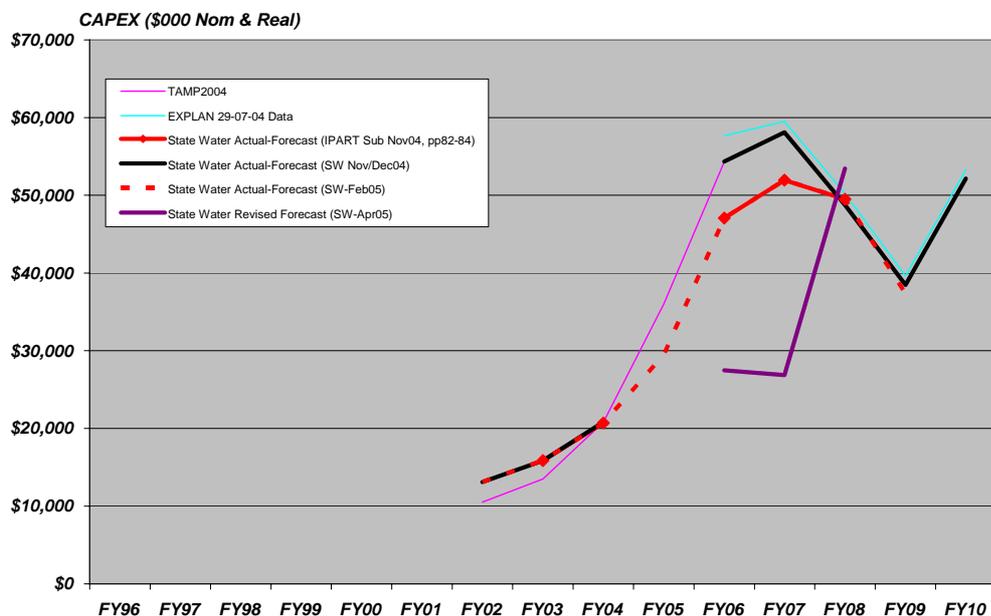
State Water’s asset management system is described in TAMP2004. The functionality of the system includes:

- periodic geotechnical, structural and mechanical engineering inspections and audits;
- asset registers with asset condition rating, risk ratings and historic and current asset valuations and asset lives;
- a Capex planning register with project by project details including annual expenditure amounts;

- a networked computerised ‘facilities maintenance management system’ (FMMS), which is still being developed; and
- extensive library of drawings and project documentation, with much of the data now digital formats through the State Water project management system.

MJA-Cardno noted that the expenditure amounts in EXPLAN are not the same as those shown in State Water’s submission to IPART. The initial submission to IPART contained Capex data only for 2002/03 to 2003/04 and 2005/06 to 2007/08. No information was provided for 2001/02, 2004/05 or 2008/09. In response to requests for the additional data, and clarification of expenditure amounts, State Water provided MJA-Cardno with data from several different sources. These forecasts were revised again in response to MJA-Cardno’s draft report. A comparison of the different data provided by State Water is shown in Chart 11 below.

CHART 11: COMPARISON OF CAPEX DATA PROVIDED BY STATE WATER



This Chart shows that actuals reported in TAMP2004 differ from actuals in State Water’s submission for 2001/02 and 2002/03; that the EXPLAN file shows different totals to those reported in TAMP2004; the TAMP2004 figures are markedly different to both the EXPLAN file and State Water’s submission to IPART; and that State Water fundamentally revised the Capex forecasts down overall by some \$40.7 million over the period 2005-06 through 2007-08, by deferring works it implied (in other parts of its response to the draft report) were essential and of high priority. State Water’s response reinforces MJA-Cardno’s conclusions that State Water’s Capex forecasts are not sufficiently robust to be considered ‘efficient’.

The reasons for these differences are not explained in either TAMP2004, State Water’s submission or State Water’s response to the draft report. However, State Water provided a reconciliation of difference between EXPLAN and the submission for the 2005/06.

The results of MJA-Cardno’s analysis of State Water Capex forecasts from different data sources derived from the asset management system creates doubts about the robustness of the expenditure forecasts.

MJA-Cardno notes that State Water's response to the draft report included the comment that:

SWC provided MJA with extensive explanations as to the differences between the actual expenditures and the levels approved by IPART in its last determination. These explanations have not been included or referred to in the report. Neither is there any conclusion as to whether MJA accepts these explanations. SWC can only assume from the findings made in the MJA Report that these explanations have been ignored.⁴⁹

Explanation of differences in financial data was only provided by State Water in response to specific requests for clarification by MJA-Cardno. All of the information provided to MJA-Cardno by State Water was considered. However, MJA-Cardno did not rely entirely on these explanations. Information that was either an outcome of a robust SW internal planning process, that had been endorsed by management or had been endorsed by State Water Board, and was corroborated by another source (typically the State Water Annual Reports or TAMP2004) was given greater weight in consideration and setting the efficient level of expenditure.

4.5.1. Asset Register

State Water provided an electronic copy of the asset register that contained a list of all the assets currently known and recorded. The data set was initially supplied without key information on asset values and age profiles. Subsequently State Water provided an updated file with the age and value data.

The asset register lists approximately 1700 individual asset items grouped into 177 parent or major assets. Assets listed individually in the asset register include:

1. individual dam, weir and hydraulic structures;
2. individual buildings;
3. individual items of equipment;
4. land under infrastructure; and
5. hydrographic stations.

MJA-Cardno's analysis of the asset register noted that there was considerable variation in the level of detail at which plant and equipment is recorded. For example large emergency generators were separately identified in the asset register under the category of plant and equipment at some sites and not at others. MJA-Cardno queried State Water on this issue and was advised that level of detail provided on individual assets that make up a facility varies from site to site depending on the approach taken by the employee who compiled the asset list at the site. This is one example of where State Water could improve information available to managers through implementation of a quality assured corporate process. In MJA-Cardno's view, continuation of the *ad hoc* procedures described by State Water is inconsistent with achieving "best practice asset management".

⁴⁹ p5, *State Water Corporation's Response to Review of Capital Expenditure, Asset Management and Operating Expenditure (Draft) Report*, State Water Corporation, March 2005.

MJA-Cardno notes that State Water, when compared to other water businesses, operates a relatively small number of dissimilar assets (See Chart 5 above). There is also significant difference in the types and numbers of asset classes between valleys/regions (as shown in Chart 12 below). Many of State Water's assets are widely dispersed and lack common technical features that could allow comparison of operational and (most particularly) maintenance requirements.

By contrast to State Water, most water supply agencies have larger numbers of assets that can be grouped into common asset classes with similar operating, maintenance and replacement characteristics. The diversity of State Water's assets emphasises the need to complete development of a rigorous asset management and condition monitoring system.

CHART 12: STATE WATER ASSET PORTFOLIO BY REGION: NUMBER OF ASSETS LISTED BY CATEGORY OF ASSETS

Asset Category	Number of Assets in Asset Register (by Region)				
	Central	Coastal	North	South	Total
Major dam	4	5	5	4	18
Minor dam	5	3	3	3	14
Medium storage	2			2	4
Weir/Regulator	78	33	37	161	309
Hydrographic station	32	8	30	30	100
Building	86	111	94	226	517
Associated structure to dams and weirs	73	2	2	68	145
Plant & Equipment	78	42	102	175	397
Land Under Infrastructure	43	28	33	24	128
TOTAL	401	232	306	693	1632

Source : Explan

4.5.2. Asset Project Register

State Water's asset management framework includes EXPLAN the capital expenditure planning register, which contains project specific details including forecast Capex cost by year over a 30-year planning timeframe. EXPLAN underlies TAMP2004 and contains coded line item descriptions of each Capex item. The coded terms identify the name, location, type of asset, nature of Capex work proposed, Product Code and the estimated cost of Capex works over a 30-year timeframe.

Chart 13 shows the total capital expenditures planned for the period 2005/06 to 2008/09 by Product Code as set out in the EXPLAN.

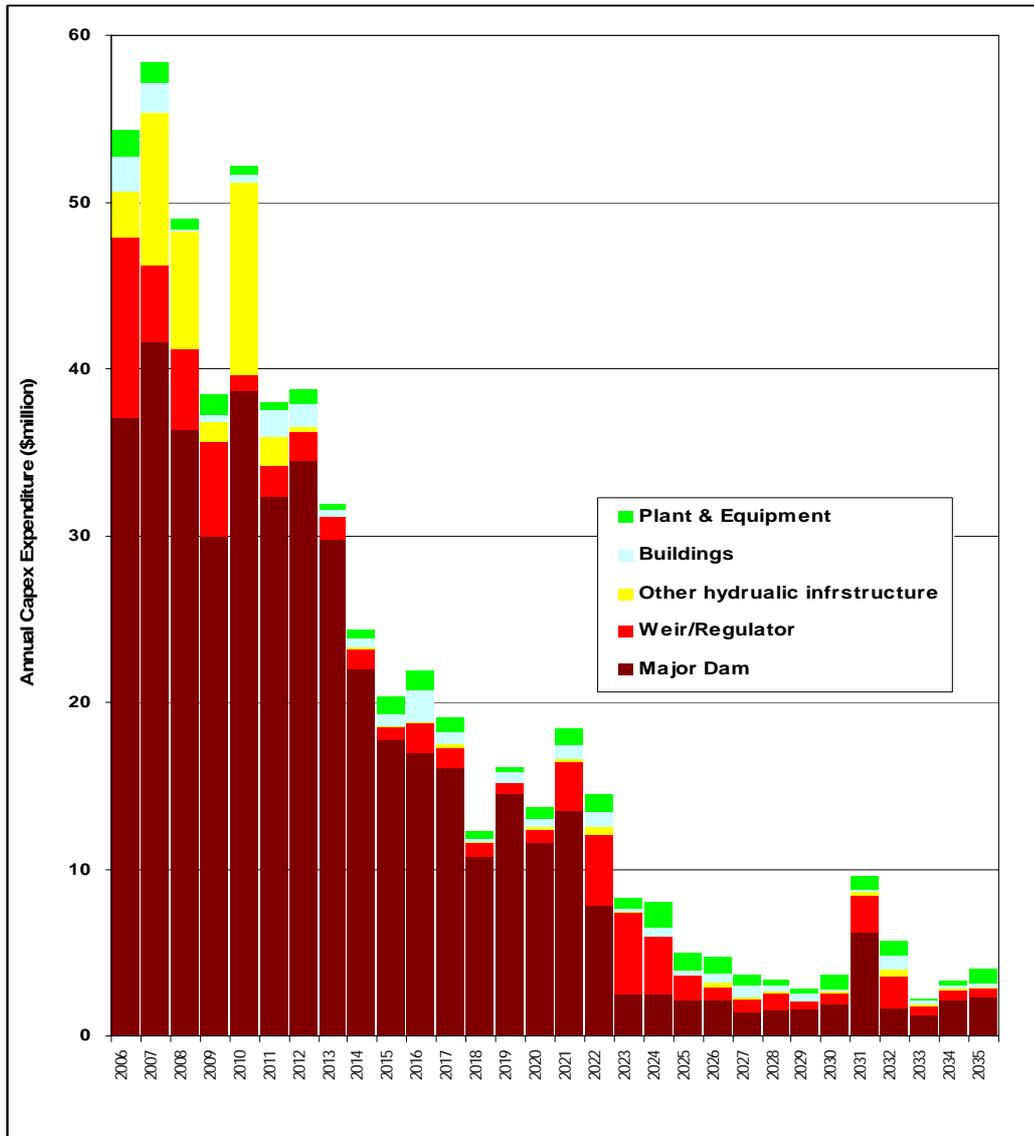
A diagrammatic presentation of the information for the full 30 year planning horizon in the EXPLAN file is shown in Chart 14 below. In this chart the expenditure data is organised by asset category.

The key issues that are clearly demonstrated in both Charts are that the overwhelming majority of forecast Capex is linked to Major Dams, primarily for upgrades associated with reducing risk of dam failure and the expenditure is heavily 'front-loaded' (that is, a significant part of the total Capex for Major Dams is forecast for the period 2005/06 to 2008/09).

CHART 13: TAMP2004 CAPEX EXPENDITURE PROFILE (EXPLAN FILE)

Product Code	Description (as per EXPLAN)	Capex 2005/06 to 2008/09 (\$000, Real 2004/05)
PC500	Artificial code - disposal of assets (all categories)	12.2
PC451	Dam compliance - OH&S/public safety	1,254
PC457	Regulated river compliance - upgrade	1,800
PC453	Regulated river compliance - OH&S/public safety	1,915
PC455	Unregulated river compliance - environment	3,195
PC402	TAMP	5,315
PC415	Maintenance and surveillance of redundant assets	5,700
PC434	Dam - service enhancement/growth	7,060
PC431	Dam rehabilitation and refurbishment	7,250
PC436	River structures - major periodic maintenance	9,948
PC452	Regulated river compliance - environment	10,188
PC435	River structure - rehabilitation	11,473
PC450	Dam compliance - environment	13,120
PC438	River structure - enhancement	18,633
PC432	Dam - major periodic maintenance	28,233
(blank)	(blank)	39,300
PC456	Dam compliance - upgrade	243,840
Total		408,236

CHART 14: TAMP2004 CAPEX EXPENDITURE PROFILE (EXPLAN FILE)



MJA-Cardno's analysis of the EXPLAN files provided by State Water found that:

- the EXPLAN file underlying the TAMP2000 (EXPLAN 040601) and the EXPLAN file underlying TAMP2004 (EXPLAN 290704) contained different Product Codes and different coded descriptions for what appear to be the same activities; (e.g. 'Major Dam' and 'Upgrade' (PC431, PC 432, PC433 and PC434) in the file EXPLAN 040601 that appear to relate to 'Dam Compliance – upgrade' (PC456) in the file EXPLAN 290704);
- EXPLAN 290704 contains hundreds of minor items with estimated total expenditure of less than \$5,000 over the period 2005/06 to 2008/09, attributed to PC432 and PC436 (Major Periodic Maintenance);
- as noted elsewhere in this report, the total number of items listed in the EXPLAN files linked to TAMP200 and TAMP2004 and the total estimated value of the 30-year works program changed dramatically;
- PC431 and PC432 (relating to Dams) and PC435 and PC436 (relating to Weirs) contain "Item" descriptions that appear to overlap (e.g. both contain big and small jobs, or involve the same activity (such as erosion repair or scour protection)); and
- entries without Product Codes (shown 'blank' in Chart 13 above) include substantial projects with Capex expenditures totalling \$39.3 million in the period 2005/06 to 2008/09.

4.5.3. Independent Audit

State Water's asset management systems and processes have been independently audited by GHD Pty Ltd (GHD) on three occasions, *viz.*, 1997, 2000 and 2004.⁵⁰ The first two audits were undertaken for IPART, and the latest for State Water.

State Water provided MJA-Cardno with a copy of the most recent (2004) GHD audit report. This audit report concludes there has been a steady increase in the overall performance of State Water's asset management systems and processes.

GHD's 2004 review also concluded that State Water was able to bring a greater level of confidence to the planning and project tasks required for the delivery of bulk water. This conclusion was based on comparisons with earlier audits in 1997 and 2000.

Compared with 2000, GHD found improvements in:⁵¹

- Processes and practices;
- Demand analysis - improving knowledge of customer and stakeholder needs;
- Strategic planning - development of coordinated and consistent process for planning of future works as part of EXPLAN;
- Business risk - risk assessment of dams and river structures;
- Data and Knowledge -
 - improving retained knowledge of assets,

⁵⁰ GHD 1997, GHD 2000 and GHD 2004.

⁵¹ TAMP 2004 , p122 (145).

- improving electronic access of asset knowledge,
- improved confidence and quality in data of planning information;
- Asset Management Information (Support) Systems; and
- Implementing life cycle costing software.

MJA-Cardno accept GHD's conclusion (from the 2004 review conducted for State Water) that the basis for planning future Capex demonstrated in TAMP2004 is reasonable (from the point of view of identifying and forecasting technical and engineering activities), and has improved progressively since 1997.

However, MJA-Cardno's analysis also found that:

- The total cost of the 30-year asset management plan increased markedly from \$397.7 million (2001/02 dollars) in TAMP2000 to \$626.8 million (2004/05 dollars) in TAMP2004, even though some \$49.6 million (nominal dollars) of Capex was undertaken in the 2001/02 to 2003/04 period. The basis for this increase is not clearly explained in TAMP2004; nor has it been explained satisfactorily in other material provided by State Water – including State Water's response to the MJA-Cardno draft report.
- The forecast cost of dam safety compliance has increased by approximately \$240 million from TAMP2000 to TAMP2004, with \$122.5 million allocated to the 2005/06 to 2008/09 period (or 19.5% of the total amount of \$626.8 million for the 30-year period).
- State Water is not able to easily and effectively track, control or manage project costs against budget, which is very likely to lead to inefficient outcomes that could not be identified sufficiently early to be controlled (although this deficiency should be addressed once State Water completes development and implementation of its Project Delivery System); and raises questions about whether State Water could demonstrate the Capex spend was 'prudent'.

MJA-Cardno notes that this deficiency should be addressed once State Water completes development and implementation of its Project Delivery System and rolls-out a new financial reporting system.

- The variation in estimated cost of options for major projects listed in TAMP2004 is too great for the estimated costs to be considered 'efficient'.

There is considerable uncertainty in scope and design detail in major expenditure items. This is demonstrated by information provided by State Water which shows the estimated costs of identified options varying by as much as -67% to 327% of the cost stated in TAMP2004.

- TAMP2004 and State Water's pricing proposal include substantial dam safety upgrades that may not eventuate if the NSW Government and State Water's Board adopt the draft "Acceptable Flood Capacity for Dams" guidelines, which incorporate a risk management approach, proposed by the NSW Dam Safety Committee (DSC) and State Water undertakes robust business evaluations of dam safety upgrade options (rather than implement 'engineering solutions' that do not take full account of the business impact on State Water or its customers).

- State Water has not taken into account the fact that Capex outcomes in the 2001/02 to 2003/04 period were substantially below the levels accepted by IPART in its 2000 Decision. Actual Capex varied between \$10.9 to \$13.3 million, or some 55% to 61% of the forecasts accepted by IPART (an average of 57% over the three year period).

MJA-Cardno has considered this to be a ‘Capex efficiency’ gain in the sense that there is no evidence that service standards or service delivery suffered; nor any evidence there was any breach of State Water’s obligations.

However, MJA-Cardno notes that the observed ‘Capex efficiency’ gain was most likely achieved by organisational inertia rather than an explicit management-endorsed business strategy. That is, State Water was not capable of committing Capex at the level forecast – because design and planning of major Capex projects was not sufficiently developed. Such an outcome is deemed ‘imprudent’ because it occurred each year, demonstrating Capex forecasts are biased by excessive optimism (or excessive caution) that is inconsistent with sound business practice. This outcome is also ‘imprudent’ because it has the regulatory impact of consistently allocating a higher than necessary cost onto State Water’s customers (in this case the NSW Government).

In MJA-Cardno’s view, these findings raise real questions about the suitability of using Capex forecasts from State Water’s asset management planning processes as a reasonable basis for establishing an ‘efficient’ cost base. In particular, the range in estimated costs for individual major projects is too great to be relied upon for the setting of prices; and adoption of the DSC draft dam safety guidelines is likely to lead to identification of lower costs for achieving compliance with some of State Water’s dam safety obligations.

4.5.4. Recurrent Capex Forecasts

The approach to forecasting recurrent Capex suffers from similar deficiencies to those described above for Opex forecasting. State Water indicated that Capex budgets for jobs such as major periodic maintenance are usually prepared using a zero-based budget approach. Salaries are allocated by hours and staff costs allocated in accordance with the budgeted hours.

Because Capex costs can vary from year to year, staffing resources may need to move between Opex and Capex activities causing a staff member’s time to be over-allocated. At this stage in the process, a decision is usually made whether to undertake an Opex or Capex job by contract, employ temporary staff or defer some work for the next year. Adjustments to the break-up of job costs are then made.

That is, the approach described by State Water personnel does not explicitly include consideration of asset condition, or service standards.

4.5.5. Major Capex Forecasts

State Water advised that major capital expenditure is estimated using typical engineering approaches based on designs (at different levels of detail for different stages of the planning process), quantity estimates and standard unit rates. Where possible the unit rates are established by comparison with similar recent (contract) projects.

In MJA-Cardno's view, this process is reasonable provided consideration is given to the relevance of the different estimates' accuracy and how the estimate will be used. MJA-Cardno note that the type and scale of major projects makes estimation of cost difficult because it is not possible to obtain robust estimates of unit rates that take into account substantial variations that could arise due to difference in scope and site-specific factors.

State Water provided a list of the major Capex projects with details of current status of the project in terms of the planning and development life cycle. Four levels of costs estimate are identified:

- **pre-concept:** judgmental cost estimate derived at the initial project definition stage;
- **concept:** a cost estimate at the options shortlist stage prior to selecting the preferred option - initial costing for planning analysis;
- **preliminary design:** a cost estimate for the preferred option based on an initial estimate of quantities and unit costs. This is often prepared prior to calling for tenders for design and construction; and
- **final detailed design:** final detailed costing, based on the final design and detailed estimate of quantities.

State Water provided MJA-Cardno with some sample estimates for the large Capex items included in TAMP2004 that had been classified against the estimate categories. This information is presented in **Error! Reference source not found.** below. The range in option estimates and the percentage variations are indicated in the three right hand columns. This demonstrates the magnitude of uncertainty in the estimates.

MJA-Cardno notes that there is considerable uncertainty in scope and design detail in major expenditure items. This is demonstrated by estimated costs of identified options varying by as much as -67% to 327% of the cost stated in TAMP2004. In MJA-Cardno's view, this range is too great to be relied upon as a reasonable basis for establishing an 'efficient' cost base.

It is MJA-Cardno's view that the magnitude of this variability is acceptable for planning purposes, but not acceptable for inclusion in a cost forecast that will be used for determining revenue.

Further issues to be considered when deciding whether or not the estimated costs should be accepted are:

- the likelihood that the project could proceed in the next regulatory period;
- the maturity of the designs and reliability of the estimated cost;
- the need to revisit consultation with stakeholders if the final costs depart markedly from the forecast cost.

MJA-Cardno considers that it would not be efficient to allow inclusion of construction cost estimates unless they are based on 'preliminary design' or final detailed design. Consideration should also be given to the likelihood that the project will proceed in the forecast timeframe. It would also be preferable to subject a (small) range of preferred options to a robust business case analysis before including the estimated cost into a forecast used for pricing.

CHART 15: VARIABILITY OF PROJECT COST ESTIMATES (\$'000, REAL 2004/05)

Storage	Purpose	Forecast Cost (\$)	Estimate Basis	Estimate Range (\$m)	Lower (%)	Upper (%)
Keepit Dam	Dam safety	64,000	Pre-design	52 to 91	-19	42
Copeton Dam	Dam safety	46,645	Concept	35 to 59	-25	26
Burrendong Dam	Dam safety	34,380	Concept	29 to 97	-16	182
Split Rock Dam	Dam safety	30,800	Pre-concept	11 to 32	-64	4
Blowering Dam	Dam safety	18,845	Concept	14 to 25	-26	33
Hume Dam	Dam safety	18,750	Pre-concept	10 to 80	-47	327
Wyangala Dam	Dam safety	18,000	Concept	13 to 19	-28	6
Copeton Dam	Environ	12,730	Pre-concept	10 to 20	-21	57
Hume Dam	Bridge	11,000	Preliminary			
Chaffey Dam	Dam safety	10,950	Preliminary	7 to 22	-36	101
Menindee Lakes	Dam safety	10,100	Concept			
Glenbawn Dam	Dam safety	10,000	Pre-concept			
Lostock Dam	Dam safety	10,000	Pre-concept			
Carcoar Dam	Dam safety	10,000	Pre-concept			
Windamere Dam	Dam safety	10,000	Pre-concept			
Lostock Dam	Environ	8,000	Pre-concept			
Wyangala Dam	Environ	6,670	Concept	1 to 10	-85	50
Carcoar Dam	Environ	5,100	Pre-concept			
Glennies Creek Dam	Dam safety	4,920	Concept			
Glennies Creek Dam	OHS/Safety	4,000	Concept	4.0 to 4.9	0	23

For example, even a major project at the ‘preliminary design’ stage would, very likely, take several years to develop to the implementation stage. A specific example is the proposed upgrade of Keepit Dam. Expenditure for this project is shown in TAMP2004 occurring from 2005/06 though 2008/09. The total project cost in TAMP2004 is estimated to be \$65.6 million (all of which is included in State Water’s pricing proposal), with \$14 million falling in 2005/06. However, the *Keepit Dam Upgrade – Feb 2005* report provided by State Water shows tendering for the project is expected to commence in March-April 2006, with design and construction commencing in July 2006. That should mean that no major expenditure will occur prior to 2006/07.

Accordingly, MJA-Cardno conclude that it would not be ‘efficient’ to allow major project expenditure to be included in the Capex forecasts unless the project has reached the stage where final detailed design can proceed and where a firm budget estimated of the project cost has been prepared and subject to a robust business case evaluation.

State Water’s response to the draft report acknowledged this criticism and moved the Keepit dam upgrade program out by 3 years, which is the main reason why the total value of the three year forecast (from 2005-09 through 2008/09) was reduced by some \$40 million. However, MJA-Cardno is still not convinced that other items in the revised Capex forecast are based on ‘efficient’ costs and timing. State Water provided no assurance that Capex cost estimates were any more robust than those examined by MJA-Cardno. MJA-Cardno remains

firmly of the view that State Water should delay uncommitted major dam safety works until it can reasonably and robustly estimate the 'efficient' cost of the option that is likely to deliver the optimum business outcome.

4.6. Dam Safety Obligations

The safety of State Water's dams is regulated under the *NSW Dams Safety Act 1978*. Under this Act, the NSW Dams Safety Committee (DSC) is empowered to regulate all aspects of dam safety.

MJA-Cardno understands that State Water's dams must achieve compliance with DSC standards and requirements for flood, seismic and other failure modes. The DSC audits State Water's conformance and reports annually to NSW Parliament. DSC may require a non-compliant dam to be modified or to direct the owner to reduce risk by lowering the storage water level to achieve an acceptable risk profile.

The most significant Capex activity (Product Code) for State Water is, and has been in the period from 2001/02, the upgrading of dams to comply with current *NSW Dams Safety Act 1978* requirements.

As noted above, the cost of meeting dam safety obligations is a major part of the 30-year Capex forecasts that are included in State Water's TAMP2004. The EXPLAN file linked to TAMP2004 identifies 2,438 projects with a total estimated value of \$626.8 million (2004/05 dollars). Of this, some \$321 million (or 51%) is allocated to 'Dam compliance – upgrade', with \$122.5 million (or 19.5% of the total amount) allocated to the 2005/06 to 2008/09 period.

MJA-Cardno notes that the total cost of the 30-year asset management plan increased markedly from TAMP2000 to TAMP2004, even though some \$49.6 million of Capex occurred in the 2001/02 to 2003/04 period. The project register file (EXPLAN) linked to TAMP2000 lists 3,340 projects with a total estimated cost of \$397.7 million (2001/02 dollars), of which \$80.7 million is allocated to 'Upgrade' of 'Major Dams'.

That is, the forecast cost of dam safety compliance has increased dramatically since 2000, and this expenditure is heavily 'front loaded'.

Key features of costs forecast in TAMP2004, which has been translated to State Water's pricing proposal, are that:

- the Capex costs are significantly 'front loaded' with a higher proportion of the forecast costs occurring in the early part of the 30-year forecast period. This is particularly the case for the forecasts of costs associated with dam safety;
- the total value of the 30-year cost stream increased dramatically from TAMP2000 to TAMP2004; and
- large amounts allocated to dam safety were shifted out (sometimes by up to 10 years or more), even though the total amount forecast for the next 3-5 years remained much the same.

The magnitude of change in these cost forecasts and the substantial degree of discretion indicated in the amounts and timing of dam safety upgrades between TAMP2000 and

TAMP2004 provided a strong reason for the asset management planning and costing processes to be closely scrutinised.

MJA-Cardno accepts that State Water must meet dam safety obligations. But changes between TAMP2000 and TAMP2004 demonstrates there is substantial variation in compliance options, substantial changes in estimated compliance cost and substantial discretion in timing of execution of works required to achieve compliance. MJA-Cardno notes that there is no explicit obligation on State Water to undertake a specific project by any clearly specified time.

4.6.1. Dam Safety Risk Assessment

State Water has completed a Portfolio Risk Assessment on all its dams. The risk assessment is a process for deciding whether existing risks are tolerable and present risk control measures are adequate, and if not, whether alternative risk control measures are required. The Portfolio Risk Assessment provides State Water with:

- a current risk profile for its dams;
- a basis for improving recurrent dam safety activities;
- the basis for a Dam Safety Improvement Program comprising a phased program of investigations and risk reduction measures, with business justifications; and
- inputs to various business processes, which aim, to place dam safety issues in the context of State Water's business.

MJA-Cardno rates the Portfolio Risk Assessment process used by State Water in 2002 equal to current industry best practice at that time.

4.6.2. Identifying 'At Risk' Dams

The Portfolio Risk Assessment process employed by State Water is compliant with the *Guidelines on Risk Assessment* published by the Australian National Committee on Large Dams (ANCOLD) in October 2003. The Portfolio Risk Assessment ranks State Water's dams into categories for societal risk being:

- 'Intolerable risks' which fall above the ANCOLD Limit Line and require high priority remedial works or investigations;
- 'Intermediate risks' which fall under the ANCOLD Limit Line but above the 'Objective Line' and are subject to the principle of 'As Low As Reasonably Practicable' (ALARP); and
- 'Acceptable risks' which fall under the ANCOLD 'Objective Line'.

A summary of the risk category for each of State Water's major dams is shown in Chart 16 below. This Chart shows that three large dams (Keepit, Chaffey and Burrendong) and two small dams (Bethungra and Moore) presented risks to life considered by ANCOLD Guidelines to be 'intolerable' ('Intolerable Risk'). Four other large dams and 5 small dams were in the 'Intermediate Risk' zone and presented risks to life that the ANCOLD Guidelines would require mitigating.

CHART 16: RISK ZONES FOR LARGE AND SMALL DAMS FROM THE STATE WATER PORTFOLIO RISK ANALYSIS (PRA)

Risk Zone	Type of Dam	Name of Dam
Intolerable	Large	Keepit
		Chaffey
		Burrendong
	Small	Bethungra Moore
Intermediate	Large	Copeton
		Split Rock
		Blowering
		Wyangala
	Small	Junction Reefs
		Queen Charlotte Vale Sheba No 2. West Gosford Railway No 1 Gallymont
Acceptable	Large	Brogo
		Burrinjuck
		Carcoar
		Glenbawn
		Glennies Creek
		Lostock
		Pindari
		Toonumbar
		Windamere
		Acceptable
Barren Jack		
Burraga		
De Burgh		
Sheba No 1.		
West Gosford Railway No 2		

Source: Portfolio Risk Assessment – Summary Report, December 2002

4.6.3. Risk Reduction Measures (Flood Capacity)

Once dams are identified as facing ‘Intolerable Risk’, the next issue for State Water is to assess the extent to which the risk should be reduced. Typically, this risk reduction is addressed in terms of altering the flood capacity of the dam. This could be achieved by:

- altering the operating regime for the dam (such as releasing water earlier when a high-intensity rainfall event is indicated or is actually occurring);
- lowering the normal maximum storage level so that more “air space” capacity is available to store flood water if a “risk event” occurs; or
- modifying the discharge capacity of the existing dam structure to allow a higher volume of water to pass if the existing spillway is insufficient to achieve the selected risk level. This can be achieved by increasing the capacity of the existing spillway or by providing supplementary spillway capacity in another location or by raising the dam wall to provide more flood storage.

State Water advised that it uses a traditional engineering approach to identifying risk reduction measures. In selecting the flood passing capacity for ‘Intolerable Risk’ dams, MJA-Cardno understands that State Water follows the deterministic requirements of the NSW Dams Safety Committee (DSC) and the Australian National Committee on Large Dams (ANCOLD) - *Guidelines on Selection of Acceptable Flood Capacity for Dams (2000)*.⁵² On this basis, State Water’s current design standard for flood passing capacity on intolerable risk dams is 100% of the full Probable Maximum Flood (PMF).⁵³

MJA-Cardno notes that classification of risk as ‘Intolerable’ or ‘Intermediate’ does not mean that the risk is either imminent or certain, or that a risk event would occur in any particular time period. An ‘Intolerable risk’ would typically be expected to be associated with conditions, or an event, that had a very low probability of occurrence (compared to other risk faced by State Water’s business and the community affected by the risk event). For example, an ‘Intolerable risk’ event may have a probability of occurrence of 1 in 1 million (chance of that event occurring in any single year) - or even less. However, if the event occurred it would be expected to have serious social, physical and economic consequences.

MJA-Cardno notes that State Water has advised that knowledge of ‘unacceptable’ risk profiles has existed for some of the ‘at risk’ dams for decades. This does not mean that the risk has been ignored. Nor does it mean that nothing need be done in future to address the risk. But it does demonstrate there is a substantial element of judgement, even discretion, involved in making the decision on when to commit resources to reducing the risk level.

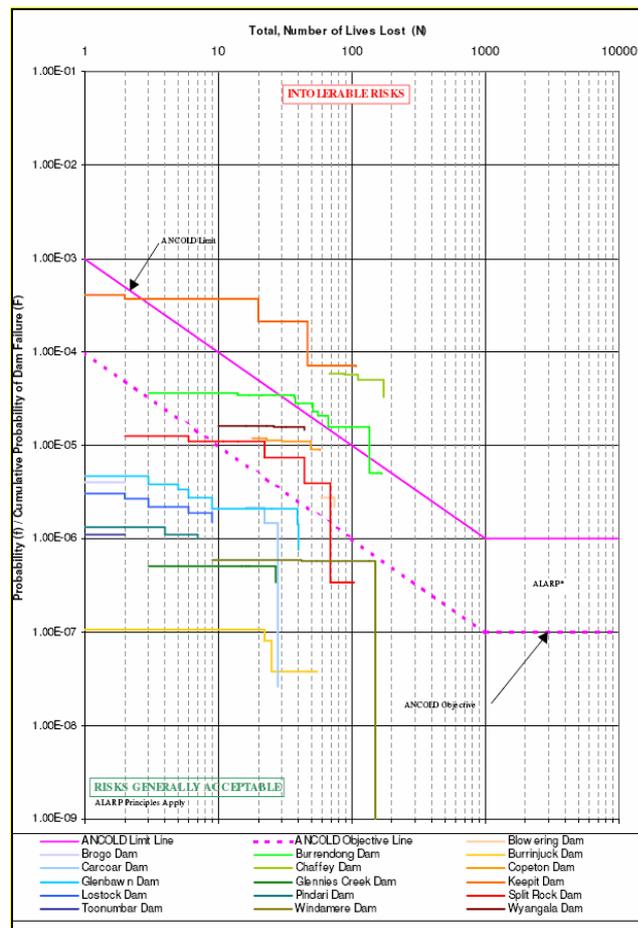
MJA-Cardno also notes that even if a risk level is changed; say by replacing or re-building a spillway at a cost of many millions of dollars, the risk cannot be eliminated entirely. A costly risk reduction measure would be expected to reduce the risk; otherwise it would not be undertaken. But it may only reduce an already low risk to what is (in reality) a relatively small improved risk (say, an existing 1 in 100,000 risk may be improved by a factor of 10 to 1 in 1 million). The fact is that any man-made dam structure or activity presents a risk of some sort to the community. The risk can never be removed entirely, even by removing the dam structure, since if the dam is removed the downstream reaches of the river would be subject once again to the higher flood risk that (almost certainly) existed before the dam was constructed.

Chart 17 below summarises the results of State Water’s risk assessment of its large dams. MJA-Cardno note that the Burrendong Dam lies just above the ANCOLD limit line. Small changes to the operating regime of the dam or minor asset upgrades might drop the dam risk to below the ANCOLD Limit Line and into the ‘Intermediate risk’ range.

⁵² p 8, Appendix 2.

⁵³ The “PMF” is the notional limiting value of an extreme flood that could reasonably occur, without superimposing risks of very low probability, but incorporating some degree of conservatism.

CHART 17: LARGE DAMS – ANCOLD SOCIETAL RISK CURVE (2002 PRA)



A key issue for this review of the ‘efficiency’ and ‘prudence’ of State Water’s expenditure is whether or not the actions undertaken, or proposed, by State Water are - in MJA-Cardno’s judgement (in the first instance) – ‘efficient’ and/or ‘prudent’. MJA-Cardno does not dispute that State Water has an obligation to ensure satisfactory safety of its dams (and all its other activities for that matter). But the questions to be addressed are:

- Is the obligation imposed on State Water explicit and clear so that State Water must undertake a particular (and very costly) activity now, or at any other specific time so as to discharge its obligation?
- If the obligation is not explicit and clear (which is the case of dam safety):
 - has State Water developed a corporate policy that clearly articulates how it should discharge - and be seen to discharge - this obligation in an efficient/prudent manner;
 - has this policy been effectively communicated to key stakeholders (particularly those meeting the cost or suffering the consequences of the policy); and
 - have those stakeholders indicated a degree of ‘informed consent’ that IPART might be expected to accept as a legitimate basis for accepting the costs incurred in implementing the policy?
- Has State Water provided sufficient evidence to demonstrate that it has considered all reasonably likely options to achieve compliance; has it determined the reduction in risk

arising from the preferred option(s); has it undertaken a robust and reasonable assessment of the costs and benefits of the options; and is it likely that State Water's processes will yield an 'efficient/prudent' outcome?

- If State Water's policies and processes are satisfactory, is the cost estimate associated with discharge of the obligation sufficiently reasonable and robust so that MJA-Cardno can recommend to IPART that it be included in the cost forecast on the basis that is necessary, efficient and/or prudent?

As noted in section 4.6.1, MJA-Cardno concluded that the Portfolio Risk Assessment process used by State Water in 2002 was equal to current industry best practice at that time. However, translation of the risk assessment outcome to 'efficient' estimates of cost and timing is far less robust. State Water effectively acknowledged MJA-Cardno's concerns about this aspect of the Capex forecasts in its response to the draft report:

The science supporting the need of this compliance work is, in some cases, incomplete or apt to change (extreme event hydrology, seismology, risk assessment, loss of life estimates). The need for compliance changes over time as knowledge increases. ...

Even after the problem at a structure is clearly identified (as is now the case for the multi-objective upgrade of Keepit Dam), the options to resolve the issue are considerable. There were originally some 70 options to address the issues at Keepit. After 4 years of investigation there are still 5 feasible options. SWC and its stakeholders are facing these types of issues for the first time and there is no precedent to follow in addressing them.

SWC has adopted a transparent and inclusive approach to the issues ensuring that all stakeholders are involved in the decision-making processes. This results in a lengthy but honest consultation period. It has taken longer to address these issues than was estimated by SWC. However being nearer to the completion of the process (Keepit), the processes and associated timeframes are more clearly understood and this will result in better estimates and a more effective process for other projects.⁵⁴

MJA-Cardno has not questioned the transparency of State Water's approach to identifying solutions to dam safety upgrades. But this statement reinforces that, even now, State Water cannot say with any reasonable certainty which of the five options is most likely to deliver the best business outcome for the Keepit upgrade. As noted in Chart 15 above, the estimated cost of options for the Keepit Upgrade range from \$52 million to \$92 million (and the budget amount included in TAMP2004 is \$64 million). It is MJA-Cardno's firm view that it not reasonable to include an activity with such a degree of known uncertainty in an 'efficient' forecast of Capex that will be translated into a revenue requirement when recent experience has demonstrated that State Water has consistently over-estimated its Capex requirement by a substantial degree.⁵⁵

⁵⁴ p28-29, *State Water Corporation's Response to Review of Capital Expenditure, Asset Management and Operating Expenditure (Draft) Report, State Water Corporation, March 2005.*

⁵⁵ It is beyond the scope of work for this review to suggest 'regulatory remedies' where this level of uncertainty exists in forecasts of major cost elements. This is clearly a matter for judgement by IPART. However, one option may be to allow State Water to 'flag' the need for a limited number of major Capex items

4.6.4. Future Dam Safety Obligations

The NSW Dam Safety Committee (DSC) released a draft update to its Guideline DSC 11 on *Acceptable Flood Capacity for Dams* in February 2002. This draft guideline was based on work then being undertaken by an ANCOLD Working Group which was subsequently published as the *ANCOLD Guidelines on Risk Assessment* in October 2003. The DSC draft guidelines propose an alternative approach to identifying flood-passing capacity risk reduction measures.

MJA-Cardno understands that the draft guidelines do not require that all ‘Intolerable risk’ dams pass 100% of the Probable Maximum Precipitation (PMP) flood. The DSC draft guidelines instead propose a risk based approach under which it is possible to reduce risk through potentially lower cost measures which pass less than 100% of the PMP flood.

The cost impact on State Water’s business activities of adopting the DSC draft guideline could be substantial. For example, in the ‘Societal Risk Curve’ diagram above, the Burrendong Dam lies just above the ANCOLD Limit Line. Under the risk based approach minor asset upgrades or a change in the operating procedure might drop the dam below the line and into the “Intermediate risk” range. That is, a change in corporate or statutory policy could allow State Water to achieve compliance with its dam safety obligations at significantly lower cost than literal interpretation to the current standards might suggest.

Given the long lead times on dam construction it would be inefficient from a cost perspective to undertake works when the design standards could change in the near future leading to a relaxation in the requirement for maximum flood passing capacity in ‘Intolerable risk’ dams.

MJA-Cardno therefore recommends that IPART require State Water to defer any major construction works on ‘Intolerable risk’ and ALARP dams, that are flood-passing capacity constrained, until the status of the DSC draft guideline on “*Acceptable Flood Capacity for Dams*” is clarified. A final decision on whether or not the draft guideline is to be adopted may take some time. MJA-Cardno recognises that the recommendation above would, most likely, result in deferral of all proposed expenditure for (major uncommitted) dam safety works until after 2008/09.

Overall, MJA-Cardno concludes that State Water has implemented a robust internal process for identifying dam safety risks. However, State Water may have an opportunity to develop different business strategies that will discharge differently defined obligation, and has yet to prepare a comprehensive business wide strategy for addressing the identified risks in a cost effective manner.

4.7. Improvements to Dam Safety Option Assessment

It is MJA-Cardno’s view that State Water should consider smoothing out the dam upgrade Capex profile.

The normal process for determining a Capex program (be it a five year, 10 year or 30 year timeframe) is a desk-top analysis that examines lives and service conditions of all assets in

and require the cost of these to be endorsed by IPART on an *ad hoc* basis during the coming regulatory period once State Water can demonstrate that it has estimated an ‘efficient’ cost and firm timing.

the portfolio to identify what work is required and when and what the estimated cost is for the work. Next, one would look at Major Periodic Maintenance requirements and estimate the cost of this work.

If the organisation has an effective condition assessment program,⁵⁶ imminent work items identified in these first two steps would be examined from a 'condition assessment' perspective to see if the work could be deferred. At the same time, assets identified as requiring work in the immediate future would be examined to see if work needs to be advanced (because the asset condition may have deteriorated faster than initially assumed).

Any enhancements, extensions or major upgrades, together with their estimated costs, would then be added to produce an expenditure profile on an annual basis. When all this data is collated, the expenditure profile will, most probably, look like the profile projected by TAMP2004. Some years will have very high expenditure levels and other years will have much smaller expenditure levels.

In MJA-Cardno's view, it would be 'efficient' for any asset intensive organisation to smooth out the peaks and troughs in the expenditure profile to ensure the organisation has adequate internal and financial resources to efficiently handle execution of the program. This can be achieved by advancing some works and deferring other works. A useful means to allocate priorities to individual projects is to subject the expenditure estimates to a business case review. That is, examine a range of options that could reduce the cost or allow the work to be delayed.

There will be occasions when it is not possible to reduce the expenditure to a level that can be readily accommodated. In these cases, one has to accept that additional resources will need to be hired on a short term contract basis, or work will need to be outsourced.

Another issue to be considered is whether the organisation has the funds to carry out the work when it is planned. The ability of the organisation to borrow capital, if it does not have the necessary funds, will also be a key factor in modifying the expenditure profile.

MJA-Cardno is concerned that State Water may be inclined to 'front-end' the Capex program, particularly the dam upgrades and any major environmental works, because the NSW Government has given a commitment for fully funding these works. While this is expedient, and even understandable, it is not necessarily a 'prudent' business decision to do so.

It is MJA-Cardno's view that the whole Capex program should be reviewed with a view to removing any unnecessary 'front loading'⁵⁷ of the dam upgrade program.

⁵⁶ MJA-Cardno notes that State Water has yet to fully develop and implement its Facilities Maintenance Management System, which means it is unlikely to have (yet) implemented an 'effective condition assessment program'.

⁵⁷ It is MJA-Cardno's view that it is also prudent to consider dam safety expenditure on a similar basis to expenditure in all other areas of business risk. A potential problem for all dam owners is that the risk assessment methodologies relating to dam safety have been developed to a much higher level of sophistication than assessment methods for other areas of business risk. Executive managers and Boards are frequently faced with the difficult decision of whether or not to proceed with dam safety expenditure when there is no equivalent rigour supporting expenditure options in other areas of the business. In some cases, the non-quantified risks could be substantially higher (in business impacts) than dam safety risks.

4.8. Customer Service Obligations

State Water has a range of formal obligations under its Interim Operating Licence and the WSPs to provide water delivery services to bulk water and retail customers. MJA-Cardno's review of State Water operations found that customer service obligations include:

- water ordering for regulated river users;
- meter reading, water billing and revenue collection for regulated river users;
- provision of annual allocation information to customers through media, internet, email, fax-stream, IVR telephones, SMS;
- administration of regulated river water accounts;
- administration of regulated temporary water trading; and
- compliance and enforcement of water account overuse.

State Water advised that the level of customer service obligations is not static but changes in response to seasonal variability in valley hydrology and developments in the policy and regulatory environments. Key trends affecting future obligations include:

- demand from State Water customers for more responsive ordering to better match on-farm or district needs to supply;
- potential obligations on water customers, reducing the scope for rainfall shutdowns or rejections (take or pay);
- new standards on water metering and metrology (which are likely to be required for NSW to demonstrate compliance with the *National Measurement Act* – although the timing for formal introduction of this requirement has not yet been agreed);
- operational implementation of rules for WSPs including the impacts of annual climatic variability;
- the rising financial value of water entitlements and allocations; and
- expansion of water trading.

State Water's Interim Operating Licence requires State Water to establish and maintain the Customer Service Committees (CSCs) and to develop a Customer Service Charter. The CSCs are the primary means of consultation with customers.

CSCs have a role in identifying service requirements and service delivery standards, providing input to water delivery strategies and annual operating plans; reviewing asset management priorities and providing input to water pricing strategies for recommendation to IPART. The CSCs also review State Water's financial statements; review billing processes and advise on debt management strategies along with assisting with the resolution of disputes; and producing annual CSC performance reports.

State Water has identified a range of potential future actions in relation to customer services including:

- conduct of the 2005 Customer Service Index survey;
- definition of agreed levels of service (LOS) with customers/stakeholders for each of the regulated valleys;

- development of various Service Level Agreements with customers and stakeholders that reflect the operating environment for State Water; and
- development and documentation of a series of factors suitable for trend analysis that will improve its asset management process, particularly in the area of service levels and customer needs.

State Water's pricing proposal does not explicitly address customer service obligations or links to Capex or Opex costs and forecasts in any detail. Accordingly, it was not possible for MJA-Cardno to form a view on whether or not the costs of meeting these obligations were reasonable, efficient or prudent. State Water did not raise any issues of concern with customer service, or service standards and MJA-Cardno notes that recent State Water Annual Reports identify no areas of concern with customer service.

MJA-Cardno notes that State Water's response to the draft report was to forecast an increase in Opex of \$124,000 per year from 2005-06 through 2007-08 for each valley above that advised to MJA-Cardno in February 2005, with an additional incremental increase of around \$65,000 per valley for 2004-05 only. No adjustments were included for inflation even though the figures were quoted as Nominal Dollars.

This amount was attributed (in State Water's response) to increased expenditure for Product Codes:

- a. PC102 Rural Water Supply Customer and Industry Liaison (\$45,000/valley) for establishing a new, high level, Community Consultation Committee;
- b. PC105 Regulatory Compliance (\$65,000/valley) for additional costs of legislative, statutory, regulatory compliance, requiring extensive monitoring and reporting of compliance and performance; and
- c. PC120 Rural Water Supply River Operations Planning (\$15,000/valley) to effect a process of identifying synergies in customer demands and environmental demands and consider implementation in consultation with DIPNR and the customers.

MJA-Cardno has no information to assess whether the proposed increase in expenditure for PC102 or PC120 would improve service delivery to customers. However, it is recommended that IPART address these issues directly with customers. If customers express support for the increased expenditure, IPART may care to add these amounts to MJA-Cardno's 'efficient baseline' Opex.

4.9. Heritage Obligations

State Water operates a number of assets with heritage values. In managing assets with heritage value, State Water aims to satisfying its requirements under the *NSW Heritage Amendment Act 1998* and other heritage guidelines.

State Water completed heritage assessments for the entire portfolio and identified 26 assets with State significance and 105 assets with local significance. State Water has started to develop heritage management guidelines and conservation management plans for assets with heritage value. A Heritage and Conservation Register was completed in 2004 to manage heritage attributes of assets as required by the *Heritage Act*. Individual Conservation

Management Plans (CMPs) are being progressively formulated and implemented. A heritage procedures manual is under development.

Heritage obligations appear to materially impact on State Water asset management costs particularly in relation to the disposal of redundant assets. MJA-Cardno was however, unable to establish with any certainty the impact of future heritage obligations on State Water's forecast costs.

4.10. Emergency Management and Critical Infrastructure Obligations

Emergency Management is required for situations arising due to deterioration of normal operations or occurrence of abnormal events.

4.10.1. Dam Safety Emergency Plans

The Dam Safety Committee requires dam owners, including State Water, to prepare Dam Safety Emergency Plans (DSEPs) for all dams where there is potential for loss of life in the event of failure. State Water has prepared DSEPs for all large dams and a number of small dams. These documents are regularly reviewed (generally annually), updated and issued to a controlled distribution list. In preparing DSEPs State Water liaises with, and seeks input from the State Emergency Service (SES), police, fire services and local government. DSEPs are tested in field and desk-top exercises carried out by State Water in conjunction with other emergency services agencies.

MJA-Cardno notes that only the Coastal Area has made allowance for updating the DSEPs in the next four years. The allowance is \$13,000 per year for their five dams. It is possible that the remaining three Areas have included the cost of updating their DSEPs under "PC310 – Flood Operation Plans".

MJA-Cardno understands that in accordance with the ANCOLD guidelines on Dam Safety Management, State Water staff undertakes daily visual inspections at extreme hazard dams and tri-weekly inspections at high hazard dams. State Water advises that the need for frequent visual inspections is one reason why State Water maintains permanent manning of dams, even when storage levels are at historic low levels. However, the ANCOLD guidelines allow other procedures that could include reliable, low-cost, remote monitoring systems that operate continuously

MJA-Cardno identified this as one area with potential to improve Opex efficiency. Manual inspection, and permanent manning, still rely on communications technology to warn of risk event and it is possible that extension of SCADA systems directly connected to existing communications facilities, coupled with periodic inspection visits, may provide an equally, or even more, reliable monitoring and communication function. MJA-Cardno believes that State Water should undertake a review of the permanent manning policies to see if other arrangements are cost effective.

State Water's response to the draft report included comment on manning levels by suggestions that the "MJA report contends that opex can be reduced through extending the use of SCADA and eliminating the current permanent manning of dams". Leaving aside the

fact that MJA-Cardno's draft report suggested this is an area with potential to improve Opex efficiency, State Water said that it had investigated these options in the past and the main finding were:

State Water has investigated these options in the past. The main findings were:

1. The potential cost/benefit of SCADA Systems (Supervisory Control and Data Acquisition)

SWC has a SCADA system at the majority of its dams and also at major river structures. Its use ranges from data gathering functions to the ability to operate structures remotely and/or automatically. All major regulators and outlet valves equipped with SCADA are used remotely, either from operations offices or the dam site offices. SWC has not identified compelling arguments to extend the use of SCADA particularly in the light of the extensive capital program that would be required to update the minor river structures to allow for remote operations. Even now, if after due analysis, this conclusion was reversed it would take a minimum of 3 years, the determination period, to introduce such systems and undertake the required modifications to river and dam structures. In future, there may be some additional unregulated river assets and hydrometric stations that may be transferred to SWC.

SWC undertakes to review this position prior to the next determination.

2. Manning Levels at Dams

SWC recognises that there is a high cost of manning dams. Equally importantly, SWC knows of the great benefits. SWC considers this expenditure prudent in the light of the river operations (24/7), dam safety requirements (surveillance and emergency response), OH&S (confined spaces), public safety (access), foreshore management as well as Critical Infrastructure Protection (prevention and response). Issues of acceptable risk, clustering, safety surveillance regimes, operational requirements, geographic isolation, housing and critical mass all need to be considered holistically in determining manning levels.

With the introduction of Water Sharing Plans, environmental contingency allowances and water trading, the operational releases are far more specific and variable, requiring 24/7, 365-day operations. The staffing levels are subject to these requirements.

SWC staff carries out contract maintenance work for hydropower generators at the dams, often responding to emergencies, on a cost recovery basis. This is an additional consideration for manning levels.

At the minor dams, the dam staff also carries out metering and associated functions. All SWC dams currently have public access for recreation. With the transfer of foreshore lands to SWC there is a need to consider land management functions imposed on it. Any decision on manning levels at dams would require significant risk analysis, HR and IR negotiations and contingency planning. SWC undertakes to continue such analysis and report on findings at the next determination.

MJA-Cardno's suggestion that potential efficiency gains may be possible from a review of dam manning was based on a comparison the manning practices of major dam operators across Australia. A brief summary of these practices is presented below.

- **New South Wales:** State Water is the only State-wide bulk water service provider that requires dams to be manned on a seven day a week basis, irrespective of storage levels.⁵⁸ State Water has 18 dams and four weirs permanently manned. Two of these weirs are on the Murray and have Navigation Locks as part of the structure.

There are 46 staff dedicated as 'OIC and 2IC' at dams and weirs and 76.74 EFT field workers located at dams and weirs.⁵⁹ Combined, these staff represent 41% of State Water's total workforce.

The NSW Dam Safety Committee (DSC) does not have a statutory requirement that all dams are manned, but they strongly recommend it. The DSC Executive Officer advised MJA-Cardno that a dam owner would have to apply to the DSC for approval to de-man a dam which had been traditionally manned.

- **Queensland:** SunWater has 15 of 26 dams manned, but not on a seven day a week basis. In most cases these dams are manned because of the isolated location and/or the difficulty of accessing the site during a flood event.

The South East Queensland Water Corporation has three dams adjacent to Brisbane. These dams are manned with two people each, mainly because of the short reaction time to a rainfall event. The Corporation has a flood control room which is activated if rainfall is imminent. There are also staff 'on call' to travel to the three dams for continuous manning, when a rainfall event is imminent. These three dams are operated by SunWater under contract.

The Queensland Dam Safety Regulator would like to see all gated spillway dams manned and other dams where the flood travel time from the dam to the centre of population is of short duration.

- **Victoria:** Melbourne Water operates 16 storages (9 dams) but do not permanently man these dams. Melbourne Water did have rostered caretakers in the past but this practice was discontinued many years ago. All dams are monitored by telemetry. However, there is a duty person on duty 24 hours a day to ensure reliable operation during an extreme event. Melbourne Water has 5 operations teams that can access the sites if required. Key issue for Melbourne Water is communications and the ability to get to the various sites in all weather conditions.
- **Goulburn-Murray Water (GMW)** operates 17 storages (11 dams). GMW has resident staff at all gated structures and other storages as required. GMW has staff on call when flood events or other events require. GMW does not use the 'dam safety' tag as a reason for having staff on site. GMW has resident staff on site because of isolation, security concerns and other operating factors (e.g. there is a pump station immediately downstream at Eppalock Dam).

⁵⁸ MJA-Cardno did not check with the Sydney Catchment Authority, but it is assumed that SCA dams are manned on a similar arrangement to State Water. The same probably applies to the dams that supply Canberra, because most of these are actually located in NSW, and the ACT appears to follow the NSW Dam Safety Committee arrangements. Scrivener Dam is manned, because it has to be operated in a very tight range of water levels to maintain the water level of Lake Burley Griffin. SunWater operate this dam under contract.

⁵⁹ Table 15, p92, TAMP2004.

The Victorian Dam Safety Regulator stated there were no specific requirements about the manning of dams. This is a business decision left to individual dam owners.

- **Tasmania:** Hydro Tasmania operates 60 plus dams throughout Tasmania. Hydro Tasmania does not have staff resident at all dams, but did not confirm how many dams had resident staff. Hydro Tasmania has people located within reasonable travelling time of any unmanned dam available on a 24 hour a day, 7 day a week basis, if an emergency arises.
- **South Australia:** There are 17 large dams in South Australia, 16 owned by SA Water. SA Water has two dams with resident staff that are generally elsewhere during the working day. SA Water has no requirement for the staff to be available 7 days a week. The other large dam in South Australia is believed to be unmanned.
- **Western Australia:** The Water Corporation owns 65 dams in Western Australia. Nine major dams which form the Perth water supply and 1 country dam are manned 7 days a week. The other 55 dams are unmanned and this includes 5 extreme hazard dams and 13 high hazard dams.

MJA-Cardno is not advocating that State Water abandon resident staff at dams. However, the staffing arrangement should be decided on the basis of 'prudent' business criteria. It is also possible that 'sensible' staffing levels at most dams could be justified from a security perspective alone, with two (minimum) or three people, depending on location, operating requirements, access to other facilities, etc.

All State Water dams which have gated spillways would probably pass a reasonable business test hurdle, but the need for these staff to be on call 7 days a week, 52 weeks a year is highly questionable. There should be arrangements in place, like there are in other States to have staff available on a 24 hour, 7 day a week basis, when there is a genuine need.

It is also reasonable to have permanent staff at the two weirs on the Murray, because of the navigation locks. But it is not clear there is a need for permanent staff at Warren Weir and Lake Cargelligo. It may not be unreasonable to have other dams permanently manned (with reasonable staffing levels) for reasons of isolation, security or operational purposes as quoted by Goulburn Murray Water.

However, it is unreasonable for State Water to claim that they must have resident staff for 'dam safety reasons'. Nor is it reasonable for State Water to put off a sensible business review of dam manning arrangements. MJA-Cardno notes that TAMP2000 states that State Water was to review manning levels at storages⁶⁰ and "*the costs of maintaining an OIC and 2IC at some (smaller, ungated) dams exceeds the value of water sold from the storages.*"⁶¹ There is no indication in TAMP2004 that this review was undertaken, and it remains as a proposed 'Future Action' in TAMP2004.⁶²

MJA-Cardno believes there is benefit in IPART providing direct incentives for State Water to undertake this review. The number of field workers located at some of the dams appears

⁶⁰ Section 5, p34 and section 6, p29, *State Water Preliminary Total Asset Management Plan*, DLWC, Revision Date 7 August 2000.

⁶¹ Section 5, p42, *Op Cit*.

⁶² See p14 and p19, *State Water Total Asset Management Plan (TAMP 2004)*, State Water Corporation, October 2004.

high, for example, 9.0 at Hume Dam, 7.3 at Keepit Dam, 6.28 at Burrinjuck Dam, and 6.25 at Copeton Dam. These numbers are in addition to the OIC and the 2IC. In Queensland, the most employees at any dam is 5 at Boondooma Dam (including the Officer in Charge), and these employees are responsible for operating and maintaining three pump stations and 100 km of steel pipeline supplying the Tarong Power Station with a number of stock water offtakes along the pipeline, as well as the running of the river below Boondooma Dam, including meter reading. This suggests there is considerable scope for efficiency gains in this one area of State Water's activities.

4.10.2. Critical Infrastructure Protection

The requirement for Critical Infrastructure Protection arises out of the increased awareness of the threat to infrastructure from terrorism, criminal activity and malicious damage. In line with various National and State strategies and initiatives on critical infrastructure, State Water has undertaken a reassessment of the security of its dams and weirs in conjunction with the State Emergency Management Committee.

State Water's response to the requirements of Critical Infrastructure Protection has included:

- preparation of several submissions to the Critical Infrastructure Review Group (CIRG) for initial review of its critical infrastructure and emergency management arrangements;
- development of security regime at the critical sites in response to the National Counter-Terrorism Plan's (NCTP) Critical Infrastructure Security Notification Model;
- provision of information and data to key agencies including the State Emergency Management Committee, and the NSW Police Counter Terrorist Coordination Command; and
- establishment of an Incident Management Room in Parramatta.

Critical infrastructure management is clearly a source of increased costs over the current regulatory period. However, MJA-Cardno was unable to establish the nature and magnitude of the cost impacts as State Water does not separately account for this cost driver.

State Water's response to the draft report included a comment that:

“The Portfolio Minister requires SWC to manage and protect, on behalf of the community, its critical infrastructure from deterioration and a range of threats. SWC has identified and included in its submission the appropriate levels of expenditure to comply with this need. These costs would not have all been included in the historical expenditure levels that have been used as a basis for MJA recommendation.”

MJA-Cardno has seen no documented evidence to support the assertion that security costs are not included in the historical expenditure levels. These requirements are not new. In any case, MJA-Cardno believes the 'efficient' response is about being aware that security is an issue and being alert to things that may be happening. The increase in cost for this course of action would be minimal.

4.11. Water Operations Obligations

State Water's operating licence and the Water Sharing Plans impose various obligations on State Water to undertake water and flood operations including:

- manage dams for flood operations, which must be consistent with Flood Operations Manuals which are prepared in conjunction with DIPNR;
- implement drought contingency plans, which are developed jointly by DIPNR and State Water;
- monitor and report on water flows and deliveries; and
- assess off-allocation flows.

Currently State Water has no specific regulatory driver for water efficiency and it is unclear whether State Water may retain the benefits of measured water efficiency. However, it is clear from discussions with State Water that effort (and resources) is committed to minimising the losses of released flows in rivers. This efficiency objective is manifest in both operational policy and capital investment decisions, but costs associated with this activity are not identified in information provided to MJA-Cardno. Accordingly, it was not possible for MJA-Cardno to form a view on whether or not the costs of meeting these obligations were reasonable, efficient or prudent.

4.12. Current and Projected Water Storage Capacity

IPART's terms of reference required MJA-Cardno to consider current and projected water storage capacity. The total storage capacity of State Water's dams and river structures has been constant for some time at or near historically low levels because of prolonged drought. No material change in the capacity of dams or river structure was reported in the current regulatory period. New river structures in the Macquarie and Murrumbidgee areas, completed in the current regulatory period, did not produce any change to the hydrological regime of the affected river according to State Water.

However, one of the options for the Keepit Dam upgrade is to increase the capacity of the storage to provide for environmental requirements and additional water supply for Tamworth. MJA-Cardno notes that costs associated with undertaking this option are expected (by State Water) to occur after June 2009.

New South Wales is in a period of extreme drought conditions with some valleys experiencing the worst drought conditions on record over the last three years. Details of the volume of water in State Water's 18 major dams from February 2003 to January 2005 is summarised in Chart 18 below.

CHART 18: CAPACITY AND STORAGE VOLUMES IN STATE WATER DAMS

Dam	Capacity when Full (ML)	Capacity in February 2003 (%)	Capacity in January 2004 (%)	Capacity in January 2005 (%)
Pindari	312,000	21	38	75
Copeton	1,364,000	21	13	28
Split Rock	397,000	9	12	30
Keepit	425,500	14	11	44
Chaffey	61,800	45	37	66
Toonumbar	11,040	13	32	78
Glenbawn	750,000	80	64	57
Glennies Creek	283,370	72	60	50
Lostock	20,230	81	99	99
Brogo	8989	12	90	100
Burrendong	1,188,000	57	24	24
Windamere	368,000	53	50	39
Carcoar	36,130	40	25	15
Wyangala	1,220,000	13	15	13
Burrinjuck	1,026,000	9	49	25
Blowering	1,631,410	4	48	22
Hume	3,038,000	5	59	47
Menindee Lakes	1,678,000	6	3	12
TOTAL	13,819,469	14	35	32

TAMP2004 reports that Water deliveries were 3,681 GL⁶³ in 2002/03, the most recent year for which data is available. The five-year average over the period 1998/99 to 2002/03 was 5,908 GL. The largest volume delivered in the last 20 years was approximately 7,100 GL in 1996/97; the smallest was 3,681 GL in 2002/03.

It is MJA-Cardno's view that current and future storage levels (over the current and next regulatory period) are not likely to impact significantly on State Water's expenditure. The exceptions to this conclusion are that historic low storage levels temporarily reduce dam safety risks, which may assist State Water 'smooth out' its dam safety expenditure profile. Historic low water levels also provide continuing opportunities to achieve lower cost maintenance, refurbishment and rehabilitation activities that have been successfully exploited by State Water over the last few years.

⁶³ The 2002/03 Annual Report on page 19 states deliveries were 4,100GL and page 20 shows Licenced Water Use as 3,291 GL.

5. Conclusions

Previous sections of this report describe the process adopted by MJA-Cardno for this review of 'efficiency' and 'prudence' of Opex and Capex. Section 4 outlines key findings from the review.

These findings have been considered in conjunction with matters identified by IPART (listed in section 1.6) to develop a set of key conclusions and recommendations. This section outlines the conclusions reached by MJA-Cardno.

As noted in section 2 above, it is MJA-Cardno's view that State Water is sufficiently different to other rural water supply businesses in Australia so that cost comparators cannot be usefully applied to draw quantitative conclusions as to the efficiency or otherwise of State Water's operations. This means that it was inevitable that MJA-Cardno would have to rely on information provided by State Water. MJA-Cardno has also outlined concerns about the robustness of State Water's reported and forecast costs at an activity (Product Code) level. If State Water had been able to provide robust cost data earlier in the review that did not exhibit the 'unusual' characteristics discussed earlier in the report, MJA-Cardno may have been able to undertake some internal cost comparisons between valleys.

This left little option but to consider State Water's activities at a whole-of-business. Given this circumstance, MJA-Cardno considered it highly desirable that State Water provide actual Capex and Opex data, aligned to State Water's revised obligations and functions, for the full period from IPART's first review in 1997. Access to this information would have allowed MJA-Cardno to make better informed recommendations to IPART.

MJA-Cardno accepts that many of the costs of a water business are largely fixed. A longer time-series of cost data provides a better, quantitative basis to compare changes in expenditure patterns with other information such as the improvement (or decline) in asset condition, or service standards, or the scope of work defined by asset management plans and operations plans. This would allow more robust conclusions to be drawn as to the 'efficiency' and 'prudence' of expenditure.

State Water initially indicated, in early November 2004, that it would be possible to provide annual Capex and Opex data for each year back to 1997/98 in a form that aligned with its current functions and obligations. Subsequently (in late January 2005), after repeated requests for this information, State Water confirmed that historical accounting records did not allow separation of actual costs in a format that could be accurately aligned with the changed obligations and functions of the newly corporatised entity back to 1997/98. MJA-Cardno was assured, however, that this had been done with Capex and Opex data for the current regulatory period, which commenced in 2001/02.

MJA-Cardno had no alternative but to accept State Water's advice on this matter.⁶⁴ However, MJA-Cardno notes that IPART has referred to virtually the same issue in each of its previous reviews. For example, in the 1998 Determination, IPART says:

⁶⁴ As noted earlier in this report, MJA-Cardno received three different versions of State Water's 'Product Code' manual, all of which were considered, by the provider, to be current. However, comparison of the documents showed that both Product Codes and descriptions were different in each. MJA-Cardno formed a view that this would indeed complicate the process of translating historical cost records into a common format.

Since 1 July 1997, DLWC has adopted a revised reporting structure which better separates water related activities. However, 1996/97 cost information (recorded under the previous reporting structure) was the most recent data available for DLWC's 1998 pricing submission. DLWC manually coded over 2000 individual activities within these costs to translate them to the revised financial reporting structure which has been in place from 1 July 1997.

This laborious task would have been unnecessary had DLWC adequately dealt with its financial management problems in the three and a half years since its creation. While the resultant cost information is significantly more useful than that submitted in previous DLWC submissions, the Tribunal is still concerned about the reliability of the data.⁶⁵

IPART's reference to the "laborious task of manually coding cost data to translate them to a revised financial reporting structure" sounds very much like the process described by State Water that was used to produce cost reports at valley/region level for this review. The only substantive change over nearly a decade appears to have been a shift from "laborious manual coding" to "irritating spreadsheet manipulation". The fact that there appears to have been little change to these procedures is disappointing. It certainly made the task assigned to MJA-Cardno much more difficult than it could have been; and, no doubt, created significant challenges and difficulty for State Water in preparing for the current IPART review.

It is clearly an issue of concern to State Water's management team and Board that little progress was made in developing robust, but reasonable, financial information systems. It is MJA-Cardno's view that State Water's predecessor organisations should have provided resources for development of financial and asset management systems required of a commercial business well before State Water was corporatised. The delay in doing so is, quite clearly, not 'prudent' and compromises State Water's ability to operate efficiently and demonstrate it is able to do so.

The concluding section of the report sets out the review team's conclusions on the efficiency of capital and operating expenditure forecasts in State Water's submission to the pricing review.

MJA-Cardno's inspection of State Water's operations and discussions with State Water managers identified no examples of obviously inefficient performance. Indeed, there is evidence that asset management and asset planning processes are reasonable (if not ideal or not best practice), and that operation of State Water's activities has been reasonably executed during a period of significant resource constraint imposed by drought and the former public service regime.

MJA-Cardno had no discussions with State Water's customers during this review to determine if customer standards of service have declined as a result of the reduction of expenditure on maintenance and asset refurbishment over the last three years. But no information was provided by State Water to suggest this had occurred and there is no reference to unsatisfactory service levels in State Water's recent Annual Reports.

⁶⁵ p10, *Bulk Water Prices for 1998/99 & 1999/00*, IPART Determination No 98-5, 16 July 1998.

However, MJA-Cardno has not been offered clear and compelling evidence that it accepts to support a recommendation that either Opex or Capex expenditure should be increased substantially. The report explains why MJA-Cardno has limited confidence in State Water's expenditure forecasts; and outlines reasons why MJA-Cardno ***does not*** recommend that IPART accept the cost forecasts proposed by State Water.

MJA-Cardno has, instead, recommended that IPART accept cost forecasts that are significantly lower than proposed by State Water, on the basis that State Water's predecessor organisations demonstrated convincing efficiency gains compared to cost forecasts accepted by IPART at the 2000 review. This positive finding is reinforced by MJA-Cardno's concerns that State Water did not provide information to explain, to MJA-Cardno's satisfaction:

- why much higher expenditure levels are essential to meet its obligations, which as far as MJA-Cardno understands have not changed in a sufficiently material way to justify the cost increases forecast by State Water;
- how cost estimates has been subject to rigorous management and State Water Board scrutiny that focuses on optimising operational efficiency;
- how the cost estimates align with corporate policies endorsed by government (since the new Board has yet to develop and endorse relevant Corporate Plans⁶⁶ and Policies); and
- how customer consent for the substantial cost increases has been obtained.

It is MJA-Cardno's view that expenditure at the level recommended in this report will, along with continuation of the positive initiatives so obviously taken by State Water managers in the recent past, allow State Water to maintain service delivery capacity in each valley/region at levels similar to those achieved over the current regulatory period.

5.1. Financial/Asset Management Information Systems

MJA-Cardno has concluded that State Water's financial/asset management information systems are not capable of reporting reliable financial information that can be relied upon to determine efficiency at an activity (Product Code) level. This suggests these systems cannot be relied upon by IPART to regulate State Water's activities at a valley/regional level.

Deferral of expenditure on activities that have been clearly identified and warranted, such as upgrading of State Water's financial management system, was not 'prudent'. Accordingly, MJA-Cardno endorses State Water's decision to replace the existing financial systems as a high priority.

Difficulties encountered by MJA-Cardno with the quality and reliability of data and information provided by State Water could be reduced substantially through introduction of a robust regulatory reporting regime that requires State Water to report on service level performance and financial performance at a valley/region level, at an activity (Product Code) level and against State Water's key obligations. While this is the intent of the existing reporting regime, this regime should be extended to include audit of financial data at a

⁶⁶ MJA-Cardno notes that State Water's response to the draft report says that the Corporate Plan was approved by the Board in November 2004. But State Water did not respond to repeated requests for a copy to be provided to MJA-Cardno.

Product Code level if IPART chooses to retain Product Codes as the basis for distributing costs between customer segments.

5.2. Procedures, Policies and Inter-agency Protocols

State Water needs to develop robust, formal corporate policies and procedures that apply uniformly across the business (or ensure existing policies and procedures are applied consistently) which define the process for identifying what obligations exist, how those obligations are to be discharged, and how costs of doing so are to be estimated, recorded and reported.

Where multiple obligations are involved, State Water should ensure the policies and procedures specify that any incremental expenditure not directly linked to discharge of an explicit obligation be subject to a cost-benefit analysis. In particular, where functional enhancement is proposed that is not directly linked to discharge of an obligation, the expenditure involved is justified by cost-benefit analysis.

MJA-Cardno notes that State Water's response to the draft report includes a statement that:

Costs benefit studies are carried out prior to major works being committed. SWC has ensured compliance with the new OH&S Act and Regulations through a structured not ad-hoc program.⁶⁷

MJA-Cardno asked to view a sample of cost benefit studies for major works across State Water's business. Only one cost benefit study was provided – the Keepit Dam upgrade and this was judged to be inadequate particularly in terms of consideration of project alternatives. From MJA Cardno's review of State Water's systems and discussions with asset engineers, MJA Cardno conclude that cost benefit studies to the standard of NSW Treasury Guidelines are not carried out for most of State Water's major works programs. In addition, State Water staff confirmed in discussions with MJA-Cardno that OHS compliance was used as a 'trigger' for some expenditure that also resulted in enhancement. But it was clear that the incremental expenditure was not subject to any formal cost benefit review in such circumstances.

5.3. Operations and Maintenance Expenditure

MJA-Cardno's review confirms that State Water's predecessor organisations (with the existing managers and staff) developed an operating regime capable of achieving Opex levels well below those judged efficient by IPART in the 2000 Determination while still meeting legal and service obligations.

This is demonstrated by comparing actual Opex over the period 2001/02 to 2003/04 to allowances accepted by IPART in its 2000 Determination. Actual total Opex was at least \$4.3 million below the amounts allowed by IPART in every year of this period; and 'efficiency gains' in Opex (defined as forecast less actual Opex) totalling \$17.3 million were achieved over this three year period.

⁶⁷ p41, *State Water Corporation's Response to Review of Capital Expenditure, Asset Management and Operating Expenditure (Draft) Report*, State Water Corporation, March 2005.

MJA-Cardno's conclusion that State Water's Opex activities are 'efficient' was reinforced by direct observation and through discussions with State Water managers and staff. MJA-Cardno observed no obvious 'feather-bedding' in State Water's operations, nor any indication of service failure or decline in standards of service delivery.

While some costs may increase, for example costs incurred in establishing State Water as a 'stand alone' corporation, MJA-Cardno expect that areas of operational improvement will be identified once State Water's Facility Management and Maintenance System (FMMS), Project Delivery System (PDS) and new financial information system are fully developed and implemented. Such an outcome is forecast in State Water's current Total Asset Management Plan (TAMP2004) and has been accepted by State Water in its response to the draft report.

However, despite observing generally 'efficient' operations, MJA-Cardno identified two areas where potential may exist to improve Opex efficiency further. These are:

- where significant investment has been undertaken to install Supervisory Control and Data Acquisition systems (SCADA) at river structures.

Potential to achieve further efficiency gains may exist because MJA-Cardno understands that investment in these systems has not been subject to cost benefit analysis that identified Opex efficiency savings; and that the functionality provided by SCADA systems is still sometimes replicated by manual processes (including stream gauging) that the SCADA system could replace; and

- the continued permanent manning of major dams, even when storage levels are at historic low levels, where investment that extends the capability of SCADA systems may provide an equally, or even more, reliable monitoring and communication function.

MJA-Cardno acknowledges that daily visual inspections of "high hazard" dams are a requirement of operating protocols established by the NSW Dam Safety Committee. However, the protocols allow other procedures that could include reliable, low-cost, remote monitoring systems that operate continuously.

MJA-Cardno expects that areas of operational improvement will be identified once State Water's Facility Management and Maintenance System (FMMS), Project Delivery System (PDS) and new financial information system are fully developed and implemented. Such an outcome is also forecast in State Water's current Total Asset Management Plan (TAMP2004).

MJA-Cardno can identify no material change in function, obligation or service standards, post 2003/04 or the next regulatory period, that justify an increase in total Opex costs in State Water's forecasts.

MJA-Cardno also conclude that forecasts for 2004/05 (used by State Water as the basis for forecasting Opex costs for the 2005/06 to 2008/09 period) have no obvious connection with actuals for the 2001/02 to 2003/04 period, or to any material change in obligations.

It is MJA-Cardno's opinion that the 2004/05 forecasts adopted by State Water are not representative of an 'efficient' cost base. Accordingly, MJA-Cardno also concludes that the Opex forecasts proposed by State Water for the 2005/06 to 2008/09 period do not represent 'efficient' costs.

Continuation of 'efficient' allocation of resources demonstrated during the 2001/02 to 2003/04 period would allow maintenance backlogs to be addressed over time without compromising service delivery or service standards. This allows the Opex forecast proposed by State Water to be reduced by some \$5 million per year for maintenance allocated to activities PC413 (Buildings), PC416 (Dams) and PC417 (River Structures).

5.4. Dam Safety and Capex

Capex in the 2001/02 to 2003/04 period was substantially below the forecast adopted by IPART in its 2000 Determination; and information provided by State Water shows that Capex in 2004/05 will also be substantially below the forecast shown in its submission to IPART – although this was not addressed in State Water's response to the draft report.

MJA-Cardno considered this reduction in Capex to be a 'Capex efficiency' gain in the sense that there is no evidence that service standards or service delivery suffered; nor any evidence there was any breach of State Water's obligations.

However, MJA-Cardno concluded that the observed 'Capex efficiency' gain was most likely achieved by organisational inertia rather than an explicit management-endorsed business strategy. That is, State Water was not capable of committing Capex at the level forecast – primarily because design and planning of major Capex projects was not sufficiently developed. Such an outcome is deemed 'imprudent' because it occurred each year, demonstrating Capex forecasts are biased by excessive optimism (or excessive caution) that is inconsistent with sound business practice. This outcome is also 'imprudent' because it has the regulatory impact of consistently allocating a higher than necessary cost onto State Water's customers (in this case the NSW Government).

As noted above, the estimated cost of meeting dam safety obligations is, by far, the largest component in State Water's Capex forecast. It is also noted the current dam safety requirements are being reviewed by the NSW Government in a process that started with release of a draft guideline in December 2002. MJA-Cardno's view is that implementation of the new guideline will be a major decision. On that basis, MJA-Cardno has concluded it may take some time to finalise State Water's dam safety obligations, possibly 2 years or longer. However, the timing of a decision on the proposed guideline is a matter that IPART may be able to clarify in discussion with the NSW Government and the DSC. If those discussions suggest a firmer timetable for the decision, then IPART could adopt a firmer position on timing.

If the draft "Acceptable Flood Capacity for Dams" guideline, which incorporates a risk management approach, proposed by the DSC is adopted, actions to achieve compliance may change. Specifically, the proposed guideline could allow State Water greater flexibility in achieving compliance at lower cost.

Even if the proposed guideline does not change the assessment criteria for high risk dams, MJA-Cardno believes that State Water should consider more thoroughly options for compliance, such as changes to operating rules, which could deliver a more favourable business outcome than currently assumed in TAMP2004. On that basis, MJA-Cardno has concluded that it is not 'efficient' to forecast expenditure that may not be required if the draft guideline allow a lower cost solution or a business case evaluation may allow a more favourable business outcome.

MJA-Cardno has also concluded that State Water does not have sufficient information to say that lower costs options are certain, or even that its forecast costs are likely to be achieved. Therefore, no recommendation can be made that State Water's dam safety compliance Capex estimates should be modified, other than that Capex should be delayed until 'efficient' Capex allowances of cost and timing can be reasonably estimated.

6. Recommendations

The recommendations formed from MJA-Cardno's review are presented in this section of the report. MJA-Cardno acknowledges that a considerable degree of judgement has been required in forming these recommendations. MJA-Cardno also acknowledges in the recommendations below that it has not been possible to formulate robust recommendations on 'efficient' Opex or Capex cost for each valley/region. Where a particular recommendation contains an element of uncertainty that is particularly high (typically because it is based on 'non-robust' quality information), MJA-Cardno has recommended that IPART requires State Water to provide additional information (to IPART) to further develop the recommendations.

As noted earlier in the report, the conclusions reached, and recommendations, made in this report are conditional to the extent that MJA-Cardno has significant reservations about the capability of State Water's current financial and management information systems. MJA-Cardno concluded that these systems are not always able to provide robust, reliable and consistently accurate information at an activity level (allocated against State Water's Product Codes) that is suitable for evaluating operational and capital expenditure efficiency or forecasting efficient and/or prudent costs.

MJA-Cardno's recommendations are also conditional to the extent that State Water has yet to develop its tactical or strategic business performance to a level that matches its operational effectiveness. MJA-Cardno concluded that State Water's managers had developed and implemented generally efficient operational practices. However, State Water has not yet achieved the same satisfactory performance in its business planning processes, as demonstrated by the substantial difference between actual expenditure during the period 2001-02 through 2003-04 and the forecasts for 2005-06 through 2007-08. Nor did State Water demonstrate that it linked forecast expenditure to coherent business evaluations based on robust estimates of asset condition, customer service, cost or timing – despite this being a stated feature of State Water's business processes.

It is MJA-Cardno's considered view that State Water could continue to operate efficiently and effectively over the next regulatory period if IPART adopts the recommendations in this report. Some additional resources may be required to allow State Water to identify and implement further business improvements. But State Water has provided no credible information that allows MJA-Cardno to make a reasoned and rational recommendation to IPART on the quantum or timing of such resources. If such resources are deemed necessary, the quantum and timing will be matters of judgement that are best made by IPART or State Water's owner.

6.1. Financial/Asset Management Information Systems

MJA-Cardno agrees that State Water must improve management information systems urgently because, *inter alia*, State Water:

- cannot readily demonstrate that it is operating efficiently at a valley/region level because of poor financial and management information systems; and

- cannot readily track, control and manage project and/or activity costs in a way that will assure efficient outcomes.

It is MJA-Cardno's view that State Water's predecessor organisations should have provided resources for development of financial and asset management systems required of a commercial business well before State Water was corporatised. The delay in doing so was not 'prudent' and compromises State Water's ability to operate efficiently and demonstrate it is able to do so. Accordingly, the cost of implementing this system (\$2 million in 2004/05) has been retained in the MJA-Cardno's recommended 'efficient baseline' Capex forecast below.

MJA-Cardno also recommends that IPART extend the current valley-based reporting regime for State Water's activities to include costs incurred to discharge State Water's key obligations. The reporting process should be subject to audit against a reporting guideline established by IPART in consultation with State Water and key stakeholders to ensure data is reliably recorded against service level performance and financial performance at an activity (Product Code) level for each valley/region. The financial performance reports should be subject to audit against statutory and tax accounts at a Product Code level should IPART choose to retain Product Codes as the basis for distributing costs between customer segments.

6.2. Procedures, Policies and Inter-agency Protocols

MJA-Cardno recommends that IPART requires State Water to develop corporate policies and procedures that apply uniformly across the business (or ensure that existing policies and procedures do so) which define the process for identifying what obligations exist, how those obligations are to be discharged, and how costs of doing so are to be estimated, recorded and reported.

In addition, where multiple obligations are involved, IPART requires State Water to ensure the policies and procedures specify that any incremental expenditure not directly linked to discharge of an explicit obligation be subject to a cost-benefit analysis. In particular, where functional enhancement is proposed that is not directly linked to discharge of an obligation, the expenditure involved is justified by cost-benefit analysis.

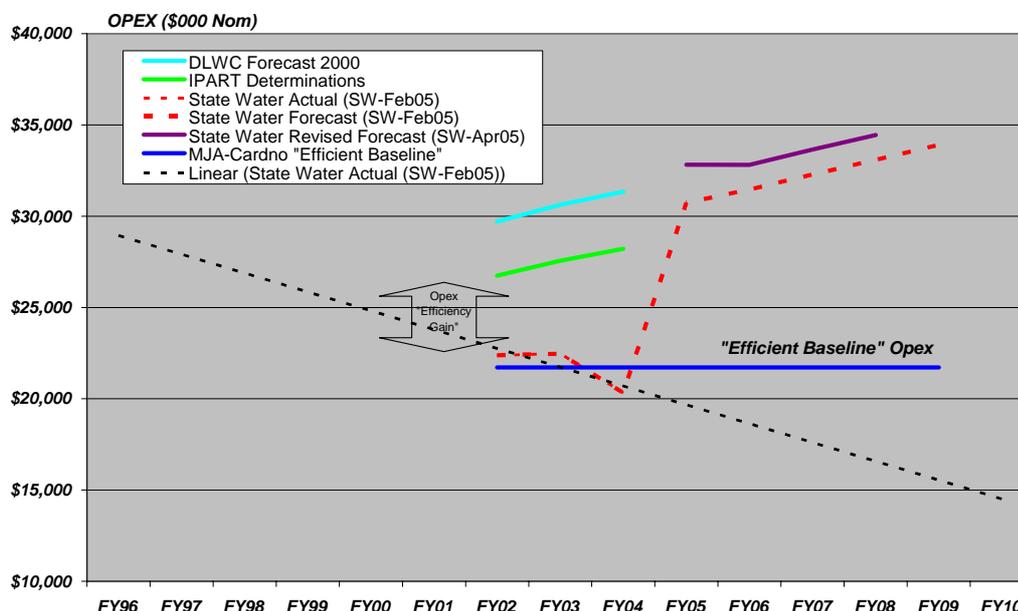
6.3. "Efficient Baseline" Opex

A simple (linear regression) analysis of State Water's actual Opex trends over the period 2001/02 to 2003/04 indicates declining costs, which MJA-Cardno considers are, most likely, not sustainable through the period 2004/05 to 2008/09. Accordingly, MJA-Cardno's recommendation for 'efficient baseline' Opex costs for the period 2005/06 to 2008/09 (that is also applicable to 2004/05) is the average of actuals for the 2001/02 to 2003/04 period. This recommendation is based on State Water's demonstrated ability (in the current regulatory period) to effectively deliver customer services and discharge its obligations at the 'efficient baseline' Opex.

State Water's response to the draft report provided no new evidence that would support a change to MJA-Cardno's conclusions or recommendations on Opex. The 'efficient baseline' Opex for the 2005/06 to 2008/09 period (and 2004/05) recommended for adoption by IPART

is, therefore, retained at \$21.7 million/year (Nominal dollars) as indicated in Chart 19 below.⁶⁸

CHART 19: RECOMMENDED "EFFICIENT BASELINE" OPEX



The information in State Water’s response to the draft report did not provide any new information that would enable MJA-Cardno to make a firm recommendation on ‘efficient baseline’ OpeX for each valley/region. The information provided by State Water does not permit determination of what, if any, allowance could (or may) be applied to ensure all major activities (Product Codes) are appropriately funded at ‘efficient’ levels.

MJA-Cardno also notes that changes in valley total OpeX proposed by State Water differ markedly, with a substantial reduction indicated for Border and the largest increases indicated for Lachlan, Gwydir, Peel, Murrumbidgee and South Coast (in ascending order) as shown in Chart 20 below. Accordingly, it is recommended that State Water be required to provide revised information on a valley basis so that it reconciles with the ‘efficient baseline’ total amount.

MJA-Cardno notes that State Water’s response to the draft report was to forecast an increase in OpeX of \$124,000 per year from 2005-06 through 2007-08 for each valley above that advised to MJA-Cardno in February 2005. An additional incremental increase of around \$65,000 per valley was also forecast for 2004-05 only. \$60,000/year of that increase was attributed by State Water to:

- PC102 Rural Water Supply Customer and Industry Liaison (\$45,000/valley) for establishing a new, high level, Community Consultation Committee; and
- PC120 Rural Water Supply River Operations Planning (\$15,000/valley) to effect a process of identifying synergies in customer demands and environmental demands and consider implementation in consultation with DIPNR and the customers.

⁶⁸ Note that Chart 19 also illustrates the effects of the ‘information asymmetry’ problem outlined above; shows the “Opex Efficiency” gain achieved by State Water’s predecessor organisations in the current regulatory period; and shows the significantly different OpeX data provided by State Water for this review.

**CHART 20: AVERAGE ACTUAL VS AVERAGE FORECAST OPEX
BY VALLEY (\$000 NOMINAL)**

Region	Valley	Average actual 2001/02 to 2003/04 (\$)	Average forecast 2005/06 to 2008/09 (\$)	% Change
Central -	Lachlan	3,097	5,185	67
	Macquarie	3,176	4,441	40
Coastal -	Hunter	2,660	4,073	53
	N Coast	448	791	77
	S Coast	429	925	116
North -	Border	1,095	949	-13
	Gwydir	1,932	3,331	72
	Namoi	2,502	3,789	51
	Peel	764	1,418	86
South -	Murray	2,005	2,695	34
	Murrumbidgee	3,616	6,448	78

MJA-Cardno has no information to assess whether the proposed increase in expenditure for PC102 or PC120 would improve service delivery to customers. However, it is recommended that IPART address these issues directly with customers. If customers express support for the increased expenditure, IPART may care to add these amounts to MJA-Cardno's 'efficient baseline' Opex.

In addition, State Water's response to the draft report re-stated brief explanations for increases totalling approximately another \$12 million (from 2003-04 to 2005-06) for other Product Codes. The explanations for these increases had been considered previously by MJA-Cardno. State Water provided no compelling new evidence to support changes to MJA-Cardno's draft recommendations. As noted above, MJA-Cardno identified no material change in function, obligation or service standards, post 2003/04 or the next regulatory period, that justify an increase in total Opex costs. While some costs may increase, MJA-Cardno expect that areas of operational improvement will be identified once State Water's new financial and management information systems are fully developed and implemented that will enable State Water to operate within the recommended 'efficient-baseline' Opex level.

State Water's response to the draft report acknowledged that "*a range of efficiencies should be achievable ...*" (through corporatisation), but proposes only to "*to identify these savings over the next 3 years (because State Water has had) little time to streamline its operations*" and asserts that Opex must be increased by more than 50% in the interim. MJA-Cardno agree that further work is required to identify further operational efficiencies, but State Water has not provided evidence that demonstrates efficiencies can only be achieved by substantially increasing expenditure across all areas of the business. It is MJA-Cardno's view, gained from working with other corporatised water businesses around Australia, that State Water will be able to identify and achieve further efficiency gains without increases in expenditure by continuing the demonstrated ability (since at least 2001-02) to manage limited resources and operate efficiently.

6.4. Stream Gauging Costs

MJA-Cardno recommends that incremental costs for DIPNR services allowed by IPART be based on comparison with costs for similar activities carried out by SunWater in Queensland and/or contract service providers in Victoria. The variation in the cost of stream gauging depends largely on geographic factors, but MJA-Cardno has confirmed that costs incurred by Victorian and Queensland irrigation businesses range from \$8,500 to \$12,500 per gauging station per year (including capital/ownership costs).

Accordingly, MJA-Cardno recommends that IPART require State Water to:

- adopt an ‘efficient’ Opex cost of \$10,500 per stream gauging station, which is the average of cost range indicated above;
- confirm the number of gauging stations required for operation of its system (bearing in mind that State Water appears to be suggesting it needs more than twice the number of stream gauging stations than SunWater in Queensland requires to operate its regulated river systems);
- confirm the number of gauging stations to be transferred from DIPNR to State Water;
- confirm the number of gauging stations that are duplicated;
- confirm the number of gauging stations accessible through its SCADA network; and
- ‘market test’ DIPNR service costs prior to 2008/09; and report these costs to IPART.

A supplementary recommendation is that IPART require State Water to investigate options for transfer of control of, and primary responsibility for, all gauging stations required for operation of State Water’s systems from DIPNR to State Water. An allocation of primary responsibility to State Water for stream gauges and meters needed for operation of its systems would be more-or-less consistent with arrangements in the energy sectors regulated by IPART.

6.5. Dam Safety Costs

MJA-Cardno accepts that State Water must meet dam safety obligations. But as noted above, the current dam safety requirements are being reviewed by the NSW Government. If the draft “*Acceptable Flood Capacity for Dams*” guideline, which incorporate a risk management approach, proposed by the DSC are adopted, actions to achieve compliance may change or options to achieve compliance identified that would achieve a more favourable business outcome than currently assumed in TAMP2004.

Accordingly, MJA-Cardno recommends that IPART require State Water to defer all major (uncommitted) expenditure on dam safety upgrades until:

- a final decision is taken by the NSW Government and the State Water Board on the DSC’s draft “*Acceptable Flood Capacity for Dams*” guideline;
- sound and coherent policies on dam safety consistent with guidelines eventually adopted are developed by the State Water Board and endorsed by the NSW Government; and
- consistent with the adopted guideline, all dam safety requirements are reviewed;

- the most ‘efficient’ compliance measures identified through robust business analysis of credible options;
- the preferred solution confirmed (from the credible options) confirmed through consultation with affected Stakeholders; and
- robust estimates of ‘efficient’ cost prepared that are suitable for incorporation into a revenue process.

It is MJA-Cardno’s view that the above recommendation would result in deferral of all major dam safety works for a period of at least 2 years. Accordingly, a delay of this duration has been assumed in developing the recommendations of ‘efficient baseline’ Capex.

Specifically, MJA-Cardno recommends that IPART:

- require State Water to defer all major (and uncommitted) dam safety expenditure until 2007/08 to allow resolution of the dam safety requirements, refinement of option designs, preparation of ‘efficient’ cost estimates and robust business case evaluations for major dam safety projects;
- allow an amount of 5% (based on total investigation, detailed design and project documentation costs being within 15% of total Capex cost) of the TAMP2004 costs for dam safety to be included in years 2005/06 and 2006/07 to cover the cost of further investigation, option identification and estimating of robust costs of dam upgrade works that will comply with the dam safety procedures eventually confirmed by the NSW Government and the State Water Board; and
- include only 57% (the average of the ratio of Capex actual/Capex forecast over the 2001/02 to 2003/04 period) of the forecast Capex proposed by State Water to allow for the Capex forecast errors, the less than robust basis on which the costs have been estimated and the ‘Capex efficiency’ (or ‘organisational inertia’) observed in the 2001/02 to 2003/04 period.

To the extent that State Water has committed to major dam safety works in the current regulatory period that could be avoided under DSC’s draft “*Acceptable Flood Capacity for Dams*” guideline, or robust business evaluation, IPART considers whether or not these costs are ‘prudent’. MJA-Cardno notes that State Water is represented on the DSC. Accordingly, State Water should be expected to take ‘prudent’ decisions to delay major dam safety expenditure until a final decision is taken on the draft guidelines and robust business case evaluation undertaken for ‘efficient’ compliance options.

MJA-Cardno note that State Water’s response to the draft report did not identify already committed Capex for 2004/05 though 2008/09, but it did include a substantial revision of Capex forecasts compared to forecasts provided in February 2005. As noted above, this substantial change confirms MJA-Cardno’s reservations about the robustness of State Water Capex forecasts.

State Water also asserted that the “*MJA proposal of a 5% of forecast dam upgrade costs to cover investigations will be insufficient. The required amount is estimated at \$4.5m/yr for the determination period*”, but provided no evidence to support the estimate of \$4.5 million/year. MJA-Cardno notes that (using State Water’s latest revised forecast) this amounts to 16% of total forecast Capex in 2005-06 declining to 8% in 2007-08, which appears far too high for investigation of dam safety options.

MJA-Cardno's estimate is based on typical costs incurred in developing large rural water supply projects to the stage where Governments are able to commit funds to the project. Definition of the project scope and cost estimate typically requires substantial engineering input, firm business case evaluation and broad stakeholder consultation. These should be common attributes for State Water's dam safety projects. Overall investigation cost for major projects, including completion of detailed design and firm business case evaluation, is typically around 3% of the total project cost. There may be economies of scale due to size of some projects, but an allowance for this was made in MJA-Cardno's estimate of 5% for State Water's program.

6.6. Fishway and Cold Water Pollution Costs

MJA-Cardno has concluded that it is not 'prudent' to incur a cost in meeting obligations that cannot be explicitly defined, nor compliance explicitly determined or demonstrated in advance of commitment of resources. Specifically, expenditure committed to fishways and cold water pollution controls that are deemed by the regulatory agency not to satisfactorily discharge State Water's obligations is not 'prudent'. Nor is it 'efficient' to include in forecast the costs of meeting obligations that cannot be adequately defined. Accordingly, MJA-Cardno recommends that IPART require:

- State Water to defer all expenditure on fishways and cold water pollution controls until protocols are developed and agreed with DPI and other agencies that adequately define how State Water can determine when it has discharged its obligations in these areas; and
- State Water and DPI develop and agree, through a public consultation process with key stakeholders, a protocol for determining the conditions under which fishways and other thermal environmental remedial actions are to be initiated.

It is MJA-Cardno's view that this would result in deferral of all fishway and cold water pollution works for a period of at least 2 years. Accordingly, a delay of this duration has been assumed in developing the recommendations of 'efficient baseline' Capex.

6.7. "Efficient Baseline" Capex Costs

The overall outcome from adopting the recommendations above is summarised in Chart 21 below. MJA-Cardno has not adjusted the recommendations to take account of State Water's latest revised Capex forecast, because this did not include any information for the period 2004-05 and appeared to be no more robust than previous forecasts. However, these amounts are shown on Chart 21 for comparison with other information provided by State Water and the recommended amounts.

MJA-Cardno acknowledges that it is not able to make a firm recommendation on 'efficient baseline' Capex for each valley/region because insufficient information is available to determine the precise distribution of dam safety and fishway/cold water cost forecasts. Accordingly, it is recommended that State Water be required to provide revised information on a valley basis so that it reconciles with the 'efficient baseline' total amount.

CHART 21: ILLUSTRATION OF "EFFICIENT BASELINE" CAPEX

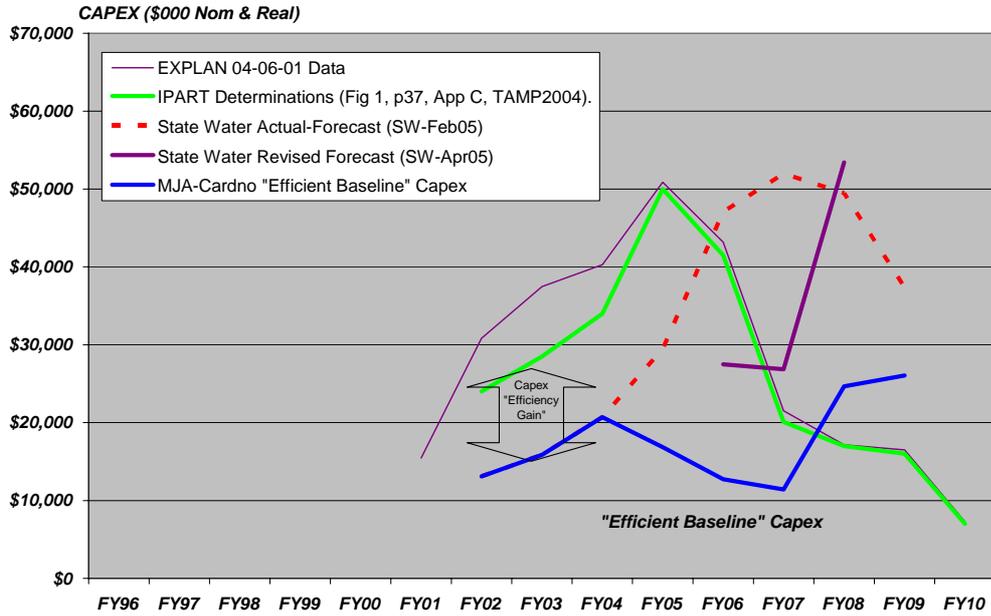


CHART 22: RECOMMENDED "EFFICIENT BASELINE" CAPEX

ITEM	Actual (\$000, Nom)			Forecast (\$000, Real 2004/05)				
	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09
State Water Actual (Feb 05)	13,102	15,866	20,703					
State Water Actual/Forecast (Feb 05)				29,486	47,071	51,954	49,473	37,364
Adjustments								
Delay Dam Safety					-22,395	-31,885	-30,170	-25,020
Reinstate Dam Safety							22,395	31,885
Delay Fishways/Cold Water					-4,387	-2,882	-2,950	-1,515
Reinstate Fishways/Cold Water							4,387	2,882
Dam Safety Investigation					1,120	1,594		
Actual/Forecast Factor				-12,628	-8,689	-7,361	-18,474	-19,528
"Efficient Baseline" Capex	13,102	15,866	20,703	16,858	12,719	11,420	24,661	26,068
State Water Revised Forecast (Apr 05)					\$27,486	\$26,860	\$53,435	

APPENDIX A: Data Checklist and Questionnaire

A.1 Introduction

A.1.1 Background and intent

This checklist has been compiled by Marsden Jacob Associates (MJA) and Cardno MBK (Cardno) to gather information for the cost review of State Water being carried out for the Independent Pricing and Regulatory Tribunal of NSW (IPART) review of bulk water prices.

The information collected through the checklist will be relied on by MJA-Cardno in advising IPART and will be made available in full to IPART.

Some of the information requires the submission of documentation while other information can be supplied through the interview process.

A.1.2 Confidentiality

The material provided will be kept confidential to MJA-Cardno and IPART except as required for the preparation of review report to IPART and IPART's subsequent actions. Note in this context that IPART intends to make public both MJA-Cardno's draft report and final report. MJA-Cardno will use the information only for the purpose of the study.

A.1.3 Contact

Any queries regarding this checklist can be forwarded to:

Mark Nayar Marsden Jacob Associates mark.nayar@marsdenjacob.com.au Tel: 03 9882 1600 Fax: 03 9882 1300 or	Bevan Faulkner Cardno MBK bjf_cons@tpg.com.au Mobile: 0421-638-673 Tel 07 3273-2809
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A.2 General information and documentation

The following general information and documentation is requested.

A.2.1 Annual Reports and Interim Report

A copy of the State Water annual report for the years 2000/01 through to 2003/04.

A.2.2 Organisation Chart, Employee Numbers and Contracted Services

A copy of State Water's organisation chart or charts showing:

- the main structure of the organisation;
- details of the main planning and operational units;
- indicative staff numbers (full-time equivalents) in each business unit; and
- an outline of the arrangements in place for activities that are routinely contracted out.

A.2.3 Corporate Plan

A copy of the corporate plan applying to the period from 2004/05 including overall corporate objectives, performance targets and corresponding performance to date focusing on those of performance that impinge on capital expenditures, the operation and maintenance of fixed assets, and the achievement of performance and service objectives.

A.2.4 Asset Management Plan

A copy of the asset management plan applying to the period from 2004/05. It is assumed that the plan will include substantially all of the following information:

1. A statement of the background and objectives of the plan including its interaction with other corporate goals, business planning processes, and other plans.
2. Statement of asset management policies, systems and information.
3. Statement of refurbishment and replacement policies.
4. Description of the present assets including their general nature and location, identification of assets by category, their capacity, condition and age profile by category.
5. Statement of asset management practices by asset category, giving reasons for their adoption for each category.
6. Details of past and projected performance levels including losses, utilisation, and reliability.
7. Justification for projected performance targets.

A.2.5 Dam Safety Plan

A copy of the dam safety risk assessment plan for the major dam and river structure assets including:

- a description of the risk assessment methodology;
- a statement of the major forecasting assumptions including application of ANCOLD guidelines; and
- hydrologic risk assessment and mitigation options and programs.

MJA-Cardno will also wish to establish how the treatment of risk for major dam and river structures differs from treatment of risk in other areas of State Water's activities. For example:

- Is there a consistent risk management policy across all areas of the business?
- How are risks in other areas of the business quantified?
- Are other areas of risk management subject to scrutiny and/or audit by an external organisation/body?

A.2.6 Acquisition and construction protocols and standards

Copies of State Water standard procurement and construction technical specifications for the following works:

- dam security upgrades;
- dam maintenance work, land and building supply and construction;
- plant and equipment procurement and outsourced operation and maintenance field services of the main types used.

A.2.7 Standard of service reports

A copy of key standard of service reports submitted to customer service committees including water ordering systems, restrictions in service provision and service priorities.

A.2.8 River operations plans

A copy of river operations plans for the major systems including rate duration and frequency of delivery, water quality and monitoring systems, capacity of storage and distribution systems and levels of automation.

A.2.9 Location maps

Maps in a suitable scale showing:

- the general location of dams and river structures;
- offices, depots and stores; and
- major customer locations and service areas.

A.3 Asset Profiles

A.3.1 Assets Quantities in Service

A schedule of assets in service at 30 June 2004 classified by primary asset categories and valley (see Table 1).

A.3.2 Age Profile of Assets in Service

Number of assets in service at in each period shown and by valley by age profile.

Table 1 : Fixed Assets

Asset category	Unit	Year												
		96/97	97/98	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09
Large dams - gated	No.													
Large dams – fixed crest	No.													
Small dams – gated	No.													
Small dams – fixed crest	No.													
Large weirs/regulators – gated	No.													
Large weirs/regulators – fixed crest	No.													
Small weir/regulators	No.													
Offtakes	No.													
Levees	Km													
Hydrographic stations	No.													
Bridges, crossings	No.													
Channels	km													
Roads	km													
Fish ways/fish passages	No.													
Major plant & equipment	No.													
Houses – active	No.													
Houses – redundant	No.													
Office Buildings	No.													
Buildings – redundant	No.													
Picnic Areas	No.													
Electricity supply lines	Km													
Transformers/switchgear	No.													
Backup generation sets	No.													
Town water supply facilities	No.													
Town sewerage treatment	No.													

A.4 Asset and Expenditure Management Systems

This section deals with asset and expenditure planning information systems and processes.

A.4.1 Asset Management Systems

- (i) Does the organisation have a physical asset inventory with details of the assets the organisation owns, the location of the assets, asset condition and asset service levels?
- (ii) When was the base data for the Asset Management System (AMS) collected?
- (iii) Has the asset data been subject to independent audit?
- (iv) Is the maintenance, rehabilitation and replacement of assets being recorded in the AMS on an ongoing basis?
- (v) Are field inspections of all assets carried out on a periodic basis to maintain currency of asset data?
- (vi) Is AMS information readily accessible to key staff and line managers?
- (vii) Is the AMS implemented on a computerised system?
- (viii) Is the system a commercial 'off-the shelf' system or is specifically developed for the organisation?
- (ix) Please provide a systems overview flowchart with linkages between asset management data warehouse and other data gathering and data storage systems including expenditure, financials and work flow.
- (x) Are accountabilities and responsibilities for asset management clearly assigned and does staff at all levels of the organisation have appropriate asset management skills? Are training resources, manuals and documented procedures provided as appropriate?
- (xi) Is it possible to establish an audit trail between the expenditure/asset management system line items and aggregate forecasts for major items of expenditure?
- (xii) Is it proposed to modify or upgrade the AMS during the forecast period beyond FY2004/05?
- (xiii) If so, why; and what additional functionality is proposed?

A.4.2 Maintenance Management System

- (i) Does the organisation have a computerised maintenance management package?
- (ii) Is maintenance information readily accessible to key staff and line managers?
- (iii) Is the system a commercial 'off-the shelf' system or is specifically developed for the organisation?
- (iv) Is the system being used to:
 - optimise maintenance planning;
 - analyse workloads and resource utilisation; and
 - measure results and provide maintenance histories?
- (v) Is it proposed to modify or upgrade the maintenance management system during the forecast period beyond FY2004/05?
- (vi) If so, why; and what additional functionality is proposed?

A.4.3 Financial Reporting System

- (i) Brief outline of State Water's computerised financial management system.
- (ii) Is financial information readily accessible to key staff and line managers?
- (iii) Is the system a commercial 'off-the shelf' system or is specifically developed for the organisation?
- (iv) What is basis for recording costs on the financial system i.e. valley, program, sub program, cost item etc?
- (v) What reporting facilities are available for:
 - monitoring of works actually undertaken against planned program; and
 - monitoring of actual expenditure against planned expenditure?
- (vi) Is information from the financial management system linked to the AMS and maintenance management system?
- (vii) Can key staff and line managers use the financial management system reports to monitor and control asset management and maintenance activities?
- (viii) Is it proposed to modify or upgrade the financial information system during the forecast period beyond FY2004/05?
- (ix) If so, why; and what additional functionality is proposed?

A.4.4 Project authorisation

- (i) What is the value threshold for works to require a formal project evaluation to justify the investment?
- (ii) Is this value consistent across all Valley/Regions?
- (iii) Details of the project approval process:
 - initiation report – approval to commit funds;
 - design report – acceptance of design and approval to proceed with implementation;
 - post-project evaluation report – assessment of project implementation.

A.5 Capital Expenditure Planning

A.5.1 Definition of capital expenditure

State Water's definitional policy for capital expenditure (Capex) with reference to the NSW Treasury's *Guidelines for capitalisation of expenditure in the NSW public sector*, June 2000 (the Capitalisation Guidelines) including:

- (i) capitalisation threshold;
- (ii) asset and component asset identification policy;
- (iii) overhead cost allocation; and
- (iv) distinguishing between replacement/enhancement and maintenance of assets.

A.5.2 Needs Assessment

a) Flood risk analysis

Details of flood risk analysis methodology including:

- (i) risk identification and assessment
- (ii) failure mode identification
- (iii) consequence assessments and scenario analysis
- (iv) ALARP interpretation and implementation
- (v) safety management principles, standards, guidelines and policies.

b) Seismic risk analysis

Details of seismic risk analysis methodology including:

- (i) risk identification and assessment
- (ii) failure mode identification
- (iii) consequence assessments and scenario analysis

c) General predictive modelling

- (i) criticality modelling
- (ii) predictive failure models for assets

d) Timing of Capex

Provide details of decision criteria for timing of significant Capex expenditure. This is particularly relevant to major works to upgrade flood capacity of dams and river structures.

e) Other criteria

Details of the criteria used for assessing individual asset performance, including information on whether any obligations are mandatory or discretionary.

- (i) asset provides core services;
- (ii) asset condition or risk;
- (iii) loading or utilisation limits;
- (iv) OHS performance;
- (v) defined as a property by customer services committee;
- (vi) heritage management – requirements under the *NSW Heritage Amendment Act 1998* and other heritage guidelines;
- (vii) environmental compliance – fish passages, cold water impacts, stream bank protection and interactions with New South Wales Fisheries, Catchment Management Authorities etc.
- (viii) other statutory or regulatory obligations;
- (ix) water order and delivery performance – delivery capacity, ordering time and take or pay obligations; and
- (x) public access and recreation.

f) Asset Condition Surveys

Details of asset condition assessment surveys carried out since 2001 if not described in the Asset Management Plan and confirm that the findings of the surveys have been taken into account in the plans.

A.5.3 Investment Appraisal

- (i) How are alternative options identified and the process for selecting the optimal alternative or solution?
- is consideration given to a base case of "do nothing", i.e. retain the status quo?
 - could operations be scaled down or closed, releasing resources for other uses?
 - This option could be particularly important in cases where the replacement of an existing asset is under consideration.
 - when is contracting out considered?
 - are different sizes or quality of operation possible?
 - what is the sensitivity of demand to the level and structure of pricing?
 - is it a realistic alternative to capital expenditure to vary the pricing structure?
 - what is the effect of varying the design life of the asset?
 - what alternative locations are possible?
 - are there choices of technique involving a trade-off between (say) labour and capital or capital and maintenance costs?
 - are there different materials, which would cost less or need less maintenance?
 - would better training of staff reduce manpower requirements?
 - are all elements of the operation equally justified?
 - Would removing some of them increase the NPV?
 - could the operation be combined with another or divided into parts to advantage?
 - are alternative time paths and output levels for the implementation of the options explored.
 - are options for the staging of proposals for increased capacity been considered?

- (ii) Have options concerning how large the increments in a project sequence are to be built been considered:
 - consideration of large increments to the system because there are often cost savings (economies of scale) involved with increasing project size;
 - deferred investment - minimised commitment to capacity that may not be used for a long time.
 - demonstrate where non-asset solutions are considered.
- (iii) Are internally prepared business cases consistent with NSW Treasury guidelines:
 - does a project review process exist from business case to post implementation review. Is this consistent with the NSW Gateway Review?
 - post implementations reviews – describe process and how this feeds back into the planning/ design phase.

A.5.4 Capex Costing

- (i) are costs organised by project deliverables and tasks? Is there consistency between technical definition and the cost estimation?
- (ii) do costs include all direct and indirect costs appropriately?
- (iii) are escalations based on a schedule which is documented and appropriately referenced?
- (iv) are appropriate contingencies included?
 - are these based on apparent project risks and documented?
- (v) are appropriate cost estimating technique used? e.g. appropriate to the scale and project life cycle:
 - screening or pre-feasibility – e.g. judgmental or based on historic experience, specific analogy
 - feasibility assessment
 - project design tendering stage
- (vi) do cost estimates includes appropriate documentation? e.g. traceable and consistent
- (vii) are the estimates produced by a qualified person? e.g. who and qualifications
- (viii) is estimates quality reviewed?
- (ix) what is the approach to contingencies through the project lifecycle?
- (x) is risk-based estimating used?

A.5.5 Unit Rate Costs

Details of unit rate costs used for preparation of forecasts.

- (i) does State Water have a unit rate database?
 - To what extent are the unit installation costs used in Capex projections optimal?
 - What evidence is available to support this view?
- (ii) When were unit costs last reviewed comprehensively and what conclusions did the review reach?
- (iii) Did this review include a review of all design aspects, project management practices, the incorporation of competitive bidding procedures, the confirmation that bid evaluation processes are robust, and that new technology and innovative design approaches have been incorporated where appropriate?

A.6 Capital Expenditure Forecasts

A.6.1 Actual v. Projected Capital Expenditure from 2001/02 to 2004/05

Details of actual and projected Capex for the years ending 30 June 2001 to 30 June 2005 by primary cost categories and principle valley.

- (i) What is the source of actual historical data?
- (ii) Has this data been subject to external oversight or review?

Note that MJA-Cardno would also like to see actual versus forecast cost comparisons for the period from FY1996/97 through FY2000/01.

Explain the reasons for variations between forecast and actual including:

- (i) changes in installed unit costs from those assumed in the projections;
- (ii) the need for compliance with new statutory or regulatory obligations, if any, introduced during the period;
- (iii) the advancement or deferral of expenditures during the period other than for reasons already listed;
- (iv) adoption of new policies, planning criteria or designs;
- (v) changes to scope of work from that assumed in the design stage;
- (vi) planning or budgeting errors (e.g. cost under-estimation, failure to plan to avoid construction bottlenecks, etc);

- (vii) the extent to which changes in policies for overhead cost allocation increased the cost of capital works;
- (viii) the extent to which demand-side management measures reduced Capex; and
- (ix) other factors, for example funding constraints.

A.6.2 Forecast Capital Expenditure from 2005/06 to 2008/09

- (i) Details of forecast Capex for the years ending 30 June 2006 to 30 June 2009 by into primary cost categories and principle valley accounts as set out in Table 3.
- (ii) Are the forecasts in real or nominal terms?
 - If in nominal terms what is the assumed inflation rate.
 - If in real terms what is the base year?

Table 3 : Capex Actuals and Forecasts

Product Code	Capex Category	\$ 2004 thousands												
		96/97	97/98	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09
PC402	Asset Management Planning													
PC415	Maintenance and surveillance of redundant assets													
PC431	Dam rehabilitation and refurbishment													
PC432	Dam – major periodic maintenance													
PC434	Dam – service enhancement/growth													
PC435	River structure – rehabilitation													
PC436	River structures – major periodic maintenance													
PC438	River structure – enhancement													
PC450	Dam compliance – environment													
PC451	Dam compliance – OH&S/public safety													
PC452	Regulated river compliance – environment													

- Data is to be provided by Valley/Region and total organisation.
- Data is to be cross-referenced to (and match) information provided in IPART's Information Templates.
- The same information is required for both forecast and actual Capex for the period FT2000/01 through FY2004/05 (and preferably from 96/97).

A.7 Operational Expenditure Planning

A.7.1 Staffing

Details of the number operating and maintenance staff as per Table 4.

A.7.2 Primary drivers

To what extent are costs driven by variable output factors such as the volume of water sales or the number of water orders?

A.7.3 Trends in the Primary drivers

Detail the trends in the potential drivers of Opex over the period 2001/02 to 2008/09 including:

- number of customers
- number of meters
- number of water orders
- frequency of meter reads
- frequency of billing
- compliance and enforcement notices

A.7.4 Improved Operational Practices

(i) **Outsourcing:**

- Does State Water outsource operations and maintenance work?
- If so are there adequate project management, contract administration, independent auditing and cost review procedures in place to ensure contracted rates are competitive?

(ii) **Logistics:**

- When did State Water last carry out a comprehensive review of operational logistics (inventory procurement, fleet and plant management, staff numbers and deployment) and practices?
- Have the conclusions of the review been incorporated into the organisation's standard practice?

(iii) **Automation:**

- When did State Water last carry out a comprehensive review of operational policies including the degree of automation and the introduction of new technology to improve service delivery?
- Have the conclusions of the review been incorporated into the organisation's standard practice?

A.7.5 Opex budgets

- (i) What is the process for establishing Opex budgets?
- (ii) Are aggregate cost forecasts established on a top down or bottom up basis?
- (iii) Which key personnel and line managers are involved in preparation of the Opex budgets?
- (iv) How is input coordinated between Asset Management Planners and line managers responsible for asset condition and operation?

Table 4. Operating and Maintenance Staff

Category	Number FTEs												
	96/97	97/98	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09
Head Office and Area Management													
Administrative and secretarial													
Dam staff													
River Structures													
River operations													
Customer services													
Meter reading and compliance													
Total													

- Data is to be provided by Valley/Region and total organisation.
- Data is to be cross-referenced to (and match) information provided in IPART's Information Templates.

A.8 Operational Expenditure Forecasts

A.8.1 Actual v. Projected Operational Expenditure from 2001/02 to 2004/05

Actual and projected Opex for the years ending 30 June 2001 to 30 June 2005 by primary cost categories and principle valley. Explain the reasons for variations between forecast and actual

A.8.2 Forecast Opex Expenditure from 2005/06 to 2008/09

- (i) Details of forecast Opex for the years ending 30 June 2006 to 30 June 2009 by into primary cost categories and principle valley accounts as set out in Table 3.
- (ii) Are the forecasts in real or nominal terms? If in nominal terms what is the assumed inflation rate. If in real terms what is the base year.

Table 4 : Opex Actuals and Forecasts

Product Code	Opex Category	\$ 2004 thousands												
		96/97	97/98	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09
PA100	Surface Water Quantity Data Collection & Archiving													
PA120	Surface Water Quality Data Collection & Archiving													
PC100	Rural Water Supply Strategies State River Operation Policies													
PC102	Rural Water Supply Custom & Ind Liaison													
PC120	Rural Water Supply River Operation Plans													
PC200	Regulated River Operations													
PC220	Regulated Water Billing													
PC221	Regulated Water Metering													
PC300	Flood airspace policy													
PC310	Flood operation plans													
PC405	Dam Safety Emergency Plans													
PC408	Water Infrastructure Insurance													
PC410	Rural Water Infrastructure Maintenance													
PC412	Rural Water Infrastructure Storage Maintenance Audit													
PC413	Rural Water Infrastructure Land & Building Maintenance													
PC416	Dam Maintenance Work													
PC417	River Structure Maintenance													
PC419	River Channel Maintenance													
PC420	Rural Water Infrastructure Surveillance													
PC421	Rural Water Infrastructure Storage Surveillance Data Collection.													
PC423	Reg River Structure Surveillance													
PA100	Surface Water Quantity Data Collection & Archiving													

- Data is to be provided by Valley/Region and total organisation.
- Data is to be cross-referenced to (and match) information provided in IPART's Information Templates.
- The same information is required for both forecast and actual Opex for the period FT2000/01 through FY2004/05 (and preferably from 96/97).

APPENDIX B: Comments on State Water Executive Summary Response to MJA-Cardno Draft Report

Executive Summary

Marsden Jacobs Associates in association with Cardno (**MJA**) has submitted to the Independent Pricing and Regulatory Tribunal (**IPART**) a draft of its report titled “Review of Capital Expenditure, Asset Management and Operating Expenditure of State Water Corporation” (MJA Report), dated 20 February 2005.

IPART has requested State Water Corporation (**SWC**) to provide comments on the MJA Report. SWC appreciates the opportunity to present its comments in this Report.

SWC, in preparing this response, accepts that some of the criticisms levelled in the report are valid and has demonstrated that in a number of cases, it has already taken steps to address them. Where this is not the case, SWC will ensure that they are addressed before the next price determination.

However, SWC believes that, in drawing its conclusions on the level of prudent and efficient opex and capex, MJA has not considered some critical issues. MJA’s recommendations:

- have not given due consideration to the prevailing circumstances of State Water Corporation and its predecessor organisation State Water (a business unit of DLWC/DEUS);
- have not considered or understood some of the information provided by SWC;

MJA-Cardno Comment: In reviewing State Water Capex and Opex practices, MJA-Cardno considered all information and documents provided by State Water. A list of the information considered has been added as an Appendix to the Final Report.

- have not demonstrated that it adequately understands the complex legislative and regulatory framework under which SWC operates;

MJA-Cardno Comment: MJA-Cardno completed a detailed review of State Water’s legislative and regulatory framework because this information was not presented comprehensively in State Water’s initial submission to IPART. An overview description of this framework is included in Chapter 4 of the MJA-Cardno report.

- propose capital and operating expenditure levels that will result in SWC being unable to meet its legislative and regulatory objectives;

MJA-Cardno Comment: The MJA-Cardno Draft Report clearly states that State Water must be able to discharge its legal obligations. No evidence was provided by State Water to suggest that the current levels of expenditure are insufficient to allow State Water to meet its obligations. Nor is there any reference in the State Water Annual Reports or the TAMP2004 that compliance with obligations is not possible at current levels of expenditure. However, MJA-Cardno found that in some instances (e.g. investment in fish passages and cold water pollution remedial measures) State Water incurred expenditure without being certain that it would discharge an obligation. Such outcomes are not considered to be prudent. Nor is it considered efficient to make allowances for such expenditure in forecasts.

- propose levels of expenditure based upon efficiency and prudence which MJA itself asserts are not clearly defined;

MJA-Cardno Comment: MJA-Cardno acknowledges that the section of the Draft Report that dealt with interpretations of ‘efficient’ and ‘prudent’ was badly drafted. Clarified interpretation of these terms have been incorporated into the Final Report.

However, the efficient Opex baseline amount was determined as the historical average of actual Opex over the period 2001-02 through 2003-04 on the basis that State Water presented no evidence to suggest it was not able to discharge its obligations or provide service to its customers at that level of expenditure. This interpretation was reinforced through discussions with senior State Water staff and by direct field observations of State Water's operations and maintenance practices. The same interpretation is reinforced by comments in each of State Water's published Annual Reports for this period and by similar comments in TAMP2004.

- propose expenditure levels that will inevitably lead to job losses in NSW; and

MJA-Cardno Comment: MJA-Cardno has no information that enables this claim to be assessed on its merits. No such comment has previously been made by State Water.

MJA-Cardno presumes the comment refers to job losses within State Water, although this may not be intended by State Water. However, MJA-Cardno also notes that staff levels in State Water have remained fairly constant since the late 1990s. State Water's various Annual Reports shows number of staff as :

- 1998-1999: 200 (p66, 1999-2002 Annual Report)
- 1999-2000: 250
- 2000-2001: 246
- 2001-2002: 257
- 2002-2003: 262.7 (EFT, p50 2002-03 Annual Report)
- 2003-2004: 253 (EFT, p68, 2003-04 Annual Report).

Staffing numbers and allocation of work to contractors are business decisions best left to State Water. MJA-Cardno's experience is that corporatisation should allow State Water to identify and act on areas where operational and business efficiencies will be achieved that would offset any increase in cost required to operate as a stand alone entity.

- have not fully recognised the steps that have already been adopted by SWC to address the identified system deficiencies. Paradoxically, MJA makes recommendations on the many improvements SWC must make, without allowing within its recommendations, the costs of such improvements.

MJA-Cardno Comment: The Final Report will be amended to make it clear that MJA-Cardno acknowledge that State Water has made significant effort to develop systems that have potential to improve operational efficiency. These areas were emphasised in presentations on the Draft Report made to both State Water and the IPART Tribunal. MJA-Cardno's Draft Report noted agreement with the predictions in State Water's TAMP2004 that final implementation of these systems will improve operations and maintenance outcomes.

MJA-Cardno also notes that the cost to date of developing and implementing these systems is included into the actual costs used to develop recommended "Baseline" costs.

MJA-Cardno also accepts that additional resources were essential to implement a financial reporting system that would be needed for State Water to operate as an efficient stand-alone business. Accordingly, MJA-Cardno endorsed State Water's budget amount of \$2 million in 2004-05 for that purpose.

2.1 State Water Corporation agrees:

- That its management information systems and processes were inefficient and cumbersome (but not materially wrong). However, despite State Water's attempts to overcome the deficiencies, up until 1 July 2004 it has been repeatedly denied the opportunity and resources by its controlling bodies to adequately address these issues. However the MJA report notes that IPART has, in each of its four reviews identified this issue but that "only recently this has been accepted by the Board". This statement suggests that SWC's Board has been tardy in accepting its responsibility in this matter. Firstly, an interim Board was formed on 1 July 2004, and only in recent months has it reached its full complement. Secondly in recognition of the previous preparatory work by Management, the Board at its first meeting approved the purchase of a new Integrated Financial Management System (IFMS) scheduled to be implemented by 1 July 2005 (not "in 2005/06" as MJA state).

MJA-Cardno Comment: MJA-Cardno acknowledged in the Draft Report presentation to State Water and IPART that no detailed audit of State Water's financial reports or systems was undertaken. However, as noted in the Draft Report differences in cost information were identified in a number of areas where the costs were expected to largely fixed (as asserted by State Water). Specific examples of these are presented in both the Draft and Final Reports. State Water has provided no new information that resolves all of the discrepancies identified by MJA-Cardno.

MJA-Cardno formed a view that the financial statements and cost reports were likely to be robust for the whole business, but unsatisfactory for IPART's purposes (or assessment of operational efficiency) at an activity (or Product Code) level. This conclusion also raised questions as to whether State Water's Valley Financial Reports are robust. Resolution of this matter was not part of the scope of work assigned to MJA-Cardno.

State Water advised MJA-Cardno in early February 2005 that it had yet to select a preferred provider for the new IT system. On that basis, and based on experience with Sun Water's implementation of a similar system, it appears unlikely the new system will be fully implemented by 1 July 2005.

The comment in the Draft Report pointing out the deficiencies of the finance system in previous reviews was not intended to reflect on actions of the recently appointed Board. This section of the Final Report has been clarified.

- The information made available to IPART and MJA could have been better managed and structured. The timing for this Determination is unfortunately during a period of great change for SWC, following on immediately after corporatisation and before appointment of the senior management. SWC has attempted to be completely transparent and this may have resulted in 'information overload'. We would urge that all the material provided be considered or that clarification is sought before finalising decisions.

- There were apparent inconsistencies in some of the historical data provided (usually of a relatively minor nature), however explanations of the inconsistencies were provided to MJA.

MJA-Cardno Comment: MJA-Cardno does not accept this statement. The inconsistencies in the data provided by State Water to MJA-Cardno were extensive, material in nature and the explanations provided by State Water were, on occasion, ad-hoc and incomplete. Only in some instances did State Water's explanation satisfactorily explain discrepancies in different versions of financial and cost data.

Irrespective of whether or not the discrepancies were explained, MJA-Cardno agrees emphatically with State Water's statement that information provided to MJA-Cardno could have been better managed and structured. Even small discrepancies in financial data raise serious questions about State Water's systems and the ability of State Water to manage its affairs efficiently.

Despite the apparent inadequacy of State Water's Systems, and the discrepancies in financial information provided to MJA-Cardno, it was concluded that, overall, State Water's operations were efficiently managed and State Water has acted prudently under difficult circumstances (due to drought) to effectively allocate financial resources. This conclusion was reinforced by comments in State Water's Annual Reports that showed backlog maintenance had been addressed and opportunities presented by historically low water levels had been taken to complete unscheduled maintenance and refurbishment work on assets in all operational Regions.

2.2 SWC does not agree with some of the key assertions of the MJA Report:

'State Water did not know or clearly identify its service standards and obligations'

- SWC's obligations are defined in legislation, regulations, licences and policies (State Water Corporation Act 2004, State Owned Corporations Act, Water Management Act 2000, Water Act 1912, Interim Operating Licence, Fisheries Management Legislation and Cold Water Impact Mitigation Strategy). Having been intimately involved in the drafting of the legislation as well as the operating licence, SWC argues that it clearly knows its obligations and service standards.

MJA-Cardno Comment: State Water has introduced their comments in this section with what appear to be, but in fact are not, quotes from the MJA-Cardno Draft Report. This manner of presentation is misleading.

MJA-Cardno acknowledged that State Water clearly understands its obligations. These are summarised in the State Water submission to IPART's review of the Interim Operating Licence and other documents.

However, no attempt was made by State Water, in submissions made to IPART or other documents provided to MJA-Cardno, to directly link obligations and service standards to explicitly defined business strategies that were linked to efficient costs in its business. Such linkages were expected by MJA-Cardno because this is the fifth IPART review of NSW bulk water prices and it was reasonably expected that State Water's managers would have incorporated learnings from previous reviews.

In some cases, such as Dam Safety, direct links were made between obligation and cost but the quality of cost information was judged by MJA-Cardno to be not sufficiently robust or comprehensive to be relied on by IPART in its pricing Determination.

In other cases, such as Occupational Health & Safety, State Water managers clearly indicated they understood and acted to ensure State Water met its obligations. However, State Water's systems and procedures did not ensure that the costs of OH&S compliance were tracked and reported. In addition, sometimes OH&S issues were used to trigger expenditure that included technical enhancement without the incremental expenditure being subject to robust business appraisal.

- These obligations were considered in the preparation of the Corporate Plan (which was approved by the Board of SWC in November 2004) and were also used as a basis to develop the capital structure of the business by NSW Treasury. SWC's Corporate Plan and the Statement of Corporate Intent clearly identify the service standards and obligations as determined by the Board and accepted by the NSW Government.

MJA-Cardno Comment: State Water's Statement of Corporate Intent identifies obligations at a high level, but does not provide detail on how these have been translated into priorities and plans and an operational level.

MJA-Cardno requested a copy of State Water's Corporate Plan but did not receive a copy, nor was a draft of the document provided. Detailed discussions with State Water staff elicited no reference to existence of a Corporate Plan or any suggestion that such a plan was a driver of policy or planning at an operational level.

MJA-Cardno was explicitly advised, in discussions with senior managers at State Water's Dubbo office, that State Water did not yet have a Corporate Plan and had not yet developed a Customer Charter.

'There is no definition of efficiency and prudence on which to assess the expenditure levels'

- By making this assertion MJA is suggesting that an ad hoc process be adopted in the absence of a definition. SWC argues there is a definition in the statutory and regulatory framework that it must operate in.

MJA-Cardno Comment: MJA-Cardno acknowledges that the section of the Draft Report that included interpretations of 'efficient' and 'prudent' was badly drafted. These interpretations have been clarified in the Final Report.

However, the efficient Opex baseline amount was determined as the historical average of actual Opex over the period 2001-02 through 2003-04 on the basis that State Water presented no evidence to suggest it was not able to discharge its obligations or provide service to its customers at that level of expenditure. This interpretation was reinforced through discussions with senior State Water staff, by direct field observations of State Water's operations and maintenance practices. The same interpretation is reinforced by comments in each of State Water's published Annual Reports for this period and by similar comments in TAMP2004.

- There are extensive precedents drawn primarily from the energy sector as to the regulatory definitions of prudent and efficient expenditures. These precedents note that appropriate systems and processes are the foundation of establishing prudent and efficient expenditure levels and this in itself will result in prudent and efficient forecasts of expenditure. SWC contends that its Total Asset Management Plan (TAMP) has been independently assessed by engineering consultants GHD as close to best practice. Adopting the guidance of Australian regulators this would prima facie result in efficient and prudent capex and opex expenditure levels.

MJA-Cardno Comment: The GHD review was a desktop assessment of State Water's asset management process. The GHD Gap Analysis report says that "State Water have made improvements both in their approach to asset management and the level of detail provided for the TAMP 2004 manual, both in their overall Asset Management System and in the information held in the Total Asset Management Plan". The Note to "Table 1: Degrees of Confidence in Asset Management Plans" says "Table 1 shows a small but definitive improvement since 1997 in the level of confidence that can be placed upon the 30-year financial projections prepared for the IPART submission and planning of future works".

MJA-Cardno accepted GHD's conclusions. The MJA-Cardno Draft Report notes that TAMP2004 represents a satisfactory basis for planning but cost estimates (and timing of expenditure) are not sufficiently robust to be considered efficient.

However, comments and conclusions presented in the Draft and Final Reports reflect the outcomes from detailed and critical examination of the outputs from State Water's TAMP processes including visual examination of actual and proposed Capex works, interviews with operations staff and testing of the extent to which TAMP systems had been implemented in the field.

MJA-Cardno concluded the variation in cost estimates for different options is too great, timing too subjective, and outcomes too different to forecasts for the TAMP2004 (and EXPLAN) forecasts to be incorporated into IPART's revenue determination process.

This response from State Water to the Draft Report reinforces MJA-Cardno's conclusions. State Water provided (what it then said were) firm and final expenditure forecasts to MJA-Cardno in February 2005. However, this response now proposes substantial reductions in Capex for the next fiscal year. Such variability in forecasts over such a short time frame reinforces MJA-Cardno's concerns about the robustness of State Water's asset management process.

- These regulatory precedents also draw the conclusion that expenditure incurred in meeting a business's legislative and regulatory obligations is de facto prudent.

'The past identified expenditure levels are an indication of future prudent and efficient expenditures'

- SWC disagrees with this assertion. The future operating environment is significantly different to the past, due to the comprehensive institutional reform of bulk water delivery. Since 1 July 2004 SWC is operating under a new State Water Corporation Act, State Owned Corporations Act, Treasury Commercial Policy, defined capital structure, Statement of Corporate Intent, an Interim Operating Licence, MoU and Water Management Works Approvals. None of these previously applied to SWC.

- This submission by SWC is its first submission as an independent legal entity. Its predecessor organisation, State Water had no control over its historical levels of funding with its controlling body (primarily DLWC) restricting its access to funds below that approved by IPART. State Water was unable to account for the levels of revenue received by DLWC. However, as recognised by MJA, State Water did operate in a prudent manner by managing expenditure within the restrictions placed on it by its managing body, albeit with less than adequate funding in a sustainable, long-term sense.
- SWC provided MJA with extensive explanations as to the differences between the actual expenditures and the levels approved by IPART in its last determination. These explanations have not been included or referred to in the report. Neither is there any conclusion as to whether MJA accepts these explanations. SWC can only assume from the findings made in the MJA Report that these explanations have been ignored.

MJA-Cardno Comment: MJA-Cardno notes that explanation of differences in financial data was only provided by State Water in response to specific requests for clarification by MJA-Cardno. All of the information provided to MJA-Cardno by State Water was considered.

However information that was either an outcome of a robust SW internal planning process, that had been endorsed by management or had been endorsed by State Water Board, and was corroborated by another source (typically the State Water Annual Reports or TAMP2004) was given greater weight in consideration and setting the efficient level of expenditure.

- SWC contends that in recommending future opex levels, adopting historical operating costs levels to determine future costs is therefore inappropriate and has no bearing on the future performance or capability of SWC. More emphasis should have been placed on analysing current development of governance and management systems, to ascertain the Corporation's future performance.

MJA-Cardno Comment: MJA-Cardno put considerable effort into analysing and understanding systems used by State Water currently and those that have been undergoing development for some time. The Final Report acknowledges that full implementation of the systems being developed or purchased by State Water will, most likely, enable State Water to achieve significant future improvements in Capex and Opex planning.

- Under the new capital structure and corporate governance of an independent Board, SWC is now far better placed to determine prudent and efficient expenditure and to be accountable for such expenditure to achieve appropriate service delivery standards.

'State Water could not provide reliable costs of executing robust, defined strategies that would enable the discharge of legal, regulatory and social obligations and the efficient delivery of services to customers'

- The levels of expenditure included in SWC's submission represent its assessment of the efficient and prudent costs of discharging its obligations, based on information and policies applicable during and immediately prior to corporatisation. This is evidenced in the Corporate Strategy supported by comprehensive total asset management planning. All requests for explanations and data were met by SWC yet many of these explanations appear to have been disregarded by MJA in formulating its recommendations. As noted above SWC accepts that the processes of providing data could have been better.

MJA-Cardno Comment: MJA-Cardno observed significant differences between formal corporate policies (as documented in State Water's submission to IPART and the Annual Reports) and actual practices employed by staff in some crucial areas.

MJA-Cardno also noted that significant further improvements in asset management planning is possible; and will be necessary before output from the asset management process can be incorporated directly into IPART's revenue determination process.

'State Water has not identified the obligations it must meet'

- MJA state that there is a lack of clarity in the inter-agency protocols. This lack of clarity is well understood and several measures are in place to deal with it. IPART is currently reviewing the interim Operating Licence with a view to finalising the Initial Operating Licence. Inter-agency roles, functions, assets and protocols are being resolved through a mediated process.

MJA-Cardno Comment: MJA-Cardno's primary focus in this review was to understand how State Water translated its obligations into business strategies that were likely to result in efficient outcomes. It is not correct to infer that this means "State Water has not identified the obligations it must meet".

MJA-Cardno's principal conclusion was that some obligations imposed on State Water are not sufficiently explicit for State Water (or the regulatory agency imposing the obligation) to determine prior to undertaking expenditure whether or not State Water's obligation would be discharged. It is MJA-Cardno's view that it is not prudent to undertake expenditure intended to discharge an obligation unless both parties (State Water and the regulatory agency) understand what is required to discharge the obligation. Nor is it efficient to include such expenditure in a forecast.

- SWC is developing appropriate instruments (MoU) to facilitate its relationships with other key NSW Government agencies. MJA identified DPI as an example of this lack of clarity. SWC has developed a close and strong working relationship with DPI particularly in relation to the issue of fish passage (which is an important issue in SWC meeting its environmental and social obligations). Both SWC and DPI recognise that there are circumstances where complying with the formalised protocol of the Fisheries Act does not necessarily provide the optimum outcomes. State Water has, and will continue to work with DPI to optimise environmental outcomes. SWC recognises the principle of the separation of regulatory and operational roles in its dealing with other NSW Government agencies.
- Safety and environmental obligations may not be explicit to the point of quantification of standards. SWC has prudently adopted a precautionary approach in these instances, which is consistent with state owned corporations and industry best practice.

MJA-Cardno Comment: MJA-Cardno acknowledges that the section of the Draft Report that deals with definitions of 'efficient' and 'prudent' is unsatisfactory. It has been amended in the Final Report to reflect consistency with approaches recently adopted by other IPART's consultants.

MJA-Cardno recognised that the definition of prudence is important because the Draft Report recommends that IPART should not accept expenditure on fish ways (and cold water pollution controls) that turned out to be unsatisfactory; and that State Water should not undertake further expenditure unless it knows beforehand whether the expenditure will produce the outcome intended (and discharge State Water's obligations).

IPART did not define either “prudence” or ‘efficient’ in the scope of works for the MJA-Cardno review, but the relevant issues have been dealt with recently in Halcrow Pacific’s Overview Report to IPART on the Metropolitan water businesses⁶⁹ and Meritec’s Final Report to IPART on electricity distribution.⁷⁰

MJA-Cardno’s view in the Draft Report was influenced by interpreting the difference between “efficiency” and “prudence” by:

- *comparing common definitions of these terms (which were noted in the Draft Report);*
- *considering what might happen in a competitive market; and*
- *considering what State Water’s customers might think is fair and reasonable, viz:*
 - *in an efficient, competitive market, a business that invested in an asset that did not do what was intended would bear the cost unless all other competitors made the same (or similar) investment decisions; and*
 - *customers would consider it fair and reasonable that they pay the full cost of a business doing something right, but not pay for investment mistakes.*

This view has some similarity to the approach that Halcrow and Meritec adopted, but there are subtle differences between the emphasis that Halcrow used in the water sector and Meritec used in the electricity sector.

Halcrow footnoted a definition of ‘prudent’ as “Discrete or cautious in managing ones activities; practical and careful in providing for the future and exercising good judgement”⁷¹ and suggested that “this approach (rolling in all ‘prudent’ Capex) may reduce the incentive for agencies to develop robust asset management procedures and deliver capital efficiencies”.⁷² Halcrow’s remaining focus, in the short discussion relating to interpretation of prudence, is on the capital efficiency incentives created by any decision by IPART to roll in all prudent expenditure and the impact that decision has (or should have) on the sharing of risks between customers and shareholders.

Halcrow also noted that “the only certain thing about forecasts is that they will be wrong. Active management of a capital programme is therefore necessary. However there is a limit to what should be considered reasonable active management of a programme at which point poor planning must be considered.”

Halcrow based its judgements on what expenditure was prudent on the presumption that IPART should not, primarily, be concerned if outcomes were different to planned, but should be concerned to create incentives for just the right amount of Capex (not too much or too soon; and not too little or too late) as these incentives were required to produce efficient outcomes. However, Halcrow also appears to argue that IPART should not accept Capex just because it was considered to be “discrete” or “cautious” or even “practical and careful”, which appears to be the focus of State Water’s comment that it “adopted a precautionary approach (in meeting its) safety and environmental obligations”. Rather, Halcrow argued, IPART should only accept Capex if the business does each of these things and the expenditure is based on the “exercise of good judgement”.

⁶⁹ NSW Water Agencies Review - Overview Report, Halcrow Pacific Pty Ltd, December 2002.

⁷⁰ Review of Capital and Operating Expenditure of the NSW Electricity Distribution Network Service Providers – Final Report, Meritec Ltd, September 2003.

⁷¹ Collins Concise Dictionary; 2nd Australian Edition 1990.

⁷² p8, NSW Water Agencies Review - Overview Report, Halcrow Pacific Pty Ltd, December 2002.

Meritec referred to the Halcrow approach, and IPART's advice to electricity distributors in November 2001 (with details of this advice summarised in Meritec's report⁷³), but placed emphasis of identifying criteria that could be applied to assist a decision on whether or not "good judgement was exercised" at the time the expenditure decision was made.

In essence, the difference between "efficiency" and "prudence" in Meritec's judgement came down to what information was available at the time the decision was made to commit Capex. This might be rephrased by saying that Meritec judged the expenditure to be 'prudent' if:

- all the assumptions underlying the investment decision were based on sound information derived in a robust asset management framework; and*
- the expenditure was reasonably likely to produce an outcome that is judged efficient*

It is relevant to note that Halcrow generally accepted as prudent expenditure that was either less than or greater than forecast, although some reservations were expressed about the robustness of asset management practices and processes that underpinned such forecasts. Meritec also accepted substantial over-spending by the electricity distributors on the basis that this was a 'prudent' response to unexpected growth in electricity demand, but also raised concerns about the robustness of the distributors' forecasting.

It is particularly relevant to this review that Halcrow expressed concern about two items of expenditure undertaken by the Metropolitan water businesses., viz:

- Hunter Water had purchased land on a potential dam site that is not identified as required in its integrated water resource plan in the foreseeable future; and*
- Sydney Water's new billing system that was subject of an enquiry by the Auditor General.*

In both cases, the businesses had undertaken expenditure that was either not clearly related to a forecast obligation, or produced an unintended outcome (a billing system that did not work properly).

MJA-Cardno might accept that it was prudent for State Water (and DPI) to acknowledge that there was uncertainty in fishway designs and embark on limited trials of alternative designs. But this is not what happened.

MJA-Cardno's Final Report retains the recommendation that expenditure be deferred on activities where uncertainty exists about whether compliance with State Water's obligations will be achieved until such time that the issues referred to by State Water are resolved.

2.3 The MJA report contends that opex can be reduced through extending the use of SCADA and eliminating the current permanent manning of dams

MJA-Cardno Comment: MJA-Cardno's Draft Report suggests this is an area where operation efficiency might be able to be improved. There is certainly evidence that SCADA has allowed substantial improvements in efficiency and service levels in Victorian rural water businesses (and in the energy sector).

⁷³ Section 2.2, pp5-6, *Review of Capital and Operating Expenditure of the NSW Electricity Distribution Network Service Providers – Final Report*, Meritec Ltd, September 2003.

State Water has investigated these options in the past. The main findings were:

1. The potential cost/benefit of SCADA Systems (Supervisory Control and Data Acquisition)

SWC has a SCADA system at the majority of its dams and also at major river structures. Its use ranges from data gathering functions to the ability to operate structures remotely and/or automatically. All major regulators and outlet valves equipped with SCADA are used remotely, either from operations offices or the dam site offices. SWC has not identified compelling arguments to extend the use of SCADA particularly in the light of the extensive capital program that would be required to update the minor river structures to allow for remote operations. Even now, if after due analysis, this conclusion was reversed it would take a minimum of 3 years, the determination period, to introduce such systems and undertake the required modifications to river and dam structures. In future, there may be some additional unregulated river assets and hydrometric stations that may be transferred to SWC.

SWC undertakes to review this position prior to the next determination.

2. Manning Levels at Dams

SWC recognises that there is a high cost of manning dams. Equally importantly, SWC knows of the great benefits. SWC considers this expenditure prudent in the light of the river operations (24/7), dam safety requirements (surveillance and emergency response), OH&S (confined spaces), public safety (access), foreshore management as well as Critical Infrastructure Protection (prevention and response). Issues of acceptable risk, clustering, safety surveillance regimes, operational requirements, geographic isolation, housing and critical mass all need to be considered holistically in determining manning levels.

With the introduction of Water Sharing Plans, environmental contingency allowances and water trading, the operational releases are far more specific and variable, requiring 24/7, 365-day operations. The staffing levels are subject to these requirements.

MJA-Cardno Comment: The previous section says “SWC has a SCADA system at the majority of its dams and also at major river structures. Its use ranges from data gathering functions to the ability to operate structures remotely and/or automatically. All major regulators and outlet valves equipped with SCADA are used remotely, either from operations offices or the dam site offices.” These statements might be consistent, but it is not immediately obvious that they are.

SWC staff carries out contract maintenance work for hydropower generators at the dams, often responding to emergencies, on a cost recovery basis. This is an additional consideration for manning levels.

MJA-Cardno Comment: And this “cost recovery” covers what, exactly? Are the “costs” only direct, or are they market based (i.e. based on a competitive alternative).

At the minor dams, the dam staff also carries out metering and associated functions. All SWC dams currently have public access for recreation. With the transfer of foreshore lands to SWC there is a need to consider land management functions imposed on it. Any decision on manning levels at dams would require significant risk analysis, HR and IR negotiations and contingency planning. *SWC undertakes to continue such analysis and report on findings at the next determination.*

2.4 MJA propose that a moratorium be placed upon compliance expenditures (for at least 2 years for environmental compliance and until DSC risk approach is decided upon for safety).

MJA propose the deferral of all compliance costs for *environmental compliance* for two years and *acceptable flood capacity compliance* until the NSW Government accepts the draft dam safety guidelines on the issue.

State Water Corporation believes that such a moratorium is not acceptable for the following reasons:

- It would be a breach of the *Dams Safety Act*. The Dams Safety Committee can direct the dam owner to immediately reduce risk by reducing *full supply level* and/or undertake remedial works. This would adversely affect business revenue, customers and the environment;

MJA-Cardno Comment: There is no evidence that such a moratorium would breach the Act as the works may still proceed, albeit in a modified more cost effective form.

- The proposed guidelines do not cover ‘extreme hazard’ dams. Even if the government accepted the new guidelines, it would not impact the majority of SWC’s dams as they have been classified in the ‘extreme hazard’ category;
- A deferral of the risk reduction program is not in accordance with SWC’s enabling legislation and other statutory obligations;
- It would not be prudent, given the current consultative processes and level of public knowledge on the issue. To suspend all work would leave SWC and ultimately the NSW Government open to legal action should an “event” occur;
- Similarly, it is SWC’s contention a moratorium of environmental capital expenditure would result in a breach of statutory obligations, Operating Licence, government policy and the MoU;
- The community and the environment continues to be exposed to high risk; and
- The deferral of the risk reduction program would increase the insurance costs as well as future project costs for SWC.

Potential impacts of accepting MJA’s proposed levels of capex and opex

If the levels of capex and opex proposed by MJA are adopted, it would result in the following:

- SWC’s inability to meet existing legislative and regulatory obligations;
- A significant threat to the financial viability of SWC;
- Losses by SWC resulting in no return to its shareholders;
- Reduction in the level of services to customers and community service obligations;
- Negative impact on public safety and on the environment; and
- Reduced employment levels.

Proposed changes to the levels of capex and opex included in SWC submission.

SWC's submission was lodged with IPART in November 2004. The majority of the data upon which the submission was based, was gathered in the first half of the year, during corporatisation. Subsequent to lodging its submission, SWC has garnered further information that updates the data provided to IPART:

Capex: Additional information relating to dam compliance costs, indicating that investigatory work and approval processes will take longer than anticipated thereby delaying capex.

Opex: A greater understanding of the SWC and DIPNR roles and functions have led SWC to marginally increase the level of these changes as set out in the report.

State Water Corporation's Proposal

In making the following proposals to IPART, SWC is cognisant of the requirement of the *IPART Act* and the matters that must be considered in making its price determination. IPART's Bulk Water Prices 2005/06 Issues Paper (Sept 2004) sets out these requirements. Having considered these requirements, SWC proposes the following:

1. Regulatory Compliance

SWC is making its first IPART submission based on its assessment of major risks, one of which is non-compliance with regulatory requirements. This poses a significant threat to a new organisation. The MJA proposals need to be tested against the level of risk that SWC is willing to assume and the government willing to accept, particularly the risk of non-compliance with statutory requirements and resulting consequences.

2. Consumer Protection

The price paths resulting from the SWC proposal are set to merely recover costs and cannot be considered as any form of monopoly pricing. SWC is highly critical of MJA's recommended levels of capex and opex because in our view, these expenditure levels will not allow SWC to provide safe and reliable services as required under the SWC's legislative and regulated objectives. SWC has consulted extensively with customers and key stakeholders in relation to the levels service and expenditure included in its submission.

MJA-Cardno Comment: State Water has not demonstrated that roles and responsibilities have materially changed. Apart from the legislation which established State Water Corporation and the State Owned Corporations Act, all other legislation applicable to State Water's business applied prior to corporatisation. MJA-Cardno concluded that State Water operated satisfactorily (complied with its legislative and regulatory obligations) for the last three years within Opex and Capex levels well below that deemed efficient by IPART in 2000 with no apparent decline in service standards.

3. Asset Protection

The Portfolio Minister requires SWC to manage and protect, on behalf of the community, its critical infrastructure from deterioration and a range of threats. SWC has identified and included in its submission the appropriate levels of expenditure to comply with this need. These costs would not have all been included in the historical expenditure levels that have been used as a basis for MJA recommendation.

MJA-Cardno Comment: There is no documented evidence to support this assertion that security costs are not included in the historical expenditure levels. These requirements are not new. MJA-Cardno believes the requirement is about being aware that security is an issue and being alert to things that may be happening is important. The increase in cost for this course of action would be minimal.

4. Economic Efficiency

SWC accepts that it has less than ideal financial information with which to support its submission. However SWC, in its brief corporate existence, has already taken action to address this matter. As new systems are commissioned, detailed investigations and designs completed, SWC will improve the quality of data during the next 2 years.

SWC strongly contends that using historical levels of expenditure is questionable and irrelevant, due to significant institutional reforms and the lack of a robust and appropriate financial system. In addition, they are not good indicators of the future needs. The merits of activities that SWC is now required to undertake and their costs should be the main consideration.

In addition the MJA report acknowledges that, as a fledging business SWC has much to achieve which will need additional funding, yet this has not been recognised in their recommended cost levels. The expenditure levels proposed by MJA will result in reduction in service and continued failure of SWC to comply with CoAG objectives of lower bound pricing, let alone achieving the National Water Initiative (NWI) commitment to proceed towards the upper bound pricing.

MJA-Cardno Comment: MJA-Cardno made no such statement.

The words in this paragraph indicate that State Water does not understand the CoAG principles of lower bound pricing. The lower bound price recovers the full cost of operation, maintenance, administration and asset renewal for a particular scheme, but provides no return on invested capital. IPART can set the water prices for any valley to recover lower bound costs, but this does not imply that SWC must spend all that money every year in every valley.

SWC acknowledges that, like other businesses that have been corporatised, a range of efficiencies should be achievable however, unlike the majority of such businesses, SWC has not been long commercialised and therefore, little time to streamline its operations. SWC proposes to identify these savings over the next 3 years.

MJA-Cardno Comment: State Water was commercialised from 1 July 1998. MJA-Cardno acknowledges that State Water's predecessor organisations have demonstrated an ability to manage limited resources and operate efficiently. MJA-Cardno agrees that further work is required to identify further operational efficiencies.

But State Water has not provided evidence that demonstrates such efficiencies can only be achieved by substantially increasing expenditure across all areas of the business. It is MJA-Cardno's view, gained from working with other corporatised water businesses around Australia, that commercial discipline provided by a skills-based Board will allow State Water to identify and achieve further efficiency gains without substantial increases in expenditure.

The price period for the current review is for three years. SWC must be provided with

appropriate resource to allow SWC to clearly measure its performance and to implement cost saving strategies, the benefits of which will emerge in the next review period.

5. Financial Viability

SWC's shareholders have proposed a capital structure for SWC, based on a mix of debt and equity. This structure was predicated broadly on the same information contained in SWC's submission to IPART. SWC has adopted a Corporate Plan that establishes the new business on a sound financial footing, enabling it to meet its obligations to its shareholders, customers and the community, subject to compliance with its regulatory and legislative objectives. The recommended changes will place in jeopardy this sound financial structure.

6. Environmental Sustainability

SWC is again highly critical of MJA's approach to, at best, delaying the need to address the environmental consequences of SWC's assets and operation. A strong commitment to the intent of the Water Sharing Plans is critical to the Business, as these plans can be reset to the detriment of the Corporation and its customers. SWC believes that addressing these matters is critical. The approach recommended by MJA hinders SWC from compliance with statutory requirements.

7. Operating Costs

SWC recommends that:

- IPART accepts the revised operating expenditure forecasts included in SWC's supplementary submission;
- SWC continues to implement improved management information systems with which to support its next submission;
- SWC regularly reports to IPART on progress in system implementation;
- SWC undertakes investigations and reports to IPART at the next determination as to the costs/benefits of:
 - the introduction of a fully functional SCADA system for each valley, and
 - the options available to restructure manning at dams;
- SWC and IPART develop an appropriate reporting structure to monitor performance during the review period (consistent with the Initial Operating Licence);
- SWC identifies efficiencies emerging from corporatisation and the introduction of improved systems;
- SWC identifies the costs and benefits of services that could be provided externally;
- SWC reviews opportunities for benchmarking its operational costs against comparable businesses; and
- SWC continues to negotiate with DIPNR to establish clarity in the responsibility for, and the costs of gauging stations.

8. Capital Costs

SWC recommends that:

- the proposed moratorium on compliance capex expenditure **not** be introduced;
- IPART accepts the revised capital expenditure forecasts included in SWC's supplementary submission;

- if IPART wishes to implement the moratorium proposed by MJA, SWC will approach the appropriate regulators for their views. Unless the regulators accept the proposal, SWC will be obligated to continue with the compliance capex program;
- where MJA recommend that capex costs should be borne by other Government departments, IPART should seek concurrence of the department with the proposal; and
- SWC develops an appropriate reporting structure to monitor performance during the determination period, consistent with the Initial Operating Licence.

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