WaterNSW Greater Sydney expenditure review

A review of capital and operating expenditure

A Final Report prepared for the Independent Pricing and Regulatory Tribunal

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Contents

Abbreviations

AIR	Annual Information Return
ANCOLD	Australian National Committee on Large Dams
Capex	Capital expenditure
CPI	Consumer price index
GS	Greater Sydney
IPART	Independent Pricing and Regulatory Tribunal
ML	Megalitre (one million litres)
ML/d	Megalitres per day
MWD	Metropolitan Water Directorate
MWP	Metropolitan Water Plan
NPV	Net present value
NSW	New South Wales
Opex	Operating expenditure
RAB	Regulated Asset Base
SCA	Sydney Catchment Authority
SIR	Special Information Return

Executive summary

Aither, and it's sub consultants Oakley Greenwood and WSP | Parsons Brinckerhoff (the review team), were engaged by the New South Wales Independent Pricing and Regulatory Tribunal (IPART) to undertake an independent review of WaterNSW's past[1] and proposed[2] capital and operating expenditure for the Greater Sydney Area component of the business. The key tasks for the review were: a strategic review of planning and management systems; a detailed review of capital and operating expenditure; and an assessment of performance against stipulated output measures.

Summary of key findings and recommendations

The review team's overall findings are:

- Strategic management, including capital planning and asset management systems and processes appear to be generally robust.
- WaterNSW has undergone a major organisational redesign linked to the merger. This transformation process is still underway and is creating expected management challenges.
- WaterNSW's capital plan for the next 10 years is substantial, yet the performance in delivering capital projects over the last 4 years has been constrained by a number of factors, with some outside the organisation's direct control or attributed to the SCA-State Water merger. As a result, capital expenditure forecasts have not been met; total under-expenditure for the current period is forecast to be $56.4 million, or 37.6% less than approved in the 2012 determination.
- There are question marks regarding the institutional arrangements for long term supply-demand planning in the Greater Sydney metropolitan area, as evidenced by a delay of two years in the delivery of the revised Metropolitan Water Plan. This has important implications for both the review team and IPART in making decisions about the prudence and efficiency of capital projects.

Capital expenditure is generally found to be prudent, with the exception of the proposed construction of the Shoalhaven Transfer Scheme, which WaterNSW has conceded does not need funding for construction in the next regulatory period. Proposed capital expenditure does require adjustment to be considered efficient, including:

- a reduction of $4 million on revised WaterNSW proposals for concept design work associated with the Shoalhaven Transfer Scheme
- efficiency reductions to the motor vehicle and IT assets programs associated with the merger
- reductions of $11.3 million to the Tallowa Dam project following changes in scope, as provided to the review team by WaterNSW
- an additional overall efficiency reduction of 5% for the whole capital program due to systemic excessive contingencies.

Based on late revised information from WaterNSW, it has also been identified that 2015-16 forecasts will not be achieved, resulting in a reduction of proposed capital expenditure in 2015-16 of $31.6 million. WaterNSW proposed re-phasing $27.5 million of this into the next regulatory period (with $4.1

[1] Financial years 2012-13 to 2015-16, assessment of 2015-16 is based on WaterNSW forecasts.

[2] Financial years 2016-17 to 2019-20.

million of further savings identified). Given how late in the review process this proposal was received, it was not possible to undertake detailed investigation of the merits of this proposal. However, the review team had pre-existing concerns about deliverability given the scale of the proposed capital program, which led to a recommendation that this amount not be allowed in the next regulatory period. While this recommendation does not question the prudence or efficiency of the projects associated with this expenditure, this effectively reduces the overall capital program proposed by WaterNSW for the next 4 years.

WaterNSW has attributed the revisions for 2015-16 to the merger, noting that project initiation processes have been tightened resulting in delays in approvals. WaterNSW has stated that they expect to be able to resolve these issues and deliver the revised capital program. On balance the review team felt that it had little choice but to reject the proposed re-phasing on deliverability grounds, but given the limited time and information available, we note that IPART may give further consideration to this matter and any concerns WaterNSW may have with the recommendation.

Operating expenditure requires adjustment to be considered prudent and efficient, including:

- increasing savings from the merger, to reflect changed assumptions regarding the number of vacancies, and to reduce the calculation of wages for staff on Awards
- changing the overhead allocation percentage attributable to the Greater Sydney business, and
- reducing the allowance for the Portfolio Risk Assessment (PRA) given the excessive contingencies.

About the review

IPART is reviewing maximum prices that WaterNSW Greater Sydney can charge for providing its regulated services from 1 July 2016. The current determination for the former Sydney Catchment Authority (SCA) commenced on 1 July 2012 and set prices until 30 June 2016. WaterNSW submitted their pricing proposal for the period from 1 July 2016 to IPART in June 2015.Maximum prices determined by IPART for the new determination period will cover a period of up to 5 years.

The purpose of this review is to help IPART determine prices which reflect the efficient costs of delivering WaterNSW's monopoly services.

Objectives and scope

IPART's objectives for the expenditure review were to provide:

- a strategic review of WaterNSW's Greater Sydney investment plans and asset management systems and practices
- a detailed review of WaterNSW's GS past and proposed operating expenditure and capital expenditures
- a review of performance against past output measures, and proposal for any new output measures for the next determination period

Past and forecast expenditure was considered for the 2012-13 to 2015-16 period and proposed expenditure considered for 2016-17 to 2019-20.

Review delivery and methods

The review was undertaken from September to December 2015, and drew on a range of public and confidential information, supported by interviews with WaterNSW officers and executives, and WaterNSW response to specific questions and information requests. The assessment framework for the review is based on *prudence* and *efficiency* tests, as required by IPART.

Major information or documentation reviewed included the Annual Information Return / Special Information Return, completed and provided by IPART; the WaterNSW pricing submission to IPART, and the submission from DPI Water, and; various documents supplied by WaterNSW, including corporate, strategic and management documentation. Interviews with officers and executives were undertaken in Sydney between 6 and 13 October 2015, with follow up discussions until 1 December 2015.

- The strategic review considered the policy, regulatory and operating environment; planning approaches; the long term capital investment strategy; WaterNSW's approach to asset management, and; associated systems or processes that may have a bearing on prudence or efficiency of decision making.
- The review of past capital expenditure included reviewing how decisions were made on individual projects, what actual spending was compared to budget, and whether project outcomes were actually realised. Future expenditure review was similar but focused on individual capital projects as part of a detailed review of a sample of 14 projects from the capital program.
- The review of operating expenditure included understanding the factors driving WaterNSW's costs, and ascertaining assumptions and methods WaterNSW adopted to translate those into operational expenditure forecasts. A range of specific assumptions, methods, or issues were considered and analysed as part of this.

Review context

WaterNSW

On 1 January 2015, the NSW Government formed WaterNSW by merging the Sydney Catchment Authority (SCA) with the State Water Corporation. WaterNSW is the new service provider for New South Wales' water sector, and manages 42 dams across NSW, delivering water from these and NSW's rivers for agriculture and drinking water purposes. WaterNSW has rural and urban water related functions, but this review is focused solely on the Greater Sydney (urban) component of the business, which is similar to the former SCA's role.

At the time of review, WaterNSW was in the process of implementing a major organisational redesign, including significant reductions in total employees and a new and integrated business structure. WaterNSW is also still resolving approaches to various corporate, financial and management systems. For example, financial systems for the two previous businesses were merged into one system while the review was underway. Such changes had implications for the currency, accuracy, and availability of information for the review, and also complicated some elements of assessment, including because WaterNSW is not a 'steady state' business.

Key policy issues

At the time of the review (and development of WaterNSW's proposals) there was a degree of uncertainty on key government policy matters, which have a bearing on the capital program. These

stem from delays in the update to the Metropolitan Water Plan (which was due in 2014, but is now expected in 2016) and the outcomes of further investigations being undertaken in support of the Hawkesbury-Nepean Valley Flood Management Review (due in 2016). Key matters include:

- The need for a final decision on the preferred next augmentation for Greater Sydney's water supply (or preferred options to investigate in more detail)
- Decisions on whether and when environmental flow requirements should be implemented at the Warragamba dam

Direction on necessary modifications to dam infrastructure or operating rules given any government decisions regarding flood mitigation in the Hawkesbury-Nepean Valley.

Strategic review

WaterNSW is a recently formed organisation and was going through an organisational restructure at the time of the review. However, based on assessment of the range of documentation and information provided the approach the former SCA and now WaterNSW is taking to strategic management is generally sound. For example:

- Major capital decisions are generally guided by well documented strategies and reports, and capital plans are consistent with service obligations, government requirements or other drivers.
- A comprehensive approach to asset management applies to all critical asset classes, and is supported by a range of well documented policies, systems and processes.
- Whole of life cycle planning is employed to help minimise long term costs of assets.
- Neither the near term or longer term capital plans appear inconsistent with long term plans or strategies. Capital plans are internally consistent and consistent with previous reviews and determinations.

However, some important strategic 'watch points' or key risks include:

- The need to consolidate or amend, and roll out, strategies and plans across the new organisation, including further roll out of asset management across asset classes.
- Delivery risks associated with the forward capital program, especially the next 10 years, given a step up in projected expenditure from 2016-17 with a further step up beyond 2020.
- The potential need for WaterNSW to investigate alternative supply options other than Shoalhaven, given direction in the Metropolitan Water Plan when released in 2016.
- Impacts on WaterNSW funding requirements if any major supply related capital project decisions are announced by the government in the next regulatory period.
- Issues regarding broader institutional arrangements for long-term supply planning, and government processes or decision making that impact on WaterNSW's capital planning, including delays in decision making or poorly aligned timing of contingent processes. These could potentially have substantial implications for works in the forward capital program, including:
    - the Warragamba Dam reliability project which could be impacted on by Metropolitan Water Plan guidance on environmental flows, or Hawkesbury-Nepean Valley Flood Management Review study outcomes regarding flood mitigation roles.

- the Warragamba pipeline valves upgrade project, the specification for which could also be impacted on by water supply augmentation or flood mitigation decisions (although this is a less significant issue than the reliability project).

- Contractual arrangements in raw water supply agreements that are not sufficiently precise in guiding trade-off cost and water quality decisions and ensuring efficient outcomes.

IPART may wish to consider mechanisms by which these matters can be addressed.

Capital expenditure review

Based on the information provided and following the interview process, the review team has identified a number of recommended changes to WaterNSW's proposed capital expenditure for the Greater Sydney area that would better ensure that expenditure is prudent and efficient. Actual expenditure incurred to date is considered prudent and efficient, however there is significant under-expenditure of $31.6 million or 54% of the expenditure originally forecast for 2015-16 in WaterNSW's proposal, and a significant re-phasing was proposed, with WaterNSW proposing deferral of $27.5 million into 2016-17 and beyond.

Past expenditure

With the exception of the forecast for the current financial year (2015-16), WaterNSW has consistently underspent when compared to the capital expenditure forecasts and allowance. With the capital expenditure forecast significantly above that actually delivered in the past, there are concerns about the deliverability of the proposed program. This may also point to a tendency to over-forecast. However the review team notes that some delays in capital projects have been driven by external factors, including some major cost items being deferred due to delays in Government decision making.

The information presented by WaterNSW indicates that:

- WaterNSW expects to underspend the capital expenditure allowance IPART provided it by around $56.4 million, 37.6%, over the period 2012-13 to 2015-16, and
- Some of the underspend ($17.7 million) has been due to the Warragamba Environmental Flows works being deferred due to external factors.
- Significant further downward adjustment for 2015-16 has been forecast by WaterNSW therefore the underspend will be higher than forecast in WaterNSW's proposal made in June 2015, with $31.6 million of underspend, $27.5 million of which is proposed to be carried forward into 2016-17 or future years. The reforecasting, submitted on 1 December 2015, is attributed to the SCA-State Water merger, external factors, and delivering works under budget.

The recommended capital expenditure for the current regulatory period is presented in the table below, including actual expenditure and forecast expenditure for 2015-16.

Table 1 Recommended capital expenditure (current regulatory period, $million, $2015-16)

	2012-13 actual	2013-14 actual	2014-15 actual	2015-16 forecast	Total
IPART determination 2012	*35.2*	*37.5*	*36.3*	*40.9*	*149.9*
WaterNSW actual/forecast expenditure	19.1	33.9	14.0	58.1	125.1
WaterNSW reforecast adjustments	0.0	0.0	0.0	-31.6	-31.6
Total recommended capital expenditure	**19.1**	**33.9**	**14.0**	**26.5**	**93.5**

Source: All data sourced from WaterNSW Submission to the Independent Pricing and Regulatory Tribunal, Prices for the Greater Sydney Area from 1 July 2016, June 2015, p.32.Note, 2014-15 actual was originally reported as $16.5 million in WaterNSW's June proposal; since revised in the SIR by WaterNSW to $13.976 million. The 2015-16 reforecast was provided by WaterNSW on 30 November 2015.

Proposed expenditure

In general, the need for proposed capital projects and programs have been well justified by WaterNSW, however, in the review team's view, the estimates are overly conservative in many cases. Several specific adjustments (reductions) to expenditure were proposed by WaterNSW during the course of the review, while others are recommended by the review team following assessment of individual projects and considering the overall program.

The overall recommended adjustments are:

- Withdraw the proposed expenditure for the Shoalhaven Transfer works in entirety ($131.1 million) and substitute with a reduced capital expenditure allowance for further investigations (WaterNSW proposal – $24.3 million).
- Tallowa Dam – WaterNSW has undertaken more recent work and determined only $3.1 million is necessary; a reduction of approximately $11.3 million.
- Re-forecast for 2015-16 – accept WaterNSW's revised forecast for 2015-16 of $26.5 million.
- Re-phasing of 2015-16 expenditure – accept that expenditure may occur at a project level from 2016-17 onwards, but do not accept the proposed re-phasing of expenditure ($27.5m) at the aggregate level due to deliverability concerns.
- IT Assets Renewal Program – efficiency reductions of $0.150 million are recommended due to staff reductions following the State Water-SCA merger
- Upper Canal works Stage 2 – a reduction of $4.972 million, an amount which was brought forward to Stage 1 but double-counted.
- Shoalhaven transfer scheme – a further $4 million reduction is recommended due to over-expenditure proposed for geotechnical investigations given the project is only at the concept design/feasibility stage.
- Motor Vehicle Fleet procurement – efficiency reductions of $0.480 million are recommended due to staff reductions following the State Water-SCA merger.

The review team also identified systemic issues associated with excessive contingencies included in the capital program, as a result an additional reduction of 5% is justified across all proposed capital expenditure from 1 July 2016 to 30 June 2020. The total reduction is approximately $12.3 million.

The recommended capital expenditure for the next regulatory period is presented in Table 2 below. It is noted that WaterNSW proposed to carry forward expenditure of $27.5 million from 2015-16; it has been included to indicate WaterNSW's overall proposed capital expenditure. As noted previously the review team received information on this proposal very late in the review process and was unable to investigate its merits in detail, but given pre-existing concerns about deliverability of the forward capital program has recommended it not be accepted at the aggregate level in the next determination period (from 2016-17).

We note that there is some uncertainty regarding our recommendation to allow the planning studies to proceed. As described above, there is significant uncertainty concerning long term supply-demand planning and resultant augmentations for Sydney. In the absence of any recent guidance from the NSW Government, WaterNSW had little choice but to include the Shoalhaven Transfer Scheme in the capital plan based on the 2010 Metropolitan Water Plan. However it is unclear that this will be the preferred augmentation and there is uncertainty regarding the appropriate timing.

It is likely that WaterNSW will need to undertake some planning or investigations over the next four years in order to meet supply requirements. On this basis we have recommended some capital allowance for the next tranche of investigations on the Shoalhaven Transfer Scheme. In reality, three options could eventuate:

1. no catchment related augmentation is required
2. Shoalhaven proceeds and the planning studies are required
3. other catchment project(s) require initial investigation by WaterNSW.

Our recommended approach enables option 2 and 3 to proceed however option 3 would likely be considered operating expenditure by WaterNSW. If option 1 eventuates, then over-recovery of revenue in the next regulatory period would occur. However this is limited to return on and of the recommend amount for the next series of planning studies and investigations (approximately $20.3 million of total capital expenditure). Other options available to IPART include: rejecting all capital expenditure on supply augmentations, or; providing an operating expenditure allowance to cover potential planning studies and investigations on other options.

Table 2 Recommended capital expenditure (next regulatory period, $million, $2015-16) including adjustments

	2016-17	2017-18	2018-19	2019-20	Total
WaterNSW proposed capital expenditure	**65.7**	**89.9**	**71.0**	**146.5**	**373.1**
Plus WaterNSW proposed re phasing from 2015-16	20.1	3.6	3.8	0.0	27.5
Minus Shoalhaven transfer scheme (withdrawn by WaterNSW)	-3.5	-7.7	-16.5	-103.4	-131.1
Plus revised WaterNSW Shoalhaven transfer scheme	2.6	9.5	8.2	4.0	24.3
Revised WaterNSW proposed capital expenditure	**85.0**	**95.4**	**66.4**	**47.1**	**293.8**
Recommended adjustments	-0.119	-14.149	-6.480	-0.158	-20.904
Sub-total recommended capital expenditure	**84.8**	**81.2**	**59.9**	**46.9**	**272.9**
Adjustment for re phasing	-20.1	-3.6	-3.8	0.0	-27.5
Sub-total minus re-phasing	**64.7**	**77.6**	**56.2**	**46.9**	**245.4**
Efficiency adjustment based on excessive contingencies	-3.2	-3.9	-2.8	-2.3	-12.3
Total recommended capital expenditure	**61.5**	**73.7**	**53.4**	**44.6**	**233.1**

Source: All data sourced from WaterNSW Submission to the Independent Pricing and Regulatory Tribunal, Prices for the Greater Sydney Area from 1 July 2016, June 2015. WaterNSW document, 'Supplementary Information : Burrawang to Avon Dam Tunnel – Revised Cost Projections' (16/10/2015 4:52 pm)), WaterNSW correspondence regarding Upper Canal received 22/10/2015, and WaterNSW correspondence regarding Warragamba received 27/10/2015. Reforecast was provided by WaterNSW on 3 December 2015.

Operating expenditure review

Past expenditure

Regarding past operating expenditure WaterNSW expects to underspend the allowance IPART provided it by around 3% over the period 2012-13 to 2015-16. Much of this is due to exogenous events, including less pumping costs from not having to transfer water from the Shoalhaven system to meets supply requirements, the repeal of the carbon tax, and less need to utilise the Fish River Scheme. However, the information provided also indicated that:

- even if these (positive) exogenous factors had not of eventuated, WaterNSW would have still underspent its allowance, primarily as a result of it transferring its insurance cover to the Treasury Managed Fund, and
- the variance from operational expenditure allowance has not impacted on the level of service WaterNSW provided to its customers.

Given the significant organisational wide savings identified by WaterNSW since the merger, the review team has concluded that the outturn operational expenditure for the Greater Sydney business could not have been consistent with the levels of a prudent and efficient business facing the same circumstances as the former SCA.

Proposed expenditure

Examining the efficiency of future operating expenditure forecasts for the Greater Sydney business is inherently difficult. Importantly, the organisational redesign was undertaken for the overall WaterNSW business. As a result, WaterNSW has stated that it is no longer possible to explicitly distinguish between resources allocated to the previous metropolitan and rural businesses. This added significant complexity to the process of developing and reviewing the costs allocated to the Greater Sydney regulated business.

In reviewing forecast operating expenditure efficiency savings resulting from the merger and organisational redesign, the review team concluded that:

- internal arrangements and structures put in place by WaterNSW to develop its new organisational structure are robust, and consistent with what the review team would expect a prudent, well run firm to undertake
- the FTE's WaterNSW is proposing under the new organisational structure are likely to be consistent with a prudent business, given the particular circumstances (environmental, geographical and functional) faced by WaterNSW

However:

- WaterNSW's forecasts should be reduced to reflect more appropriate remuneration and vacancy rates over the forthcoming regulatory period. As outlined in the table below, this results in some additional operational expenditure savings attributable to the GS business.

The cost allocation methodology was also reviewed in detail, and the review team are of the view this should be adjusted to better reflect the likely causal drivers of corporate overheads.

In addition, WaterNSW provided a late proposal to undertake a Portfolio Risk Assessment for 20 metropolitan dams. The review team view this as prudent, but in terms of efficiency, recommend a reduction in the allowance due to excessively conservative assumptions regarding contingencies.

In summary, the key changes recommended changes to forecast operational expenditure are to:

- increase savings from the merger, to reflect changed assumptions regarding the number of vacancies assumed over the forthcoming regulatory period, and to reduce the calculation of wages for staff on Awards
- change the overhead allocation percentage attributable to the Greater Sydney business, and
- reduce the allowance for the Portfolio Risk Assessment (PRA) given the highly conservative basis of the estimates provided by WaterNSW.

These are summarised in the following table.

Table 3 Summary of proposed and recommended operational expenditure ($2015-16 '000)

	2016-17	2017-18	2018-19	2019-20	Total
WaterNSW proposed operating expenditure	**102,680**	**100,956**	**101,436**	**100,633**	**405,704**
Minus subsequent efficiency savings - (revised by WaterNSW)	-4,727	-6,918	-6,626	-6,953	-25,224
Plus proposed PRA	764	1,320	1,772	640	4,496
Revised total WaterNSW proposed operating expenditure	**98,717**	**95,358**	**96,582**	**94,320**	**384,977**
Adjustments					
Changes to remuneration and vacancies	-2,497	-305	-597	-270	-3,669
Changes to cost allocation of overheads*	557	21	303	823	1,704
Reductions to efficient costs of the PRA	-138	-238	-320	-116	-812
Sub-total recommended adjustments	**-2,078**	**-522**	**-614**	**-437**	**-2,777**
Sub-total recommended operating expenditure	**96,639**	**94,836**	**95,968**	**94,757**	**382,200**
Efficiency adjustment (0%)	0	0	0	0	0
Total recommended operating expenditure	**96,639**	**94,836**	**95,968**	**94,757**	**382,200**

Source: WaterNSW spreadsheet 'Estimate summary.xls' and Metro Project Brief Form 2014/15 Metro Portfolio Risk Assessment – PRA.

1. Introduction

1.1. Overview

Aither, and its subcontractors Oakley Greenwood and WSP | Parsons Brinckerhoff (the review team), were engaged by the New South Wales Independent Pricing and Regulatory Tribunal (IPART) to undertake a review of past and proposed future expenditure for WaterNSW's Greater Sydney (GS) area. WaterNSW is a relatively newly formed organisation resulting from the merger of the Sydney Catchment Authority and State Water. This report documents the outcomes of the review, and will support IPART in making its determination on the maximum prices that WaterNSW GS can charge from 1 July 2016.

1.2. Background

1.2.1. Role of IPART

IPART is conferred by several pieces of state legislation to regulate the prices for government monopoly services such as energy, public transport and water services in New South Wales (NSW). The *Independent Pricing and Regulatory Tribunal Act 1992* was amended in 1996 to establish the six primary responsibilities for IPART. Under the *Independent Pricing and Regulatory Tribunal Act 1992*, IPART is required to regulate, review and set the (maximum) prices that public water utilities may charge for water. IPART is responsible for maintaining competitive neutrality for water utilities and ensuring that costs which are recovered through water charges are prudent and efficient.

IPART's role is to set prices which reflect the efficient costs of delivering WaterNSW's regulated services. Price reviews help protect customers from paying for inefficient or unnecessary expenditure, while ensuring these businesses raise adequate revenue to cover the efficient costs required to deliver regulated services. IPART seeks to set prices which do not reward inefficient investment and asset management decisions, or inefficient operations and practices.[3]

In order to meet its responsibilities, IPART has various review or assessment processes associated with price determinations. One such process is independent expenditure reviews, which help determine whether utilities have incurred or are proposing prudent and efficient costs. Expenditure reviews, which assess capital and operating expenditure of regulated water businesses, are an input to allow IPART to determine maximum prices.

2016 price review

IPART is conducting a review of the maximum prices that WaterNSW GS can charge for providing water services to its customers from 1 July 2016. The maximum prices determined by IPART for the new determination period will cover a period of up to five years. The length of the determination will be determined by IPART during the course of the review. The current price determination for the former Sydney Catchment Authority (SCA, now WaterNSW) commenced on 1 July 2012 and set prices until 30 June 2016 (the 2012 Determination).[4]

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[3] IPART Scope of Work, p.2.

[4] Ibid.

Audits and operating licence reviews

IPART also plays a role in regulating the operation of utilities through issuing operating licences to those utilities, and through regular audits and reviews of performance with the respect to the licences.

WaterNSW is responsible for the operating licences previously issued to the Sydney Catchment Authority and State Water. The SCA licence was audited by IPART (for the 2014-15 financial year) concurrent with this expenditure review.

1.2.2. About WaterNSW

Business overview

WaterNSW is responsible for the management and supply of raw water in NSW. It is responsible for supplying high quality drinking water to the Greater Sydney, Blue Mountains and Illawarra area of operations and delivering raw water to towns and irrigators and other customers across NSW. WaterNSW operates major water storage infrastructure, provides water infrastructure solutions to customers and stakeholders and is responsible for the protection of declared drinking water catchments in its area of operations (WaterNSW 2015a).

In supplying and delivering water in the GS area, WaterNSW's role includes[5]:

- Being the primary supplier of bulk water to Sydney Water
- Protecting 16,000 square kilometres of drinking water catchments
- Managing and operating 21 dams and 11 weirs
- Managing prescribed dams in accordance with NSW Dams Safety Committee requirements and Australian National Committee on Large Dams (ANCOLD) guidelines
- Preparing emergency management plans for prescribed dams
- Managing pipelines and other infrastructure used to supply raw water to customers.
- Supplying water for environmental flows
- Providing services in accordance with the operating licence, water sharing plans, water supply agreements, Memorandum of Understandings with NSW Health and NSW EPA and relevant legislation (see below) including the *Water NSW Act 2014, Water NSW Regulation 2013, Dam Safety Act 1978* and the *Independent Pricing and Regulatory Tribunal Act 1992.*

In the GS area, WaterNSW supplies bulk water to four water utilities and 61 retail customers. The four bulk water utilities are:

- Sydney Water Corporation (which is by far the biggest customer)
- Wingecarribee Council
- Shoalhaven Council
- Goulburn-Mulwaree Council.

[5] WaterNSW water pricing submission, p.15.

Implications of the Sydney Catchment Authority and State Water merger

WaterNSW is the result of a merger (formalised on 1 January 2015) of the former Sydney Catchment Authority and State Water. WaterNSW now provides the services of these organisations, and as a result includes rural and urban related business components.

The merger impacts the way IPART regulates both prices for WaterNSW in the Greater Sydney area (formerly the Sydney Catchment Authority) and its Rural function (formerly State Water Corporation). In the future, the new merged entity could be subject to a single investigation and determination process in respect of the monopoly services it provides. However, for this review, IPART has decided to conduct a separate determination of WaterNSW's GS prices.[6]

The merger also has implications for aspects of the review, including allocation of costs between the two main components of the business, and the distribution of efficiencies and savings associated with the merger of the two organisations and associated organisational redesign, which is currently being implemented.

Operating licence and legislative arrangements

WaterNSW's operating licence for the Greater Sydney Area sets minimum performance standards it must meet as well as obligations in relation to customer service, system performance and environmental performance. In relation to standards, the licence specifies standards for catchment management and protection, the environment, raw water quality, management of catchment infrastructure works and customers.[7]

WaterNSW GS provides its services in accordance with the following legislative instruments:

- *Water NSW Act 2014*
- *Water NSW Regulation 2013*
- *Dam Safety Act 1978*
- *Independent Pricing and Regulatory Tribunal Act 1992*
- Relevant water sharing plans.

1.3. Previous expenditure review and pricing determination

1.3.1. Previous expenditure review of the Sydney Catchment Authority

In February 2012, Halcrow completed an independent review of the then Sydney Catchment Authority's operating and capital expenditure on behalf of IPART. The review was an input into IPART's 2012 price determination for Sydney Catchment Authority for the regulatory period from 1 July 2012.

Halcrow's review similarly investigated past and proposed capital expenditure, associated with regulatory periods immediately prior to 2012, and for up to 5 years from 1 July 2012. Key issues raised or highlighted in the review included (Halcrow 2012):

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6 IPART Scope of work, p.1.

7 IPART Scope of Work, p.2.

- changes in the SCA's operating environment leading to changes in water sales and demand, and impacts on infrastructure or operational management
- changes to, and the extent of implementation of, its management systems and approach
- the impact of the Sydney desalination plan on SCA water sales
- clarity and documentation regarding prioritisation processes for the capital expenditure program
- some shortfalls in the capital planning and management systems.

Key conclusions, findings or recommendations included:

- statutory obligations and service standards had been met despite lower operating expenses
- there were proposed increases in operating expenditure relative to the previous period
- identified gaps in institutional arrangements for the coordination of the metropolitan water supply
- a lack of consistency in documenting business needs with respect to capital expenditure
- recommended adjustments to the capital program based on reduced project expenditure, efficiency adjustments, project deferment and expensing
- minor upward adjustments to proposed operating expenses due to expensing, and substantial recommended reductions in capital expenditure.

1.3.2. Summary of IPART's previous pricing determination

In relation to the then SCA's proposals and Halcrow's review of expenditure, IPART determined that: [8]

- relatively small increases in operating costs would be permitted, which were driven by expected water transfers from the Shoalhaven river, and the impact of the carbon tax, as well as an annual efficiency target to encourage the SCA to achieve ongoing efficiencies
- most of the proposed capital program was prudent and efficient, but overall it should be reduced by around 12%, reflecting Halcrow's concerns about some capital works, with most of the reduction driven by deferral of proposed expenditure on the Warragamba Dam reliability upgrade.

1.4. Review objectives and scope

1.4.1. Review objectives

The objectives set for this review by IPART were to undertake:

- a strategic review of WaterNSW's GS investment plans and asset management systems and practices
- a detailed review of WaterNSW's GS past and proposed operating expenditures and capital expenditures

[8] IPART, *Review of prices for the Sydney Catchment Authority From 1 July 2012 to 30 June 2016—Final Report,* June 2012, p.4.

- a review of performance against past output measures and to propose any new output measures for the next determination period.

1.4.2. Scope of review

Consistent with the review objectives, the scope of work for the review covers four main areas: strategic considerations, detailed review of operational expenditure, detailed review of capital expenditure, and review of output measures.

Strategic considerations

The strategic component of the review includes consideration of WaterNSW's GS investment planning, and its asset management systems, and practices. This includes reviewing medium and long term investments plans and strategies, and associated or supporting systems, including for asset management.

Operational expenditure

The operational expenditure component includes reviewing the efficiency of past operating expenditure (for the 2012-2016 period) and proposed expenditure for the period 1 July 2016 to 30 June 2020.This includes assessing any variance from that allowed under the 2012 determination, and how expenditure relates to regulated services, and if it has delivered against required service standards.

Assessment of proposed expenditure includes consideration of the level required to efficiently undertake the regulated business, consideration of the potential for cost reductions and efficiency gains, and the appropriateness of cost allocation methods or approaches given the SCA and State Water merger.

Capital expenditure

The capital expenditure is informed in part by the strategic review, but also by a review of a sample of WaterNSW's past and proposed capital projects. The capital program as a whole is reviewed and a detailed investigation is made into planning and outcomes for the sample of capital projects. The capital projects are assessed specifically in relation to prudence and efficiency. Cost allocation for capital projects, and asset lives, are also considered.

Both past and proposed capital expenditure is considered, including whether past expenditure has contributed to meeting standards and outcomes, and consideration of variance between actual expenditure and that allowed under the current determination. Future expenditure is considered in relation to what is viewed as prudent and efficient for WaterNSW to deliver its regulated business, and the potential for efficiency savings is also considered in this context.

Output measures

WaterNSW's performance against its output measures for the current determination period was also considered. There are nine output measures for the current period which relate to capital projects or programs. Recommendations were also made for output measures for the next period.

1.5. Report outline

The report is broadly structured to align with the objectives and scope of work, in addition to further detailed requirements set by IPART. Specifically:

- This **Section 1** provides background on IPART and its role, that of WaterNSW, and the objectives and scope of this review.
- **Section 2** outlines the methodology and associated considerations for the review.
- **Section 3** documents the results of the strategic assessment component of the review, including planning and strategic management systems, processes and documentation.
- **Section 4** documents the analysis, findings and recommendations associated with past and proposed capital expenditure, including in relation to a sample of capital projects (detailed project information is contained at Appendix A). The section also considers performance against output measures and provides proposed future output measures.
- **Section 5** documents the results of the operating expenditure review, including past and proposed expenditure, and explores issues related to the merger
- **Section 6** summarises the assessment and findings and recommendations of the review.
- **Appendix A** contains detailed summaries of the reviews undertaken of fourteen capital expenditure projects and programs.

2. Review methodology

2.1. Overview

The overall approach to delivering the review involved four phases, as follows:

- **Initiation** – gathering initial documentation, and selecting capital projects for review
- **Information discovery** – reviewing available information, developing and submitting further information requests, confirming the evaluation criteria and approach, and undertaking initial meetings or interviews with WaterNSW staff
- **Analysis and review** – completing analysis in support of the major components of the review, further interviews or meetings, follow up information requests, and consolidation of findings across review elements
- **Reporting** – documenting the results of the analysis and review (this report).

The methodology was designed to assess:

- the extent to which strategic and capital planning, and asset management systems are conducive to ensuring efficient expenditure
- the prudence and efficiency of operational and capital expenditure, and
- progress against agreed output measures, and recommend future output measures.

The review was undertaken from September to December 2015, with the majority of the information discovery, analysis and review, and reporting confined to a four week period in October 2015.

2.2. Review process

Consistent with the overview above, completing the review involved the following steps:

- initial receipt of information from IPART
- review of initial information, and other publically available documentation
- initial introductory meeting with WaterNSW (11 September 2015)
- preparation and submission of information requests to IPART (15 and 17 September 2015)
- receipt of data and information from WaterNSW
- initial strategic focused interviews with WaterNSW staff (30 September 2015)
- review and analysis of data and other information received
- report drafting
- further interviews and follow up information requests (6 to 8 October, 13 October 2015)
- further drafting, and checking of relevant analysis as required by WaterNSW
- submission of draft report to IPART

- presentations to IPART
- report revision and submission of final report, including based on feedback from WaterNSW and further information.

2.3. Assessment framework

The framework for assessment of expenditure under this review is based on *prudence* and *efficiency* tests, as required by IPART. Application of these tests in relation to each of the review elements is explained further below, but the terms are defined here.

Prudence test

The prudence test assesses whether, in the circumstances existing at the time, the decision to invest in an asset is one that WaterNSW, acting prudently, would be expected to make. In assessing prudence, it is necessary to assess both *how the decision was made*, and *how the investment was executed* where the asset has been built, having regard to information available at the time. In examining forecast expenditure, the prudency test examines the consistency of this expenditure with WaterNSW GS's longer term capital expenditure program.[9]

Efficiency test

In reviewing expenditure, the efficiency test is used to determine how much of WaterNSW's proposed expenditure (operating and capital) for the upcoming determination period (commencing on 1 July 2016) will go into IPART's determination of WaterNSW's revenue requirement. The efficiency test should examine whether WaterNSW GS's proposed expenditure represents the best and most cost effective way of meeting the community's need for the relevant services.[10]

2.4. Information sources

The major information sources that have informed the review include:

- The Annual Information Return / Special Information Return, prepared by WaterNSW and provided by IPART
- The WaterNSW pricing submission to IPART, including a confidential attachment to the submission (includes the 10 year capital program and a forecast of major projects)
- Various documentation supplied by WaterNSW, including
  - Corporate and strategic documents
  - Strategies, including for risk management, asset management, program and project management, operations and maintenance, procurement and capital planning.
  - Site specific strategic action plans, maintenance plans, and asset renewal plans
  - Project business cases
  - Project change form requests and project review panel reports

[9] IPART Scope of Work, p.4.

[10] Ibid.

- Estimates of expenditure, and spreadsheets of costs
- Benchmarking reports
- Site response plans
- Service delivery agreements

- The results of discussions with WaterNSW staff
  - A number of interviews with WaterNSW staff took place in Sydney between 6 and 13 October.
  - Meetings for overall capital planning and individual capex projects in the review sample were held during the 6 to 8 October
  - Meetings for operational expenditure were held on 13 October, and included discussions on various aspects of the merger of the Sydney Catchment Authority and State Water Corporation.

2.5. Review of strategic management

The review of strategic management was primarily undertaken on a qualitative basis, and focused on WaterNSW or NSW Government policy, regulatory and planning matters that may be driving decisions, investments, and processes within WaterNSW GS. The review team considered:

- The policy, regulatory and operating environment, including obligations imposed upon WaterNSW and the relationship between these and investment or asset management decisions.
- Planning matters, including in relation to long term supply and demand and other long term strategic considerations that may influence large capital investments.
- WaterNSW's capital investment strategy, including over short and longer term horizons, and alignment, risks and efficiency of the strategy.
- WaterNSW's approach to asset management including whole of lifecycle planning, risk, asset condition assessment and reporting, asset life, and similar matters.
- Systems or processes associated that may have a bearing on the prudence or efficiency of decisions, including risk management, procurement, project management, and others.

2.6. Assessment of operating expenditure

To provide sufficient depth of analysis in support of any findings in relation to prudency and efficiency of operating expenditure, the review team sought to first understand, and then critique, the methodology and underlying assumptions adopted by WaterNSW to establish their forecasts. As a result, the review team focused on:

- understanding the factors driving WaterNSW's future costs
- ascertaining the assumptions and methodologies WaterNSW adopted to translate those cost drivers into an operational expenditure forecast.

Having regard to the above, our assessment of the prudency and efficiency of WaterNSW operating expenditure involved, amongst other things:

- Reviewing WaterNSW's regulatory submission to identify key forecasting issues and assumptions. In this context,the review team note that WaterNSW provided very little detail in its

regulatory submission as to the methodology and underlying drivers for its forecast operational expenditure, hence significant time and effort was invested in other data gathering and analytical techniques, and

- Providing WaterNSW with a detailed questionnaire related to their operating expenditure forecasts. This step was complicated by the fact that WaterNSW was unable to provide responses to our operational expenditure information requests until very late in the review process.[11] Amongst other things, this initial questionnaire addressed:
  - The methodology WaterNSW used to develop its operational expenditure forecasts – so that the review team could better understand WaterNSW overarching forecasting methodology
  - Non-recurrent events - so that the review team could understand whether or not WaterNSW's operational expenditure forecasts reflected the costs of events are, in a probabilistic sense, likely to be non-recurrent in nature
  - Related party transactions – so that the review team could better understand whether or not WaterNSW's operational expenditure forecasts included payments made to one or more related parties
  - Cost allocation methodology – so that the review team could better understand how WaterNSW allocates costs between its Greater Sydney business and its Rural business
  - Escalators and growth drivers – so that the review team could understand how WaterNSW has escalated its forecasts over the period covered by the regulatory submission to account for potential changes in the real cost of labour, materials and electricity costs, as well as changes in the underlying drivers of those costs.
  - Capitalisation policy – to ensure that WaterNSW has not included in its operational expenditure forecasts, the labour costs that it expects to capitalise over the regulatory period (i.e., to ensure there is no double counting).
  - Capex/opex trade off – to understand whether or not WaterNSW has made any allowance for the impact that its capital program may have on its operational expenditure forecasts over the regulatory period, and if not, the rationale for adopting this position.
  - Changed levels of service – to understand whether or not WaterNSW's operational expenditure forecasts reflect existing or improved levels of services, and if the latter, their rationale for proposing those improved levels of service.
  - Regulatory or Licence obligations - to understand whether or not WaterNSW's operational expenditure forecasts reflect the need to meet changed regulatory or Licence obligations that will come into effect in the next regulatory period.
  - Cost reductions and efficiencies – to better understand how WaterNSW's operational expenditure forecasts include, either directly or indirectly, allowances for on-going productivity improvements.
- Conducting interviews with WaterNSW to discuss their operational expenditure forecasts. Unfortunately, WaterNSW postponed a scheduled day-long meeting that was designed to discuss their operational expenditure forecasts[12] – further limiting our ability to drill down in some expenditure areas, and
- Developing this draft report for comment and feedback.

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[11] Aither provided an initial set of questions to WaterNSW on Thursday, September 17, 2015 (email from Ryan Gormly to Ed Chan). Aither received substantive responses to this questionnaire on the 9th of October.

[12] Aither was scheduled to meet WaterNSW on the 8th of October. On the day, Aither was informed that this meeting would not be taking place. This meeting was subsequently held on the 13th of October.

2.7. Assessment of capital expenditure

2.7.1. Overview

An assessment was made of the prudent and efficient expenditure compared to actual and proposed expenditure, as outlined in Section 4 of this report. The assessment of prudency and efficiency of WaterNSW's capital expenditure was based on understanding, and then critiquing, the methodology, underlying assumptions and models that were used to establish capital expenditure forecasts. This was given effect through the following tasks:

- Desktop review of information provided by WaterNSW including AIR/SIR, policies and procedures, strategies, and documentation relating to individual projects or programs
- Desktop review of information found in the public domain
- Interviews with WaterNSW officers as part of the strategic review and in meetings on each of a number of individual capital projects selected for detailed review
- Further desktop review of documentation provided by WaterNSW following these interviews
- Assessment of prudence and efficiency of the sample capital projects, including drawing on the professional judgement of WSP | Parsons Brinckerhoff in relation to the efficiency of proposed capital expenditure.
- Assessment of the prudence and efficiency of the overall portfolio of actual and proposed capital expenditure, considering whether the findings of the review of sample projects and programs indicate any systemic imprudence or inefficiencies.

With respect to making an assessment of past expenditure the approach was to gain a view as to whether there is any systemic evidence of inefficiencies or imprudent decisions. This was carried out by reviewing how decisions were made on individual projects, what actual spending was compared to budget, and whether project outcomes were actually realised. The approach was that should any expenditure found to have been clearly imprudent or inefficient, a recommendation would be made to not allow part or all of that expenditure.

For future expenditure the approach was similar though it is more focused on individual projects than at a portfolio level. However, the review team also considered if it is appropriate to apply a global reduction in WaterNSW's forecast capital expenditure as a result of systematic inefficiencies. Our detailed method for this assessment is outlined further below.

2.7.2. Approach for selecting sample capital projects

IPART provided initial guidance regarding the selection of a sample of capital projects, including that the selection contain the Upper Canal Rehabilitation, Metropolitan Dams Electrical Upgrade, Catchment and Minor Asset Renewals and the Shoalhaven Transfer Project. IPART also requested that at least 10% of capital projects by number and total value be included in the sample.

The following methodology and criteria were subsequently developed and applied in selecting capital projects to meet the 10% requirement:

1. Select one project from each category[13], based on the highest total capital expenditure within that category over the 10 year capital program (whilst ensuring that some of this expenditure is incurred in the next regulatory period)

2. Select additional major projects from each category

3. Select any projects with potentially 'anomalous' spending – e.g. spending that begins at the end of the regulatory period, spending that is erratic, or is rapidly increasing or decreasing

4. Revise the projects selected through steps 1 to 2 on the basis of step 3, if required, to make up the required total number and value of projects.

Additional considerations or criteria applied in making the selection included ensuring adequate representation of:

- past and proposed capital expenditure
- projects that cover multiple regulatory periods and are particularly significant in future regulatory periods
- projects that were highlighted as being problematic or of concern in the last review, that remain in the proposals, including where underspending and delays have been observed
- expenditure carries out under ongoing asset renewal programs, rather than only one-off projects
- expenditure dependent on number of FTEs.

In addition, consideration was given to overweighting discretionary projects (given their potentially discretionary nature) and underweighting projects that meet mandatory standards, or are for business efficiency (given the relatively low capital expenditure in that category).

2.7.3. Assessment of capital projects

An assessment was carried out of the selected capital projects for prudency and efficiency. This was carried out by a combination of a desktop review of documents obtained as part of the strategic review, desktop review of documentation specific to each project, and interviews with WaterNSW officers. It was also informed by consultation with some external stakeholders including DPI Water (Metropolitan Water Directorate) and Infrastructure NSW.

To aid the process a number of assessment criteria were developed. This gave effect to the prudency and efficiency tests as noted above. An indication of some of the elements of this are outlined below.

Prudency

Is the project need demonstrated by an obligation, for example:

- A constraint restricting capability to deliver service, a legal obligation, or business efficiency improvement

If the need is not required through obligation, is evidence presented to show, for example:

- Asset deterioration, asset capacity constraint or technological obsolescence.

[13] Existing mandatory standards; discretionary standards; government programs, and; business efficiency.

- The timing is appropriate (including no earlier or later than necessary to meet need).
- Corporate policy, objective or strategy alignment.

Efficiency

Is the project being delivered at lowest cost, for example:

- Has a complete set of options been considered or are alternative options identified that were not considered.
- Is the scope of work appropriate to meet the need, and is the standard of work appropriate.
- Are unit costs are based on market rates or otherwise shown to be efficient; are costs benchmarked; or, are efficiency savings recommended.
- Are synergies with other projects considered.

2.7.4. Review of output measures

The review of output measures was undertaken by initially reviewing information in the WaterNSW pricing submission. Further to this, an information request to WaterNSW asked that evidence be provided to substantiate measures that were noted as completed in the submission, and provide further information regarding any measures not completed, including a rationale.

This information was subsequently assessed, including in the context of the overall capital expenditure review, and commentary was made regarding the reasonableness of the rationale for measures that had not been completed.

For the new output measures, consideration was given to:

- Existing output measures that had not been completed
- WaterNSW's proposed future output measures, in its submission to IPART
- Findings and recommendations made by the review team on the capital projects in the sample, including any recommended adjustments to expenditure amounts or their timing
- Other future capital projects proposed that were outside the sample reviewed
- External drivers, such as the Metropolitan Water Plan and Hawkesbury-Nepean Valley Flood Management Review study
- IPART's objectives in setting output measures
- The Review Team's view on the value of these output measures.

The review team provided a rationale or justification for each of the proposed new output measures.

2.8. Dollar values and inflation rates

Throughout this report, all expenditure has been reported according to the IPART 2014 Guidelines for Water Agency Pricing Submissions. In line with this approach, where relevant:

- forecast costs and prices from 1 July 2016 are presented in $2015/16 values
- historical costs are reported in nominal values

- aggregate figures for the current determination period are expressed in $2015/16 values.

Inflation figures have been used throughout the report to ensure data supplied is consistent with the above requirements. These are set out below.

Table 4 Inflation rates

	$2010-11 to $2011-12	$2011-12 to $2012-13	$2012-13 to $2013-14	$2013-14 to $2014-15	$2014-15 to $2015-16
Inflation factor	2.3%[a]	2.4%[b]	3.0%[c]	2.4%[d]	2.5%[e]

a. 2012 annual average/2011 annual average, All groups CPI Australia
b. Jun Qtr 2013/ Jun Qtr 2012, All groups CPI Australia
c. Jun Qtr 2014/ Jun Qtr 2013, All groups CPI Australia
d. Bloomberg Mean Consensus inflation forecast as at 10/10/14, given that ABS data is not available)
e. Mid-point of the RBA inflation target range, given the Bloomberg Mean Consensus Inflation forecast is not available for this future period, as at 10/10/14

Source: As advised in letter sent to SCA by IPART via email: IPART 2014 Guidelines for Water Agency Pricing Submissions.

3. Strategic review

3.1. Overview

The extent to which WaterNSW makes prudent and efficient capital investment and operating decisions is partly driven by its policy and operating context, including obligations placed upon it. It is also driven by its approach to strategic management of its assets and the business more broadly, including its strategic objectives, corporate management, and delivery systems.

This section considers the policy and operating context of WaterNSW, and a range of corporate and management systems that are used to guide capital and operating spending and management decisions. While not a sufficient condition, the existence and use of effective strategic, corporate and management systems is a necessary condition to achieving prudent and efficient capital and operating expenditure.

3.2. Policy and operating context

This expenditure review was undertaken in the context of significant organisational change for WaterNSW, and a period of policy uncertainty, in part driven by misalignment in the timing of important and interrelated government policy development or review processes.

The relatively recent merger between the former SCA and State Water means that WaterNSW is still resolving its preferred approach to consolidating or modifying various corporate, financial and management systems for the new organisation. For example, financial systems for the two previous businesses were merged into one system while our review was underway. In addition, the merger necessarily involves efficiency gains in certain areas, many of which were still being determined during the course of the review. Importantly, the merger needs to be viewed as more than just a means of driving back office efficiency savings. As discussed in more detail below and in section 5, the merger has been complemented by a complete organisational redesign.

From a policy perspective, decisions on future water supply augmentation, flood management, and environmental flow management are outside the direct control of WaterNSW but have significant implications for its capital program. At the time of the review (and when the WaterNSW proposal was prepared), there were a number of outstanding decisions in each of these areas that impacted on WaterNSW proposals.

3.2.1. WaterNSW; the SCA and State Water merger

In March 2014 the NSW State Government announced its intention to merge State Water Corporation and the Sydney Catchment Authority. The merger was stated to be driven by a desire to ensure the highest quality and most efficient services to customers across NSW.

The merger was informed by the findings of Stage 1 of the 2013 independent Bulk Water Delivery Review, and involved the integration of the dam management, water quality, flood mitigation and catchment management expertise of the SCA and State Water.

The legislated requirements to provide clean and safe drinking water were to continue, and no changes to the objectives of ensuring water and catchment quality and related public health and safety outcomes were proposed as part of the change.[14]

WaterNSW was formally established on January 1 2015, however the review team understand that work to combine the organisations was occurring prior to, and following this date. WaterNSW is now Australia's largest water supplier, managing 42 dams across NSW, and delivering water from these and NSW's rivers for agriculture and drinking water supply customers.

This expenditure review only relates to the Greater Sydney metropolitan related functions of WaterNSW.

3.2.2. Operating framework

WaterNSW's activities are guided and regulated by:[15]

- The Water NSW Act 2014 – which establishes and defines WaterNSW, including its constitution, foundation charter, objectives and functions, board and executive management arrangements, operating licences, arrangements for drawing water, and various other elements.
- Water NSW Regulation 2013 – which regulates the operation of WaterNSW with respect to environmental protection, conduct on Crown and other land, and protection of assets.
- Operating licences – which govern aspects of how WaterNSW sources and supplies water, and are granted and audited by IPART. Licences currently remain separate for the rural and urban functions of WaterNSW (the former SCA operating licence is now granted to WaterNSW).
- Water sharing plans (WSP) – which determine the balance of water available for water and consumptive use in different catchments or WSP areas, and under which water access licences and other approvals, are issued to allow WaterNSW to take and use water.
- Memoranda of understanding – which are established with other NSW agencies regarding cooperative management of environmental and health related matters, as well as non-statutory arrangements with other stakeholders.
- Water supply agreements – which document arrangements with customers that WaterNSW supplies bulk water to, including Sydney Water and major local council customers. The arrangement with Sydney Water addressed water quality standards, continuity of supply, costs to the customer, and dispute resolution.
- Catchment audits – which review the health of declared catchments from which Sydney's drinking water is sourced (and which are managed by WaterNSW).
- Price determinations – which are made by IPART, and determine the maximum prices that may be charged by WaterNSW over specific regulatory periods. WaterNSW GS is currently operating under the former SCA determination for the period 1 July 2012 to 30 June 2016.
- Dam Safety Act 1978 (and recent changes resulting from implementation of the Dam Safety Bill 2015) – which establishes a range of requirements for prescribed WaterNSW dams, and drives operational management decisions and capital investment to ensure consistency with standards.

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14 https://statewater.com.au/About%20us/News%20and%20events/Media-releases-2014/New%20world-class%20water%20delivery%20provider%20for%20NSW

15 http://www.waternsw.com.au/about/legislation

Operating licence

WaterNSW's current operating licence for the Greater Sydney Area took effect from 1 July 2012 and is valid until 30 June 2017, being the licence of the former SCA.[16] The licence includes provisions or requirements relevant to this expenditure review, such as the holder:

- maintaining water quality systems consistent with guidelines
- managing infrastructure consistent with design criteria
- managing and protecting catchments
- developing or maintaining asset management systems consistent with standards
- adhering with terms and conditions and delivering against levels of service for raw water supply.

Annual audits of WaterNSW compliance with the Operating Licence have been undertaken by others on behalf of IPART.

Service standards

The key service standards for WaterNSW in the Greater Sydney region are specified in the Operating Licence, and in Raw Water Supply Agreements with its customers. Under the *Water NSW Act 2014*, WaterNSW is required to enter into arrangements with Sydney Water Corporation for supply of water, which is given effect by a Raw Water Supply Agreement (RWSA).[17]

Clause 6 of the SCA Operating Licence also requires WaterNSW to have supply agreements with customers other than Sydney Water. WaterNSW has signed agreements with its council customers, which are similar to the RWSA between WaterNSW and Sydney Water, but simpler in content given less complex nature of the supply relationship.[18]

RWSAs specify that WaterNSW must deliver water quantities in accordance with volume forecasts provided by the customers, at the quality specified in the agreements. The RWSA with Sydney Water has additional clauses that require WaterNSW to supply water with sufficient hydraulic capacity for each water filtration plant (subject to available storage); to effectively maintain and operate its infrastructure/equipment; and where reasonably practicable to do so, ensure sufficient supply to enable Sydney Water to meet its retailer of last resort obligation.[19]

The current SCA Operating Licence also requires WaterNSW to maintain water quality standards that are consistent with Australian Drinking Water Guidelines and any other requirements specified by NSW Health (Clause 2). Clause 3 requires WaterNSW to maintain supply sufficiency in accordance with Design Criteria.

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16 Information on IPART's operating licence for the former SCA is available at: http://www.ipart.nsw.gov.au/Home/Industries/Water/Reviews/Metro_Pricing/Review_of_Sydney_Catchment_Authoritys_Operating_Licence_and_Prices_from_1_July_2012

17 See: http://www.waternsw.com.au/__data/assets/pdf_file/0004/65839/SCA-and-SWC-Raw-Water-Supply-Agreement-2013.pdf

18 WaterNSW response to information request, item 4.

19 Ibid.

3.2.3. Water planning and management policy

Metropolitan Water Plan

The Metropolitan Water Plan (MWP) is a high level policy and planning document that outlines strategies and actions related to immediate and long term water supply and demand management measures for greater Sydney. The Plan also addresses matters related to liveability in urban communities and protection of river health in rivers impacted by water supply dams. Development and review of the Plan is led by the Metropolitan Water Directorate, which leads a whole-of-government to its implementation. WaterNSW provides technical input to the plan but is not the decision making authority.

The current plan was released in 2010 (the 2010 Metropolitan Water Plan), and concentrated efforts on dams, recycling, desalination, and water efficiency. Important matters raised in the 2010 Plan of particular relevance to WaterNSW and the current expenditure review include:

- Shoalhaven Transfers Works project – the plan outlines long-term plans to augment the Shoalhaven water supply transfer system. The MWP indicated the timing of this initiative will depend on factors such as future climate predictions, population growth and demand, with a view to have an augmented system operation around 2025.
- Warragamba Dam Environmental Flows – are confirmed in the plan as a means to cost effectively deliver required environmental flows specified by the NSW Government. Regulations outlining the specific implementation were earmarked for inclusion in the next iteration of the MWP. In formulating plans for environmental flows infrastructure, WaterNSW provided hydrological as well as economic support to the NSW Government in evaluating a range of possible environmental flow regimes for Warragamba Dam. Construction is expected at the request of government.
- Upper Canal refurbishment and replacement project – The Upper Canal is an essential component of the water supply system for Sydney. It transfers water from the four Upper Nepean dams (and the Shoalhaven transfer system) to the Prospect Water Filtration Plant. The 2010 MWP states that complete refurbishment works of urgent and high priority sites are to be completed by 2016 and further rehabilitation and upgrades are to be completed by 2020. The works on the Upper Canal form an important capital project for WaterNSW GS.

The 2010 Metropolitan Water Plan is currently under review. It was due for completion in 2014, but it is now expected to be released in early 2016. The lack of a revised MWP has driven a degree of uncertainty in capital proposals put forward by WaterNSW for the upcoming regulatory period.

The Water Sharing Plan for the Greater Metropolitan Region Unregulated River Water Sources

The Water Sharing Plan for the Greater Metropolitan Region Unregulated River Water Sources 2011 (the Plan) has been developed in response to the expansion of water extraction in NSW which has placed catchments at the limit of their sustainable extraction rates. This has led to increased competition for water resources and associated pressure on the health of rivers and aquifers.

The Plan is a legally binding instrument created under the *Water Management Act 2000* (NSW). It provides the legislative basis for sharing water between environmental and consumptive uses. In effect the Plan is a series of smaller water management plans amalgamated at a higher level. Plans in effect for the Greater Sydney region include those made for the Shoalhaven, Upper Nepean and Upstream Warragamba, Hawkesbury & Lower Nepean and Southern Sydney Rivers Hydrological valleys (see figure below). Actions outlined within the plans include rules for protecting the environment, extractions, managing licence holders' water accounts, and water trading in the plan area.

Source: NSW Department of Primary Industries.

Figure 1 Greater Metropolitan Region Water Sharing Plans

The development of the plan occurred in the context of some significant policy issues. Actions outlined in the plan to address these are relevant to the operating and policy context of WaterNSW in Greater Sydney. They include:[20]

- The protection of environmental releases from dams on the Nepean River – the plan adopts and implements these releases by establishing the necessary environmental release rules on the dams. The former SCA has undertaken extensive upgrades to infrastructure to enable pass through of environmental flows.
- Negotiated releases from Warragamba Dam – in 2009 the NSW Government resolved that the SCA investigate releases from the Warragamba Dam for consumptive use. The plan provides measures composed of a seasonally varying release, and a fixed daily release. During negotiation, Sydney Water proposed that the plan provide for amendment to these volumes pending the incoming agreement on environmental flow rules for Warragamba Dam.
- Extraction limits for the SCA (now WaterNSW) – while the entitlements set an upper limit on extraction volumes by WaterNSW in any one year and have been set to provide flexibility in extraction, the average annual extraction limit being set at a lower volume is the means by which more environmentally sustainable levels of extraction are established for the long-term.

Importantly, WaterNSW is waiting for a final decision from government on the Warragamba environmental flow requirements. Implementing a decision to provide environmental flows will require considerable works to be undertaken at the dam, which have been earmarked for the subsequent regulatory period in WaterNSW's long term capital plan. By reducing system yield, it would also have important implications for future system augmentations.

The water sharing plan is due for extension or replacement in July 2021.

[20] NSW Office of water 2011, Water Sharing Plan for the Greater Metropolitan Region Unregulated River Water Sources – Background document, pp.38-50.

Hawkesbury Nepean Valley floods investigations

In 2013 a review of Hawkesbury-Nepean Valley flood management arrangements was instigated in response to the *State Infrastructure Strategy 2012-2032* and heightened community awareness of flooding. The review outlined ten major strategies for consideration to improve flood risk management in the Hawkesbury-Nepean Valley. The strategies are broadly grouped under three categories – infrastructure, governance, and non-infrastructure.

Pertinent to this review are findings in regards to water infrastructure in the Hawkesbury-Nepean Valley system. The review suggested that infrastructure could reduce (but not eliminate) the risk of flooding by lowering flood levels of particular sized flood event[21]. The review recommended two options for further investigation which would have significant consequences on WaterNSW capital expenditure planning:[22]

1. changing the operation of the dam to provide for flood mitigation, and

2. raising the height of Warragamba Dam wall by 15 or 23 meters.

Options for operating the existing Warragamba Dam for flood mitigation

The review recommended that provisions to increase available airspace by lowering the Full Supply Level (FSL) of Warragamba Dam by up to five meters be further investigated. This option would provide greater certainty and increase in evacuation times for minor flood events. In addition, the review suggested that 'surcharging' of the radial gates during storm events be investigated as a mitigation option.[23]

While these strategies can potentially reduce the risk from flood events, there were associated negative impacts upon the operation and management of Warragamba Dam. Reduction of the FSL in combination with surcharging would only have minor flood mitigation benefits without reduction of the utility of the asset.[24] Lowering the FSL to provide flood mitigation benefits would reduce the amount of water available for consumptive uses and bring forward the timing of new supply options. The option has associated risks, risk reduction costs, and environmental and economic impacts. As a result, this option is undergoing comprehensive investigation as part of the second stage of the review to establish worthiness.

Warragamba Dam raising option

The review also investigated the option of raising the crest height of the Warragamba Dam. Doing so would hold flood waters back and provide greater response time for evacuation in large flooding events. It was determined that raising the dam wall by 15m or 23m was the most cost effective when considering the reduction in average annual damages, evacuees and rescues. This analysis was based on the available cost, damages and population information.[25] The outcomes of the flood review

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21 NSW Department of Primary Industries 2014, Hawkesbury-Nepean Valley Flood Management Review Stage One: Review Report, p.5.

22 DPI Water Submission to IPART's reviews of prices for WaterNSW, Sydney Water Corporation and Hunter Water Corporation 2015, p.1.

23 NSW Department of Primary Industries 2014, Hawkesbury-Nepean Valley Flood Management Review Stage One: Review Report, p.33.

24 Ibid.

25 NSW Department of Primary Industries 2014, Hawkesbury-Nepean Valley Flood Management Review Stage One: Review Report, pp.33-35.

could significantly impact the management of Warragamba Dam, and capital expenditure planning throughout WaterNSW's portfolio.[26]

Environmental flows

Riparian systems require a range of environmental states including floods (very high flows), freshes (high flows) and dry spells (very low flows) to remain healthy and reproductive. Environmental flows are the release of water from dams or rivers upstream to improve the health of the river downstream and aim to mimic, or provide these states.

Environmental flows are established in the *Water Management Act 2000* (NSW) which recognises the need to allocate and provide water for the ecological health of rivers and groundwater systems. The provision of environmental flows serves to:

- Protect aquatic ecosystems and reduce aquatic weeds and frequency of algal blooms
- Improve river health
- Improve conditions for native fish, frogs, water birds and river-dependent plants and animals that rely on different flows to trigger migration and breeding
- Protect river condition for recreation such as boating and swimming

WaterNSW releases environmental flows from the following dams and water supply weirs: Avon, Cataract, Cordeaux, Nepean, Tallowa, Wingecarribe, Fitzroy Falls and Woronora dams, and Broughtons Pass and Pheasants Nest weirs.

Current releases by WaterNSW

Warragamba System
WaterNSW currently releases water for consumptive purposes at a fixed daily and additional seasonal rate. The releases are primarily to allow the function of service delivery infrastructure downstream. As noted above, provisions for environmental flows from Warragamba Dam are expected to be announced following the current review of the Metropolitan Water Plan, now due in 2016.

Shoalhaven System
WaterNSW releases water from Tallowa Dam and Wingecarribee and Fitzroy Falls reservoirs to help improve the environmental health of the rivers downstream and to fulfil obligations to sustain the rights of riparian landholders to use the river.

Upper Nepean System
WaterNSW introduced daily variable environmental flows from the Upper Nepean dams and water supply weirs from 1 July 2010. It has also undertaken upgrades to weirs along the Hawkesbury-Nepean River to ensure downstream flow, and installed fishways to facilitate fish breeding.

Woronora system
On 15th July 2009, WaterNSW introduced daily variable flows from Woronora Dam for environmental purposes. At times of low flows, all inflows up to 4.1 million litres a day are released to the downstream river. During times of higher flow, an additional 20 percent of inflows to Woronora Dam are released downstream.

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[26] DPI Water Submission to IPART's reviews of prices for WaterNSW, Sydney Water Corporation and Hunter Water Corporation 2015, p.1.

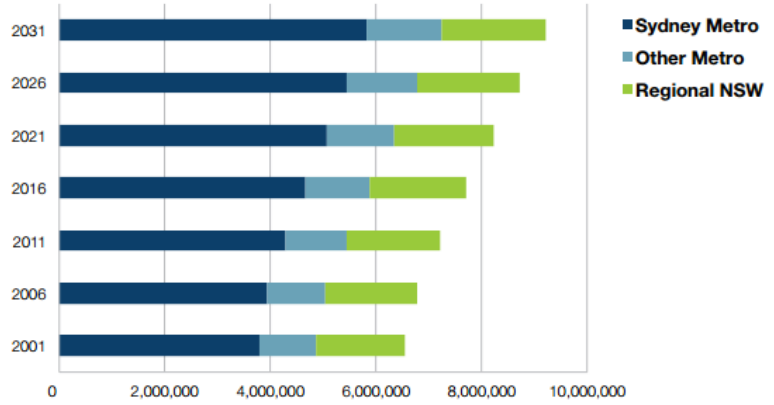
Population growth and water demand

Population growth and anticipated increased demand for water continues to influence WaterNSW's decision making and operational context. Importantly, WaterNSW relies on the demand projections provided by Sydney Water, which is its major customer.

Population growth

Population projections are illustrations of the change in population that would occur if certain assumptions about future levels of fertility, mortality and migration were to hold true over time. The population growth projection used by WaterNSW in its 2015 Price submission is based on the latest demand forecast provided to WaterNSW by Sydney Water in June 2015. The projection estimates that Sydney's population will reach 5.85 million people by 2026, which is substantially earlier then the NSW Department of Planning and Infrastructure's projection of 5,467,200.[27] It should be noted that the population projection WaterNSW used in its submission to IPART is based on a high growth scenario.[28]

	2001	2006	2011	2016	2021	2026	2031
Sydney	3,796,800	3,937,100	4,284,200	4,653,300	5,054,500	5,436,700	5,815,400
Other metropolitan	1,058,400	1,100,200	1,149,800	1,215,300	1,283,900	1,349,800	1,412,700
Regional NSW	1,684,800	1,738,600	1,777,500	1,832,400	1,885,400	1,929,800	1,965,800
NSW	6,575,200	6,816,100	7,211,500	7,701,000	8,223,900	8,716,400	9,193,900



Source: NSW Department of Planning and Infrastructure 2013, New South Wales in the future: Preliminary 2013 population projections, p.3.

Figure 2 NSW and main regions population projections 2001-2031

Water demand

Greater Sydney's water demand for the years 2016-17 to 2019-20 is forecast to grow by 3% in total.[29] This increase in demand will be driven primarily by Sydney Water. WaterNSW does not conduct its own end user demand forecast, rather this is conducted by Sydney Water who maintains data on usage and billing. The water demand forecast provided to WaterNSW by Sydney Water includes three scenarios: business-as-usual (BAU), high and low. The predicted population growth means that

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27 NSW Department of Planning and Infrastructure 2014, New South Wales State and Local Government Area Population Projections: 2014 Final

28 WaterNSW's submission to IPART, p.37.

29 Ibid.

water demand has increased significantly compared to the forecast conducted in September 2013.[30] The table below shows the change in water demand put forward by WaterNSW.

Table 5 Forecast water demand increase from 2013

Demand scenarios	5 year horizon (2018) GL/year	15 year horizon (2028) GL/year	50 year horizon (2063) GL/year
Business as usual	25	56	133
High	50	130	323
Low	-15	-39	-30

Source: WaterNSW submission to IPART, p.37.

WaterNSW have also suggested that there has significant variability in Sydney Water demand forecasts since 2006, but that growth trend has tended to mirror a high demand scenario, and that both the increase in the water demand forecast and tendency for demand projections to trend towards the high demand scenario has a major influence on the infrastructure investment for WaterNSW.[31]

3.3. Organisational management

3.3.1. Organisational objectives and structure

Organisational objectives

WaterNSW was created under the *Water Act NSW 2014* (NSW) (the Act). Under the Act, WaterNSW's objectives are to:

- to provide for the planning, design, modelling and construction of bulk water infrastructure
- to supply water in compliance with appropriate standards of quality
- to protect public health, safety and the environment and provide for the management of designated catchment areas
- to maintain and operate the works of WaterNSW efficiently in accordance with sound commercial principles
- to capture, store and release water in an efficient, effective and safe manner.

While most of these functions reflected the previous businesses, the role of planning for the construction of new bulk water infrastructure was added specifically to WaterNSW, although this mainly applies to the rural component of the business.

WaterNSW's strategic objectives

The former SCA's objectives were defined in its Corporate Sustainability Plan, however following the merger, WaterNSW has developed a series of objectives supporting the requirements under the Act.

30 WaterNSW's submission to IPART, p.38.

31 Ibid.

WaterNSW's strategic objectives are summarised by the following headings:

- Safety excellence
- Business Transformation
- Customer Value Creation and Responsiveness
- Growing the Capabilities of Our People
- Water Quality Research and Expertise
- Better Business Systems
- Knowledge Management
- Capability To Develop and Evaluate Infrastructure Solutions
- Asset Health and Capability Management

WaterNSW's organisational structure

The new organisational structure for WaterNSW was still being implemented during the course of the review, but is made up of delivery teams in three functional areas:

- market delivery
- asset delivery
- policy and service delivery.

Under each of these functional areas are a number of specific business units which provide the capabilities and implement the processes required to deliver WaterNSW's strategic objectives. There are 10 business units across the three delivery areas. These are:

- Retail
- Asset Operations and Maintenance
- Water Quality, Catchment Protection, People & Culture
- Strategic Engineering
- Asset Development Projects
- Information & Communications Technology
- Finance & Pricing
- Corporate Systems & Risk
- Legal Services & Corporate Governance
- Transformation Services

Strategic Action Plans

Strategic Action Plans (SAP) are targeted plans that link each of WaterNSW's overarching strategic objectives with measures and actions to facilitate their achievement. SAPs are prepared for each of WaterNSW's 10 business units, and provide short term actions and medium term performance measures years that support the delivery of WaterNSW's cross cutting strategic objectives. Each SAP contains one or more corporate goals for each strategic objective, as well as corporate measures (3 year timeframe) and actions or milestones (1 year timeframe).

The SAPs provide the link between the strategic objectives and the business units, thereby specifying how the organisation will deliver against the goals. Not all business units are responsible for achieving outcomes in relation to all objectives. As an example, the sections below outline SAPs, and their goals or actions of most relevance to capital and operating expenditure.

Asset development projects

- For the strategic objective 'asset health and capability management' the SAP provides actions to ensure that the capex plan is delivered throughout its lifetime.

Strategic engineering

- For 'Capability to Develop And Evaluate Infrastructure Solutions' the Strategic Engineering SAP provides actions to ensure that WaterNSW has identified, modelled and prioritised water infrastructure solutions that address identified water quality and reliability deficiencies, and to ensure water infrastructure solutions are adopted.
- For 'Asset Health and Capability Management' the Strategic Engineering SAP outlines actions to ensure Water NSW's portfolio of assets have the right capability to deliver on customer needs and regulatory requirements, and that capability is maintained.

Finance and pricing

- For 'Asset Health and Capability Management' the Finance and Pricing SAP outlines actions to ensure asset planning and regulatory pricing submission processes are integrated and transparent.
- For 'Capability to Develop And Evaluate Infrastructure Solutions' the Finance and Pricing SAP outlines action to identify, model and prioritise water infrastructure solutions that address identified water quality and reliability deficiencies. It also has actions to ensure water funded infrastructure solutions are more efficient than other solutions.
- For 'Capability to Develop And Evaluate Infrastructure Solutions' the SAP provides actions to ensure the capex plan is delivered over the life of the determination period.

Relationship with capex or opex proposals

WaterNSW's strategic and organisational objectives provide the mandate to scope, develop and propose solutions to identified deficiencies in the quantity and reliability of water supply. In turn the organisational structure and associated SAP's outline the responsibilities of specific business units in achieving these, and ensure alignment of organisational activities, with overarching objectives.

In principle, these arrangements should contribute to ensuring proposals are aligned with the core functions and responsibilities of the organisation, including its mandated responsibilities and obligations under the *Water Act NSW 2014* (NSW).

Importantly, as discussed in section 5, the redesign of the organisation around the SAP and 10 new business units, of which 1 is temporary with a 2 year horizon, was central to the ability of WaterNSW to be able to propose operational expenditure savings.

3.3.2. Long term supply planning

Supply augmentation decisions are made by the Government on the advice of its water industry entities and agencies and coordinated by the Metropolitan Water Directorate (MWD). The Metropolitan Water Plan (MWP) sets out the policy framework for water supply and demand management measures within which the asset delivery entities secure sustainable water supply.[32]

MWD adopt a 'real options' approach which ensures that options or pathways for future action should not be cut off unnecessarily and irreversible decisions should be deferred, where there is uncertainty

[32] WaterNSW response to initial information request, item 2, long term supply planning, p.3.

without compromising objectives. The decision-making framework considers decisions that need to be made within different time frames.[33]

WaterNSW's contribution to long term supply planning is documented and reported in the *Water Supply Plan 2100* document. This document provides input to analysis and considerations made by the MWD and MWP process. WaterNSW also contribute though use of a hydro-economic model, called MetroNet which is used for investigation of water supply options and the optimisation of the whole water supply system, including Desalination plants, groundwater, surface water, recycled water, Shoalhaven Transfer options.[34]

The MWP planning process does not cover small systems such as Blue Mountains, Upper Nepean or Fish River Water Supply Scheme (FRWS). WaterNSW is responsible for ensuring ensure supply security for these systems, and plans for this through strategies such as the Blue Mountains Water Supply strategy developed in 2012.[35]

3.3.3. Capital planning

WaterNSW approach to capital planning

The WaterNSW approach to capital planning is guided by a number of planning and strategy documents that guide some of the major investment decisions throughout the Greater Sydney Region. These documents include:

- Water Supply Plan 2100
- Blue Mountains Water Supply Strategy
- Upper Canal Strategy
- Special Areas Strategic Plan of Management
- State of the Assets Report

Broadly, investment decisions are made based on the future needs for infrastructure as outlined in the aforementioned documents, or, the preservation, renewal or replacement of existing assets that is guided by the Asset Management System. The AMS, and specifically the Asset Management Plans, identify asset investment requirements to ensure that assets allow the continued delivery of services.

Operationalising WaterNSW's approach to capital planning

To progress capital investment plans towards implementation, a number of approval gates must be met. All expenditure submissions are approved in accordance with WaterNSW's Standing Delegations. All investments require an Options Analysis Business Case that provides analysis of different options and financial, social and environmental analysis. Capital submissions valued over a certain threshold are required to be approved by the Board. The path to Board approval includes internal peer review by the Infrastructure Planning & Development (IPAD) Management Committee, internal review by the Executive team and review by the IPAD Board Sub Committee.

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33 Ibid.

34 Ibid.

35 Ibid.

Source: WaterNSW, email from Elli Baker to Chris Olszak, 30 November 2015, 2:55pm.

Note: Figure has been removed at the request of WaterNSW due to being commercial-in-confidence.

Figure 3 Approval gates and financial thresholds for capital projects

Submissions for capital expenditure over a different threshold amount are required to be approved by the CEO. The path to CEO approval includes peer review by the Infrastructure Planning & Development (IPAD) Management Committee and the Executive team. High cost investments are also subject to the NSW Treasury Gateway review (now coordinated by Infrastructure NSW). Approval gates and financial thresholds were detailed in the diagram above, however this figure was removed at the request of WaterNSW due to being commercial-in-confidence. All capital expenditure requires submission to the Finance team.

Ensuring planning for capital investment that is prudent and efficient

At the highest level, options and efficiencies for future water supply demand and infrastructure are explored in plans and strategies such as:

- Water Supply Plan 2100
- Upper Canal Strategy
- The Future of Warragamba Dam A Strategic Approach

These strategies are designed to ensure that drivers for all expenditure activities are understood and clearly documented, along with evidence to demonstrate whether spending is mandatory or discretionary. Engaging in robust processes and considering a range of options for infrastructure investments is intended to drive prudent and efficient expenditure decisions.

WaterNSW is currently working towards a risk based approach to capital investment whereby investment needs are prioritised based on risk in accordance with the Corporate Risk Management Framework. Capital items are likely to be included in the capital program where a medium or higher risk prevails or an emerging risk is likely.

Low risks are managed within the business and monitored. Lower risk items may be placed on the 10 year planning horizon, but as conditions change works may be required earlier. Alternatively risk associated with items on the 5 year horizon may not have materialised and in some cases expenditure can be deferred.

The Capital Investment Strategy (CIS) is being developed with the aim of delivering a prudent and efficient program of capital investment that is aligned to customer needs, asset strategies and corporate priorities / objectives in counteracting the impacts of asset consumption.

Development of 5 and 10 year capital programs

WaterNSW develops an overarching capital program with 5 year and 10 year planning horizons as part of the same program. The 10 year horizon identifies potentially high cost investments that require

significant lead time that may require early notification to Government and Treasury. The basis for capital items being included in the program includes consideration of needs, outcomes of investigations, condition assessments, risk assessments, or similar processes, which have highlighted a need for investment.

The capital investment planning process was developed in accordance with the PAS55 AM principles (now ISO55001: 2014, which WaterNSW is on the path towards certification in 2016) as part of the Asset Management System. The Asset Management System aims to ensure assets can provide the level of service and address risk requirements.

Alignment is also ensured with the relevant corporate level strategies and plans, with assets managed throughout their lifecycle in accordance with the Enterprise Risk Management Framework. The Asset Management Strategy provided the long-term approach to an optimised asset portfolio, which is reflected in the Asset Management Plans in accordance with the Strategic and Operational risks identified for the various asset categories.

The strategies for each asset category detail the asset management response to emerging strategic risks to maintaining the required future service levels and operational risks experienced by the assets, which are informed by various risk and reliability assessment methods. Priority investment needs detailed in the asset management plans are reported annually in the State of the Assets Reports (SotAR). The updates to the SotAR highlight the status of asset investment approaches to managing asset risks, issues and opportunities over both short (5 year) and longer term horizons.

3.3.4. Risk management

WaterNSW approach to risk

The WaterNSW approach to risk management is described in the Risk Management Policy. The Risk Management Framework (the Framework) implements this policy, and forms part of WaterNSW's strategic and operational planning, across business functions, and for project and contract management. It details the responsibilities, governance, processes and communication requirements for risk management and is consistent with ISO 31000 – Risk Management.[36]

The Framework allows for identification and management of risk throughout the WaterNSW business. It is applied to all decision making activities and ensures that risks are identified, understood and appropriate controls are implemented. It also outlines governance arrangements; the WaterNSW Board and Management Committees oversee the risk universe, establish risk context and appetite, identify key and emerging risks, and monitor progress against risk management plans.[37] The risk management plans are linked to the strategic risk register and document at a high level the risk controls addressed in separate systems and frameworks established to manage particular risks.

WaterNSW keeps a register of current major risks, and maps mitigation controls or strategies to these. Risk are also categorised. The top major current risks identified are:[38]

- Health and safety systems, processes or management fail to protect WaterNSW from harm
- Critical Asset failure or deterioration affects service capability
- Deterioration in raw water quality and/or reduction in service being delivered to customers

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[36] WaterNSW response to follow up information request, Risk Management Framework, p.4.

[37] Ibid.

[38] WaterNSW response to follow up information request: Listing of Major Risks, pp.1-2..

- Failure to provide the skills and resources required to deliver corporate strategies
- Business systems fail to meet WaterNSW needs adversely impacting business performance
- Inadequate planning to meet long term water demand
- WaterNSW causes significant environmental damage
- Material breach of legislation or licence or a dispute
- WaterNSW fails to meet the expectations of customers, shareholder, regulator or community

The following table provides an example of how risks are managed or controlled at a high level.

Table 6 WaterNSW mitigations or controls to manage current major risks

Risk description	Mitigation or control
Critical Asset failure or deterioration affects service capability	Asset Management Strategy Capital Investment Program Maintenance Program (eg strategic asset renewal and maintenance planning, asset inspection and corrective maintenance) Assessment of future asset service potential (FASP) Failure Modes Effects and Criticality Analysis (FMECA) Procedure use for critical assets SCADA monitoring of performance and condition Dam Safety Emergency Plans and O&M Manuals Inspection, monitoring and reporting program Safety reviews and risk assessments Standard Operating Procedures Incident Management Framework Insurance Incident Management Framework and procedures Contingency and site response plans
Inadequate planning to meet long term water demand	Wathnet modelling WaterNSW contribution to a consolidated NSW Government response to implementing the Basin Plan Suitable water savings projects due diligence Involvement in metropolitan water planning (MWP)

Source: WaterNSW response to follow up information request: Listing of Major Risks, pp.1-2

Operationalising risk management

Operationalisation of the Framework occurs through application of risk management tools and governance. Risk identification is the process of finding, describing and recognising uncertainties that might enhance or inhibit WaterNSW's ability to achieve its objectives. WaterNSW adopts a self-assessment process for most risk assessments.

As part of the business planning process, each business unit is required to formally review its activities and events that may affect its ability to achieve its objectives on an annual basis.[39] On completion of the process, all strategic and operational risks are recorded by the Corporate System and Risk team and rated against a matrix. Risks with a high or extreme rating are added to the strategic risk register and must have a risk management plan put in place to outline mitigation strategies. These are reviewed by the CEO and Management Committee. Risk assessments, plans, processes and tools are reviewed periodically.

The following matrix, taken from the WaterNSW Risk Management Framework defines the risk severity to WaterNSW by considering both the likelihood and consequence. A similar matric was in place while the former SCA was in existence.

RISK MATRIX					
Likelihood	Consequence				
	Negligible (1)	Minor (2)	Moderate (3)	Major (4)	Severe (5)
Almost Certain (5)	Medium (5)	Medium (10)	High (15)	Extreme (20)	Extreme (25)
Likely (4)	Low (4)	Medium (8)	High (12)	High (16)	Extreme (20)
Possible (3)	Low (3)	Medium (6)	Medium (9)	High (12)	High (15)
Unlikely (2)	Low (2)	Low (4)	Medium (6)	Medium (8)	Medium (10)
Rare (1)	Low (1)	Low (2)	Low (3)	Low (4)	Medium (5)

Source: WaterNSW Risk Management Framework, p.10.

Figure 4 WaterNSW risk matrix

How risk management informs asset management and other decisions

The system of risk reporting is designed to identify the source of the risk, the event that causes the risk to materialise, and the business objective impacted. By identifying how risks impact upon business objectives, the risk management process identifies risks associated assets or processes, and therefore informs capital and operating expenditure decisions, which might be made in order to address certain risks.

WaterNSW is working towards a risk-based approach to asset management. Determination of asset health is a fundamental aspect of asset management that takes also into account asset risk. In establishing the health of an asset, and identifying the risk associated with potential failure of that asset, WaterNSW aims to better balance risk and asset performance for the lowest whole of life cost. For example, the process informs expenditure proposals by determining and prioritising which assets might be replaced versus repaired based upon the level of associated risk.

By developing risk profiles across the entire asset portfolio and identifying opportunities to minimise risk, the WaterNSW risk management approach aims to guide asset management.

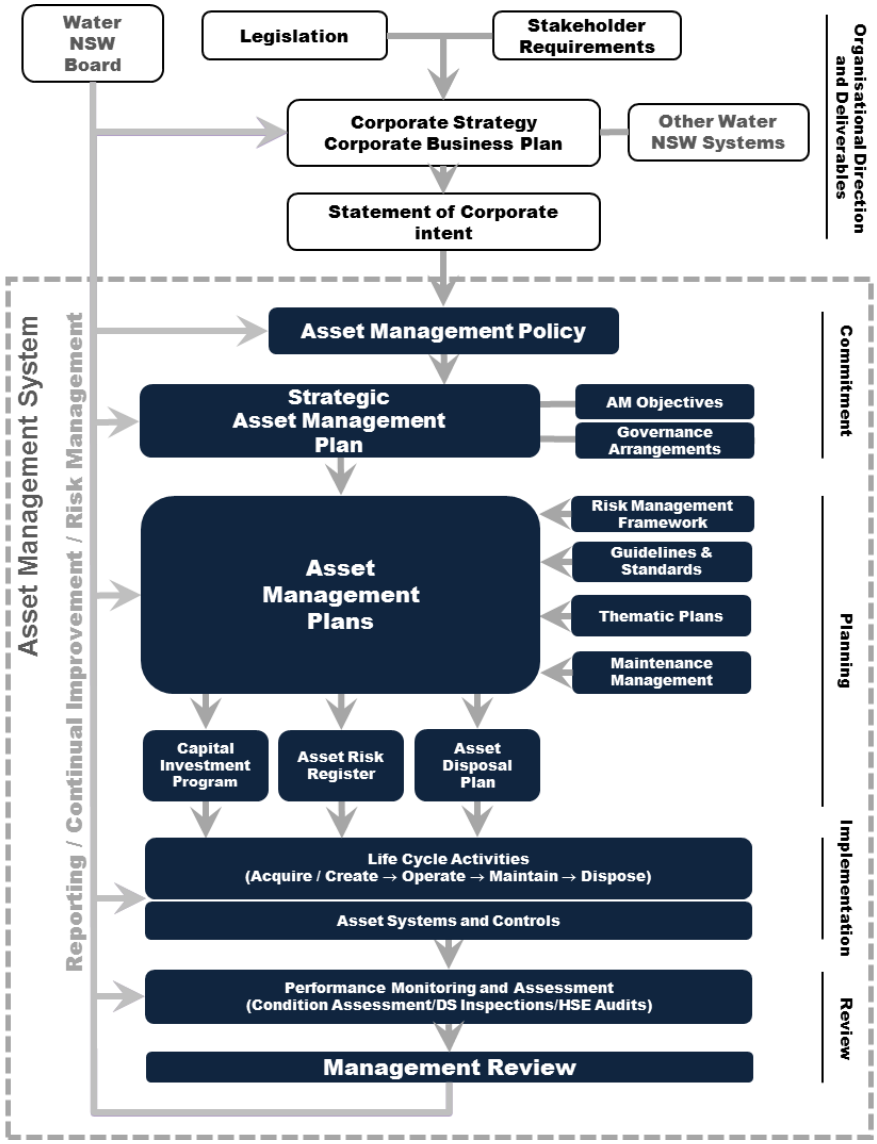
[39] Ibid.

3.3.5. Asset management

WaterNSW approach to asset management

Following the amalgamation of Sydney Catchment Authority and State Water Corporation, various Asset Management (AM) strategies or plans from each entity are being integrated into a unified approach scheduled for full implementation in December 2015. WaterNSW are aiming to have the new Asset Management System certifiable by June 2016, however, it is currently comprised of the:

- Asset Management Policy
- Asset Management Strategy, which contains the Asset Management System (or framework) and approach to Asset Life Cycle Management.
- Asset Reliability & Maintenance Strategy, which includes asset management, life cycle planning and references to detailed procedures, capital investment for minor renewal and replacement works.
- Asset Management Plans, which contain generic service requirements, but also provide detailed serviceability requirements and strategies within the appendices. Examples include AM plans for Pipelines, Dams, and Canals and Tunnels.



Source: WaterNSW initial information request item 1, Asset Management Framework, p.7.

Figure 5 WaterNSW asset management framework

The Asset Management Policy seeks to comply with the *ISO5500X* series of standards, and apply the Asset Management System to all assets, and further develop planning processes to balance performance, risk and cost across its asset portfolio.

The AMS Framework is intended to provide a consistent approach to the management of WaterNSW's asset portfolio across the full asset lifecycle. The processes, practices, systems and plans that WaterNSW utilises to manage the asset portfolio are intended to be fully completed and documented within the Strategic Asset Management Plan (SAMP), which was due to for completion in October 2015.[40]

[40] WaterNSW 2014/15 State of the Assets Report, p.8.

Operationalising WaterNSW's approach to asset management

The AMS outlines six asset management objectives to drive asset management outcomes.[41] They align closely with WaterNSW's Strategic Action Plans.

- Safer workplace
- Service dependability
- Life cycle efficiency
- Asset portfolio capability
- Statutory/ regulatory obligations
- Asset management best practice.

The AMS Framework, in consideration of the asset management objectives, forms the basis for development of specific Asset Management (AM) Plans for each category of asset.[42] The AM Plans are the main operational component of the AMS.

WaterNSW manages a diverse set of assets, whereby each asset set has unique requirements for decision making and performance management. Although the template for asset management plans may not be easily applied to all assets in a uniform manner, asset management plans consistently contain eight prompters and potential contents as outlined in the table below.

Table 7 Asset management plan guidance

Prompters	Potential contents
Asset Overview 1. *What assets are being managed by this plan?*	• Overview of the assets that currently exist including detailed asset information and the range of assets within the category • Where are the assets located? • History of the development of assets, including previous owners, previous management strategies, issues etc. • How are the assets related to other assets?
Asset Objectives 2. *Why do we own these assets and what objectives are we trying to meet?*	• Linkage to Corporate Objectives • Linkage to Asset Management Objectives • Levels of Service • Stakeholder (service delivery, regulatory, legislative) requirements • Demand, capacity and functionality requirements
Performance Management 3. *How do we measure the performance of these assets with respect to the stated objectives?*	• Linkage to asset objectives, levels of service • Condition assessments • Capacity and functionality assessments • Dependency and utilisation assessments • Current Issues • Current assessment of performance against the objectives

[41] WaterNSW initial information request item 1, Asset Management Strategy, p.11.

[42] WaterNSW initial information request item 1, Asset Management Strategy, p.44.

4. *How are the assets currently performing?*	
Investment Decision Making 5. *What risks need to be considered?* 6. *How are investment decisions made?* 7. *What are the outcomes of the analysis undertaken?*	• Decision making frameworks • Description of supporting asset systems and tools • Risk Assessments • What other Asset Management Plans should be considered with respect to these assets? • How are local requirements taken into consideration? • How are investment decisions prioritised? • What are the key management strategies to be implemented? • What are the outcomes of the decision making process?
Required Actions 8. *What actions are required to meet the objectives?*	• Capital Investment Plan • OpEx Plans • Contingency Planning Requirements • Disposal Plans

Source: WaterNSW request to initial information request, Asset Management Strategy, p.45

Implications of asset management approach on asset management and other decisions

As part of the AMS Framework, a Capital Investment Strategy (CIS) is being developed with the aim of delivering a program of capital investment that is aligned to customer needs, asset strategies and corporate priorities or objectives in counteracting the impacts of asset consumption.

The AM Plans are intended to provide the information and analysis to allow WaterNSW to optimise asset lifecycle costs, meet specified service level requirements and mitigate risks to a level that is reasonably practicable and acceptable.

3.3.6. Asset operations and maintenance

WaterNSW approach to asset operations and maintenance planning

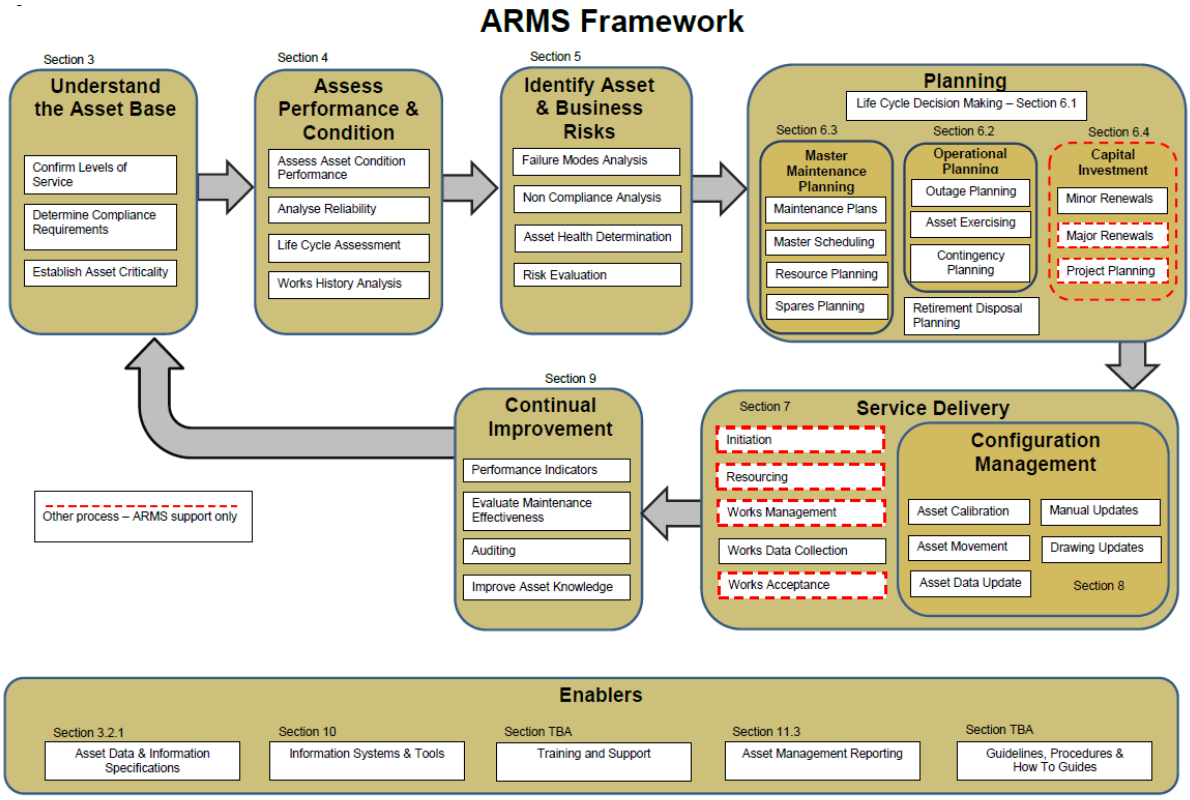
WaterNSW has a series of plans and strategies in place that support the detailed planning and implementation of its operations and maintenance activities. A key part of the overarching Asset Management Policy and embedded AMS is the Asset Reliability and Maintenance Strategy (ARMS). This strategy is designed to support maintenance through a whole of lifecycle approach that minimises the life time costs of asset ownership and operation. It does this by balancing performance, risk and cost across asset lifetime.[43] The ARMS supersedes and was partially based on a previous asset strategy that was in use by the SCA that informed the asset renewal strategies in place during the current regulatory period.

The strategies outlined under the ARMS are applicable across all asset lifecycle stages, however, its primary function is to support the strategic management of assets during the Operational Readiness, Operate/ Utilise, Maintain, Monitor, Renew and Dispose stages.

[43] WaterNSW Asset Reliability and Maintenance Strategy, p.24.

Implementation of ARMS

All asset managers with responsibilities for assets over these lifecycle stages are required to comply with the ARMS by following the guidelines and strategies outlined within it. The figure below provides a diagrammatic overview of the ARMS framework, which is outlined in detail in the WaterNSW Asset Reliability and Maintenance Framework document.



Source: WaterNSW Asset Reliability and Maintenance Framework, p.12.

Figure 6 WaterNSW ARMS Framework

Implications for expenditure proposals and other decisions

This framework has implications for expenditure proposals as it contributes to decision making by providing processes to ensure asset knowledge is available, and that decisions are prioritised according to performance and risk. Key components of the ARMS can be summarised as follows.

Understand the Asset Base

This is the step that informs the rest of the framework's processes. Given the long lifetime of many of WaterNSW's assets, capture of knowledge is critical for the ongoing management of assets. Asset managers must confirm levels of service at which an asset must perform over its lifespan. The agreed levels of service are determined in service agreements between WaterNSW and its customers and identified in the asset management plans.

Assess performance and condition

Asset performance and condition information is used to determine the likelihood of asset failure, forecasting asset lifespan expectations and supporting more accurate asset valuations. Determination of these factors contributes to optimised decision making.

Identify asset and business risks

The framework ensures that maintenance and operational effort applied to WaterNSW's assets is in direct response to the risk exposure and the organisation's risk appetite. The process for determining risk is in accordance with the Corporate Risk Management Framework mentioned above. Striking an appropriate balance between performance, risk and cost is designed to help ensure maintenance operations and investment decisions are prudent and efficient manner.

3.3.7. Program and project management

WaterNSW approach to program and project management

To support the achievement of its organisational and strategic objectives, WaterNSW has developed Program and Project Management Guidelines. WaterNSW undertakes a diverse range of projects that vary in size and scope to address its business needs.[44] The Program and Project Management Guidelines are used to deliver each project through four key phases; initiation; planning; execution and; completion. This is intended to ensure a common, transparent and systematic approach that enables optimum investment decisions to be made and implemented by WaterNSW.[45]

Operationalising WaterNSW approach to program and project management

The guidelines are applicable to all operating and capital projects undertaken by WaterNSW. They are designed as a scalable and pragmatic approach that recognises both the similarities and differences between different types of projects, including being applied in a way that is commensurate with the level of risk and/or extent of investment being considered.[46] The Guidelines are also used in conjunction with the WaterNSW Procurement Policy and Procedures.

Interaction with expenditure proposals and other decisions

Applied in conjunction with the suite of business strategy approaches at WaterNSW, the project management guidelines are designed to ensure a common, transparent and systematic approach is taken to managing programs and projects. This helps to ensure efficiency and quality in delivery of agreed project proposals, and delivery of benefits and outcomes proposed.

3.3.8. Procurement

WaterNSW approach to contract procurement and management

Following amalgamation of the SCA with State Water Corporation, the different procurement strategies of each organisation are undergoing integration. The former Sydney Catchment Authority's Contract Procurement and Management Manual provided by WaterNSW is the current approach to contract procurement. The manual was under review as of August 2015 and is awaiting consolidation into an overall strategy for WaterNSW.

The manual outlines principles that must be adopted, together with the necessary roles, responsibilities and delegations for effective contract development and administration. Its purpose is to:

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[44] WaterNSW response to initial information request, Item 1, DRAFT Program and Project Management Guidelines, p.5.

[45] Ibid.

[46] Ibid.

1. assist personnel in compiling Specifications, Tenders and Contracts on behalf of WaterNSW.

2. assist with Invitations to Tender, the evaluation of Tenders and the award of Contracts.

3. provide a comprehensive reference document for both experienced and novice contract management personnel in Contract management activities.

Operationalising WaterNSW's approach to procurement

The manual provides instructions on how to prepare and manage Supply and Construction type contracts. It encourages a greater use of procurement methods and systems that utilise performance-based specifications that specify required outcomes as opposed to narrow prescriptive-type specifications and design.[47] This approach is intended to allow WaterNSW to take advantage of innovative solutions and new technologies when tenders are invited. These broad principles also apply to contracts for Maintenance and Professional Services.[48]

To undertake procurement of a contract, management of the whole process is allocated to a contract manager. The contract manager is commonly sourced from within WaterNSW, however, where required an external candidate may be chosen. The contract manager is required to engage in-house resources or external contractors to design, document and implement activities to fulfil the contract.

At the initial stages of program or contract development, project managers and leaders discuss with the procurement office and select a strategy that is identified to deliver the contract on time, within budget and to the required quality.

Depending on the circumstances, the strategy identified may include one of the following contracts:

- Design & Construct (D&C)
- Design Development and Construct (DD&C)
- Construct Only
- Specialist Service Provision
- Goods Supply.

The procurement manual identifies core criteria that are to be incorporated into any assessment of responses to procurement processes.[49] This is designed to provide some flexibility given the diversity of goods or services procured.

- Strategic direction and objectives
- Contract objectives and outcomes
- Cost effectiveness
- Efficient employment of SCA resources
- User needs.

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47 Sydney Catchment Authority Procurement and Management Manual 2013, p.12.

48 Ibid.

49 Sydney Catchment Authority Procurement and Management Manual 2013, p.20.

How procurement guidelines affect expenditure proposals and other decisions

To ensure cost effective decisions are made in procuring goods and services contracts, the Procurement Manual outlines a number of procurement planning tiers with associated protocol.

Embedded in the procurement manual is a charter to maximise stakeholder value through cost effective sourcing of goods and services whilst ensuring probity and compliance with NSW Procurement guidelines. The manual ensures WaterNSW fulfils this charter through the implementation of proven sourcing, negotiation, contract management, supplier management and benefits realisation processes to ensure repeatable and successful outcomes. In theory, this approach would ensure that value for money is sought in all procurement decisions, and that selections are made in a cost according to the least cost.

3.4. Our assessment of WaterNSW's strategic planning and asset management

This section was to consider the role of WaterNSW's policy and operating context, and its corporate and management systems, in guiding expenditure related decision making. As was previously noted, effective systems and approaches are a necessary, but not sufficient condition, for prudent and efficient decision making.

Drawing on the review of strategic documentation, questions put to WaterNSW, interviews, and other sources, this section presents the review team's high level assessment of the overall strategic planning and asset management approaches of WaterNSW.

3.4.1. Corporate planning and strategic direction

WaterNSW is a relatively new organisation, and at the time of the review was still substantially involved in implementing new or modified corporate and business arrangements, including a new organisational structure and business units. However, at the time of review a range of important aspects of this had been completed, and were reviewed.

In general, the review team is of the view that the approach taken to redesigning and implementing new corporate arrangements is sound, and that the strategic objectives of the organisation are consistent with its mandate, including statutory obligations placed upon it, and commercial arrangements with customers. The approach taken to operationalising objectives throughout the business also appears sound and consistent with higher level objectives. For example:

- The organisations strategic objectives are consistent with the WaterNSW objectives set under the Water NSW Act 2014, and were developed to meet obligations under the State Owned Corporations Act, and in conjunction with key stakeholders within the NSW Government
- The new organisational structure is consistent with both sets of objectives, and addresses the key obligations, service standards, and other requirements placed upon WaterNSW
- Strategic Action Plans have been completed for all business units under the new structure, and are consistent with, and tied to, the strategic objectives of the organisation. While the SAPs were not all reviewed or critiqued in detail, they
    - contain more specific corporate goals for each business unit, which are directly associated with the organisations strategic objectives
    - have longer term measures that define outcomes or success

- have shorter term actions or milestones that are specific and measurable

Given full implementation of and adherence to these arrangements, they should contribute to prudent and efficient decision making in WaterNSW. As discussed in section 5 in more detail, this strategic approach to redesigning the organisation is also the source of the operational expenditure savings put forward by WaterNSW.

3.4.2. Capital investment and asset management

Long term capital investment strategy

Planning and strategy

The long term capital investment strategy for Greater Sydney is guided by both internal and external factors, information, analysis and decisions. Major supply augmentation decisions are made by Government on the advice of its water industry entities and agencies including WaterNSW. The Metropolitan Water Directorate (MWD) coordinates a planning process through periodic reviews of its Metropolitan Water Plan (MWP). Other major longer term capital investments are driven by other external drivers such as dam safety regulations and WaterNSW in response to internal management systems and processes, including through its Asset Management System.

From the WaterNSW perspective, longer term augmentation or other major capital decisions are generally guided by clearly documented strategies and reports, such as the Upper Canal Strategy, the Special Areas Strategic Plan of Management, The Future of Warragamba Dam A: A strategic Approach, and the State of the Assets Report. The Asset Management System employed by WaterNSW also supports and drives longer term capital decisions. Whole of life cycle planning is guided by the Asset Reliability and Maintenance Strategy, which contains detailed analysis and prescriptive guidance on life cycle planning and optimised decision making to ensure a 'whole-of-life' approach is taken that minimises long term costs of asset ownership and operation.

WaterNSW has developed a clear and transparent 10 year capital plan that include the phasing of expenditure on projects over the next ten years.

Drivers of expenditure

As is discussed in relation to detailed individual capital projects reviewed later in the report, drivers of expenditure are varied, but consistent with WaterNSW's obligations and requirements. For example, some expenditure is being driven by new regulatory requirements and updated risk assessments, while some is driven by operating licence conditions (including to supply water of a certain volume and quality), and others by agreed strategies related to capital assets (such as the Upper Canal strategy). Further, WaterNSW advised that capital expenditure for the upcoming period is focused on the renewal and replacement of assets to ensure infrastructure is able to reliably provide water supply service to WaterNSW's customers, in addition to dam safety, and ensuring dam infrastructure meets contemporary safety standards.[50]

Supporting processes and trade-offs

WaterNSW has a detailed series of steps in its project development process. These include the development of an options assessment business case, which is focused on defining the need and the range of options to meet the need. This can include strategies that might trade-off between operational and capital expenditure, and structural and non-structural measures. The review team has seen evidence of these options being investigated in the review of a sample of capital projects. WaterNSW has provided evidence that it assesses trade-offs associated with projects including examples of independent cost benefit analysis undertaken for major capital projects.

[50] WaterNSW response to initial information request, Item 4, p.1.

Assessment

Overall, the review team is of the view that the approach to longer term capital investment is *generally* robust. While it was beyond the scope of the review to undertake detailed analysis of individual strategies the review found that:

- WaterNSW has a long term capital strategy associated with water supply, and has other strategies, processes and documentation for guiding longer term investment for other major capital items. WaterNSW also takes guidance from whole of government processes on augmentation.
- Through the variety of planning and management systems in place, consideration is generally given to the most appropriate and least cost way of meeting current obligations, or anticipated future needs, including for major long term capital investment decisions.
- There is a whole of organisation procurement strategy that applies contemporary procurement processes to ensure goods and services are sourced at least cost. Other changes, including internalising project management functions, have been implemented by WaterNSW in pursuit of lower costs associated with projects.

Notwithstanding further comments below about institutional arrangements for supply-demand planning, the WaterNSW approach to longer term capital planning appears to be generally robust and is unlikely to be a barrier to ensuring prudent and efficient investment decisions.

However, the review also observed that a number of strategies or plans are still being amended (or awaiting decisions on modification or amendment) subsequent to the merger, and WaterNSW will need to ensure any consolidation is effective, and that processes are fully and effectively implemented across the new organisation. There appears to have been a number of delays in the implementation of the capital program during the current regulatory period. While most of these have been beyond the direct control of WaterNSW, it will be important that internal and external factors are supporting the delivery of the proposed capital program over the next regulatory period, and more specifically over the next 10 years, given the large increase in capital works projected in the subsequent regulatory periods (i.e. after 2020).

Asset management

Approach and implementation

WaterNSW has a comprehensive approach to asset management, comprising of an asset management policy, asset management system and framework, reliability and maintenance strategy, and individual asset management plans for specific assets or asset classes. The various strategies and documents are supported by comprehensive data and information collection and analysis on assets, including condition reporting, and risk assessment and analysis tools and frameworks.[51]

While the asset management approach clearly focuses effort on high value and service delivery critical assets (e.g. water storage and delivery related infrastructure), it is progressively being applied to various other asset types throughout the organisation. The AMS seeks to comply with international standards, and WaterNSW is intending that its Asset Management System is certifiable to ISO 55001:2014, the international standard for Asset management – Management systems, by June 2016.

Linking asset management and service requirements

The WaterNSW Operating Licence and its Raw Water Supply Agreements with customers generally define the required levels of service and performance requirements. The Asset Management Policy

[51] Including data collection, analysis and reporting tools such as SCADA and MAXIMO.

links with these requirements, including by stating that the AMS will consider requirements within each phase of asset lifecycles to maximise capabilities for providing agreed service levels, and committing to continual improvement and identification of opportunities to improve performance of assets in response to agreed service levels.[52] The AMS is also explicit in linking asset categories to services, by defining asset management objectives and linking these with specific outcomes sought from different assets in order to deliver services outlined in the WaterNSW Service Delivery Strategy.[53]

High level long term plans, such as within Water Supply 2100, consider water quantity and quality constraints that are intended to feed into infrastructure options analysis and if necessary investment requirements. For shorter term and current considerations, the water supply agreements are reviewed and meetings held with major customers to review performance against agreements and identify improvement opportunities. Issues related to asset service levels and performance are notified through work orders for corrective works. Identification of capital renewals and replacement due to performance gaps is identified by an 'Asset Renewal' work order, and these must also have a risk assessment and justification for consideration in the asset renewal program, which are documented in asset renewal program procedures.[54]

The Asset Management Plans also identify service requirements using input from changed service requirements and performance monitoring of existing assets. The asset and non-asset options for service delivery are assessed in project business cases along with a range of financial, risk, social and environmental considerations.[55]

Risk of asset failure or underperformance

The Asset Management Strategy helps define how WaterNSW manages risks associated with asset failure or underperformance. Dam infrastructure is maintained to a level of risk that is as low as reasonably practical (ALARP). Dam safety surveillance inspections and monitoring reports document and make recommendations for works to ensure the risks and asset condition remain within regulatory and corporate risk boundaries.[56]

The Asset Management Plans identify risks associated with operating and maintaining assets, and include risk control measures. WaterNSW has stated that it seeks to optimise expenditure for assets through orchestrated responses to failures rather than more expensive asset solutions and high maintenance costs. Contingency plans and site response plans have been developed for facilities to ensure orderly response to asset failures should they occur. [57] These include various different scenarios and response plans for different types of failures.

For certain facilities and assets, criticality assessments are undertaken to focus investment, through the Asset Reliability & Maintenance Strategy. Some low criticality assets have a 'run to failure' approach if the cost and impact of failure is low relative to ongoing inspection and maintenance. If criticality increases, effort toward monitoring and maintenance is also increased with many critical assets having real-time monitoring through WaterNSW's automated SCADA system.[58]

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52 SCA/WaterNSW Asset Management Policy p.1.

53 SCA/WaterNSW Asset Management Strategy p.3.

54 WaterNSW response to initial information request, item 3, p.4.

55 Ibid.

56 WaterNSW response to initial information request, item 3, p.5.

57 Ibid.

58 Ibid.

Determining and prioritising future expenditures

The AMS is also intended to provide long-term optimisation of the asset portfolio, by having Asset Management Plans that are consistent with strategic and operational risks identified for different asset categories. Strategies for asset categories detail responses to strategic risks to maintaining future service levels and operational risks experienced by the assets, which are informed by risk and reliability assessment tools.[59]

Priority investment needs detailed in asset management plans are reported in annual in the State of the Asset Reports, which highlight and summarise the status of assets and investment needs to manage risks, issues and opportunities over different time horizons. WaterNSW is also working towards implementing a risk based approach across the organisation where investment needs are prioritised based on risk in accordance with the Corporate Risk Management Framework.[60]

Assessment

WaterNSW has a comprehensive approach to asset management that is supported by a range of well documented strategies and processes, this includes:

- A clearly defined asset management policy, system and framework, supported by detailed asset management plans for individual assets or asset categories, that is applied to most high value and service delivery critical asset classes
- Generally established relationship between service levels and customer requirements and asset operation and maintenance, and investment
- Clear processes for managing asset failure or under performance
- Incorporation of asset condition and risk assessments in determining investment priorities.

3.4.3. Long term supply demand planning

WaterNSW plays a role in the long term supply demand planning for Sydney's water supply, but does not ultimately make final decisions on preferred major augmentations which must be within the scope of the MWP and are decided by Government. However, WaterNSW inputs a significant amount of information into this process including long-term supply demand planning and associated water modelling which are used to present WaterNSW's views, and provide information and inputs, to those processes.

Supply demand assumptions

WaterNSW advised that it does not conduct its own demand forecasts, and that forecasts for the Greater Sydney area are sourced from customers. WaterNSW relies on Sydney Water to inform WaterNSW's operations as well as supply planning forecasts.[61] WaterNSW do also have internal modelling capabilities, including MetroNet, which is used for long term planning and to provide input to MWP processes.[62]

In its public submission, WaterNSW highlighted that its demand projections are based on information supplied by customers, and its reliance on Sydney Water for updated demand forecasts for operational planning and financial modelling purposes. The WaterNSW submission used the latest update provided by Sydney Water in June 2015. WaterNSW have noted however some uncertainties

[59] WaterNSW response to initial information request, item 1, p.2.

[60] Ibid.

[61] WaterNSW response to initial information request, item 5, p.6.

[62] WaterNSW response to initial information request, item 6.

with projections, including higher population growth than previous forecasts, and substantially greater water demand in the June 2015 update compared with September 2013. In its submission, and in its discussions with the review team, WaterNSW also highlighted that actual historical demand has tended to approximate 'high' model run scenarios. This was in part presented as a rationale for the bringing forward of the Shoalhaven project in WaterNSW's original submission.

Other factors that have been considered by WaterNSW were the potential impacts of any environmental flow arrangements implemented for Warragamba dam, which would reduce system yield and bring forward the next required supply augmentation. Similarly, WaterNSW have considered possible implications of new flood management roles that may result from the Hawkesbury-Nepean Valley Flood Management Review, which could also impact on system yield and alter the timing and extent of supply augmentation.

Alignment of short and long term capital plans

WaterNSW's capital program is one main program of work, but has two planning horizons that are aligned with regulatory periods (a 5 year and 10 year horizon). The current plan contains relatively more capital expenditure in the forward than the latter period. The plan is structured around four categories of expenditure as set by IPART (mandatory standards, discretionary standards, government programs, and business efficiency).

Over the first period (and subject of this review) there is a relatively even distribution in the number of proposals across the two standards based categories and business efficiency, with fewer in government programs. Proposed spending amounts in the standards categories are substantially higher than business efficiency but consistent between them. Spending on government programs is substantially weighted towards the near term by the proposal to commence construction of the Shoalhaven transfer scheme in 2019-20. The Warragamba environmental-flows project drives significant expenditure in this category in the latter planning horizon.

Some major capital items relate to both the short and long term planning horizons including the proposed Shoalhaven transfer scheme, and the Upper Canal program, while some are only in the latter period, such as the Warragamba dam environmental flows construction. Major proposals only in the forward program include upgrades to Warragamba dam for reliability purposes, metropolitan dams electrical system upgrades, and Tallowa dam works to address code requirement issues.

While a number of these proposal are assessed in detail later in the report, neither the near term nor longer term proposals appear inconsistent with long term plans or strategies. For example, the Upper Canal proposals are aligned with the Upper Canal strategy, and the Shoalhaven proposal is consistent with the MWP and Water Supply 2100. The Warragamba environmental flows project is consistent with MWP 2010 but was deferred given the delay in MWP 2014. Other programs or projects are consistent with previously undertaken work, such as risk and reliability assessments of particular dams.

However, there are certain risks or other issues with respect to some of the proposals across the program, including:

- the deferral of the Warragamba e-flows capital program (proposed for 2020-21 to 2024-25), given a decision could potentially be made on this issue in the MWP to be released in 2016. If a decision is made by Government to implement environmental flows for Warragamba in the near term, there may be challenges in WaterNSW deferring this work until the next regulatory period.
- the Warragamba Dam reliability project being in the short term program, which could be impacted on by decisions in the MWP in 2016 about supply augmentation or environmental flows, or by decisions resulting from the Hawkesbury-Nepean Valley Flood Management Review regarding any flood mitigation role for Warragamba dam. There is a risk associated with proceeding with

upgrades to infrastructure that become redundant. However, there are also risks associated with doing nothing in the short to medium term.

- the Warragamba pipeline valves upgrade project, which is in the near term program, and could also be impacted on by decisions made about Warragamba Dam with respect to water supply augmentation or flood mitigation, and could require minor respecification of proposed works to ensure they are consistent with any changes to the dam (meaning if some works proceed, this could also become redundant and require replacement or remedial works should any valve replacements take place prior to the outcome of the Hawkesbury-Nepean Valley Flood Management Review outcome being known).

Further to the above, there may also be risks associated with WaterNSW needing to further investigate alternative water supply augmentation options. In the short term program, there is no allowance for investigations into water supply options alternative to the Shoalhaven. While MWP 2010 indicated Shoalhaven was the preferred option (and therefore WaterNSW developed its proposals accordingly) new information from the Metropolitan Water Directorate (including within DPI Water's public submission to the review[63]) suggest other options could potentially require investigation (but not construction) during the next regulatory period.

Notwithstanding these possible risks and concerns, the near and longer term elements of the capital program are broadly consistent with longer term plans and strategies developed by WaterNSW, or external agencies. There is also evidence that WaterNSW is conscious of and desiring to respond to direction from other policy processes when decisions are made, but the timing of these matters has led to WaterNSW developing its proposals in the absence of complete information or guidance from Government.

The delays in the revision of the MWP have adverse impacts on WaterNSW and raise questions in relation to institutional roles and responsibilities for supply-demand planning in the Greater Sydney area. However, if the NSW Government makes decisions in early 2016, WaterNSW has the ability to refine the capital program and ensure that decisions are made prudently and efficiently. The challenge for the review team and for IPART is that this misalignment creates significant uncertainty around a number of projects that are included in the WaterNSW submission, and some that are not included. These factors have been considered carefully in our assessment of each of the sampled capital projects, in section 4.

There is some risk that major capital project decisions are announced by the NSW government in 2016, and that these have a material impact on WaterNSW's funding requirements for the next regulatory period. IPART could consider developing a method for ensuring that lack of funding does not prohibit required work to manage long term supply-demand balance, if and when decisions are made.

3.4.4. Water quality standards in Raw Water Supply Agreements

One particular area in which the review identified opportunity for improvement was around the specification of service standards for water quality in Raw Water Supply Agreements.

Based on the current agreement with Sydney Water, there are maximum limits on a variety of water quality parameters. For example, water quality parameters at Prospect Water Filtration Plant include

[63] DPI Water Submission to IPART's reviews of prices for WaterNSW, Sydney Water Corporation and Hunter Water Corporation 2015, p.2.

turbidity, colour, iron, manganese, aluminium, hardness, alkalinity, and algae. WaterNSW is required to ensure that these limits are not exceeded.

However, clause 7 (sub-clause 2 and 3) of the agreement also state that:

> *SCA (i.e. now WaterNSW) must use its best endeavours to supply the SWC the best quality water from that which is reasonably available to the SCA at the relevant time except where:*
>
> *a. to do so would be inconsistent with the Water Sharing Plan or the SWCM Act; or*
>
> *b. the parties otherwise agree following their discussions in clause 7.1(3).*
>
> *SCA and SWC must discuss and work together, in good faith, to achieve the objectives of:*
>
> *c. efficiently managing the total operating costs of the supply of water to Customers; and*
>
> *d. effectively balancing storage levels and water quality in SCA's storages.*

As a result of these clauses, we understand that WaterNSW currently surpasses agreed maximum water quality standards and its actual management objective (as stated in the agreements) is to provide the best possible water quality in accordance with the good faith requirement for both WaterNSW and Sydney Water to efficiently manage the total operating cost of the supply of water to customers. However, there does not appear to be any transparency around the short and long term optimal levels of water quality and the trade-offs with costs by either Sydney Water or WaterNSW.

Interviews revealed that, in practice, WaterNSW does consider the costs of actions that it takes to manage water quality, as compared with the cost of providing lower quality water to Sydney Water for treatment. While admirable that both parties are attempting to manage overall costs and risks for the benefit of customers, it appears that the quantitative standards for water quality are not the drivers of investment decisions and this arrangement could break down if both parties were not entirely transparent about their water quality treatment and management costs. Therefore, regardless of how well both parties are performing, there is no clear or transparent driver for investment and service provision. The review team recommends that IPART further considers the appropriate design of these agreements to ensure that they are driving efficiency in an open and transparent manner.

3.5. Summary of key findings

- WaterNSW has undergone a major organisational redesign linked to the merger. This transformation process is still underway and is creating expected management challenges. Full and proper implementation of this process, plus integration of the supporting business systems and processes will be important for WaterNSW over the course of the next 12 months.
- By adopting a clear Strategic Action Plan with measureable KPIs for each team, WaterNSW has taken a major step forward.
- WaterNSW's capital plan for the next 10 years is substantial, yet the performance in delivering capital projects over the last 4 years has been constrained by a number of factors, often outside of the organisation's direct control. WaterNSW appear to have effective and robust processes and systems in place, however they need to ensure that they can translate plans into action and deliver projects efficiently on the ground. This will be a critical issue leading into the 2020 regulatory period, or earlier depending on various government decisions that may trigger large capital works. It is also a significant issue for the immediate next regulatory period, given the proposal to undertake higher amounts of capital expenditure than has been delivered in the past.

- There are question marks about the effectiveness and appropriateness of the institutional arrangements for long term supply-demand planning in the Greater Sydney metropolitan area. A delay of two years in the delivery of the revised Metropolitan Water Plan has resulted in significant planning uncertainty for WaterNSW. This has important implications for both the review team and IPART in making decisions about the prudence and efficiency of capital projects (see following section). The review team have needed to make a number of recommendations with imperfect information.

4. Capital expenditure

4.1. Overview

This section summarises the review of the capital expenditure undertaken; discusses WaterNSW's performance against performance measures; discusses proposed future performance measures; and makes an overall assessment of capital expenditure with recommended prudent and efficiency adjustments. It also discusses asset life assumptions and heritage assets. The outcome of our review of past and proposed expenditure and any adjustments recommended are presented herein with detail of the review of sample projects contained within Appendix A.

4.2. Summary of past and proposed expenditure

In the 2012 determination IPART approved capital expenditure for WaterNSW of $149.9 million, and WaterNSW had forecast actual expenditure of $125.1 million. For the forthcoming determination period WaterNSW proposed approximately $373.1 million. While this is a significant increase, it is heavily influenced by the Shoalhaven transfer scheme with WaterNSW's forecast including commencement of construction in 2019-20, with annual capital expenditure ranging from $65.7 to $89.9 million in the first three years, and increasing to $146.5 million in 2019-20.

WaterNSW's actual and proposed capital expenditure for the 2012-13 to 2015-16 period is presented below, and compared to the 2012 IPART determination.

Table 8 WaterNSW actual and forecast capital expenditure (current regulatory period, $million, $2015-16)

Expenditure	2012-13 actual	2013-14 actual	2014-15 actual	2015-16 forecast	Total
IPART determination 2012	35.2	37.5	36.3	40.9	149.9
Actual/forecast June 2015 proposal	19.1	33.9	14.0	58.1	125.1
WaterNSW Dec 2015 revision	0.0	0.0	0.0	-31.6	-31.6
Revised Actual/forecast	19.1	33.9	14.0	26.5	93.5
Variance to determination	-16.1	-3.6	-22.3	-14.4	-56.4
Variance to determination (%)	-45.7%	-9.6%	-61.5%	-35.2%	-37.6%

Source: Data sourced from WaterNSW Submission to the Independent Pricing and Regulatory Tribunal, Prices for the Greater Sydney Area from 1 July 2016, June 2015, p.32; 2014-15 actual was originally reported as $16.5 million in WaterNSW's June proposal; since revised by WaterNSW to $13.976 million; finally the revised forecast for 2015-16 was provided by WaterNSW on 30 November 2015.

WaterNSW's proposed capital expenditure for the 2016-17 to 2019-20 period is presented in the table below, by service requirement.

Table 9 WaterNSW proposed capital expenditure (next regulatory period, $million, $2015/16)

Financial year	2016-17	2017-18	2018-19	2019-20	Total
Renewals and reliability	48.8	73.2	48.6	36.6	207.2
Water security	3.8	8.5	17.4	104.9	134.6
Business efficiency	10.0	8.1	5.0	5.0	28.1
Other regulated	3.0	0.0	0.0	0.0	3.0
Total	**65.7**	**89.9**	**71.0**	**146.5**	**373.1**

Source: All data sourced from WaterNSW Submission to the Independent Pricing and Regulatory Tribunal, Prices for the Greater Sydney Area from 1 July 2016, June 2015, p.54.

The majority of the expenditure relates to a renewals and reliability service requirement, which involves replacing ageing assets or undertaking remedial works to typically maintain or occasionally improve reliability of existing assets. Most of the water security expenditure is for the Shoalhaven Transfer works. WaterNSW's ten year capital expenditure plan, including the current financial year, is presented in the table below.

Table 10 WaterNSW proposed capital expenditure (10 year plan, $million, $2015/16)

	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	TOTAL
Proposed capex	26.5	65.7	89.9	71.0	146.5	135.0	182.2	175.0	147.6	35.0	1,106

Source: Data sourced from 'SIR Capex 2' Tab of AIR/SIR excel file provided by IPART on 8 September 2015 (WaterNSW Greater Sydney 2015 Price Submission - Annual and Special Information Return 2015.xlsx (8/9/2015, 2:47pm)); the 10 year Capital Program table contained within the Commercial-in-Confidence appendices to WaterNSW's June 2015 proposal with exception of 2015-16, which was provided by WaterNSW on 30 November 2015. Reforecast for 2015-16 was provided by WaterNSW on 30 November 2015; does not include any 'carry forward' amounts.

4.3. Capital projects overview

A detailed review of a representative sample of past, current and proposed future capital projects was undertaken. The rationale and method for the selection of projects, presented at Section 2.7.2 above, was designed to ensure a range of project types, time periods, and past and future expenditure, and ensure sufficient coverage of the capital program by both number of projects and total value.

The fourteen projects are listed in the table below, along with the proposed capital expenditure. Of the fourteen projects examined in detail, thirteen have some expenditure already incurred or forecast to be incurred in the current regulatory period. Similarly, thirteen of the projects have expenditure forecast for the next regulatory period. The combined proposed capital expenditure is $890.6 million, representing 80.5% of the $1,106 million over the ten year planning horizon.

Table 11 Capital projects assessed ($000s, $2015-16)

Project name	SIR ID No.	Proposed capital expenditure (all years from 2012-13)
Hydrometric Renewals	WEM001	12,449
Tallowa Dam	WEM009	14,402
Warragamba Dam Reliability Upgrade	WEM013	32,737
Metropolitan Dams Electrical upgrade stage 3	WEM028	*
Catchment Security & Fencing Program	WDS002	7,697
Warragamba Pipeline valves and controls	WDS003	11,740
Catchment upgrade and rep of plant and equip	WDS008	6,937
Upper Nepean Transfer Scheme - Upper Canal Refurbishment	WDS010	12,776
Upper Nepean Transfer Scheme - Upper Canal Refurbishment Stage 2	WDS023	*
IT Assets Renewals Program	WDS025	21,082
Shoalhaven transfer works	WGP003	610,736
Bendeela Recreational Area Upgrade	WGP004	*
Minor Assets Renewals	WBE002	22,340
Motor Vehicle Fleet - procurement	WBE005	31,402
TOTAL		**890,643**

Source: Financial data sourced from 'SIR Capex 2' Tab of AIR/SIR excel file and the 10 year Capital Program table contained within the Commercial-in-Confidence appendices to WaterNSW's June 2015 proposal, provided by IPART on 8 September 2015 (WaterNSW Greater Sydney 2015 Price Submission - Annual and Special Information Return 2015.xlsx and WaterNSW Greater Sydney 2015 Price Submission to IPART - Appendices - Confidential.pdf (8/9/2015, 2:47pm)).

Notes: Expenditure totals are from WaterNSW's SIR from 2012-13 to 2024-25, adjusted to $2015-16. * Denotes content removed at the request of WaterNSW due to being commercial-in-confidence.

4.4. Past expenditure – 2011-12 to 2015-16

As detailed in Table 8, WaterNSW forecast its actual capital expenditure for the 2012-13 to 2015-16 period to be $125.1 million; with the December 2015 revised forecast for 2015-16, WaterNSW forecast total expenditure of $93.5 million, which is $56.4 million or 37.6% lower than the 2012 IPART determination. Of the fourteen projects examined in detail, thirteen have some expenditure already incurred or forecast to be incurred in the current regulatory period.

Much of the underspend ($17.7 million) has been due to the Warragamba Environmental Flows works being deferred due to external factors. While this does account for most of the underspend over the four year period however does not fully account for the wide variance in annual expenditure to that planned in 2012-13, 2014-15 and 2015-16 which can be indicative of an inability to forecast accurately, which may be driven by over-conservative estimates containing excessive contingencies. There may also be capability or resourcing issues associated with achieving proposed project delivery, which may have been exacerbated in the last year or so due to the merger.

Other projects not fully progressed as planned with a delay in forecast completion include the Warragamba Dam Reliability Upgrade, the Metropolitan Dams electrical system upgrade project, and the Burrawang Pumping Station Electrical system. The reasons for the delay to the Warragamba Environmental Flows and the Warragamba Dam Reliability Upgrade projects were found to be prudent given the external factors. Expenditure for much of the three partially delayed projects has been mostly shifted to the next regulatory period. Offsetting some of the underspend, WaterNSW also committed to bringing forward some works on the Upper Canal Refurbishment that were planned for latter stages of the program.

4.5. Capital project review

The following sections present summary results of the investigations into each of the capital projects reviewed. They draw on more detailed information presented in Appendix A.

4.5.1. Hydrometric Renewals Program WEM001

Project description and details

The Hydrometric Renewals Program is a 5 year rolling program of renewals to WaterNSW's hydrometric monitoring network which is used to meet operational needs and obligations relating to environmental flows, which requires monitoring of inflow and outflow of designated water storages. It identifies equipment that is obsolete, unsupported or otherwise unable to perform reliably for replacement with more appropriate equipment. The scope includes annual updates of 'Hydrometric condition assessment reports' performed by hydrometric field services contractors, and consultation with stakeholders to target high priority sites. The renewals program will progressively replace the oldest equipment or equipment before it becomes unsupported.

WaterNSW has forecast expenditure $3.668 million in the current regulatory period and $3.660 million in the next regulatory period. Delivery of the program is expected to be fairly steady from year to year in the forthcoming regulatory period. There was a spike in expenditure in the 2014-15 financial year, with $1.438 million, approximately double that of previous years. WaterNSW provided an explanation behind what drove this spike; a volume of 'LDS' replacements which are typically more expensive than other equipment and had to be replaced that year. Future expenditure is forecast to be fairly consistent.

Assessment

The past and forecast expenditure proposed under this project is considered to be prudent. There is a clearly defined need that is essential to fulfilling operating licence and other requirements. The expenditure is made no earlier than required to meet the need, and the investment aligns with corporate policies, strategies and objectives. The renewals also contribute to lowering operational expenditure. Past and proposed expenditure is also considered efficient, as the option chosen had the highest NPV, the program focuses older or obsolete equipment first, and the scope is no more than that intended to meet the identified need.

The review team did however observe there is no asset management plan in place for this program, which is critical to ensuring a risk-based approach to renewals, and could potentially further contribute to minimising expenditure.

Recommendation

No adjustments are recommended to proposed capital expenditure for this item (see Appendix A for proposed expenditure phasing).

4.5.2. Tallowa Dam Preliminary Risk Assessment and Design WEM009

Project description and details

Following reviews of flood hydrology and dam stability assessments WaterNSW has determined that remedial works are required to the Tallowa Dam to meet dam safety obligations. Comprehensive condition assessments and options assessments have arrived at a scope of work to undertake work on two abutment blocks, and undertake some erosion protection works for the right hand side abutment. Prior to having undertaken more detailed investigations which included obtaining concrete core samples and testing for tensile strength, the scope of works was significantly larger with five abutment blocks to have remedial work. The project is currently towards the end of the 'Stage 2' phase, i.e. investigations / concept design, with the business case for 'Stage 3' under preparation, due to be finalised in 2015.

WaterNSW proposed expenditure of $13.825 million in the forthcoming regulatory period and a forecast $0.577 million in the current regulatory period, a total of $14.402 million. It was stated at the relevant interview and clarified in writing later that due to recent investigations carried out since the pricing proposal was prepared, the scope reduced significantly, with the proposed capital expenditure reduced to approximately $3.1 million. WaterNSW plans to undertake further concept design work, to be completed April 2016. Followed by going to market (e.g. request for tender) by the end of the 2015-16 financial year with construction to take place from 2016-17.

Assessment

The revised expenditure proposed under this project is considered to be prudent. Compliance with dam safety obligations is mandatory; WaterNSW have undertaken analysis and investigations to best determine how to meet obligations, and the investment is consistent with WaterNSW's asset management plan for dams. The revised amount is also considered efficient. While a lengthy options assessment has not been carried out for the proposed works, it is clear that in this case there are no credible alternatives to meet the required need. WaterNSW has also undertaken similar works in recent years, so has high confidence in cost estimates. The unit rates are also not excessive.

Recommendation

The following table contains the recommended expenditure and compares this with WaterNSW's proposed expenditure.

Table 12 WEM009 actual, forecast and recommended capital expenditure ($000s, $2015/16)

	Current reg period 2015-16	Next reg period 2016-17	Next reg period 2017-18	Next reg period 2018-19	Total
WaterNSW actual/forecast expenditure	577	1,061	6,442	6,322	14,402
Recommended expenditure	577	1,061	1,462	-	3,100
Variance	-	0.000	-4,980	-6,322	-11,302
Variance (%)	-	0.0%	-77.3%	-100.0%	-78.5%

Source: All data sourced from 'SIR Capex 2' Tab of AIR/SIR excel file provided by IPART on 8 September 2015 (WaterNSW Greater Sydney 2015 Price Submission - Annual and Special Information Return 2015.xlsx (8/9/2015, 2:47pm)).

4.5.3. Warragamba Dam Reliability Upgrade WEM013

Project description and details

Following a previous project to investigate risk and reliability issues with Warragamba Dam, WaterNSW is proposing expenditure to undertake remedial works or replacements associated with drum and radial gates, which have been found to be unreliable. The project is driven by dam safety requirements, rather than water supply requirements. The dam gates have an important role in mitigating impacts associated with seismic activity, which is put at risk if the gates are unreliable.

Expenditure commenced in 2014/15. WaterNSW has proposed expenditure of $31.058 million in the next regulatory period and forecast $1.679 million in the current regulatory period, with expenditure forecast to be completed by 2017/18. Works are proposed to commence in the 2015-16 financial year. This is in line with the last pricing review with some minor slippage. Following the interview WaterNSW provided a revised forecast for the current financial year, with forecast expenditure of $500,000, with the balance ($1.063 million) shifted into 2016-17. This was then included within WaterNSW's December 2015 reforecast for all projects in 2015-16.

Assessment

The proposed expenditure is considered to be prudent and efficient. Issues raised with this project as part of the 2012 review have now been addressed. However, there are some risks that the new assets could be made redundant if the outcomes of the Hawkesbury-Nepean Valley Flood Management Review show that major dam alterations are required. However, any such changes could take at least 5 to 10 years to be implemented, and delaying proposed works would not be prudent, given the identified risks. The cost estimates prepared to date are sound with the estimates provided not using excessive rates, and the review team they are the best estimates available at this time. Works will be procured under public tender therefore market rates will apply. A relatively high allowance is made for contingency though no reduction is proposed for this individual project. The issue of contingency allowance is discussed in Section 4.5.15.

Recommendation

No adjustments are recommended to proposed capital expenditure for this item (see Appendix A for proposed expenditure phasing).

4.5.4. Metropolitan Dams Electrical system (stage 3) WEM028

Project description and details

WaterNSW has carried out a series of investigations into the suitability of the existing electrical assets at five dams that provide raw water supply for the Greater Sydney Area: Nepean, Cataract, Cordeaux, Avon and Woronora. This project is to renew and upgrade critical electrical systems to replace aged assets (74 to 108 years old) that in some cases present significant safety risks; it also involves upgrades to capabilities enabling less labour intense monitoring, and provides improved reliability. Electrical equipment to be replaced includes electrical, control, SCADA and communication systems.

WaterNSW provided its proposed expenditure for the forthcoming regulatory period and a forecast for the current regulatory period, however these figures have been removed at the request of WaterNSW due to being commercial-in-confidence. WaterNSW is progressing the project with construction works possibly to begin in the current financial year (2015-16).

Assessment

The expenditure proposed under this project is considered to be prudent and efficient. With ages between 74 and 108 years, condition reports on these electrical and communication assets show that they represent a risk to the reliability and safety of dam operations and should be replaced; the need has been clearly demonstrated. A thorough process has been undertaken to establish the most appropriate option with an appropriate scope of work to deliver the project needs at the least whole of life cost. While the underlying estimate is considered efficient, the allowance for the contingency amount is considered high[64]; a consideration was made whether to recommend a reduction in expenditure on this project to reduce the contingency however given evidence was found of systemic over-conservatism due to excessive contingencies, the review team decided to deal with this at a portfolio level.

Some aspects of the business case are lacking in robustness but these do not appear to affect the proposed expenditures. For example the reason for the timing of the preferred option (all works over a 4 year period) has not been stated. The condition reports state a period of 5 years, but it is evident that a delay in the works would lead to an increased risk of failure and hence spreading the works over a longer time period would appear to be not prudent.

Recommendation

The following table contains the recommended expenditure and compares this with WaterNSW's proposed expenditure, noting that figures were removed at the request of WaterNSW due to being commercial-in-confidence, and that the review team did not recommend any changes relative to the proposal.

In isolation the project timing appears appropriate however WaterNSW may find it prudent to investigate options to defer some expenditure until the final year of the next period (e.g. 2019-20) during which WaterNSW has forecast a drop in expenditure in the overall capital program. This project is one of several coincidental projects with peak expenditure during years 2016-17 and 2017-18; WaterNSW's executive and Board will be best place to make the judgement on how to smooth out some of the peaks in expenditure with a more even spread.

[64] Note that the contingency value has been removed at the request of WaterNSW due to being commercial-in-confidence.

Table 13 WEM028 proposed and recommended capital expenditure ($000s, $2015/16)

	Current reg period 2015/16	Next reg period 2016/17	Next reg period 2017/18	Next reg period 2018/19	Total
WaterNSW proposed expenditure	*	*	*	*	*
Recommended expenditure	*	*	*	*	*
Variance	-	-	-	-	-
Variance (%)	-	-	-	-	-

Source: All data sourced from 'SIR Capex 2' Tab of AIR/SIR excel file provided by IPART on 8 September 2015 (WaterNSW Greater Sydney 2015 Price Submission - Annual and Special Information Return 2015.xlsx (8/9/2015, 2:47pm)).

Note: * Denotes content removed at the request of WaterNSW due to being commercial-in-confidence.

4.5.5. Catchment Security & Fencing Program WDS002

Project description and details

WaterNSW has an established program to undertake capital works to upgrade or repair fit for purpose security barriers including fencing within designated special areas in order to protect water quality, water security, public safety and avoid expenditure for clean-up due to illegal dumping of refuse. The program has been in place since 2011-12 and is proposed to carry on into the next regulatory period and beyond. The scope of work includes identification and prioritisation of fencing needs including undertaking risk assessments; any planning or environmental approvals required; stakeholder negotiations; and finally procurement and handover of the assets.

WaterNSW has forecast expenditure of $1.792 million in the current regulatory period and proposed $3.013 million in the next regulatory period. Delivery in the current regulatory period is generally in line with the forecast contained within the business case. Works are being prioritised so that areas with the greatest need are carried out first.

Assessment

The expenditure incurred under this project during the current regulatory period and proposed for the future is considered to be prudent and efficient. The need has been demonstrated by WaterNSW and is considered to be necessary to protect water quality, maintain security of water supply, and for public safety reasons. There is also a business efficiency driver, with unplanned operating expenditure for clean-up of illegally dumped material being considerable. WaterNSW is following an appropriate risk based process to prioritise expenditure.

Some aspects of the business case are lacking in robustness but these do not appear to affect the proposed expenditures. For example different options to stage the works are not explicitly considered through it is understood from the material and from the interviews that optimal timing has been considered. The review team recommends that WaterNSW develops an optimised implementation plan for roll out of the project over the next regulatory period.

Recommendation

No adjustments are recommended to proposed capital expenditure for this item (see Appendix A for proposed expenditure phasing).

4.5.6. Warragamba Pipeline valves and controls upgrade WDS003

Project description and details

Warragamba Dam provides the primary source of Greater Sydney's water supply, storing approximately 80% of available water. Water from the dam is transferred via the Warragamba Pipeline, which comprises two parallel pipelines each approximately 27km long and ranging in diameter from 2100mm to 3000mm. The pipelines were constructed in the 1950s and 1960s, with valves on the pipeline dating back to the same era. The inherent risks of pipeline unavailability due to valve failure are significant. This project is to replace valves and actuators on the Warragamba Pipeline, leading to increased reliability, improved safety, and to allow remote operation of key valves.

WaterNSW has proposed expenditure of $10.137 million in the forthcoming regulatory period, forecast expenditure of $1.175 million in the current regulatory period, and $428,000 in 2020/21, a total of $11.74 million. Expenditure incurred to date is $727,000 with a further $448,000 forecast in the 2015-16 financial year.

Assessment

The proposed capital expenditure is considered prudent and efficient. The need has been clearly demonstrated by WaterNSW, satisfying a number of criteria including meeting licence obligations, reducing the risk of pipeline outages, delivering a safer working environment. While not a reason alone to replace an asset the valves are quite old and following a number of activities over the years to extend their life they will soon be uneconomic to maintain.

While the underlying estimate is considered efficient, the allowance for contingency is considered high[65]; a consideration was made whether to recommend a reduction in expenditure on this project to reduce the contingency, however given evidence was found of systemic over-conservatism due to excessive contingencies, the review team decided to deal with this at a portfolio level. This is discussed in Section 4.5.15.

The outcome of the Hawkesbury-Nepean Valley Flood Management Review may influence the project, as noted by DPI Water in their submission in response to IPART's WaterNSW price review Issues Paper though it is expected to be minor and should be taken into account by WaterNSW during detailed design. WaterNSW may need to make adjustments to the project scope depending on the outcome of the review, which is expected to be known by the second quarter of 2016.

Recommendation

No adjustments are recommended to proposed capital expenditure for this item (see Appendix A for proposed expenditure phasing).

[65] Note that the contingency value has been removed at the request of WaterNSW due to being commercial-in-confidence.

4.5.7. Catchment upgrade and replacement of plant and equipment WDS008

Project description and details

WaterNSW owns and maintains a suite of plant and equipment used for firefighting and other proactive hazard reduction works. This includes mobile plant such as firefighting appliances, front-end loaders, lawn mowers, along with portable equipment such as chainsaws, pumps, radios, spray units for weed management and trailers. To ensure these assets are fit for purpose and turned over in a sustainable manner WaterNSW has an ongoing replacement program, that has been in place during the current regulatory period and will continue into the future.

WaterNSW has forecast actual expenditure of $1.113 million in the current regulatory period and $2.786 million in the next regulatory period. Expenditure forecasts are provided beyond this out to 2024-25. Expenditure typically ramps up and down from year to year, with a limited ability to or value from smoothing expenditure. This is driven by the program renewing assets on an age and condition basis, optimising the residual value available.

Assessment

The expenditure incurred to date and that proposed is considered to be prudent and efficient. Retaining the assets is essential to WaterNSW meeting its obligations under the Rural Fire Act 1997, while replacement of assets on the basis of either when they reach end of useful life or when they will achieve an optimised trade-in price, which is sound and appropriately risk based.

WaterNSW is following an appropriate process to prioritise renewals expenditure and ensure it is carried out based on evidence of asset performance and condition. WaterNSW is optimising the financial outcome by taking into account likely residual values of plant and equipment, which results in an overall lower capital cost.

Recommendation

No adjustments are recommended to proposed capital expenditure for this item (see Appendix A for proposed expenditure phasing).

4.5.8. Upper Nepean Transfer Scheme - Upper Canal Refurbishment WDS010

Project description and details

The Upper Canal is the primary method of transferring water from the four Upper Nepean dams to the Prospect Water Filtration Plant, supplying on average approximately 20% of Greater Sydney's water. Originally constructed in the 1800's, and in very sparsely populated areas, asset deterioration and urban encroachment has resulted in a different risk profile for the Upper Canal. Urbanisation increases risks to water quality and water security, while the Upper Canal itself poses a safety risk to surrounding populations. Asset deterioration constrains available water supply.

WaterNSW has developed The Upper Canal Strategy to address the range of issues associated with the canal, including system yield, workplace health and safety and public safety risks, which are primarily to do with the asset condition. The Upper Canal Refurbishment is a multi-stage project to refurbish the Upper Canal, which is deteriorating and impacting on WaterNSW's ability to supply water to Sydney. This project is for 'Stage 1' of the short term works for which expenditure is occurring within the current regulatory period. Another project (WDS023) is for Stage 2 of the short term works to occur primarily in the forthcoming regulatory period, and is subject to a separate assessment.

WaterNSW has incurred expenditure to date of $5.869 million and proposes expenditure of $6.907 million in 2015/16, a total forecast expenditure of $12.776 million. This includes an amount of approximately $4.85 million for works brought forward from Stage 2.

Assessment

The expenditure proposed under this project is considered to be prudent and efficient. The Upper Canal is currently the only substantial source for Sydney if the Warragamba storage and pipelines are taken off line, providing valuable redundancy to the system in response to unexpected events (e.g. water quality incidents in Warragamba). The project was previously reviewed as part of the regulatory proposal for the current regulatory period and found to be prudent. Works are being carried out in accordance with the approved expenditure and the Upper Canal Strategy. Replacement of the canal in the short or even medium term was found to be inefficient, with WaterNSW choosing a cost effective way of extending the life of the Upper Canal at least cost. The allowance made for contingency was found to be high however given much of the expenditure has already taken place a reduction was not considered necessary in this case.

The more recent decision to bring forward work was prudent and based on a clear need to reduce risks, and also for efficiency reasons. As there are multiple drivers for the project (including delivering on core obligations and managing external risks), WaterNSW has consulted widely on the strategic approach culminating in the public release and widespread endorsement of the Upper Canal Strategy, demonstrated the multiple benefits from carrying out the works.

Recommendation

No adjustments are recommended to proposed capital expenditure for this item (see Appendix A for proposed expenditure phasing).

4.5.9. Upper Nepean Transfer Scheme - Upper Canal Refurbishment Stage 2 WDS023

Project description and details

As described above, the Upper Canal Refurbishment is a multi-stage project to refurbish the Upper Canal, which is deteriorating and impacting on WaterNSW's ability to supply water to Sydney. This project is for 'Stage 2' of the short term works for which expenditure is proposed largely within the forthcoming regulatory period. Stage 2 is the more substantive of the two stages.

The scope of work required under Stage 2 includes the balance of work identified in the Upper Canal Strategy to enable WaterNSW to operate the canal at an acceptable level of service until 2035. Works include repairs to canal walls, access platforms, stormwater cross drains, aqueduct inlet and outlet, provision of props to support canal walls, and other ancillary works.

WaterNSW provided its proposed expenditure for the forthcoming regulatory period and a forecast for the current regulatory period, but these figures have been removed at the request of WaterNSW due to being commercial-in-confidence. Some of the works proposed for Stage 2 will be carried out earlier under Stage 1, after WaterNSW made a decision to bring forward some works from Stage 2. It is proposed that the Stage 2 works are carried out by 2019/20.

Assessment

The expenditure proposed under this project is considered to be prudent and efficient. The Upper Canal is currently the only substantial source for Sydney if the Warragamba storage and pipelines are taken off line, providing valuable redundancy to the system in response to unexpected events (e.g. water quality incidents in Warragamba). The current condition of many parts of the Canal is poor

posing a range of water related and WHS risks. Condition assessments have been used to justify timing of the works.

Cost estimates developed during the Upper Canal Strategy process followed a robust process with no excessive scope. Estimates provided are sufficiently detailed given the stage of the project. Preparation of the Upper Canal Strategy as noted has been quite thorough and has undertaken analysis of a wide range of real options to meet the needs in different ways including short, medium and long term timeframes. Replacement of the canal in the short or even medium term was found to be inefficient, with WaterNSW choosing a cost effective way of extending the life of the Upper Canal at least cost.

Due to some expenditure being reallocated from this project to Stage 1, a discrepancy was noticed with the proposed expenditure for this stage still including the funds already added to Stage 1. This resulted in a reduction of approximately $5 million being required for this stage.

The allowance for contingency is considered high[66]; a consideration was made whether to recommend a reduction in expenditure on this project to reduce the contingency however given evidence was found of systemic over-conservatism due to excessive contingencies, the review team decided to deal with this at a portfolio level. This is discussed in Section 4.5.15.

Recommendation

The following table contains the recommended expenditure and compares this with WaterNSW's proposed expenditure.

Table 14 WDS023 proposed and recommended capital expenditure ($000s, $2015/16)

	2015-16	2016-17	2017-18	2018-19	2019-20	Total
WaterNSW proposed expenditure	3,075	*	*	*	*	*
Recommended expenditure	3,075	*	*	*	*	*
Variance	-	-	*	-	-	*
Variance (%)	-	-	-25.2%	-	-	-7.2%

Source: All data sourced from 'SIR Capex 2' Tab of AIR/SIR excel file provided by IPART on 8 September 2015 (WaterNSW Greater Sydney 2015 Price Submission - Annual and Special Information Return 2015.xlsx (8/9/2015, 2:47pm)).

Note: * Denotes content removed at the request of WaterNSW due to being commercial-in-confidence.

4.5.10. IT Assets Renewals Program WDS025

Project description and details

WaterNSW has had a program in place for renewal of Information Management and Communication Technology (IM&CT), prior to the current regulatory period beginning. The program generally replaces assets once they reach their depreciation age, which for desktop PCs is four years, laptop computers three years and for servers and network equipment (e.g. routers) it is five years. An unchanged

[66] Note that the contingency value has been removed at the request of WaterNSW due to being commercial-in-confidence.

approach from the current regulatory period is proposed for the next regulatory period. The works program is based on retiring all IT assets and replacing with new once the standard age is reached.

WaterNSW has forecast expenditure of $4.928 million in the current regulatory period, and proposes $8.673 million in the next regulatory period. There is a forecast increase in expenditure compared to the current period. During the interviews WaterNSW advised this is due to the types of assets that are due for renewal. WaterNSW also advised during the interviews that no consideration has been made yet regarding any change in IT infrastructure required as a result of the SCA-State Water merger though in early December provided some high level analysis of the impact of the merger.

Assessment

The expenditure undertaken in the past and that proposed is considered to be prudent. The need is demonstrated, provision of fir for purpose IT infrastructure is necessary for most it not all WaterNSW operations. However, some aspects of the most recent business case are lacking in robustness, including that there is no consideration of actual condition or performance of the assets other than to consider bringing forward replacement if performance deteriorates, and the age at which assets are replaced has not been justified. There is also no recent evidence of assumptions having been tested regarding the economic case of retaining IT assets for longer periods. However, the adoption of options to extend asset lives is not likely to materially affect the overall expenditures required.

Past expenditure is considered efficient, given these were made in accordance with approvals from the last review, options assessments were carried out, and purchasing approaches make use of whole of NSW government negotiated pricing wherever possible. Proposed future expenditure is considered efficient for the current workforce composition; however WaterNSW has proposed reduced as a result of the State Water-SCA merger. From 2016-17 this will lead to a reduced need for certain IT assets such as desktop PCs and laptops, and as such, adjustments to the future program are recommended. The review team does not believe there will be a material impact of any reduction in headcount for the year 2015-16.

Recommendation

The following tables contain the recommended expenditure and compare this with WaterNSW's proposed expenditure.

Table 15 WDS025 actual, forecast and recommended capital expenditure ($000s, $2015/16)

	Current reg period 2012-13	Current reg period 2013-14	Current reg period 2014-15	Current reg period 2015-16	Total
WaterNSW actual/forecast expenditure	1,006	853	719	2,578	4,928
Recommended expenditure	1,006	853	719	2,578	4,928
Variance	-	-	-	-	-
Variance (%)	-	-	-	-	-

Source: All data sourced from 'SIR Capex 2' Tab of AIR/SIR excel file provided by IPART on 8 September 2015 (WaterNSW Greater Sydney 2015 Price Submission - Annual and Special Information Return 2015.xlsx (8/9/2015, 2:47pm)).

Table 16 WDS025 proposed and recommended capital expenditure ($000s, $2015/16)

Financial year ($2015/16)	Next reg period 2016-17	Next reg period 2017-18	Next reg period 2018-19	Next reg period 2019-20	Total
WaterNSW proposed expenditure	1,929	2,105	3,051	1,588	8,673
Recommended expenditure	1,892	2,068	3,014	1,551	8,523
Variance	37.5	-37.5	-37.5	-37.5	-150
Variance (%)	-1.9%	-1.8%	-1.2%	-2.4%	-1.7%

Source: All data sourced from 'SIR Capex 2' Tab of AIR/SIR excel file provided by IPART on 8 September 2015 (WaterNSW Greater Sydney 2015 Price Submission - Annual and Special Information Return 2015.xlsx (8/9/2015, 2:47pm)).

4.5.11. Shoalhaven transfer works WGP003

Project description and details

The Shoalhaven transfer works project involves construction of a 3.2 metre diameter, 20 kilometre long gravity tunnel from Burrawang to Avon Dam, and would also involve increasing the system supply level trigger for initiating Shoalhaven transfers. It is designed to provide the next major water supply augmentation to Sydney by increasing the overall system yield from Sydney's water supplies by up to 30 GL per year. The project would address current constraints to additional pumping from the Shoalhaven system to the main metropolitan system. The works have been under consideration for some time, and various configuration options have previously been investigated and assessed. The project is driven by commitments made in the 2010 Metropolitan Water Plan that the Shoalhaven transfer should be completed by around 2025.

In its original proposal WaterNSW proposed expenditure of $113.116 million in the upcoming regulatory period, including approximately $100 million in the final year of the period for the first year of project construction. However, since submitting the proposal and following interviews in early October, WaterNSW withdrew the proposal to progress construction, and instead focus its investment only upon design and approvals, in the next regulatory period.

The revised proposal was for expenditure of $24.295 million over the four year period. This expenditure allows for completion of sufficient investigatory work to progress with a concept design, feasibility study and to prepare a business case. It includes expenditure on environmental studies, and a considerable allocation for geotechnical investigations ($6.9 million).

Assessment

The review team do not believe it is prudent to allow expenditure for construction during the next regulatory period. The Metropolitan Water Plan is now out of date and under active review, it is not clear that the project remains the preferred next augmentation, and given current understanding of water demand, DPI Water have suggested it is not necessary to begin construction of any augmentation for Sydney in the next regulatory period.

However, the review team do view it as prudent to allow pass-through of necessary capital expenditure for undertaking planning, conceptual design and approvals for Shoalhaven, during the

next period, based on the assumption that the WaterNSW Board would approve a new business case and respond accordingly to direction provided in Metropolitan Water Plan 2016.

In this regard, the review team believe the WaterNSW supplementary proposal of $24.295 million over the next regulatory period is inefficient due to inclusion of expenditure not required until the detailed design and construction phase; namely geotechnical investigations. The documented need of this phase is to prepare a concept design and business case in readiness for a future decision to proceed with detailed design and construction. Accordingly an adjustment is recommended. Other elements of the proposed expenditure appear reasonable and efficient.

We note that there is some uncertainty regarding our recommendation to allow the planning studies to proceed. As described above, there is significant uncertainty concerning long term supply-demand planning and resultant augmentations for Sydney. In the absence of any recent guidance from the NSW Government, WaterNSW had little choice but to include the Shoalhaven Transfer Scheme in the capital plan based on the 2010 Metropolitan Water Plan. However it is unclear that this will be the preferred augmentation and uncertainty regarding the appropriate timing.

It is likely that WaterNSW will need to undertake some planning or investigations over the next four years in order to meet supply requirements. On this basis we have recommended some capital allowance for the next tranche of investigations on the Shoalhaven Transfer Scheme. In reality, three options could eventuate:

1. no catchment related augmentation is required
2. Shoalhaven proceeds and the planning studies are required
3. other catchment project(s) require initial investigation by WaterNSW.

Our recommended approach enables option 2 and 3 to proceed however option 3 would likely be considered operating expenditure by WaterNSW. If option 1 eventuates, then over-recovery of revenue in the next regulatory period would occur. However this is limited to return on and of the recommend amount for the next series of planning studies and investigations (approximately $20.3 million of total capital expenditure). Other options available to IPART include: rejecting all capital expenditure on supply augmentations, or; providing an operating expenditure allowance to cover potential planning studies and investigations on other options.

Recommendation

The following table contains the recommended expenditure and compares this with WaterNSW's actual and proposed expenditure.

Table 17 WGP003 proposed and recommended capital expenditure ($000s, $2015/16)

	Next reg period 2016-17	Next reg period 2017-18	Next reg period 2018-19	Next reg period 2019-20	2020-21 and beyond	Total
WaterNSW proposed expenditure (original)	3,477	7,708	16,527	103,404	479,620	610,736
WaterNSW proposed expenditure (revised)	2,645	9,526	8,165	3,959	-	24,295
Recommended expenditure	2,645	5,526	8,165	3,959	-	20,295
Variance from supplementary proposal	-	-4,000	-	-	-	-4,000
Variance from supplementary proposal (%)	-	-42.0%	-	-	-	-16.5%

Source: WaterNSW Submission to the Independent Pricing and Regulatory Tribunal, Prices for the Greater Sydney Area from 1 July 2016, June 2015 and WaterNSW document, 'Supplementary Information : Burrawang to Avon Dam Tunnel – Revised Cost Projections' (16/10/2015 4:52 pm)).

4.5.12. Bendeela Recreational Area Upgrade Project WGP004

Project description and details

The project is for the upgrade of a recreational use and camping area in the Kangaroo Valley on Lake Yarrunga, including improved facilities and landscaping. The site is popular and heavily used, but has a range of management issues such as antisocial behaviour, overcrowding and vandalism particularly in the peak use periods. Ongoing management results in safety risks to WaterNSW staff and significant operating costs which is not currently recovered. Costs are associated with provision of temporary toilet facilities, collection of rubbish, and general clean-up and repairs, which are necessary to protect water quality and foreshore riparian areas. Divesting the site (given it is not usual utility business) was investigated but is not feasible, however outsourcing future management of the site is being considered. The NSW Government committed to upgrade of the site as part of Metropolitan Water Plan 2006.

WaterNSW provided its proposed expenditure for the forthcoming regulatory period and a forecast for the current regulatory period, however these figures have been removed at the request of WaterNSW due to being commercial-in-confidence. Capital expenditure is proposed to be included within WaterNSW's RAB.

Assessment

The review team questioned the inclusion of past and future capital expenditure in the RAB given the potential for unregulated revenue generation and non-core service provision, but was satisfied with WaterNSW responses (See Section 7.12.7). The proposed expenditure is considered prudent, given the need has been established and the NSW Government's formal commitment to upgrade. The project does have several benefits, including public safety, mitigation of water quality risks, and reduced WaterNSW management costs. The contingency allowance within the proposed expenditure

is considered high[67]; no reduction for this project specifically is recommended in lieu of an action at a portfolio level. This is discussed in Section 4.5.15.

However, the review team does recommend that IPART and WaterNSW ensure the appropriate regulatory treatment applies to any non-regulated income or licence fees generated through this capital investment which is being added to the regulated asset base and recovered from customers.

Recommendation

No adjustments are recommended to proposed capital expenditure for this item (see Appendix A for proposed expenditure phasing).

4.5.13. Minor Assets Renewals Program WBE002

Project description and details

The Minor Assets Renewals Program is an ongoing program to replace 'minor' assets on a prioritised basis once they reach end of life, and includes civil, mechanical and electrical assets, predominantly for water supply only. It does not include any renewal of hydrometric assets, property assets, IT assets or assets related to catchment operations. Program scope changed midway through the current regulatory period; additional expenditure was identified for 'canals and pipelines' assets such as buildings and structures and fencing and barriers. At this stage the name of the program was changed to Water Supply Asset Renewals.

WaterNSW has proposed expenditure of $6.795 million in the forthcoming regulatory period and a forecast $6.401 million in the current regulatory period. WaterNSW's asset management tools are used to drive the program and are used to determine which assets require renewal on a rolling 12 month program using an evidence-based approach to prioritise expenditure. This enables the program to fit within budgeted expenditure and manage risks. Options investigations have been undertaken which support the current approach to renewals.

Assessment

Both past and proposed expenditure is considered prudent. There is a clearly defined need and the annual budget is based on a model that uses asset condition and criticality information stored in the asset management system. The forecast proposed is also consistent with past expenditure, giving some confidence there is no over-forecasting, and timing of asset renewals are being optimised. Expenditure is also considered efficient, with contractors being used to deliver work and cost forecasts based on market rates. Contracting and delivery arrangements also support efficient outcomes.

While the underling estimates and expenditure to date is considered efficient, the allowance for contingency is considered high; no reduction for this project specifically is recommended in lieu of an action at a portfolio level. This is discussed in Section 4.5.15.

Recommendation

No adjustments are recommended to proposed capital expenditure for this item (see Appendix A for proposed expenditure phasing).

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[67] Note that the contingency value has been removed at the request of WaterNSW due to being commercial-in-confidence.

4.5.14. Motor Vehicles

Project description and details

WaterNSW maintains a motor vehicle fleet for the Greater Sydney area of approximately 87 vehicles made up of pool, operational and package vehicles. The vehicles are required mostly for front-line operational staff, but some are used for office-based staff. Vehicles are owned by WaterNSW and are replaced once they reach a certain age or travel a certain distance. WaterNSW has previously investigated optimal replacement profiles, which have been updated in recent years, and vehicles are procured via whole of government panel arrangements.

WaterNSW has proposed expenditure of $9.752 million in the forthcoming regulatory period and a forecast $9.886 million in the current regulatory period. No explicit contingency allowance was made. WaterNSW has assumed an average changeover cost per vehicle and has estimated the number of vehicles to be replaced in a given financial year; however these figures have been removed at the request of WaterNSW due to being commercial-in-confidence.

Assessment

The expenditure undertaken in the past and proposed for the future is considered to be prudent. There is a demonstrated need and expenditure has been carried out in accordance with an approved business case. Past expenditure is considered efficient, including the current turnover policy achieving high trade-in values, use of least cost procurement approaches, and synergies have been implemented with other programs. However, adjustments are proposed to future expenditure to ensure it is efficient, and recognises savings that should result from the merger.

Recommendation

The following table contains the recommended expenditure and compares this with WaterNSW's actual and proposed expenditure.

Table 18 WBE005 proposed and recommended capital expenditure for next regulatory period ($000s, $2015/16)

Financial year ($2015/16)	Next reg period 2016-17	Next reg period 2017-18	Next reg period 2018-19	Next reg period 2019-20	Total
WaterNSW proposed expenditure	2,120	2,688	2,160	2,784	9,752
Recommended expenditure	2,000	2,568	2,040	2,664	9,272
Variance	-120	-120	-120	-120	-480
Variance (%)	-5.7%	-4.5%	-5.6%	-4.3%	-4.9%

Source: All data sourced from 'SIR Capex 2' Tab of AIR/SIR excel file provided by IPART on 8 September 2015 (WaterNSW Greater Sydney 2015 Price Submission - Annual and Special Information Return 2015.xlsx (8/9/2015, 2:47pm)).

4.5.15. Contingency allowances

The review team found that allowances for contingencies varied across the different projects with a bias towards a larger percentage contingency on larger projects. Smaller projects including Tallowa

Dam and the renewals programs for hydrometric, catchment plant and equipment, IT and motor vehicles did not make any explicit allowance for contingency.

A summary of project level contingency was prepared by the review team and provided to IPART, however, this has been removed at the request of WaterNSW due to it containing commercial-in-confidence information. Shoalhaven Transfer works were excluded from this analysis due to the large size of the project in proportion to the overall scheme, and the limited information available on what contingencies were included in the original and revised estimates. The analysis completed suggests there may be a systemic bias towards over-conservatism across the capital works program, which could be a contributing factor towards over-forecasting of capital expenditure which has occurred in the past.

Table 19 Contingency allowance per project

Project name	Total contingency allowed ($nominal)	Proposed capital expenditure all reg periods ($2015-16)	% Contingency allowed
Items removed due to containing commercial-in-confidence information.			
TOTAL			

Source: Forecast expenditure per project data sourced from 'SIR Capex 2' Tab of AIR/SIR excel file provided by IPART on 8 September 2015 (WaterNSW Greater Sydney 2015 Price Submission - Annual and Special Information Return 2015.xlsx (8/9/2015, 2:47pm)) while contingencies were extracted from various business case and other supporting information provided by WaterNSW for each project.

In the review team's experience unjustified non-specific contingencies at the project level are inefficient as they tend to overestimate the outturn cost variance at the portfolio or program level. Hence contingencies for estimated outturn cost error should be accounted for at the portfolio level, not the project level. This would ensure that the smoothing effects provided by diversifying risks (and upside benefits) across a larger project portfolio are appropriately captured; that is projects will come in over and under budget.

In previous determinations in other regulated industries such as electricity, the AER has applied a diversified risk contingency across a project portfolio typically ranges from 2.6% for large portfolios to 4.6% for smaller portfolios where risk is diversified across fewer projects.[68] This range is confirmed in the TransGrid determination where the approved risk allowance was 2.8%[69] and in the Powerlink determination where the approved risk factor was 2.6%.[70]

Therefore the review team recommends that the contingencies built into WaterNSW's forecasts are inefficient and should be removed and replaced with a portfolio level risk contingency[71] to account for the probability of cost underruns when risk is priced into cost estimates. Rather than take action on a project by project basis which is unlikely to capture all of the inefficiencies given not all projects were sampled, the review team recommends a 5% reduction over the total proposed expenditure over the

[68] AER, 2008, ElectraNet Transmission Determination 2008-09 to 2012-13, p.133.

[69] AER, 2009, TransGrid Transmission Determination 2009-10 to 2013-14, p.35.

[70] AER, 2009, Powerlink Queensland transmission network revenue cap 2007-08 to 2011-12, p. 43.

[71] Note that the proposed range has been removed at the request of WaterNSW due to being commercial-in-confidence.

period 1 July 2016 to 30 June 2020 can be reasonably justified given the evidence of excessive contingencies built into the projects sampled.

The review team notes that there is little long term risk in adopting less conservative contingencies. If projects that are approved for expenditure in the next regulatory period do go over budget, then the subsequent regulatory review provides WaterNSW with the opportunity to justify that any additional expenditure was efficient, and that it should be rolled into the RAB.

4.5.16. Impacts of staff reductions on capital expenditure

A brief review was undertaken of all projects contained in the SIR to make an assessment as to whether any of the proposed expenditure is proportional to levels of staffing. The intention was to subject any such projects to a further review to determine if any adjustments had already been made by WaterNSW to account for staffing changes, or if they were considered necessary as part of this review. No projects were identified beyond the IT Assets Renewal Program and Motor Vehicle Fleet procurement that could potentially be dependent on staffing numbers.

4.5.17. Summary

After conducting the review of past, forecast and proposed capital expenditure for individual projects, the review team makes the following recommendations for adjustments:

- Tallowa Dam – WaterNSW has undertaken more recent work and determined only $3.1 million is necessary; a reduction of approximately $11.3 million.
- IT Assets Renewal Program – efficiency reductions of $0.150 million are recommended due to staff reductions following the State Water-SCA merger.
- Upper Canal works Stage 2 – a reduction of $4.972 million, an amount which was brought forward to Stage 1 but double-counted by WaterNSW.
- Shoalhaven transfer scheme – a further $4 million reduction is recommended due to over-expenditure proposed for geotechnical investigations given the project is only at the concept design/feasibility stage.
- Motor Vehicle Fleet procurement – efficiency reductions of $0.480 million are recommended due to staff reductions following the State Water-SCA merger.
- A reduction of a further 5% be made across all proposed capital expenditure from 1 July 2016 to 30 June 2020 to account for excessive contingency allowance being built into forecasts.

4.6. Performance against output measures

IPART has used output measures since the 2005 price determination to act as a point of reference and as an input to assessing the prudence and efficiency of WaterNSW's' capital and operating expenditure.

As part of this expenditure review, an assessment of whether WaterNSW has delivered against the output measures identified in the 2012 pricing determination has been undertaken.

Performance measures for the next period are discussed in Section 4.7.

4.6.1. Upper Canal Strategy

Deliver a strategy for the future of the Upper Canal by June 2013.

The Upper Canal is an essential component of Sydney's water supply system. The Upper Canal transfers water from the four Upper Nepean dams via a network of canals, tunnels and aqueducts to the Prospect Water Filtration Plant. The Upper Canal provides water supply diversification for Sydney as an alternative supply source to Warragamba Dam. Capable of supplying up to 40 per cent of Sydney's daily water requirement, on average, the Upper Canal supplies approximately 20 per cent of Sydney's water. The Upper Canal system is ageing and faces risks associated with asset condition, water quality and drainage, security and workplace health and safety. Originally designed with a capacity of 680 ML/d, the capacity of the canal is currently limited to around 500 ML/d for a range of reasons[72]

In April 2013, WaterNSW released the Upper Canal Strategy. The Upper Canal Strategy outlines a short, medium and long-term strategy for the Upper Canal. In summary:

- The short term strategy (out to 2020) is an immediate rehabilitation program designed to "reduce as many of the high and medium risks that can feasibly be addressed in a relatively short time frame, with the canal in its current form. A two stage rehabilitation program will address the most immediate issues and help increase the reliability and stability of the canal. It also includes measures to increase automation and set the canal up to continue to provide adequate service into the medium term. At the end of the rehabilitation works, all but two of the seven current high risks would have been reduced to medium".[73] Stage 1 of this rehabilitation program is well underway and WaterNSW is finalising its business case for Stage 2 of the rehabilitation program.[74,75]
- The medium term strategy (from 2020 until around 2035) is to adopt an adaptive monitoring and response approach. In anticipation of changing circumstances and emerging risks, annual budgetary provisions of $1m Capex and $0.5m Opex will be made.[76]
- The long term strategy for the existing canal involves replacement of the canal (such as with an above ground or within canal pipeline, or a tunnel), and increasing the capacity of the canal to at least 740 ML/d. A final decision has not yet been made at this stage, however any solution needs to be made as part of the metropolitan water planning process and may need to be in place by 2040, or potentially earlier.

Assessment

WaterNSW has met the performance measure.

4.6.2. Prospect Reservoir downstream filter trench upgrade

Complete the Prospect Reservoir downstream filter trench upgrade by June 2014.

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72 WaterNSW, *Submission to the Independent Pricing and Regulatory Tribunal*, June 2015, p.23.

73 Sydney Catchment Authority, *Upper Canal Strategy*, April 2013, p.2.

74 WaterNSW, *Submission to the Independent Pricing and Regulatory Tribunal*, June 2015, p.24.

75 Note that program values have been removed at the request of WaterNSW due to being commercial-in-confidence.

76 Ibid.

Prospect Dam is an earth fill dam that serves as an off line storage, providing flexibility for the water supply system and essential back up supply capability to help ensure supply continuity in the event of water quality issues or asset failure elsewhere in the system.[77]

The upgrade works to be completed under this performance measure were intended to address the downstream piping risk of the dam, and to ensure the dam meets the current dam safety requirements of the NSW Dam Safety Committee (DSC) and the Australian National Committee on Large Dams (ANCOLD).[78,79]

WaterNSW undertook a thorough process to meet the performance criterion including:

- Completion of a detailed dam safety risk assessment
- Downstream piping concept options analysis
- Economic and financial evaluation and appraisal of options for downstream improvement
- Business case development and approval of the preferred option as part of the NSW Treasury Gateway Process.[80]

The preferred option involved removal of the top portion of the existing downstream buttress, and extension of the existing filter to full crest height for the length of the dam and across into the left and right abutments as well as the installation of new filters.

The construction stage of the project was awarded for $13.7 million, $8.2 million below the original estimate. Site works commenced in October 2013 and all works were completed in October 2014.[81]

Assessment

WaterNSW has substantially met the performance measure with the project being delivered less than four months after the target timeframe.

4.6.3. Wingecarribee Dam safety upgrade

Complete the Wingecarribee Dam safety upgrade project by June 2013.

Wingecarribee Dam is a rock and earth fill dam located in the Southern Highlands region. Built in 1974 as part of the Shoalhaven Scheme, it provides water supply to the nearby towns of Bowral and Mittagong and provides top up supplies to Sydney and the Illawarra during drought periods".[82]

The Wingecarribee Dam safety upgrade was designed to "address two dam safety risks: the potential of erosion of dam material during flood events and overtopping of the dam crest which could occur due to blockage of the spillway and radial gate by floating peat".[83]

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77 WaterNSW, Submission to the Independent Pricing and Regulatory Tribunal, June 2015, p.25.

78 Ibid.

79 Sydney Catchment Authority, *Prospect Dam Improvement Works*, approval to proceed - board paper.

80 Ibid.

81 Water NSW, *Submission to the Independent Pricing and Regulatory Tribunal*, June 2015, p.25.

82 Ibid.

83 Ibid.

The project was completed in September 2012, three months ahead of schedule, and $600,000 under the initial budget of $11.9 million.[84] The completed works ensured the Wingecarribee Dam meets NSW Dams Safety Committee Regulations.[85]

Assessment

WaterNSW has met the performance measure.

4.6.4. Metropolitan Dams electrical system upgrade

Complete the Metropolitan Dams electrical system upgrade project by June 2017.

In the 2012 price determination, the Metropolitan Dams electrical system upgrade project was identified as a performance measure to be completed by April 2013. Based on advice from Halcrow, IPART agreed that the project be pushed back to "allow the project to operate with improved efficiency".[86] A revised output measure was outlined requiring delivery of the project by June 2017.

WaterNSW note that "the majority of the electrical systems at the Metropolitan Dams (Avon, Cataract, Cordeaux, Nepean and Woronora) were installed when the dams were constructed. These systems are outdated and require upgrade. The project is designed to upgrade critical electrical infrastructure such as power distribution infrastructure, substations, switchboards, cabling and monitoring and control equipment".[87]

WaterNSW advise that the concept design and documentation stage of the project has been completed and the business case for the construction and implementation phase ("Phase 3") is being finalised. WaterNSW have suggested that the construction phase of the project will be completed by 2017-18[88] although as expenditure is still proposed by WaterNSW to occur in 2018-19, this suggests this timeframe will not be met.[89]

Assessment

While good progress towards the output measure has been made, WaterNSW have suggested the project could be delayed between 1 and 2 years. This suggests the timeframe of the current output measure is unlikely to be met.

4.6.5. Upper Canal refurbishment

Upper Canal refurbishment – complete refurbishment works by June 2016.

In the 2011 price submission, the former SCA proposed a $33 million refurbishment plan for the Upper Canal. The project was to refurbish areas of the canal classified to be of major concerns and in poor condition. Works under this project include repair of the worst structural problems, fencing

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84 Wingecarribee Dam Safety Upgrade, *Project Review and Closure,* December 2012.

85 Ibid.

86 IPART, *Review of prices for the Sydney Catchment Authority From 1 July 2012 to 30 June 2016, Final Report*, June 2012, p.47.

87 WaterNSW, *Submission to the Independent Pricing and Regulatory Tribunal*, June 2015, p.25.

88 Ibid.

89 WaterNSW, Confidential appendices to pricing submission, June 2015, p.4..

improvements, refurbishment of the stormwater works in areas that present the highest structural or water quality risk and risk to public safety. The project was to be completed by December 2016.[90]

Output Measure 1 of the 2012 Determination required the former SCA to deliver a strategy for the future of the Upper Canal by June 2013. The Upper Canal strategy that was developed and submitted consisted of short, medium and long term strategy. The short term strategy consisted of a two stage rehabilitation program to address the most immediate issues and help increase the reliability and stability of the canal. The original scope of the refurbishment was therefore changed to align with the Upper Canal Strategy.[91]

The review team understands from interviews held with WaterNSW staff that works associated with Stage 1 of the strategy are on track, and due for completion in early 2016. This work has targeted the most high risk issues, consistent with the strategy.

Assessment

WaterNSW has substantially met the performance measure.

4.6.6. Warragamba Dam Environmental Flows

Warragamba Dam Environmental Flows – confirm a means of cost effectively delivering the required environmental flows specified by the NSW Government in the 2014 Metropolitan Water Plan by June 2014, with construction to begin as directed by the Government

WaterNSW advised that it has provided support in the form of hydrological and financial analysis to the NSW Government to evaluate a range of potential environmental flow regimes for Warragamba Dam. WaterNSW advised that the option assessment was completed by 30 June 2014.[92] WaterNSW also advised that a preliminary business case had been prepared and was endorsed by the Metropolitan Water Chief Executive Officers Committee for consideration as part of the next Metropolitan Water Plan.[93] As part of a status report collected for WaterNSW's annual operating licence review, WaterNSW also advised that it is contributing to revisions to the business case in support of the next Metropolitan Water Plan and the Hawkesbury Nepean Valley Flood Management Review. It is promoting the rigorous consideration of options and their economic analysis, as the first stage of ensuring overall cost effectiveness.[94]

Assessment

WaterNSW has substantially met the performance measure by providing hydrological and financial analysis support to the NSW Government for analysis of environmental flow delivery options. It continues to provide input to relevant processes affecting government decision in this area. As the MWP has not yet been finalised, it is appropriate that WaterNSW has not yet commenced construction of any works to deliver environmental flows specified in the revised MWP.

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90 WaterNSW, *Response to initial information request, Item 25 – Output measures*, October 2015 p.2.

91 Ibid.

92 WaterNSW, *Submission to the Independent Pricing and Regulatory Tribunal*, June 2015, p.25.

93 WaterNSW, *Response to initial information request, Item 25 – Output measures*, October 2015 p.3.

94 Ibid.

4.6.7. Warragamba Dam Pipeline Valves and Controls

Warragamba Dam Pipeline Valves and Controls – establish and deliver a 5-year capital program to refurbish, modify and replace all existing valves and associated infrastructure (including controls) on the Warragamba pipeline by December 2012.

The Warragamba Pipelines (No. 1 and No. 2) are two parallel pipelines that deliver raw water by gravity from Warragamba Dam to the Prospect Water Filtration Plant for treatment. The pipelines provide the majority of Sydney's water needs. The pipelines were commissioned in 1953 and 1969 respectively.[95] Prior to 2012, the pipelines had received no major upgrades since their construction and the major valves were approaching the end of their design lives.[96]

Prior to 2012, the sectional valves were subject to rigorous inspections and investigation to determine their condition and serviceability. The main purpose of the sectional valves along the Warragamba Pipelines is to regulate flows and isolate pipeline sections for maintenance purposes. In total, there are 27 such valves along the Warragamba Pipelines, ranging in size from 600mm to 3000mm.[97] A number of investigations on the sectional valves resulted in finalisation of the Warragamba Pipelines Valves and Controls Upgrade Program which was submitted to IPART in December 2012. The valves upgrade program includes a schedule of works to upgrade associated valves including by-pass valves, scour valves, anti-air/vacuum valves and minor ancillary valves.

WaterNSW advised that the program of works will now be delivered within a six year timeframe.[98] WaterNSW advised that "the business case for the construction and implementation phase of the project is being prepared. The upgrade is expected to be completed by 2021".[99] The duration of the program is dictated by the necessary valve configurations, available resources, supply considerations and operational constraints.

Assessment

WaterNSW has partially met the performance measure. The capital program has been established but capital works have not been delivered. However, it appears based on communication between WaterNSW and IPART, and the WaterNSW submission, that the performance measure was interpreted as delivery of a capital program or strategy, not delivery of physical works.

4.6.8. Warragamba Dam Reliability Upgrade

Warragamba Dam Reliability Upgrade – complete upgrade works to the crest gates and their operating systems by 2016 to ensure they are code compliant, and investigations associated with the remainder of works to address reliability of Warragamba Dam by June 2013.

The Warragamba Dam Reliability upgrade project will involve works to address dam safety issues identified through the Warragamba Dam Risk and Reliability Investigations. Investigations are onging and further details have been removed at the request of WaterNSW due to being commercial-in-confidence.

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95 Sydney Catchment Authority, *Warragamba Pipelines Valves and Controls Upgrade Program,* 2012.

96 Water NSW, *Submission to the Independent Pricing and Regulatory Tribunal*, June 2015, p.26.

97 Sydney Catchment Authority, *Warragamba Pipelines Valves and Controls Upgrade Program,* 2012.

98 Water NSW, *Submission to the Independent Pricing and Regulatory Tribunal*, June 2015 p.26.

99 Ibid.

WaterNSW have also noted that the works may be dependent on the outcomes of the Hawkesbury Nepean Valley Flood Management Review, which is not scheduled for completion until early 2016. An internal Project Change Request to extend the investigation project was approved by the SCA Chief Executive in May 2014.[100]

Assessment

WaterNSW is unlikely to meet the performance measure to deliver the Warragamba Dam Reliability Upgrade and operating system update by 2016. However, it is reasonable for the works to be delayed until the Hawkesbury Nepean Valley Flood Management Review are finalised, and the reasons for the delays have been documented and approved.

4.6.9. Shoalhaven Transfers Works

Shoalhaven Transfers Works – complete preparation and gain approval of a business case for the preferred option specified by the NSW Government in the 2014 Metropolitan Water Plan for the transfer of water from the Shoalhaven River to Sydney by June 2015.

The 2010 MWP identified the construction of a water transfer tunnel from Burrawang to Avon Dam as the likely next augmentation of Greater Sydney's water supply system. WaterNSW advised that the development of the business case is currently on hold until the next MWP is finalised. It is expected that the MWP, which is currently under review, will be updated and released in 2016.

WaterNSW expect that the revised MWP will provide further guidance on requirements for the next system augmentation. The revised MWP will provide guidance to enable WaterNSW to proceed with planning, options analysis and preparation of a business case to meet requirements specified in the revised MWP.

The review team understands that WaterNSW has been assisting the Metropolitan Water Directorate with analysis or other inputs to inform development of the next MWP, including information on factors relevant to decision making for the next augmentation.

Assessment

The performance measure has not been met owing to circumstances beyond the control of WaterNSW. It would not be appropriate for WaterNSW to develop a business case prior to completion of the revised MWP.

4.7. Proposed future output measures

IPART requested that the review team propose future output measures for the next determination period. The review team's assessment of past output measures suggest the following output measures may need to be amended and carried over:

- *Complete the Metropolitan Dams electrical system upgrade project by June 2017.*
- *Warragamba Dam Pipeline Valves and Controls – establish and deliver a 5-year capital program to refurbish, modify and replace all existing valves and associated infrastructure (including controls) on the Warragamba pipeline by December 2012.*

[100] Water NSW, *Response to initial request*, Item 25 – Output measures, p.4.

- *Shoalhaven Transfers Works – complete preparation and gain approval of a business case for the preferred option specified by the NSW Government in the 2014 Metropolitan Water Plan for the transfer of water from the Shoalhaven River to Sydney by June 2015.*

Based on the findings of the review of capital projects review, a number of new output measures could be defined around newly proposed, or updated, capital works projects or programs.

4.7.1. WaterNSW proposals for future output measures

During the course of the review, WaterNSW submitted its own proposals for future output measures, in response to the IPART issues paper, as outlined in the following table. WaterNSW's rationale for this particular selection include that the projects and their budget and delivery deadlines are representative of the Greater Sydney capital program, and cover a range of total spend amounts, business drivers, timing, and project type.[101]

Table 20 WaterNSW proposed output measures

Project name	Driver	Total Cost $000 (2015-16)	2017-2020 Cost $000 (2015-16)	Expected completion
Blue Mountains Electrical Monitoring and Control	Discretionary Stds	3,585	3,585	2019
Warragamba Embankment Upgrade	Mandatory Stds – Renewals	10,050	7,200	2022
Burrawang Pumping Station Elect System Stage 3	Mandatory Stds – Other	*	*	2018
Warragamba Pipelines valves and controls upgrade	Discretionary Stds – Other	11,533	10,137	2021
Upper Canal Interim Works Phase 2	Discretionary Stds – Other	*	*	2020
Next tranche of water (notionally Shoalhaven)	Growth	610,736	131,116	2024

Source: WaterNSW submission to IPART issues paper, p.5.

Note: * Denotes content removed at the request of WaterNSW due to being commercial-in-confidence.

4.7.2. Recommended future output measures

The review team propose the following output measures. Key selection criteria were that there be a balance of projects due for completion by the middle of the regulatory period and those due later or beyond, a variety of works ranging from one-off projects to ongoing renewal programs, and to capture an adequate proportion of the spend.

[101] WaterNSW submission to IPART issues paper, p.5.

Table 21 Proposed output measures for next regulatory period

Project	Proposed output measure	Expected completion	Rationale
Tallowa Dam Preliminary Risk Assessment and Design (WEM009)	Completion of the project meeting budget and outcomes	By December 2018	Near term project
Upper Canal Interim Works Phase 2	Completion of the project meeting budget and outcomes	2019/20	Later in regulatory period
Metropolitan Dams Electrical system (stage 3) (WEM028)	Completion of the project meeting budget and outcomes	By the end of the next regulatory period	Medium term project
Warragamba Pipelines valves and controls upgrade	Percentage of valves replaced each year	2020-21	Ongoing project
Motor vehicle fleet – procurement	Achieve a reduction in aggregate for vehicle renewal	Ongoing	Efficiency gain
Hydrometric Renewals Program (WEM001)	Detailed asset management plan in place for the program	By December 31 2016	Based on improving the evidence base and transparent prioritisation of expenditure
Blue Mountains Electrical Monitoring and Control	Project completion	By December 31 2019	Proposed by WaterNSW
Warragamba Embankment Upgrade	Progress towards project completion	By December 31 2022	Proposed by WaterNSW
Burrawang Pumping Station Elect System Stage 3	Project completion	By December 31 2018	Proposed by WaterNSW
Future augmentation of Sydney's water supply	Substantial progress required in identifying and planning the next augmentation for Sydney's water supply	By the end of the next regulatory period	Revision to proposal by WaterNSW

4.8. Heritage assets

IPART requested that the review team Identify and segregate any past or proposed capital expenditure associated with heritage assets, and quantify any expenditure on heritage assets or activities that does not contribute to the delivery of services, if possible.

WaterNSW confirmed to the review team that WaterNSW's Greater Sydney capital program does contain any expenditure that restores assets for heritage preservation purpose. While the Greater

Sydney region has a number of assets that have significant state heritage value, they are all assets that are currently operational and critical to the water supply function. While the primary purpose of any capital works is to ensure assets continue to provide reliable service, WaterNSW does ensure works comply with Heritage Council NSW requirements and do not negatively affect the heritage value of the assets.[102]

With the exception of the Upper Canal project, the review team did not find any projects relating to heritage assets. While the Upper Canal project contains heritage assets, expenditure is not being driven by heritage matters, but to address matters associated with ensuring reliability of water supply.

4.9. Asset lives

The review team were asked to consider the appropriateness of the asset lives used to calculate regulatory depreciation (return of capital) in WaterNSW's pricing proposal, and recommend adjustments if appropriate.

IPART provides for an allowance for regulatory depreciation, which provides a return of capital. In the 2012 determination an asset life of 60 years for both new and existing assets was applied across all asset classes. WaterNSW has again proposed an asset life of 60 years for this determination. WaterNSW has stated it "is of the view that the capital investment profile in the current determination period will not materially alter the average useful life of its assets."

In the Annual Information Return (AIR) WaterNSW has presented the average useful life of assets in eight different asset classes, for both new assets and for existing assets, as presented in the table below. The asset lives reported by WaterNSW for each category appear reasonable for new assets. Assets such as dams are expected to have long lives (e.g. 200 years) compared to pumping stations which would have shorter lives. However, the review team has concerns with the assumptions for the remaining life of existing assets as the remaining life is close to, or greater than, the life of new assets in some asset categories, as outlined in the following table.

[102] WaterNSW, *Response to initial request*, Item 8 – Heritage measures p.2.

Table 22 Average useful asset lives reported by WaterNSW within annual information return (Actual, 2014-15), with the review team's comments

Asset class	Average useful life of new assets (years)	Average remaining life of existing assets (years)	Reviewer comments
Unallocated assets	56	20	No comment
Dams	200	81	At face value, this appears reasonable.
Treatment plants	45	41	New asset life appears reasonable however the remaining life indicates that the current stock of treatment plants is only four years old on average, or had a different asset life.
Pipelines	120	99	At face value, this appears reasonable. However it implies that the average pipeline age is approximately 20 years.
Reservoirs/tanks	150	57	At face value, this appears reasonable.
Pump stations	45	34	These assumptions indicate that WaterNSW has a relatively new stock of pump stations.
Office equipment	12	13.5	The review team is unclear how the remaining life could be longer than the life of new assets.
Buildings	50	27	No comment
Vehicles	8	8	The remaining life could only be the same as the life of new assets if all assets were brand new.

Source: All data sourced from 'Asset lives' Tab of AIR/SIR excel file provided by IPART on 8 September 2015 (WaterNSW Greater Sydney 2015 Price Submission - Annual and Special Information Return 2015.xlsx (8/9/2015, 2:47pm)).

The unweighted average of all data within this table is 59.3 years. For new assets the unweighted average is 76.2 years and 42.3 years for existing assets. However, it is noted that these cannot be directly compared with the 60 year estimates as these are unweighted estimates. In the absence of any underlying asset value, the review team cannot convert this to a weighted average remaining life, however, given the relatively high value of dams and pipelines, and the likelihood that these make up a sizeable proportion of WaterNSW's existing asset base (relative to assets with a shorter life), the 60 years proposed by WaterNSW would appear 'reasonable'. This does assume that the remaining lives that are reported are correct, which, as stated above, seems questionable. Therefore, the review team recommend further re-examination of the weighted asset lives for the existing assets.

In principle, adopting a single asset life for existing assets is appropriate and standard regulatory practice. It is noted that there has not been substantial investment in long lived civil assets over the last four years, so it could be expected that the average remaining asset life has reduced by up to four years (i.e. to 56 years). This is further supported by our understanding that the assets that WaterNSW has constructed over this regulatory period (and which are rolled into the RAB and thus reflected in the remaining asset life) are relatively low value compared to the existing RAB, and generally not

assets that have very long lives (e.g. no dams). As a result, on balance, the review team believes that the remaining life would, if anything, have declined.

In our view, adopting a single asset life of 60 years for new assets may form an appropriate estimate in the long run, once a mix of investments have been made. A single asset life for new assets provides the benefit of simplicity when determining the regulatory allowance for return of capital under the building block approach. However, this approach is likely to lack accuracy for any particular project and within specific regulatory periods. In turn, this impacts on the timing of depreciation related cash flows, and thus risks under or overcharging customers in any particular regulatory period.

On balance, the review team recommend that IPART explores differentiating the asset lives for new assets into categories such as those provided by WaterNSW, although possibly a smaller number of categories. This is likely to provide a more accurate outcome for the upcoming regulatory period. However, it would require additional analysis of the proposed capital program. It would also introduce some minor additional complexity into IPART's pricing model, although the review team understand that this approach has been adopted in the past across a range of regulated businesses.

4.10. Overall assessment of capital expenditure

4.10.1. Past and forecast expenditure 2011-12 to 2015-16

As detailed in Table 8, in the June 2015 proposal WaterNSW forecast its actual capital expenditure for the 2012-13 to 2015-16 period to be $125.1 million, which would have been $24.8 million, or approximately 16.6%, lower than the 2012 IPART determination. The majority of this underspend was due to several large projects being deferred while there was planned to be a 'catch up' in year 2015-16 to deliver some work originally planned to take place in earlier years.

In December 2015 just prior to completing this report WaterNSW provided a revised forecast for 2015-16 which reduced the forecast in 2015-16 from $58.1 million down to approximately $26.5 million. For the four year period, total forecast capital expenditure is $93.5 million, $56.4 million or 37.6% lower than the 2012 IPART determination.

Of the expenditure examined in detail as part of the sample projects, it appears that most expenditure has delivered upon expectations with regards to outcomes. For example the hydrometric renewals program has enabled a reduction in unplanned maintenance while the Catchment Security and Fencing and Minor Assets Renewals programs are achieving the outcomes in terms of works carried out. As noted already the Warragamba Dam reliability upgrade and Metropolitan Dams electrical systems upgrade projects have been delayed, in both case the expenditure has been limited and deferred.

Past expenditure for two projects in the sample was questioned:

- Warragamba Dam Reliability Upgrade
- Bendeela Recreational Area Upgrade Project

Past expenditure (2014-15 only) for the Warragamba Dam Reliability Upgrade was deemed appropriate however WaterNSW was requested to confirm whether the forecast expenditure of $1.563 million in 2015-16 is realistic given the outcomes of the Hawkesbury-Nepean Valley Flood Management Review will not be known until closer to Q2 of 2016. WaterNSW provided a revised forecast for the current financial year, with forecast expenditure of $500,000, with the balance ($1.063 million) shifted into 2016-17. This was subsequently included in the overall re-phasing for 2015-16.

For the Bendeela Recreational Area Upgrade Project the review team noted that expenditure was incurred in each previous year of the current period and questioned whether this should have been allocated to operating expenditure. WaterNSW advised this was originally forecast to be undertaken as capital expenditure and did not believe it should be reclassified.

Following the review, only one project-level adjustment was deemed necessary for the current regulatory period, for the Warragamba Dam Reliability Upgrade. The review team does not believe any actual expenditure incurred or forecast for the remainder of the 2012-13 to 2015-16 regulatory period is imprudent or inefficient, notwithstanding the questions on deliverability.

4.10.2. Proposed expenditure 2016-17 to 2020-21

Following the review of forecast capital expenditure, the review team has recommended several adjustments. It has not determined that any projects should not proceed at all, rather there are some projects that require adjustments, generally involving reductions.

The majority of the adjustment (by value) is associated with the Shoalhaven transfer. During the course of the review, the review team questioned the proposal to undertake construction in the next regulatory period, given a range of factors and information reviewed. In response, WaterNSW proposed that the proposed expenditure for the Shoalhaven transfer scheme ($131.1 million) be withdrawn, and submitted a revised proposal for $24.3 million, but further adjustments to this amount are recommended by the review team. The other recommended adjustments are:

- Tallowa Dam – WaterNSW has undertaken more recent work and determined only $3.1 million is necessary; a reduction of approximately $11.3 million.
- IT Assets Renewal Program – efficiency reductions of $0.150 million are recommended due to staff reductions following the State Water-SCA merger.
- Upper Canal works Stage 2 – a reduction of $4.972 million, an amount which was brought forward to Stage 1 but double-counted.
- Shoalhaven transfer scheme – a further $4 million reduction is recommended due to over-expenditure proposed for geotechnical investigations given the project is only at the concept design/feasibility stage.
- Motor Vehicle Fleet procurement – efficiency reductions of $0.480 million are recommended due to staff reductions following the State Water-SCA merger.
- A reduction of a further 5% be made across all proposed capital expenditure from 1 July 2016 to 30 June 2020 to account for excessive contingency allowance being built into forecasts.

Detailed reasoning for each adjustment is contained within the Appendices under each relevant project.

In general most expenditure proposed by WaterNSW was found to be prudent. Our observations are that most projects examined had a good level of planning and detailed investigations have been carried out prior to committing to design and implementation phase. However the conservatism in estimating, including the use of arbitrary non-specific contingencies, indicates the potential for systemic inefficiencies to be built into the forecast capital expenditure, which may partially explain the consistent under-expenditure compared to forecasts in the past.

4.11. Recommended capital expenditure

Adjustments are recommended to capital expenditure for the current and future regulatory periods.

From the review, no adjustments were deemed necessary for the current regulatory period. The review team does not believe any other actual expenditure incurred or forecast for the remainder of the 2015-16 regulatory year is imprudent or inefficient. However as noted earlier WaterNSW in December 2015 submitted a revised forecast for 2015-16 which forecast capital expenditure of approximately $26.5 million, a downward revision of $31.6 million, with $27.5 million proposed to be carried over into future years, mostly 2016-17. The recommended allowable capital expenditure for the current regulatory period is as per Table 23 below.

Table 23 Recommended capital expenditure (current regulatory period, $million, $2015-16)

	2012-13 actual	2013-14 actual	2014-15 actual	2015-16 forecast	Total
IPART determination 2012	*35.2*	*37.5*	*36.3*	*40.9*	*149.9*
WaterNSW actual/forecast expenditure	19.1	33.9	14.0	58.1	125.1
Recommended project adjustments	0.0	0.0	0.0	0.0	0.0
WaterNSW adjustment 1/12/2015	0.0	0.0	0.0	-31.6	-31.6
Total recommended adjustments	**0.0**	**0.0**	**0.0**	**-31.6**	**-31.6**
Total recommended capital expenditure	**19.1**	**33.9**	**14.0**	**26.5**	**93.5**

Source: All data sourced from WaterNSW Submission to the Independent Pricing and Regulatory Tribunal, Prices for the Greater Sydney Area from 1 July 2016, June 2015, p.32. 2014-15 actual was originally reported as $16.5 million in WaterNSW's June proposal; since revised by WaterNSW to $13.976 million. Reforecast was provided by WaterNSW on 30 November 2015.

Following the review of capital expenditure proposed by WaterNSW for the next regulatory period, some adjustments are recommended as summarised in the table below.

As noted earlier, WaterNSW has proposed to carry forward expenditure of $27.5 million from 2015-16 into future years as indicated in the table below. With the review team noting that given the past history of deferrals means there may be more in the future, any additions to 2016-17 could result in further expenditure being deferred to future years. For example if $20.1 million was shifted into 2016-17, the annual expenditure as forecast by WaterNSW in 2016-17 would be approximately $84.8 million, more than three times the expected expenditure in 2015-16.

Table 24 Recommended capital expenditure (next regulatory period, $million, $2015/16) including adjustments

	2016-17	2017-18	2018-19	2019-20	Total
WaterNSW proposed capital expenditure	**65.7**	**89.9**	**71.0**	**146.5**	**373.1**
Plus WaterNSW proposed re-phasing from 2015-16	20.1	3.6	3.8	0.0	27.5
Minus Shoalhaven transfer scheme (withdrawn by WaterNSW)	-3.5	-7.7	-16.5	-103.4	-131.1
Plus WaterNSW's revised Shoalhaven transfer scheme proposal	2.6	9.5	8.2	4.0	24.3
Revised WaterNSW proposed capital expenditure	**85.0**	**95.4**	**66.4**	**47.1**	**293.8**
Adjustments					
Tallowa Dam	0.039	-5.019	-6.322	0.0	-11.302
Upper Canal Refurbishment Stage 2	0.0	-5.0	0.0	0.0	-5.0
IT Assets Renewal Program	-0.0375	-0.0375	-0.0375	-0.0375	-0.15
Shoalhaven transfer works	0.0	-4.0	0.0	0.0	-4.0
Motor Vehicle Fleet procurement	-0.12	-0.12	-0.12	-0.12	-0.488
Sub-total recommended adjustments	-0.119	-14.149	-6.480	-0.158	-20.904
Sub-total recommended capital expenditure incl. WaterNSW proposed re-phasing	**84.8**	**81.2**	**59.9**	**46.9**	**272.9**
Recommended adjustment for re-phasing	-20.1	-3.6	-3.8	0.0	-27.5
Sub-total recommended capital expenditure minus re-phasing	**64.7**	**77.6**	**56.2**	**46.9**	**245.4**
Efficiency adjustment (5%)	-3.2	-3.9	-2.8	-2.3	-12.3
Total recommended capital expenditure	**61.5**	**73.7**	**53.4**	**44.6**	**233.1**

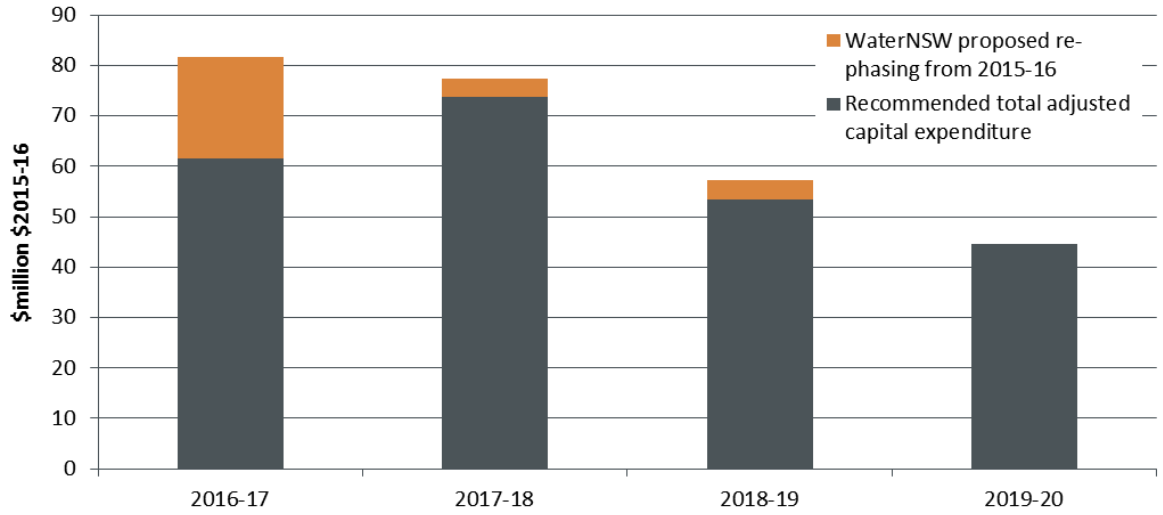
Source: All data sourced from WaterNSW Submission to the Independent Pricing and Regulatory Tribunal, Prices for the Greater Sydney Area from 1 July 2016, June 2015. WaterNSW document, 'Supplementary Information : Burrawang to Avon Dam Tunnel – Revised Cost Projections' (16/10/2015 4:52 pm)), WaterNSW correspondence regarding Upper Canal received 22/10/2015, and WaterNSW correspondence regarding Warragamba received 27/10/2015. Reforecast was provided by WaterNSW on 3 December 2015.

4.12. Deliverability of capital expenditure

The review team identified that the capital expenditure profile may be a challenge for WaterNSW to deliver; particularly when compared to actual expenditure during the current regulatory period. The review team's initial investigations found the forecast for 2015-16 had already been reduced by approximately $1.1 million due to deferral of some works on the Warragamba Dam Reliability Project and also identified there may have been other expenditure at risk of not being delivered as forecast, resulting in further work being carried forward into 2016-17.

Given concerns around 2015-16 expenditure and deliverability more broadly, in late November 2015 WaterNSW was asked to clarify its forecasts for the 2015-16 year. It advised that a review had recently been undertaken to determine whether the forecast expenditure would eventuate. WaterNSW's review resulted in a revised total forecast capital expenditure for 2015-16 of approximately $26.5 million, approximately $31.6 million less than the original forecast. The majority ($27.5 million) was proposed to be carried over into 2016-17 and following years. The reasons for the delays included the merger, delivering works under budget, and external factors. In particular, WaterNSW noted that improved rigour around project approvals processes has slowed down the rate of project initiation. However WaterNSW noted that it expects these challenges to be short term and that they would result in improvements in the following regulatory period.

Given how late the information was received, the review team was unable to undertake detailed investigations of the proposed re-phasing. However, the revision further highlighted the review team's existing concerns regarding deliverability, so further high-level assessment was undertaken. The review team found that the average annual expenditure ($58.2 million) is similar to that originally forecast in 2015-16 ($57.037 million), but more than double the latest forecast for 2015-16 ($26.5 million). The annual capital expenditure increases to a peak in 2017-18 at $73.5 million before dropping to $53.2 million and $44.6 million in 2018-19 and 2019-20 respectively as presented in Table 25 above and the figure below. Figure 7 below shows the increase the proposed roll forward amount of $27.5 million would have on the program.



Source: All data sourced from WaterNSW Submission to the Independent Pricing and Regulatory Tribunal, Prices for the Greater Sydney Area from 1 July 2016, June 2015.

Figure 7 Recommended WaterNSW capital expenditure profile 2016-17 to 2019-20 and WaterNSW proposed re-phasing from 2015-16

An expenditure profile with peaks and troughs is not necessarily an issue providing there are sufficient resources available to manage and deliver the work, and that there are not constraints on undertaking several large projects at once on the network. However, the review team's concern is that the expenditure profile may be unrealistic to deliver, and that there is a risk that WaterNSW will under-deliver against the proposed expenditure as has occurred in the past. Disruptions from the merger are additional factors not present in past years.

An example of past under-expenditure is the Prospect Reservoir Upgrade for which in the proposal WaterNSW reported will cost $13.7 million, $8.2 million below the estimate. Tallowa Dam provides an example of proposed expenditure that was over-forecast, the revised estimate now $3.1 million, well

below the $13.825 million contained within the WaterNSW proposal; and on the Warragamba Dam Reliability Upgrade project with the June proposal by WaterNSW forecasting expenditure during 2015-16 of approximately $1.6 million, since revised down to $500,000.

During the interview process it was acknowledged by WaterNSW officers that it may be a challenge to deliver some of the projects concurrently due to the ability to isolate different sections of the network at the same time (e.g. Warragamba Pipeline and Upper Canal). There may also be difficulties with internal resources to manage projects involving mechanical and electrical expertise such as the Metropolitan Dams Electrical Upgrade project and Warragamba Pipeline valves and controls upgrade, along with external resources.

For these reasons, we recommend that the under-spend in 2015-16 is not re-phased into the next regulatory period. Given the limited time available, the review team is not disputing the prudence or efficiency of the expenditure proposed for re-phasing. It is simply our view that WaterNSW may not be able to absorb this increase into the next four year period, which may result in further under-delivery. On balance the review team felt that it had little choice but to reject the proposed re-phasing on deliverability grounds, but given the limited time and information available, we note that IPART may give further consideration to this matter and any concerns WaterNSW may have with the recommendation.

To ensure the remaining capital expenditure proposed is able to be delivered as planned in an efficient and sustainable manner, it is also suggested that WaterNSW consider the proposed phasing of several of the larger projects to ensure they are able to be delivered as currently forecast, and if not, make adjustments to the planned expenditure profile to reflect a realistic delivery timeframe taking into account interdependencies, within the same overall capital expenditure forecast.

With the significant change in proposed expenditure on the Shoalhaven Transfer Scheme from that contained within WaterNSW's original pricing proposal, WaterNSW may already have been planning to revisit the proposed phasing of expenditure and interdependencies between projects. The review team recognises WaterNSW management and Board will be in the best position to determine the most efficient, achievable and sustainable capital expenditure profile; for clarity, the review team is not recommending a re-phasing of remaining capital expenditure in order to deliver a smoothed expenditure profile, but raising the issue of whether the expenditure profile can be delivered as planned.

4.13. Approach to allocating capital expenditure on corporate overheads

In its regulatory submission, WaterNSW stated that[103]:

> *costs associated with corporate wide capital projects (such as corporate information technology projects) are isolated and then allocated to each region based on the proportional value of the Regulatory Asset Base (RAB). On the basis of RAB proportion, 67% of the cost associated with corporate wide capital projects are allocated to the Greater Sydney customer base.*

This approach leads to $15.26m of WaterNSW's corporate capital expenditure being allocated to the Greater Sydney customer base over the forthcoming regulatory period.

[103] WaterNSW, *2015 Pricing submission to IPART*, June 2015, page 56

Table 25 Projects subject to WaterNSW's Corporate Allocation approach ($million, nominal)

Projects	2016-17	2017-18	2018-19	2019-20	TOTAL
WDS025 IT Assets Renewals	1,929	2,105	3,051	1,588	8,673
WBE023 ERP Implementation	2,661				2,661
WBE025 New Intranet/Internet	185			467	652
WBE026 Information Management Framework	222				222
WBE027 Enterprise Architecture		505			505
WBE035 Telephone System Replacement				1,217	1,217
WBE036 Disaster Recovery Program	148	505			653
WBE037 Merge and Upgrade Virtual Environment	44				44
WBE039 Forward Web proxy infrastructure	52				52
WBE042 Integrated WNSW Intranet	370				370
WBE043 Expansion of the integration engine	185				185
WBE044 Video conferencing expansion and bridge	22				22
TOTAL	**5,818**	**3,115**	**3,051**	**3,272**	**15,256**

Source: WaterNSW Greater Sydney 2015 Price Submission, - Annual and Special Information Return 2015

In assessing whether WaterNSW's RAB based approach is the most appropriate allocation methodology, it is important to consider:

- the cost driver that is likely to be most closely correlated with the capital costs proposed
- the administrative costs associated with implementing different approaches to measuring that cost driver, and
- the materiality of the capital costs that will be allocated based on that allocation methodology.

Based on the list of projects proposed by WaterNSW, the three main drivers of WaterNSW's forecast corporate capital expenditure appear to be:

- the physical assets owned and operated by each business (e.g., if an IT system is required to support the operation, maintenance or replacement of a physical asset, then the driver is related to the physical stock of assets)
- FTE's, where the capital cost is directly or indirectly related to the number of staff within each business (e.g., if an IT system is required to support the staff that work in each business)
- business support, where the capital cost is related to the on-going operation of the business as a whole, and not specific parts of the business (e.g., accounting systems, intranet).

Based on our review, most would appear to be related to the last cost driver – business support. For example, costs related to the internet/intranet, are not likely to be directly related to either the physical assets deployed within each business, or the number of staff deployed within each business. Rather, they would appear to be a function of the on-going operation of the WaterNSW entity as a whole.

There are a small number of minor projects which appear to be directly driven by the number of FTE's, for example, the upgrade of the telephone system. However, over half of the costs are related to IT Asset Renewals. This program replaces assets once they reach their depreciation age, which for desktop PCs is four years, laptop computers three years and for servers and network equipment (e.g. routers) it is five years. The cost of replacing computers will in part be driven by FTEs, however this is less likely to be the case for servers and network equipment, which may be a function of the amount and accessibility of information, which may include information related to the physical assets, or the operation and maintenance of those assets.

Notwithstanding any of the above, changing WaterNSW's allocation methodology to one that uses FTEs as the underlying allocation mechanism (or having a different allocation mechanism for different projects, depending on the causal driver), would need to be considered in light of the administrative costs associated with making that change, and the materiality of the impact from making that change. To this end, it is important to note that:

- the organisational redesign recently undertaken by WaterNSW was for the overall WaterNSW business, and as a result, WaterNSW has stated that it is no longer possible to explicitly distinguish between resources allocated to the previous metropolitan and rural businesses. This would add to the complexity of adopting a corporate allocation methodology that relies on FTE's as the causal driver, and
- despite IT assets having short depreciation lives (and therefore, higher percentage depreciation rates), at around $15m over 4 years, changing the allocation methodology is unlikely to materially influence forward-looking prices for either business.

Therefore, whilst WaterNSW's use of RAB as the basis for allocating corporate costs is unlikely to be perfectly reflective of the underlying cost driver, it has the benefit of:

- being readily available, and therefore easy to calculate, and
- a reasonable proxy for the physical asset base, which will be a driver of some corporate capex costs.

Overall, these features, and the fact that the costs being allocated are relatively immaterial, leads us to recommend that no change be made to WaterNSW's proposed approach to allocating WaterNSW's corporate capital expenditure costs.

5. Operating expenditure

This section discusses WaterNSW's past and forecast operating expenditure, and more specifically, our opinion as to whether that expenditure should be considered to be prudent and efficient, given WaterNSW's objectives, obligations and operating environment.

5.1. An overview of WaterNSW's forecasting approach

As discussed in section 3, WaterNSW reflects the merging of two legacy organisations – State Water and the Sydney Catchment Authority – into one combined entity. WaterNSW was formed on 1 January 2015.

Due to the timing of the development of its initial regulatory submission, WaterNSW's operational expenditure forecasts were developed midway through the budgeting processes of the former SCA and State Water. Therefore, WaterNSW's original operational expenditure forecasts (being those contained in its original regulatory submission) were based on data derived from the two former organisations' budgeting processes.[104]

The SCA's 2015-16 budgeting process involved finance collecting 10 year operational expenditure forecasts from the business, whilst the State Water 2015-16 budgeting process involved finance collecting 1 year operational expenditure forecasts with the finance budgeting team extrapolating those forecasts to future years.

Critically, it is noted that WaterNSW's original operational expenditure forecast did not include any savings resulting from the merger of the two entities. This was conveyed to IPART at the time and WaterNSW subsequently provided forecasts of the labour savings associated with the merger and organisational redesign, which have been considered by the review team.

WaterNSW's final operational expenditure forecasts are therefore a function of:

- Labour costs – which were derived based on the requirements of the new integrated organisation, and which were communicated subsequent to the original regulatory submission, and
- Non-employee related costs – which were based on data derived from the two former organisations' budgeting processes, and which were communicated in the original regulatory submission, noting that the new management did review and rationalise expenditure on consultancies as part of this process.

5.2. Approach to assessing forecast operational expenditure

To provide sufficient depth of analysis in support of any findings in relation to prudency and efficiency of operating expenditure, the review team sought to first understand, and then critique, the methodology and underlying assumptions adopted by WaterNSW to establish their forecasts. As a result, the review team focused on:

- understanding the factors driving WaterNSW's future costs

[104] WaterNSW, 2015 Pricing submission to IPART, June 2015

- ascertaining the assumptions and methodologies WaterNSW adopted to translate those cost drivers into an operational expenditure forecast.

Having regard to the above, our assessment of the prudency and efficiency of WaterNSW operating expenditure involved, amongst other things:

- Reviewing WaterNSW's regulatory submission to identify key forecasting issues and assumptions. In this context, the review team note that WaterNSW provided very little detail in its regulatory submission as to the methodology and underlying drivers for its forecast operational expenditure, hence significant time and effort was invested in other data gathering and analytical techniques, and
- Providing WaterNSW with a detailed questionnaire related to their operating expenditure forecasts. This step was complicated by the fact that WaterNSW was unable to provide responses to information requests until very late in the review process.[105]

5.3. Past operating expenditure

This section:

- highlights how WaterNSW's expenditure over the current regulatory period compares to its allowance
- summarises the key factors that have led to WaterNSW's actual expenditure differing from its allowance
- provides the review team's opinion as to the prudency and efficiency of WaterNSW's historical expenditure, given the information available.

5.3.1. Review of past operating expenditure

In its original regulatory submission, WaterNSW stated that:

> *The 2012 Determination allowed a total operating expenditure of $407 million ($2015-16) over the determination period. Based on current forecast, WaterNSW is likely to underspend its operating expenditure target by around $10 million (-3%).*[106] *The variance comparison is shown in Table 2.4 below.*

The table referenced in the above quote is reproduced below.

[105] Aither provided an initial set of questions to WaterNSW on Thursday, September 17, 2015 (email from Ryan Gormly to Ed Chan). Aither received substantive responses to this questionnaire on the 9th of October.

[106] WaterNSW, 2015 Pricing submission to IPART, June 2015, page 30.

Table 26 WaterNSW's actual operating expenditure as compared to its allowance ($million)

$ million	2012-13 actual	2013-14 actual	2014-15 forecast	2015-16 forecast	Total
2012 Determination					
Operating expenditure allowance ($2015-16)	100.6	101.8	102.1	102.2	406.7
Actual/forecast expenditure					
Operating expenditure ($nominal)	86.4	93.8*	98.6	103.6	382.4
Operating expenditure ($2015-16)	93.4	98.5	101.1	103.6	396.5
Variance to Determination ($2015-16)	-7.2	-3.4	-1.0	1.4	-10.2
Variance %	-7%	-3%	-1%	1%	-3%

* This amount excludes one off employee superannuation actuarial adjustment of $8.8 million. This amount was incurred as a result of the transfer of staff from the SCA Division to the Department of Trade and Investment as part of the Government Sector Employee Act (GSE Act) implementation.

Source: WaterNSW, 2015 Pricing submission to IPART, June 2015, page 30.

Following on from this, WaterNSW states that the main reasons for the lower than expected operating expenditure over the determination period were as follows:[107]

- Lower energy costs – Shoalhaven transfers. In the 2012 Determination, IPART provided a probability based allowance for Shoalhaven pumping cost. As dam levels remained at above 75% during the determination period, water transfers from the Shoalhaven system were not required. Expenditure is around $1.9 million below determination allowance.
- Lower energy costs – routine pumping. Apart from drought transfers, WaterNSW conducts routine transfers between its Greater Sydney reservoirs in order to balance storage levels. However, during the current determination period, high storage levels meant that routine transfers occurred less than originally budgeted, resulting in lower routine pumping cost of around $0.9 million over the determination period.
- Repeal of the Carbon Tax. Allowances for carbon tax incurred as part of day-to-day operation and Shoalhaven pumping was provided for the current determination period. Over the determination period, the carbon cost incurred by WaterNSW's Greater Sydney area of operations was around $5.6 million below determination forecast. As the Carbon Tax was repealed with effect from 1 July 2014, the carbon tax allowance for 2014-15 and 2015-16 are no longer required. As discussed in section 2.3, the allowance will be refunded to WaterNSW's customers.
- Bulk water purchases. Bulk water purchases from the Fish River Scheme were lower than initially forecast for 2012-13 as high storage levels negated the need for water purchases. Expenditure is around $0.4 million lower than determination forecast.
- Insurance premiums. Lower insurance premium were negotiated when the former SCA transferred its insurance cover to the Treasury Managed Fund. Expenditure is around $4 million below determination forecast.

[107] Ibid, page 31.

WaterNSW goes on to state that the under expenditure was offset by higher than expected costs associated with:[108]

- Managing incidents. Additional costs (around $1.2 million) were incurred to manage incidents such as bush fires in and around catchment areas as well as heavy rainfall events that led to Warragamba Dam spilling.
- Warragamba Dam Risk and Reliability Investigation. Expenditure associated with the investigation will be around $1.5 million higher than expected due to longer the expected geological investigation of Lapstone Fault complex[109].

On face value, the above information indicates that:

- WaterNSW expects to underspend the operational expenditure allowance IPART provided it by 3% over the period 2012-13 to 2015-16, and
- Much of this under expenditure is due to the impact of exogenous events, namely less pumping costs as a result of it not having to transfer water from the Shoalhaven system to meets supply requirements, the repeal of the carbon tax, and less need to utilise the Fish River Scheme, again due to the underlying supply / demand balance.

However, the information presented above indicated that even if these (positive) exogenous factors had not of eventuated, WaterNSW would have still underspent its allowance, primarily as a result of it transferring its insurance cover to the Treasury Managed Fund.

That said, two other pieces of information – the Annual Information Request and supplementary information provided in response to a question on this issue – present a different figure for actual expenditure in 2014/15, relative to what was expected at the time the regulatory submission was developed. We have tabularised these alternative data sources for completeness.

Table 27 WaterNSW's actual expenditure – as per its AIR; Supplementary information; and its original regulatory submission ($nominal million)

	2012-13 actual	2013-14 actual	2014-15 forecast	2015-16 forecast	Total
Operating expenditure – Regulatory Submission	86.4	93.8[1]	98.6	103.6	382.4
Table 3.1 of the AIR	86.4	102.6[1]	100.89	NA	NA
Supplementary information request	86.4	93.8	100.9	NA	NA

* This amount appears to reflect the difference in treatment of the one off employee superannuation actuarial adjustment of $8.8 million

Source: WaterNSW, *2015 Pricing submission to IPART*, June 2015, page 30; Table 3.1 of WaterNSW's Annual Information Return; Attachment to an email from Elli Baker to Ryan Gormly et al, Friday, 09 Oct 2015, 6:26pm.

Note: 1) This amount appears to reflect the difference in treatment of the one off employee superannuation actuarial adjustment of $8.8 million.

[108] Ibid.

[109] We note that we assume this was incurred before the project was classified as a capital expenses in 2014-15. The review team could confirm this with WaterNSW at IPART's request.

Overall, the difference in 2014/15 does not materially change the results (nor the underlying justification for the results) presented by WaterNSW in their Regulatory Submission.

In its supplementary information response, WaterNSW reiterated the drivers for its forecast under expenditure in the current regulatory period. It also stated that:

> *The variance from operational expenditure allowance has not impacted on the level of service WaterNSW provided to its customers. During the period, WaterNSW supplied water required by its customers within agreed quality specification. The underspend compared to target in the first two years is largely due to a change in climatic condition (from drought to heavy rainfall) negating the need to transfer water between systems.*[110]

On face value, this information indicates that the former SCA responded to the underlying incentives in the regulatory framework to seek out efficiencies over the regulatory period. In particular, they have:

- responded to opportunities to reduce costs in response to favourable external events – in this case, favourable climatic conditions,
- sought out opportunities to reduce costs through more efficient processes and management initiatives – in this case[111], via reduced insurance premiums stemming from SCA changing its service provider and negotiating a lower premium, whilst
- continued to provide 'water required by its customers within agreed quality specification'.

However, this does not mean that the former SCA's actual operating expenditure over the current regulatory period was necessarily prudent and efficient. It could be that the former SCA's underlying starting cost structure was in fact too high, and therefore, its outturn expenditure higher than prudent and efficient levels. The preferable way to assess this is would be to undertake a detailed benchmarking study to compare the former SCA's outturn costs of similar businesses. Such a study is beyond the scope of this engagement.

That said, WaterNSW has acknowledged that the merger of the former SCA and State Water businesses will (a) result in permanent operational expenditure savings in the upcoming price path, and in discussing these savings, WaterNSW made it quite clear that (b) it did not attribute 100% of the proposed savings to the greater economies of scale and scope that would result from merging the SCA with State Water, but rather, some of the savings would have been generated by management, even if the merger had not of occurred. Prima facie, this acknowledgement, as well the evidence that WaterNSW's has relied upon to underpin the labour costs savings it is proposing to achieve during the next regulatory period (discussed in the next section), leads us to conclude that WaterNSW's outturn expenditure for the Greater Sydney business would not have been consistent with levels of a prudent and efficient business facing the same circumstances as the former SCA. However, the review team note that the business has, and continues to undergo significant change, and although the future operating expenditure savings have been budgeted for, they have not yet been achieved in practice.

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110 Attachment to an email from Elli Baker to Ryan Gormly et al, Friday, 09 Oct 2015, 6:26pm

111 Another example of this will be if WaterNSW's FTE reductions start to manifest in 2015-16.

5.4. Future operating expenditure

This section:

- outlines the information that the review team have relied upon when making our assessment of the prudency and efficiency of WaterNSW's operational expenditure forecasts
- provides our opinion as to whether or not WaterNSW's operational expenditure forecasts are likely to be prudent and efficient, and our reasons for coming to that conclusion
- summarise the adjustments that the review team believe need to be made to WaterNSW's proposed operating expenditure forecasts to align them with levels that the review team believe are prudent and efficient.

To meet this objective, the review team have separated out our discussion into the following sub-sections:

- Efficiency savings resulting from the merger and organisational redesign
- Cost allocation methodology
- Labour cost escalators (and labour productivity)
- Materials cost escalators
- Electricity costs
- Changes in levels of service, regulatory or licence obligations
- Related Party Transactions
- Step Changes
- Capitalisation Policy
- Capex / Opex tradeoff
- Other on-going operational expenditure costs
- On-going productivity and efficiency improvements
- Final recommendations for changes

5.4.1. Efficiency savings resulting from the merger and organisational redesign

Assessment of WaterNSW's approach to developing the new organisational structure

The key factor affecting WaterNSW's forecast operational expenditure over the forthcoming regulatory period relates to the savings it is forecasting from creating the merged entity. These savings are expected to be in part, driven by the synergies generated from the creation of the combined entity, including but not limited to the removal of duplicated lines of management in every business/service unit area, as well as the removal of duplicated resources in "shared services" [112].

[112] WaterNSW, '*CEO Presentation to WaterNSW Employees: Building WaterNSW and Setting It Up For Success*,' David Harris, 21 July 2015.

To this end, WaterNSW provided the following table outlining the savings it expected to generate from the merger.

Table 28 WaterNSW's proposed savings resulting from the merger and organisational redesign

Step	Desc.	2017	2018	2019	2020	Comments
1	**WaterNSW forecast restructure savings**					
	Total savings	(6,997)	(9,883)	(9,496)	(11,839)	Calculated as the difference in the forecast costing of the new organisation structure compared to the cost of the current organisation structure
2	**WaterNSW overhead vs direct cost savings**					
	Direct $	(3,415)	(5,979)	(4,782)	(5,094)	Savings from the following Business Units were allocated as direct: Asset Development Projects, Asset Operations & Maintenance, Strategic Engineering, Water Quality Catchment Protection and People & Culture.
	%	49%	60%	50%	43%	
	Overhead $	(3,582)	(3,904)	(4,714)	(6,746)	Savings from all other Business Units are allocated to overhead.
	%	51%	40%	50%	57%	
3	**Savings allocated to the Greater Sydney area**					
	Direct %	75%				Of the employee related costs that are categorised as direct costs, 75% have been allocated to the Greater Sydney region. This forecast allocation is based on analysis of the new organisation structure, where efficiency gains are greater in the overhead business units and Greater Sydney activities than the Rural activities where resourcing has increased in the State-wide asset planning and infrastructure solutions functions.
	$	(2,561)	(4,484)	(3,587)	(3,820)	
	Overhead %	*53%*				53% of the overhead cost efficiency savings are allocated to the Greater Sydney region. This allocation is based on current forecast of the historical overhead share proportion of the combined former Sydney Catchment Authority and the former State Water Corporation.
	$	(1,899)	(2,069)	(2,498)	(3,575)	
	Total $	(4,460)	(6,553)	(6,085)	(7,395)	
4	**Savings allocated to the Rural area**					
	Direct %	25%				As above
	$	(854)	(1,495)	(1,196)	(1,273)	
	Overhead %	47%				As above
	$	(1,684)	(1,835)	(2,216)	(3,170)	
	Total	**(2,537)**	**(3,330)**	**(3,411)**	**(4,444)**	

Source: WaterNSW, 'Opex Changes Letter - 29SEPT2015 - draft for IPART v2 (clean).doc', 29 September, 2015.

Whilst the letter from which the above table was extracted contained some discussion as to how WaterNSW *allocated* its proposed efficiency savings, there was little in the way of substantive, quantitative discussion as to how WaterNSW *derived* the overall savings. Again, no information related to this topic was provided as part of WaterNSW's original regulatory submission.

To augment this, the review team met with WaterNSW to better understand their approach to developing their forecast of savings, with this supported by further written information being provided both prior to, and following, that meeting.[113]

In summary, WaterNSW has indicated that it:

- designed a new organisation Strategic Action Plan, and which feeds into a "Statement of Corporate Intent Business Plan", which NSW Treasury both reviews and is involved in the development of
- designed new team charters to support the achievement of that Strategic Action Plan
- designed new team structures, resourcing requirements, and job descriptions which followed a set of design principles that required that WaterNSW, amongst other things, (a) internally resource mission critical activities and 'baseload' work and (b) use term resources or consultants for one-off improvement, transitional or transformational work
- benchmarked proposed resourcing against peers (which will be discussed in more detail below);
- involved the executive team in scrutinising proposed resourcing, particularly where this was above the 50th percentile identified in the benchmarking report
- engaged Mercer to evaluate every job in the new organisation chart (whether a new or continuing job) and assign Mercer points based on the skills and expertise requirements of the position
- calculated the revised labour cost for the organisation derived from mapping the positions and associated Mercer points (June 2015), to existing pay scales across the existing enterprise agreements.

Importantly, the organisational redesign was undertaken for the overall WaterNSW business. As a result, WaterNSW has stated that it is no longer possible to explicitly distinguish between resources allocated to the previous metropolitan and rural businesses. This added significant complexity to the process of developing and reviewing the costs allocated to the Greater Sydney regulated business.

Notwithstanding the above, based on the information presented to us throughout the evaluation process, our opinion is that the internal arrangements and structures put in place by WaterNSW to develop its new organisational structure are robust, and consistent with what the review team would expect a prudent, well run firm to undertake.

Assessment of the number of staff proposed by WaterNSW under the new organisational structure

As referred to above, WaterNSW did commission a benchmarking study to inform the development of its organisational structure. This study, which WaterNSW provided to us, was undertaken by Third Horizon. For that benchmarking study, Third Horizon used a reference group of comparable, Australian water utilities.[114]

This Study indicated that WaterNSW's proposed staffing levels under the new structure were above the 50th percentile of the comparator firms assessed. On face value, this could indicate that despite

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[113] Meeting between Elli Baker, Chris Olszak, Rohan Harris, Greg Dowsett and Thomas Clay on 13th October, 2015.

[114] The peer group for each category was selected from a list of 12 Australian water utilities including: Barwon Water, City West Water, Hunter Water, Melbourne Water, Queensland Urban Utilities, South East Water, SunWater, Sydney Water, Water Corporation, Western Water, Wyong Shire Council and Yarra Valley Water.

the well-constructed internal process for developing the new organisational structure, the outcomes (at least in terms of staffing levels) may still be well away from the efficient frontier.

In response to this line of questioning, WaterNSW stated that the Third Horizon benchmarking report:[115]

- is accepted by WaterNSW as stipulating aspirational and steady state targets in terms of medium term employee resourcing numbers
- was considered by, and an important input into, Management and the Board's consideration of responsible staffing levels for the organisation at this time along with other appropriate matters to be taken into account.

As noted above, WaterNSW stated that all executives were specifically asked to justify resourcing where it was above the 50th percentile level. In further discussions and information provided, WaterNSW also highlighted a number of more detailed reasons why the benchmarking study was primarily used in the context of setting aspirational targets for staffing levels, and not immediate staffing level targets.

In particular, WaterNSW stated that in recommending higher staffing levels at this time, management had regard to:[116]

> *The volume of transformational, integration and business improvement work required in the short term to ensure WaterNSW meets its Strategic Action Plan deliverables and gets itself into a "steady state". This can be quantified by summing the entries under those headings in each Team Charter;*
>
> *The generally poor state of our information and communications management systems. Our key water accounting systems, by way of example, are more than 10 years out of vendor support period and require a high level of manual intervention to deliver reliable customer account and billing outcomes. Similarly, WaterNSW does not currently have a Program Management Office nor any systems and tools usually provided by such a function. The absence of such systems necessarily means that delivery requires manual input and intervention;*
>
> *The geographic spread of our business. This in part explains the slightly above benchmark numbers in our Asset Operations and Maintenance function – the need for resources on site during flood operations, for example, necessitates a higher staffing requirement than may be considered "efficient" by water utilities without our geographic spread or range of functional requirements. (Also, in the Operations area, the number of positions reflects the lack – almost absence - of operational systems giving rise the challenge for us to capture the critical knowledge of the people before many of them retire in the next few years.) It also largely explains, again by way of example, our above benchmark resourcing in our Retail function as we are required to maintain a team resourced to not only be "on the ground" to promptly address customer issues but also to manually read non-telemetered meters.*

In considering the issue of what is the appropriate staffing levels of the new WaterNSW entity, the review team need to balance management's responsibility for creating an organisation that is fit-for-purpose - that is, one that can deliver on its overarching strategic objectives - versus the likelihood

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115 WaterNSW, CONFIDENTIAL Supplementary Information - WNSW Organisation Design and Benchmarking, page 3, provided via email on 16th October, 2015.

116 Ibid.

that those staffing levels may potentially be too high, relative to a prudent and efficient business faced within similar circumstances to WaterNSW.

In assessing this, the review team have given explicit consideration to the internal process that WaterNSW's management has undertaken to create the new organisation structure, their willingness to offer up to customers, savings stemming from that new organisation structure, as well as our view as to whether the benchmarking study was fit-for-purpose, in the context of its potential use in deriving starting FTE numbers for the newly created WaterNSW business.

In relation to the level of reliance that can be placed on the benchmarking study, on the evidence presented to us during this review process, the review team broadly agree with WaterNSW's position, in particular that:

- it is inappropriate to use a benchmarking of steady state businesses to inform the resourcing requirements of a newly formed business that is undergoing significant transition
- the geographic spread of the newly created WaterNSW business – along with many other environmental, geographical and functional differences - means that drawing definitive conclusions from a "benchmarking" study such as this can be fraught with risk.

To be quite clear – none of the above is meant to reflect criticisms of the benchmarking study per se – in fact, Third Horizon make a number of similar observations.[117]

Finally, in considering our position, the review team have been mindful of the likely benefits and costs of making an incorrect assessment on such an important issue. In particular, in our view, the risks are likely to be asymmetric, in that the consequences in terms of economic efficiency associated with recommending an operational expenditure forecast that is too high in relation to this issue (i.e., prices would be higher than they otherwise should be) is likely to be outweighed by the consequences of recommending an operational expenditure forecast that is too low in relation to this issue (i.e., service levels may diminish, it has the potential to skew other investment decisions).

In summary, the review team accept that that the FTE's WaterNSW is proposing under the new organisational structure are likely to be consistent with a prudent business, given the particular circumstances (environmental, geographical and functional) faced by WaterNSW. A summary of the FTE estimates from the benchmarking study and the levels proposed by WaterNSW is outlined below.

Table 29 Proposed FTE's as compared to external benchmarks and current levels

Current FTEs*	50th Percentile Benchmark*	Blended Benchmark – 50th Percentile Greater Sydney, 75th Percentile Rural*	Proposed FTEs (July 2015)^
663	478	487	582

Source: * WaterNSW, '*CEO Presentation to WaterNSW Employees: Building WaterNSW and Setting It Up For Success*,' David Harris, 21 July 2015

^ WaterNSW, CONFIDENTIAL Supplementary Information - *WNSW Organisation Design and Benchmarking*, page 3, provided via email on 16th October, 2015

[117] For example, Third Horizon states on page 2 of its presentation that: 'WaterNSW has a number of factors that must be considered when interpreting these results, including: – *Geographic spread of assets/ services - WaterNSW has a large geographic area impacting its ability to realise synergies due to distance between assets; – Efficiencies of existing processes - Inefficient processes relative to peers will require additional resources to perform required activities*' (Third Horizon, Benchmarking Study, Final Report, 10th July, 2015).

Remuneration levels

WaterNSW effectively multiplies its FTE forecasts under the new organisational structure by a remuneration level to derive their labour costs forecast. Based on information provided by WaterNSW in meetings to discuss this issue, as well as in follow up correspondence, it is our understanding that WaterNSW effectively:

- assigns each position a 'grade'
- creates wage points (MIN, MID, MAX) for each position based on a complicated set of rules taking into account target remuneration levels and the two current Awards.

To derive the overall labour cost forecast, WaterNSW has applied a particular point on this wage range to the number of staff associated with that band, and made a series of other assumptions about vacancy rates, phasing of term positions over time, and other factors. Detail on these assumptions is not included at the request of WaterNSW due to being commercial-in-confidence.

In that same correspondence, WaterNSW noted a number of what they considered to be conservative features associated with their forecasting methodology, including that:

- The cost savings were applied to operational expenditure only, which implicitly means that WaterNSW has assumed that capitalised salaries remain fixed. The corollary is that if salary capitalisation targets are not meet, operational expenditure will be higher than otherwise forecast
- It has not made any allowance for any real labour cost increases, instead, WaterNSW states that "*we have accounted for this by using an upper end of band assumption in estimating total salary costs*".[118]

Overall, there are some aspects of WaterNSW's approach that the review team have concerns with, which the review team expressed to WaterNSW during the interview process. These included assumptions about vacancies and salaries for Award staff. As a result, the review team sought further information from WaterNSW as to the impact that varying different assumptions would make to the results. The following three figures highlight these variations. The first table is the original forecast of savings. It generates $25.2m of savings over 4 years.

Table 30 Original forecast of savings ($2015-16)

	2017	2018	2019	2020
Total operating expenditure – Original Submission	**102,680**	**100,956**	**101,436**	**100,633**
Less Savings attributable to Restructure	(4,727)	(6,918)	(6,626)	(6,953)
Add Profile Risk Assessment ('PRA') Costs	764	1,320	1,772	640
Total operating expenditure – Revised Submission	**98,717**	**95,358**	**96,581**	**94,320**
Net Savings	3,963	5,598	4,854	6,313

Source: 'Estimate Summary.xls' – an attachment to an email from Eilli Baker to Chris Olszak et al, on Wed 14/10/2015 8:51 PM

[118] Ibid.

The next table assumes a slightly higher rate of vacancies and lower average salaries for positions within each grade, with exact details not disclosed at the request of WaterNSW due to being commercial-in-confidence. This nearly doubles the savings from the merger attributable to Greater Sydney, to $45.9m over 4 years.

Table 31 Revised forecast of Savings assuming low salaries and higher vacancies ($2015-16)

	2017	2018	2019	2020
Total operating expenditure – Original Submission	**102,680**	**100,956**	**101,436**	**100,633**
Less Savings attributable to Restructure	(10,094)	(10,929)	(11,633)	(13,261)
Add Profile Risk Assessment ('PRA') Costs	764	1,320	1,772	640
Total operating expenditure – Revised Submission	**93,350**	**91,347**	**91,574**	**88,013**
Net Savings	9,330	9,609	9,862	12,620

Source: 'Estimate Summary.xls' – an attachment to an email from Eilli Baker to Chris Olszak et al, on Wed 14/10/2015 8:51

The final table uses what WaterNSW believes to be a more "considered" weighting of remunerations and the same level of vacancies as per the previous table.

Table 32 Revised forecast of Savings based on WaterNSW's considered remunerations ($2015-16)

	2017	2018	2019	2020
Total operating expenditure – Original Submission	**102,680**	**100,956**	**101,436**	**100,633**
Less Savings attributable to Restructure	(7,223)	(7,223)	(7,223)	(7,223)
Add Profile Risk Assessment ('PRA') Costs	764	1,320	1,772	640
Total operating expenditure – Revised Submission	**96,221**	**95,053**	**95,984**	**94,050**
Net Savings	6,459	5,903	5,452	6,583

Source: 'Estimate Summary.xls' – an attachment to an email from Elli Baker to Chris Olszak et al, on Wed 14/10/2015 8:51 PM

In proposing this in response to our initial request for further analysis of this issue, WaterNSW provided a detailed justification but this has not been published at the request of WaterNSW due to being commercial-in-confidence.[119] This alternate approach leads to $28.9m in savings over 4 years, relative to the current proposal of $25.2m. This leads to an increase in the savings of 14.7% over the four years.

[119] Email from Eili Baker to Chris Olszak et al, on Wed 14/10/2015 8:51 PM

Based on the options modelled by WaterNSW, the third option presented above would, on face value, be the option that the review team believe is closest to the expected labour costs and resultant opex that an efficient service provider would incur, given the circumstances faced by WaterNSW.

In particular, the third option:

- removes the unrealistic assumption that there will be no vacancies over the 4 years. We take on face value WaterNSW's statement that its HR department has advised that this is a reasonable representation of historic vacancy levels – this also accords with our experience having worked in and for regulated water business in the past, and
- reflects WaterNSW's own internal analysis of its actual underlying position in terms of where staff sit within those pay ranges.

Therefore, the review team would recommend that WaterNSW's forecasts be reduced to reflect this outcome (see Table 32 above).

5.4.2. Cost allocation methodology

In addition to deriving the overall savings stemming from the merger, WaterNSW has had to allocate those savings to either the Greater Sydney business or the Rural business.

In considering WaterNSW's savings cost allocation methodology, it is it important to note the two broad components that underpin it:

- Direct costs
- Overhead costs.

Direct cost savings

In relation to direct cost savings, WaterNSW states that[120]

> *Savings from the following Business Units were allocated as direct: Asset Development Projects, Asset Operations & Maintenance, Strategic Engineering, Water Quality Catchment Protection and People & Culture, and that*
>
> *Of the employee related costs that are categorised as direct costs, 75% have been allocated to the Greater Sydney region. This forecast allocation is based on analysis of the new organisation structure, where efficiency gains are greater in the overhead business units and Greater Sydney activities than the Rural activities where resourcing has increased in the State-wide asset planning and infrastructure solutions functions.*

Further information provided during the interview process and in response to specific questions on this issue indicates that the following percentages were applied to each sub-area:

- Asset Development Projects (50%)
- Asset Operations and Maintenance (50%)
- Strategic Engineering (85%)

[120] WaterNSW, 'Opex Changes Letter - 29SEPT2015 - draft for IPART v2 (clean).doc.

- Water Quality, Catchment Protection and People and Culture (75%).

For completeness, it is noted that the percentages above are applied to net savings, not gross savings. This means that the percentages do not account for the potential for more expenditure in say rural areas and less expenditure in the Greater Sydney region – i.e., the savings could in theory be over 100% for the Greater Sydney region.

When WaterNSW described the approach to developing the allocation percentages for Direct Costs, it became quite apparent that these percentages were predominately based on management's perception as to the areas in the newly combined business (Rural business versus the Greater Sydney business) that will become more efficient in the future. Therefore, the percentages reflect not only management's view of the savings that may result from the merger itself (e.g., economies of scale and scope), but also, efficiencies that can be made in each area, even if the merger was not undertaken.

Given the holistic nature of the new organisational design, WaterNSW stated that it was not possible to disaggregate the direct costs into the two historical business units. They did state, however, that they will be able to make better informed cost allocation decisions in the future once time is recorded to specific projects.

In this context, it is difficult, as an external reviewer, to be able to form a reasoned opinion as to the ability for *individual business* units to make savings, particular as the percentages reflect not only the direct consequence of the merger but also management's perception of where efficiency gains can be made. Therefore, the review team have accepted management's proposal on face value, as assuming that:

- management does not have an incentive to "skew" the allocation of savings to or from one business or another, as the management of newly formed WaterNSW should equally represent the interests of both the Rural business and the Greater Sydney business, and
- management has an intimate knowledge of both of the predecessor organisations, as well as the new merged entity, and therefore, are clearly best placed to make educated estimates regarding the potential scope for each business unit to make efficiency savings, and in which predecessor business those savings are likely to be attributable to.

Overhead cost allocation and overhead cost savings

WaterNSW stated that overhead cost savings were allocated between Greater Sydney and Rural customers in the same proportion as the average allocation of actual forecast overhead costs before the savings, being 53% to Greater Sydney.

WaterNSW stated that they undertook a four step approach to developing the percentages that they use to allocate overheads to the two customer segments (Greater Sydney and Rural). These steps are:[121]

- Step 1: Capitalise Asset Development Projects ("ADP") overheads in proportion to ADP direct opex

[121] 'WNSW allocation methodology from CFO Presentation FY16 Budget 20150410.pdf', an attachment to an email from Elli Baker to Ryan Gormly on Fri 9/10/2015 8:56 AM.

- Step 2: Determine the "within the region"[122] overhead for the Greater Sydney business based on the former Sydney Catchment Authority's "within the region" overhead, with this derived from information contained in the former SCA's finance system (SUN)
- Step 3: Determine the "within the region" overhead for the Rural business based on the former State Water's "within the region" overhead, with this derived from information contained in the former State Water's finance system (TechOne), with this being further allocated to 'Core', 'Core-Plus' and 'Opportunistic' projects within each valley based on the proportion of direct operational expenditure salaries and wages in those valleys, and
- Step 4: Allocate the "WaterNSW wide" corporate overhead in proportion to direct operational expenditure salaries and wages (i.e., based on the results of Step 1).

In reviewing this approach, the review team had a concern with Step 4. In particular, our initial view was that this step results in overheads being allocated based on direct opex salaries and wages only, thus excluding "within the region" overheads (those costs directly attributable to either the Rural business or the Greater Sydney business, but not attributable to a particular capital project). This is despite the fact that there will be a causal relationship between "within the region" overhead costs and Corporate overheads.

Therefore, by excluding "within the region" costs from the costs that are used to create the allocation percentages for overheads, WaterNSW's approach may inappropriately allocate more costs to a business that has a higher proportion of direct costs, even though they may have a much lower proportion of "within the region" overhead costs, which, as noted, will also be likely to drive the need for those corporate overheads to be incurred in the first place.

In response to this, the review team asked WaterNSW to re-estimate what their allocation percentages would be if they included "within the region" costs. WaterNSW communicated the following:[123]

- Based on 2H15 actual expenditure, including 'contained within region' within the denominator for allocating costs, the percentage share to Greater Sydney has moved from 53% to 55%.
- Note that for consistency, if the overhead savings are allocated on this basis, then it should be that overhead costs are allocated on this higher percentage as well.
- Therefore, whilst more of the savings would go to Greater Sydney on this basis, those savings would be coming off a higher cost allocation to Greater Sydney, which, in net terms, would increase the overhead costs of WaterNSW which are funded by the Greater Sydney customers.

It is our view that a more appropriate approach to allocating overhead costs is to include "within the region" costs, as well as other "direct costs". The previously discussed merger savings – in particular, the revised figures provided by WaterNSW -- already reflect this change of approach. We would also recommend that this change in approach be extended so that overhead costs are also allocated based on this higher percentage as well. To be clear:

- The change cost allocation of overheads from 53 to 55% for Greater Sydney would mean that this part of the business will obtain an increased proportion of the merger savings

[122] 'Within the region' overheads are those costs that are directly related to either 'Rural' or 'Greater Sydney', but which are not directly attributable to a capital project.

[123] Email from Elli Baker to Chris Olszak et al, on Wed 14/10/2015 8:51 PM.

- However, the general proportioning of overheads for the new business would also need to be revised so that 55% of the total overheads are allocated to Greater Sydney, prior to the assessment of any savings.

The first step in this change has been calculated and presented below. However, the net result of both steps needs further modelling by WNSW. We suggest this be undertaken if IPART agrees with the review team's draft recommendation.

5.4.3. Labour cost escalators and labour productivity

In an initial set of questions, the review team asked WaterNSW whether they could provide information on the levels of, and methodologies used for deriving, its proposed real labour cost escalators (including whether any allowance has been made for productivity improvements).

WaterNSW stated that:

> *WNSW forecasts in $2015-16 REAL DOLLARS so no escalation is assumed. We use 2.5% p.a. when we convert to show any nominal data.*[124]

WaterNSW restated at a subsequent meeting that it did not factor into its operating expenditure forecasts, any real labour cost escalators.

The practical implications of this approach are that WaterNSW has not included any labour cost increases above CPI in its forecasts, nor has it made any explicit allowance for any labour productivity in its forecasts.

In our opinion, this approach is if anything, likely to lead to an underestimate of WaterNSW's future labour costs, as generally:

- the cost of labour increases at rates above CPI, and
- this growth in real labour costs is not fully offset by productivity improvements in organisations that operate in industries such as the water and wastewater industry.

As such, the review team do not recommend that any adjustments be made to this component of WaterNSW's operational expenditure forecasts.

5.4.4. Materials costs escalators (excluding electricity)

In an initial set of questions, the review team asked WaterNSW whether they could provide information on the levels of, and methodologies used for deriving, its proposed real materials cost escalators.

WaterNSW stated that:

> *WNSW forecasts in $2015-16 REAL DOLLARS so no escalation is assumed. We use 2.5% p.a. when we convert to show any nominal data.*[125]

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124 Email from Elli Baker to Ryan Gormly et al, on Fri 9/10/2015 8:40 AM.

125 Email from Elli Baker to Ryan Gormly et al, Thursday, 8 October 2015 9:25 PM.

WaterNSW restated at a subsequent meeting that it did not factor into its operating expenditure forecasts, any real materials cost escalators[126]. It further stated that materials (excluding electricity) reflected a fairly minor component of its overall cost base. In reviewing the AIR, the 'Materials' category makes up less than 0.5% of WaterNSW's forecast operational expenditure.[127]

Based on this information, and the fact that this cost category will not be affected by the reduction in FTE's, the review team are of the view that this component of WaterNSW's operational expenditure forecasts is likely to be prudent and efficient, and therefore, the review team do not recommend any adjustments be made to WaterNSW's forecasts as a result of this issue.

5.4.5. Electricity costs

In an initial set of questions, the review team asked WaterNSW whether they could provide information on the levels of, and methodologies used for deriving its proposed electricity costs.[128] WaterNSW provided a detailed memorandum in response to this information request.[129] WaterNSW's forecast electricity costs are a function of two components:

- Volumes – how much electricity WaterNSW is forecasting to purchase, and
- Rates – what (unit) price WaterNSW is forecasting to pay for that electricity.

In relation to the first component, based on the memo WaterNSW provided, it would appear that WaterNSW relies heavily on:

- their energy manager forecasting energy requirements (volumes) using history, with
- Shoalhaven pumping volumes being subjected to a more sophisticated statistical analysis of the probability of pumping occurring in each of the forecast years.

In relation to the second component, based on the memo WaterNSW provided, it would appear that WaterNSW relies on:

- seeking competitive prices from a centralised NSW State Government contract, or
- having directly entered into a long-term electricity supply contract with an energy supplier (in the case of Shoalhaven pumping costs), or
- having previously integrated a number of small sites together with a single supplier who has in turn offered a master bill.

There are a number of positive features of WaterNSW's forecasting approach, including that:

- they probability weight the pumping volumes using the outputs of their WATHNET modelling system, which, on face value, is a robust and reasonable way of assessing the expected electricity volumes stemming from an intermittent supply source such as Shoalhaven, and
- by accessing competitive prices from the NSW State Government contract, WaterNSW should, on face value, benefit from (a) the scale efficiency benefits that centralised procurement options can deliver, and (b) lower transaction cost, and

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126 Meeting between Elli Baker, Rohan Harris, Chris Olszak and Thomas Clay on 13th October, 2015.

127 'WaterNSW Greater Sydney 2015 Price Submission – Annual and Special Information Return 2015.xls'.

128 Email from Ryan Gormly (Aither) to Ed Chan (WaterNSW) on Wednesday, 16 September 2015 8:08 AM.

129 Attachment to an email from Ed Chan to Ryan Gormly et al, Thursday 17/09/2015 6:34 PM.

- they have previously integrated a number of small sites together with a single supplier who has in turn offered a master bill, which should achieve both scale benefits as well as reducing the administrative costs of undertaking this function.

Our only two initial concerns were that the:

- Outside of Shoalhaven, the energy manager uses historic volumes to forecast future energy requirements - the countervailing argument put forward by WaterNSW at a meeting on the 13th October is that these volumes relate to routine pumping between sites, therefore, it is fairly stable, hence reliance on historic volumes is reasonable basis for deriving forecasts in this situation, and
- Shoalhaven electricity contract appears to have been renegotiated back in 2012 - our initial concern was that electricity market conditions have changed significantly since then, in particular, wholesale prices (and price forecasts) have declined due to there being a significant over-supply of generation in the electricity market, whilst transmission and distribution prices are significantly lower than they were (or could have reasonably been forecast back then) as a result of recent AER determinations. The countervailing argument is that the approach adopted by the then SCA to go to market was an informed, robust approach, and reflected the market dynamics at the time. In particular, a well-functioning market would have priced in all of the *known* information at the time. The fact that parameters affecting the electricity market may have changed since then is to be expected, however this does not necessarily mean that the approach adopted by WaterNSW was inappropriate, or inconsistent with the approach that a prudent and efficient service provider would have adopted at the time.

In summary, the review team accept WaterNSW's position that volumes for routine pumping are likely to be fairly stable, and therefore, the review team accept WaterNSW's underlying approach (of relying on historic volumes to inform forecast volumes) to developing these forecasts. To confirm this, the review team reviewed the detailed electricity budgets provided to us, which clearly indicated that Routine pumping is fairly stable over the regulatory period.[130]

With regards to Shoalhaven Pumping costs, our opinion is that a well-functioning market would have priced in all of the known information at the time the contract was re-negotiated, and the fact that parameters affecting the electricity market may have changed since then not unexpected. This is not, in and of itself, a reason to deem this expenditure imprudent and inefficient. Furthermore, it is our understanding that a decision has been made to treat these costs as a cost pass through, therefore, these costs will not be passed through to end customers unless WaterNSW actually has to incur costs under that contract.

Overall, the review team recommend that if WaterNSW's forecast energy costs for Shoalhaven are treated as a cost pass through, and the fact that this cost category will not be affected by the reduction in FTE's, no other adjustment be made to this component of WaterNSW's operational expenditure forecasts.

5.4.6. Changes in levels of service, regulatory or licence obligations

Like any regulated business, WaterNSW's proposal is underpinned by the need or desire to deliver a certain level of service to its customers. Where businesses are in a steady state, regulators generally draw the conclusion that a business' historic expenditure reveals their efficient costs of meeting those required levels of service. However, WaterNSW operational expenditure forecasts may reflect changes to the levels of service that it:

[130] WaterNSW, 'Copy of Energy Planning 2015-16 – 20150917 v2.xls,' provided as an attachment to an email from Ed Chan to Ryan Gormly et al, Thursday 17/09/2015 6:34 PM.

- seeks to deliver to its end customers as a result of its own analysis/decisions, or
- must deliver to its end customers, or the broader the community as a result of external requirements such as changes in regulatory or licence obligations.

The former, if proposed, would in theory need to be underpinned by a detailed analysis of the affected customers' willingness to pay for those enhanced levels of service. The latter, if proposed, would in theory need to be underpinned by a direct linkage to a discrete change in regulatory obligation of licence obligation (e.g., a specific clause).

In written correspondence, WaterNSW stated:[131]

> *WaterNSW has not proposed to change the levels of service it delivers to its customers for the upcoming determination period in its price submission. Service standards (in the form of water quality standards and reliable delivery of water) are contained in supply agreements WaterNSW has with its major customer. These agreements are not due for review in the foreseeable future.*
>
> *There are no changes to the regulatory or licence obligations. Forecast operational expenditure is developed based on current licence and regulatory obligations.*

At meetings to discuss WaterNSW's opex forecasts, WaterNSW reiterated that their proposed operational expenditure did not reflect any additional expenditure required to deliver enhanced levels of services. Based on this information, the review team do not recommend any adjustments be made to WaterNSW's forecasts as a result of this issue.

5.4.7. Related Party Transactions

Related party transactions reflect payments from one related party to another that are in turn reflected in the payee's underlying operational expenditure forecasts. The reason why regulators are concerned about related party transactions is that they in theory represent a means by which a regulated business could either:

- inflate their underlying costs to the detriment of its customers, or
- shift efficiency gains from the regulated business to the unregulated related party, again to the detriment of its customers.

Therefore, the review team asked WaterNSW whether their operational expenditure forecasts included any costs associated with related party transactions, and if there were, whether WaterNSW could:

- specify the value of those related party transactions, and
- describe the approach it has used to derive those forecasts (e.g., cost based; cost plus margin).

In response, WaterNSW stated that:

> *'The FRWS is a water supply scheme operated by the former State Water Corporation from which Greater Sydney purchases bulk water. The amount for FRWS bulk water purchases are estimated at around $3 million per year ($2015-16). This amount is separately shown in WaterNSW price proposal. Please refer to Table 6.1 (page 50) of the price submission. Prices for bulk water purchases from the*

[131] Email from Elli Baker to Ryan Gormly et al, Friday, 09 Oct 2015, 6:26pm.

FRWS are determined by IPART through a separate pricing determination for the coastal valleys and the FRWS. Purchases of water from the FRWS is tied to the operation of the Blue Mountains Water Supply System, the total cost contained in the pricing proposal reflects WaterNSW's estimate of the amount of water required to ensure a reliable supply of water to the Blue Mountains region'[132]

In reviewing this response, the review team noted that the scope and costs (and therefore value) of the related party transaction is already subject to external regulatory oversight by IPART. Therefore, in this context, our view is that this expenditure is likely to be prudent and efficient.

5.4.8. Step Change – Portfolio Risk Assessment

WaterNSW has included forecasts for one material Step Change. We define a Step Change as a change to the way in which a business will be operated over the forthcoming regulatory control period, relative to how it is now currently operated.

WaterNSW's Step Change relates to additional portfolio risk assessment costs for 20 metropolitan dams excluding Warragamba and Tallowa dams. These costs were not reflected in WaterNSW's original submission. In support, WaterNSW has stated that:[133]

The addition of dam safety Portfolio Risk Assessment ("PRA") costs reflect the adoption of a common dam safety risk assessment process after the merger of SCA and State Water.

The main objective of the PRA is to provide a comparable understanding of all credible dam safety risks across the portfolio. The assessment of probabilities and consequences of failure will follow a robust process providing an important business planning output for a risk based assessment of dam safety compliance activities including: providing the basis for assessment of potential capital works and consideration of a staged risk reduction approach to dam safety upgrades where prudent; prioritisation of studies to better understand identified risks; and generating a rigorous starting point from which to build the case for As Low As Reasonably Practicable (ALARP) where dams plot sufficiently within the Tolerability Review Region of the Societal Risk plot.

Acceptance of ALARP cases, where it can be demonstrated that risks are 'as low as reasonably practicable', will negate the need for further dam safety upgrades even though from a standards criteria perspective, a dam considered ALARP may not satisfy all dam safety criteria (eg. flood capacity for extreme floods such as the Probable Maximum Precipitation Design Flood (PMPDF), Dam Crest Flood (DCF) or Probable Maximum Flood (PMF). Further detail about PRA is provided in the attached Project Brief Form.

Given the late submission of this additional item, the review team asked for additional detailed and interviewed WaterNSW staff to better understand the rationale for the PRA. The review team was also provided with a detailed breakdown of the proposed costs in the revised submission.

In our view, the additional expenditure appears to be prudent. The main argument put forward by WaterNSW is that undertaking the PRA will enable the business to take a more holistic and risk based

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132 Email from Elli Baker to Ryan Gormly et al, Fri 9/10/2015 8:40 AM.

133 Opex Changes Letter - 29SEPT2015 - draft for IPART v2 (clean).doc'.

approach to dam safety management. Rather than meeting rigid standards that can result in very large capital expenditure, it will build the case for an approach based around the concept of "As Low As Reasonably Practicable (ALARP)". WaterNSW stated evidence that adopting this approach has helped the former State Water avoid very large capital expenditure programs on dam safety. Given the limited time available for further assessment, the review team has accepted this rationale on the prudence of the investment at face value.

In terms of efficiency, the review team recommends a reduction in the allowance for the PRA. In our view, the proposed cost estimates, particularly for consultancies, are too conservative, particularly given the method was based on applying a contingency to an upper estimate of cost.

The review team observed that:

- The allowance for WaterNSW staff does not appear to be overly excessive, given the review team understand that they would undertake significant modelling tasks, though it is noted the estimate provided had upper and lower bound estimates therefore some contingency may be built in.
- There are some large consultancies proposed including a consequence assessment and failure modes / risk analysis & PRA reporting.[134]
- There appears to be some inconsistency in the estimates provided:
    - The estimate provided (PRA Budget Estimate for Metro IPART Submission 2015.pdf) has two tables at the bottom, each containing a budget estimate. Only the second table was used in the different estimates; one table has an estimate ranging from $3,473,250 to $4,631,000 including a 10% contingency, the other from $3,372,000 to $4,496,000.
    - The Metro Project Brief form has $4,496,000, the higher figure from the estimate table.
    - The letter from WaterNSW dated 29 September 2015 has an estimate of $4,785,000.
    - The review team do not think it is appropriate to have a 10% contingency added on top of what has been prepared with lower and upper bounds. It is likely that the cost of the PRA has been over-estimated by effectively having a contingency on top of a contingency.

The review team has not been provided with sufficient time to benchmark the costs of PRAs. In the absence of independent estimates, the review team recommends that a more reasonable method to arrive at an efficient cost would be to take the average of the upper and low estimates, excluding any contingency on consultants. This results in a proposed expenditure of $3,683,750, as shown in the table below, a saving of $821,000 when compared to the estimate of $4,496,000 included in the revised submission. We have assumed that this saving is equally distributed through the regulatory period based on the proposed expenditure in each year.

[134] Consultancy cost estimates were removed due to being commercial-in-confidence.

Table 33 Review team's assessment of PRA cost estimates ($2015-16)

WaterNSW estimate	Lower ($)	Upper ($)	Notes
External consultancies estimate including 10% contingency	*	*	
External advisors estimate including 10% contingency	*	*	
Internal resources (no contingency included)	*	*	
Total budget estimate including 10% contingency for consultancies only	3,372,000	4,496,000	
External resources excluding 10% contingency	*	*	Divided the estimates for external resources by 1.1
Total budget estimate excluding 10% contingency	3,157,500	4,210,000	Sum of Internal resources and Externals excluding contingency
Average of the lower and upper estimates	3,683,750		

Source: WaterNSW additional information and review team
Note: * Denotes content removed at the request of WaterNSW due to being commercial-in-confidence.

We also note that the review team asked WaterNSW to confirm that the internal staff costs for the PRA were not included in the current budget operating expenses. In the interview, WaterNSW confirmed that this was the case, and that there was no double counting. Further, WaterNSW confirmed during the interview that the PRA would not delay or otherwise change the proposed capital expenditure for the next regulatory period. In other words, WaterNSW confirmed that dam safety projects for Tallowa and Warragamba would not be affected by conducting the PRA.

Following production of the draft report, WaterNSW provided the review team with an alternative proposal for the PRA, based on an average between the upper and lower bound estimates plus a 5% contingency for any consultancies. This would arrive at a figure of $3,802,917. The review team considered this alternative approach but maintains its estimate of an efficient cost of $3,683,750.

5.4.9. Capitalisation Policy

WaterNSW's capitalisation policy will affect both its operational expenditure forecasts and its capital expenditure forecasts. In particular, everything else being equal, the more operational expenditure WaterNSW expects to capitalise over the regulatory period, the lower will be its operational expenditure forecasts, and the higher will be its capital expenditure forecasts.

Therefore, the review team asked WaterNSW whether they could provide information on its capitalisation policy (i.e., how much of its forecast operating expenditure it expects to capitalise). In response, WaterNSW stated that:

> *The principal impact the proposed capital expenditure program has on opex forecasts is the capitalisation of labour cost. As the delivery (construction) of capital projects is*

> *outsourced to external contractors, the magnitude of the capital program has only a small impact on opex forecasts. During the budgeting and planning process, managers were requested to nominate the proportion of time their staff members are likely to spend on managing the delivery capital projects. This cost is added to the budget of capital projects and not included in the labour cost component of the opex forecast.*[135]

The important component of this response is WaterNSW's statement that *'this cost is added to the budget of capital projects and not included in the labour cost component of the opex forecast'*. We have taken this assurance on face value, and therefore do not propose that any change be made to WaterNSW's proposed operational expenditure.

WaterNSW adopts the approach of considering all project expenditure as operating expenditure up until the completion of the options analysis business case (phase 1 of their internal capital planning process). Once this business case is approved and options are selected, future expenditure is considered capital expenditure. We have not identified any evidence that WaterNSW is not following this approach for past and proposed capital expenditure.

The capitalisation policy is particularly important in influencing the revenue requirement in the upcoming regulatory period, with operating expenditure being recovered directly when incurred, and capital expenditure being recovered over the life of the asset. External uncertainty surrounding the next augmentation for the Sydney means that while some capital expenditure is forecast to be spent on the Shoalhaven Transfer Scheme, if the Government decides that this is no longer the preferred option, WaterNSW may need to move back to phase one investigations of other options, which would likely be considered operating expenditure.

5.4.10. Capital and operating expenditure tradeoffs

In theory, the level of a business' capital expenditure may impact on its operational expenditure forecasts (and vice versa). For example, if a business was to add a new water source to its portfolio of water sources, this may require it to incur more pumping related costs than may be otherwise reflected in its underlying (historic) operating expenditure levels. Conversely, a business may be seeking to replace a large number of ageing assets that were otherwise costly to operate and maintain. In these circumstances, the capital expenditure may lead to a reduction in future operational expenditure.

In response to a question asked on this topic, WaterNSW stated that:

> *"For the upcoming price path, the Greater Sydney capital expenditure program is aimed at the construction and renewal of assets to ensure WaterNSW continues to meet its core service standard of delivering a reliable supply of best possible quality water. The proposed capital expenditure program therefore does not have affect Greater Sydney's operations and opex forecasts"*[136]

Whilst the response clearly states that WaterNSW does not consider there to be any relationship between its capital expenditure program and operational expenditure, there is little in the statement that substantiates this. That said, based on our review of WaterNSW's capital expenditure program, the review team consider that it is reasonable to consider that a prudent and efficiency business'

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135 Email from Elli Baker to Ryan Gormly et al, Fri 9/10/2015 8:40 AM.

136 Ibid.

forecast operational expenditure would not to be materially impacted by a WaterNSW's forecast capital expenditure program.

5.4.11. Other on-going operational expenditure costs

WaterNSW's operational expenditure forecasts comprise a number of other less material operational expenditure costs items such as travel, training, insurance and consultancies. WaterNSW stated in a response to our information request that it has:

- rigorously scrutinised the consulting and contractor costs line by line (see attached "Reconciled Consultancies and Contractors…xlsx"); and
- lowered other proposed costs such as travel to be more in-line with historical actuals.[137]

To assess this, the review team reviewed WaterNSW's 'Annual and Special Information Return' to ascertain how its forecast for these type of costs changed, in percentage terms, over the regulatory period, relative to current expenditure levels.[138] To do this, the review team summated costs classified as Consultants, Licence Fees, Grants & Sponsorships and Property and Insurance. From 2013/2014 to 2019/20, WaterNSW forecasts these costs to change in nominal terms by a compound annual growth rate of 3.03%, as compared to an average inflation rate of 2,5%. Whilst this is slightly above inflation, the review team believe that this is within the expected range of what a prudent and efficient service provider would increase its expenditure in these areas by in real terms. In forming this view, the review team also considered the fact that if Insurance were to be removed from this analysis, WaterNSW's proposed change reduces to 2.54%, which effectively represents no real change over the period for these cost items. We also considered the detailed information provided in the 'Reconciled Consultancies and Contractors', which indicated a diligent approach to reviewing internal budget proposals. We note that whilst a small component of this cost category may be affected by the reduction in FTE's (e.g., travel costs may reduce slightly), the most significant items would not (e.g., Insurance). On this basis, we have not made any further adjustment for the reduction in FTEs.

In addition to the above, WaterNSW's operational expenditure includes some costs for 'mining management'. Over the regulatory period, this value fluctuates up and down. In particular, in 2018-19, WaterNSW's 'mining management' costs increase by $950k (as per SIR), which causes WaterNSW's overall expenditure in that year to also increase. The review team is well aware of the potential relationship between mining activities and water quality, therefore the review team acknowledges the importance of this activity to WaterNSW. The review team also notes that it would expect this cost to fluctuate up and down, depending on what mining development or /activity was occurring in WaterNSW's operational area. In this context, the increase of $950k in 2018-19 is preceded by an $800k reduction in 2017-18, and followed by a $1.6m reduction in 2019-20. This leads to overall expenditure levels on 'mining management' declining by $1.85m over the regulatory period. Overall, given the importance of this activity to water quality, and the overall reduction on current levels reflected in the forecast, we believe this expenditure is likely to be prudent and efficient.

5.4.12. On-going (broad based) efficiency savings

It is important that any assessment of WaterNSW's ability to make on-going efficiency savings is not undertaken in isolation. In particular, the extent to which it is appropriate to include a separate

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137 Email from Elli Baker to Ryan Gormly et al, Thursday, 8 October 2015 9:25 PM.

138 WaterNSW Greater Sydney 2015 Price Submission – Annual and Special Information Return 2015.xls'.

allowance for on-going efficiency savings in WaterNSW's opex forecast needs to give consideration to, amongst other things:

- The fact that outturn rates of growth in the Consumer Price Index (CPI) - which will impact upon the prices WaterNSW is able to charge for its products and services - will, by definition, already reflect changes in productivity across the NSW economy (e.g., if there are economy-wide productivity improvements, say as a result of general technological improvements, this will flow through to lower CPI results, and therefore, lower nominal prices for WaterNSW),
- Whether the factors driving future productivity improvements are likely to affect WaterNSW more or less than the broader NSW economy (i.e., whether WaterNSW is likely to be more affected by technology changes over the regulatory period, as compared to the general NSW economy),
- Whether WaterNSW has assumed real increases in its labour costs, and if so, whether it has offset this by estimated improvements in the productivity of workers employed within the water and wastewater sector in NSW, and
- Whether WaterNSW is or is not already on the efficient frontier.

In this context, it is important to note that whilst WaterNSW's has not directly reflected an estimate of labour productivity in its labour cost escalators, neither has it reflected changes in the real cost of labour in its operational expenditure forecasts. As stated earlier in this report, this approach is likely to if anything, lead to an underestimate of WaterNSW's future labour costs, as generally:

- The cost of labour increases at rates above CPI, and
- This is not fully offset by productivity improvements in organisations that operate in industries such as the water and wastewater industry.

Furthermore, we are not in a position to assess whether WaterNSW is likely to be more affected by the future drivers of productivity improvements affecting the broader NSW economy, as this would require:

- a forecast of what these drivers are likely to be, and
- information as to the relative effect that these drivers will have on WaterNSW's cost structure, relative to the NSW economy as a whole.

This, combined with the fact that WaterNSW is already reflecting significant savings in labour costs as a result of the creation of the combined entity, leads us to conclude that an additional 'on-going' productivity adjustments should not be applied to WaterNSW's operational expenditure forecasts.

5.4.13. Final recommendations for changes

Subject to the following adjustments, the review team consider WaterNSW's operational expenditure forecasts to be consistent with a prudent and efficient service provider, faced with similar circumstances to those which WaterNSW currently faces. Those adjustments include:

- increase the savings from the merger, to reflect changed assumptions regarding the number of vacancies and reduce the calculation of wages for staff on Awards
- change the overhead allocation percentage attributable to the Greater Sydney business to 55%, from 53% - this impacts on the distribution of efficiency savings but also on the initial allocation of corporate overheads
- a reduction in the allowance for the PRA based on our assessment of the efficient cost of this project.

A summary table is provided below for the proposed operating expenditure.

Table 34 Recommended operating expenditure (next regulatory period, $million, $2015/16) including adjustments

	2016-17	2017-18	2018-19	2019-20	Total
WaterNSW proposed operating expenditure	**102,680**	**100,956**	**101,436**	**100,633**	**405,704**
Minus subsequent efficiency savings - (revised by WaterNSW)	-4,727	-6,918	-6,626	-6,953	-25,224
Plus proposed PRA	764	1,320	1,772	640	4,496
Revised total WaterNSW proposed operating expenditure	**98,717**	**95,358**	**96,582**	**94,320**	**384,977**
Adjustments					
Changes to remuneration and vacancies	-2,497	-305	-597	-270	-3,669
Changes to cost allocation of overheads*	557	21	303	823	1,704
Reductions to efficient costs of the PRA	-138	-238	-320	-116	-812
Sub-total recommended adjustments	**-2,078**	**-522**	**-614**	**-437**	**-2,777**
Sub-total recommended operating expenditure	**96,639**	**94,836**	**95,968**	**94,757**	**382,200**
Efficiency adjustment (0%)	0	0	0	0	0
Total recommended operating expenditure	**96,639**	**94,836**	**95,968**	**94,757**	**382,200**

Source: WaterNSW spreadsheet 'Estimate summary.xls' and Metro Project Brief Form 2014/15 Metro Portfolio Risk Assessment – PRA.

6. Conclusions and recommendations

6.1. Overview

The review of WaterNSW's past and proposed capital and operating expenditure has been based mostly on information provided by WaterNSW, and interviews conducted with its executives and officers. Assessment was complicated by delays in information provision, and for some elements, gaps in information provision.

However, sufficient information has been made available and reviewed to allow the team to make firm conclusions with respect to the three major aspects of the review: strategic management, capital expenditure and operating expenditure. The review finds that strategic management is generally sound, and that with a number of exceptions and recommended adjustments, proposed capital and operating expenditure is generally prudent and efficient. However, the inability to meet forecast for capital expenditure is a consistent theme for WaterNSW and a concern looking forward.

6.2. Strategic management

6.2.1. Overall conclusions

WaterNSW is a recently formed organisation and was going through an organisational restructure at the time of the review. This has a bearing on a range of strategic and operational matters. The assessment was undertaken on processes and documentation that are being progressively updated or otherwise confirmed as fit for purpose for the new organisation. Given the review is focused on WaterNSW Greater Sydney, many of these are former SCA processes or approaches.

However, based on assessment of the range of documentation and information provided the approach the former SCA and now WaterNSW is taking to strategic management is generally sound. This includes its new corporate objectives, organisational structure, business units, and strategic action plans, and the variety of systems, processes or documentation for capital planning and asset management.

There are however issues with respect to institutional roles or responsibilities for long term supply demand planning, and the timing and general alignment of government policy processes and decision making. These arrangements impact on WaterNSW's ability to deliver long term capital plans and have driven uncertainty in the current proposals for expenditure to IPART.

6.2.2. Capital planning

Major capital decisions are generally guided by well documented strategies and reports, and capital plans are consistent with service obligations, government requirements or other drivers. The asset management systems employed by WaterNSW also play a key role in driving capital planning, and whole of life cycle planning is employed to help minimise long term costs of assets.

The WaterNSW 10 year capital plan is clear and transparent and broadly consistent with requirements and obligations. The drivers for expenditure under the plan are varied, but within WaterNSW's mandate, and include regulatory requirements, updated risk assessments, licencing

conditions. The plan for the next regulatory period has significant drivers associated with dam standards and safety regulations, as well as operating licence conditions.

Neither the near term or longer term capital plans appear inconsistent with long term plans or strategies, and are internally consistent. Other programs or projects are consistent with previously undertaken work, such as risk and reliability assessments of particular dams.

Overall, the review team view the approach to long term capital investment as generally robust. WaterNSW has appropriate long term strategies in place, and take direction from external agencies where appropriate. Consideration is generally given to the lease cost ways of meeting obligations or requirements, and approaches to procurement and project management support this. The capital planning approach is unlikely to be driving imprudent or inefficient outcomes.

However, some important 'watch points' include:

- The need to consolidate or amend, and roll out, strategies and plans across the new organisation. There are a number of strategies or plans still being amended (or awaiting decisions on modification or amendment) subsequent to the SCA-State Water merger. WaterNSW will need to ensure effective and full consolidation and implementation across the new organisation.
- The delivery risks associated with the forward capital program, especially the next 10 years, given large increases in works projected after 2020. There have been delays in implementation of the capital program during the current and past regulatory periods (some due to external factors) and it will be important that internal and external factors are supporting the delivery of the proposed capital program over the next regulatory period.
    - This is further complicated by certain projects dependent on external government decisions, including for Warragamba environmental flows, the next supply augmentation, and impacts of flood management decisions.
    - WaterNSW and the former SCA has consistently not met forecasts for capital expenditure, as demonstrated by actual expenditure being lower each year in the current pricing period. The reasons are varied but it indicates as a trend that what is forecast does not eventuate. The forecast for 2015-16 contained within the June 2015 proposal was revised downwards by December 2015 by 54%.

6.2.3. Asset management

WaterNSW has a comprehensive approach to asset management supported by a range of well documented policies, systems and processes. This includes an asset management policy, asset management system and framework, reliability and maintenance strategy, and individual asset management plans. These are supported by data and information collection and analysis tools and frameworks, and robust organisational wide approaches to risk management. The approach applies to most asset classes critical to delivering service obligations, and is expected to be certified against standards in the near future.

The WaterNSW approach links asset management with service requirements, by aligning asset categories with specific outcomes sought in service deliver strategies. The asset management strategy also manages risks associated with asset failure and underperformance, through contingency and site response plans, and criticality assessments focus investment in ways that seek to minimise overall costs while maintaining an acceptable level of risk. Asset Management Plans also help to optimise the asset portfolio over the long term through alignment with strategic and operational risks identified for different asset categories, and annual state of assets reporting highlights and prioritises investment required based on risks, issues and opportunities.

Overall, the review team are satisfied that WaterNSW has a comprehensive approach to asset management supported by a range of well documented strategies and processes. However, consistent with the capital planning approach, WaterNSW will need to commit to ensuring former SCA systems and processes are effectively carried over and adapted if required in the new WaterNSW operating environment.

6.2.4. Long term supply demand planning

WaterNSW plays a role in long-term supply demand planning, but does not make ultimate decisions on augmentation. This is largely driven by other government processes and agencies, but WaterNSW plays a role in modelling and providing information inputs to support processes and decision making. In doing so, WaterNSW relies on demand forecasts of its customers, including Sydney Water, which are also used for operational purposes. WaterNSW have suggested that actual demand has tended to approximate high water use scenario forecasts, which in part drove timing associated with some capital expenditure in their proposal.

The review team observed some issues with the institutional arrangements around long-term supply planning and other government processes that impact on this, including flood investigations and delays in the metropolitan water planning process. The lack of alignment in timing between these processes and the IPART pricing process has driven uncertainty in WaterNSW's proposals, and may create challenges in the near term for different items in the capital program. These include:

- the Warragamba Dam reliability project which could be impacted on by decisions in the MWP in 2016 about supply augmentation or environmental flows, or by decisions resulting from the Hawkesbury-Nepean Valley Flood Management Review study regarding any flood mitigation role for Warragamba dam.
- the Warragamba pipeline valves upgrade project, which could also be impacted on by decisions made about Warragamba Dam with respect to water supply augmentation or flood mitigation.
- the Shoalhaven transfer proposal, although the review team have made specific adjustment recommendations to address this (see capital expenditure conclusions)

Further risks of challenges highlighted with respect to long-term supply demand planning include that:

- WaterNSW may need to investigate alternative supply options other than Shoalhaven, depending on direction in the Metropolitan Water Plan when released in 2016
- If any major supply related capital project decisions are announced by the government in the next regulatory period, these could have a material impact on WaterNSW's funding requirements.

IPART may wish to consider mechanisms by which these matters can be addressed.

6.2.5. Water quality standards in Raw Water Supply Agreements

The review identified opportunity for improvement around service standards for water quality in Raw Water Supply Agreements. Under current arrangements, WaterNSW attempts to deliver the best possible water quality without a clear cost incentive, and in many cases, manages trade-offs between cost and quality in a collaborative way with Sydney Water.

While in practice WaterNSW considers the costs of actions taken to manage water quality, and manages overall costs and risks for the benefit of customers, the contractual framework is not driving investment decisions.

IPART should further consider the appropriate design of these agreements to ensure they are driving efficiency in an open and transparent manner.

6.3. Capital expenditure

6.3.1. Overall conclusions

Based on the information provided and following the interview process, the review team has concluded that WaterNSW's proposed capital expenditure for the Greater Sydney area would not be prudent and efficient as originally proposed without reductions. Actual expenditure incurred to date is considered prudent and efficient.

There are doubts over whether the capital expenditure forecasts the pricing proposal is based upon will eventuate. WaterNSW has consistently underspent the capital expenditure forecasts, and with the capital expenditure forecast significantly above that actually delivered in the past, there are concerns about the deliverability of the program as it is currently forecast. This also tends to suggest that WaterNSW has a tendency to over-forecast, a view that was supported by the inclusion of large non-specific contingencies within estimates for projects sampled by the review team. Another driver may be a lack of organisational capability or resources in the project delivery space. A case in point is the forecast for the current year, 2015-16; in their June 2015 proposal WaterNSW proposed expenditure of $58.1 million, which in December 2015 was revised down to $26.5 million.

In general the need for projects and programs have been well justified by WaterNSW, however the efficiency of the estimates is a concern. Several adjustments (reductions) to expenditure have been proposed by WaterNSW while others have been recommended by the review team following assessment of individual projects and considering the overall program. The majority of the adjustment (by value) is associated with the Shoalhaven transfer. During the course of the review, the review team questioned the proposal to undertake construction in the next regulatory period, given a range of factors and information reviewed. In response, WaterNSW proposed that the proposed expenditure for the Shoalhaven transfer scheme ($131.1 million) be withdrawn, and submitted a revised proposal for $24.3 million, but further adjustments to this amount are recommended by the review team. The overall recommended adjustments are:

- Withdraw the proposed expenditure for the Shoalhaven Transfer works in entirety ($131.1 million) and substitute with a reduced expenditure (WaterNSW proposal- $24.3 million).
- Tallowa Dam – WaterNSW has undertaken more recent work and determined only $3.1 million is necessary; a reduction of approximately $11.3 million.
- IT Assets Renewal Program – efficiency reductions of $0.150 million are recommended due to staff reductions following the State Water-SCA merger.
- Upper Canal works Stage 2 – a reduction of $4.972 million, an amount which was brought forward to Stage 1 but double-counted.
- Shoalhaven transfer scheme – a further $4 million reduction is recommended due to over-expenditure proposed for geotechnical investigations given the project is only at the concept design/feasibility stage.
- Motor Vehicle Fleet procurement – efficiency reductions of $0.480 million are recommended due to staff reductions following the State Water-SCA merger.

- A reduction of a further 5% be made across all proposed capital expenditure from 1 July 2016 to 30 June 2020 to account for excessive contingency allowance being built into forecasts; total reduction approximately $12.6 million.

The review team found that there is a bias towards over-forecasting within WaterNSW, partially driven by using unjustified non-specific contingencies at the project level. As outlined above many of the adjustments have been agreed with WaterNSW while several like the proposed efficiency adjustments have been proposed by the review team. The total recommended prudent and efficient expenditure for the current and future pricing periods are presented in the two tables in the following sub-sections.

6.3.2. Review of past and forecast capital expenditure for the current regulatory period

The information presented by WaterNSW indicates that:

- WaterNSW expects to underspend the capital expenditure allowance IPART provided it by around $56.4 million, 37.6%, over the period 2012-13 to 2015-16, and
- Some of the underspend ($17.7 million) has been due to the Warragamba Environmental Flows works being deferred due to external factors.
- Short term forecasts such as the forecast of $58.1 million for 2015-16 made in June 2015 was unrealistic, being revised down to $26.5 million in December 2015.

The recommended capital expenditure is presented in Table 35 below, including actual expenditure and forecast expenditure for 2015-16.

Table 35 Recommended capital expenditure (current regulatory period, $million, $2015-16)

	2012-13 actual	2013-14 actual	2014-15 actual	2015-16 forecast	Total
IPART determination 2012	*35.2*	*37.5*	*36.3*	*40.9*	*149.9*
WaterNSW actual/forecast expenditure	19.1	33.9	14.0	58.1	125.1
Recommended project adjustments	0.0	0.0	0.0	0.0	0.0
WaterNSW adjustment 1/12/2015	0.0	0.0	0.0	-31.6	-31.6
Total recommended adjustments	0.0	0.0	0.0	-31.6	-31.6
Total recommended capital expenditure	**19.1**	**33.9**	**14.0**	**26.5**	**93.5**

Source: All data sourced from WaterNSW Submission to the Independent Pricing and Regulatory Tribunal, Prices for the Greater Sydney Area from 1 July 2016, June 2015, p.32. 2014-15 actual was originally reported as $16.5 million in WaterNSW's June proposal; since revised by WaterNSW to $13.976 million. Reforecast was provided by WaterNSW on 30 November 2015.

6.3.3. Review of future capital expenditure

The information presented by WaterNSW indicates that:

- Overall, expenditure proposed is prudent.
- Several of the sample projects required downward adjustments due to inefficiencies, errors or following further investigation and design work being carried out by WaterNSW.

- No efficiencies following the SCA-State Water merger were initially built into the forecasts for replacement of IT infrastructure or Motor Vehicles.
- There is a systemic bias towards over-conservatism used by WaterNSW in preparing estimates for capital projects, which is likely to be a contributing factor towards over-forecasting of capital expenditure therefore an efficiency adjustment of 5% is recommended.
- There are doubts over WaterNSW's ability to deliver a significantly increased capital expenditure program, based on past and current delivery performance. Once the merger is bedded down and the new structure fully implemented this presents an opportunity for WaterNSW to improve performance.

The recommended capital expenditure is presented in the table below. In addition to the recommended adjustments, an additional line item has been included within Table 36 to include WaterNSW's proposed carry forward expenditure of $27.5 million. The review team does not necessarily endorse this position given the past history of deferrals means there may be more in the future. For this reason an equivalent amount to that proposed by WaterNSW to be carried forward has been subtracted from each year.

Table 36 Recommended capital expenditure (next regulatory period, $million, $2015-16) including adjustments

	2016-17	2017-18	2018-19	2019-20	Total
WaterNSW proposed capital expenditure	**65.7**	**89.9**	**71.0**	**146.5**	**373.1**
Plus WaterNSW proposed re-phasing from 2015-16	20.1	3.6	3.8	0.0	27.5
Minus Shoalhaven transfer scheme (withdrawn by WaterNSW)	-3.5	-7.7	-16.5	-103.4	-131.1
Plus revised WaterNSW Shoalhaven transfer scheme	2.6	9.5	8.2	4.0	24.3
Revised WaterNSW proposed capital expenditure	**85.0**	**95.4**	**66.4**	**47.1**	**293.8**
Total recommended project adjustments	-0.119	-14.149	-6.480	-0.158	-20.904
Sub-total recommended capital expenditure incl WaterNSW proposed re-phasing	**84.8**	**81.2**	**59.9**	**46.9**	**272.9**
Adjustment for re phasing	-20.1	-3.6	-3.8	0.0	-27.5
Sub-total recommended capital expenditure minus re-phasing	**64.7**	**77.6**	**56.2**	**46.9**	**245.4**
Efficiency adjustment based on excessive contingencies	-3.2	-3.9	-2.8	-2.3	-12.3
Total recommended capital expenditure	**61.5**	**73.7**	**53.4**	**44.6**	**233.1**

Source: All data sourced from WaterNSW Submission to the Independent Pricing and Regulatory Tribunal, Prices for the Greater Sydney Area from 1 July 2016, June 2015. WaterNSW document, 'Supplementary Information : Burrawang to Avon Dam Tunnel – Revised Cost Projections' (16/10/2015 4:52 pm)), WaterNSW correspondence regarding Upper Canal received 22/10/2015, and WaterNSW correspondence regarding Warragamba received 27/10/2015.

6.4. Operating expenditure

6.4.1. Overall conclusions

Based on the information provided, the review team has concluded that WaterNSW's outturn operational expenditure for the Greater Sydney business would not have been consistent with the levels of a prudent and efficient business facing the same circumstances as the former SCA.

Based on the information provided, the review team has concluded that WaterNSW's forecast operational expenditure does not reflect the levels that a prudent and efficient water business, faced with the same exogenous factors that WaterNSW faces, would incur over the next regulatory period. The key changes that the review team recommend be made to WaterNSW's forecast operational expenditure are to:

- increase the savings from the merger, to reflect changed assumptions regarding the number of vacancies assumed over the forthcoming regulatory period, and to reduce the calculation of wages for staff on Awards from 98% to 94% of the defined maximum level
- change the overhead allocation percentage attributable to the Greater Sydney business to 55%, from 53%, and
- reduce the allowance for the Portfolio Risk Assessment (PRA).

These are summarised in the following table.

Table 37 Summary of proposed and recommended operational expenditure ($2015-16 '000)

	2016-17	2017-18	2018-19	2019-20	Total
WaterNSW proposed operating expenditure	**102,680**	**100,956**	**101,436**	**100,633**	**405,704**
Minus subsequent efficiency savings - (revised by WaterNSW)	-4,727	-6,918	-6,626	-6,953	-25,224
Plus proposed PRA	764	1,320	1,772	640	4,496
Revised total WaterNSW proposed operating expenditure	**98,717**	**95,358**	**96,582**	**94,320**	**384,977**
Adjustments					
Changes to remuneration and vacancies	-2,497	-305	-597	-270	-3,669
Changes to cost allocation of overheads*	557	21	303	823	1,704
Reductions to efficient costs of the PRA	-138	-238	-320	-116	-812
Sub-total recommended adjustments	**-2,078**	**-522**	**-614**	**-437**	**-2,777**
Sub-total recommended operating expenditure	**96,639**	**94,836**	**95,968**	**94,757**	**382,200**
Efficiency adjustment (0%)	0	0	0	0	0
Total recommended operating expenditure	**96,639**	**94,836**	**95,968**	**94,757**	**382,200**

Source: WaterNSW spreadsheet 'Estimate summary.xls' and Metro Project Brief Form 2014/15 Metro Portfolio Risk Assessment – PRA.

6.4.2. Review of past operating expenditure

The information presented by WaterNSW indicates that:

- WaterNSW expects to underspend the operating expenditure allowance IPART provided it by around 3% over the period 2012-13 to 2015-16, and
- much of this under expenditure is due to the impact of exogenous events, namely less pumping costs as a result of it not having to transfer water from the Shoalhaven system to meets supply requirements, the repeal of the carbon tax, and less need to utilise the Fish River Scheme, again due to the underlying supply / demand balance.

However, the information provided also indicated that:

- even if these (positive) exogenous factors had not of eventuated, WaterNSW would have still underspent its allowance, primarily as a result of it transferring its insurance cover to the Treasury Managed Fund, and
- the variance from operational expenditure allowance has not impacted on the level of service WaterNSW provided to its customers.[139]

On face value, this information indicates that the former SCA responded to the underlying incentives in the regulatory framework to seek out efficiencies over the regulatory period. However, WaterNSW has also acknowledged that the merger of the former SCA and State Water businesses will (a) result in permanent operational expenditure savings in the upcoming price path, and (b) in discussing these savings, WaterNSW made it quite clear that it did not attribute 100% of the proposed savings to the greater economies of scale and scope that would result from merging the SCA with State Water, but rather, some of the savings would have been generated by management, even if the merger had not of occurred.

Prima facie, this acknowledgement, as well the evidence that WaterNSW's has relied upon to underpin the labour costs savings it is proposing to achieve during the next regulatory period, leads us to conclude that WaterNSW's outturn expenditure for the Greater Sydney business would not have been consistent with levels of a prudent and efficient business facing the same circumstances as the former SCA. However, the review team note that the business has, and continues to undergo significant change, and although the future operating expenditure savings have been budgeted for, they have not yet been achieved in practice.

6.4.3. Review of future operating expenditure

Efficiency savings resulting from the merger and organisational redesign

The review team's assessment of WaterNSW's forecast operation expenditure efficiency savings resulting from the merger and organisational redesign has concluded that:

- based on the information presented to us throughout the evaluation process, the internal arrangements and structures put in place by WaterNSW to develop its new organisational structure are robust, and consistent with what the review team would expect a prudent, well run firm to undertake

[139] Attachment to an email from Elli Baker to Ryan Gormly et al, Friday, 09 Oct 2015, 6:26pm

- the FTE's WaterNSW is proposing under the new organisational structure are likely to be consistent with a prudent business, given the particular circumstances (environmental, geographical and functional) faced by WaterNSW.

However:

- WaterNSW's forecasts should be reduced to reflect more appropriate remuneration and vacancy rates over the forthcoming regulatory period, with this based on:
  - removing the current assumption that there will be no vacancies over the regulatory period, and instead, reverting to a vacancy rate assumption that is more consistent with historical vacancy rates, and
  - setting Award staff remuneration rates at levels that better reflect WaterNSW's own internal analysis of its actual underlying position in terms of where staff sit within exiting pay ranges.

Cost allocation methodology

The review team's assessment of WaterNSW's proposed Cost Allocation Methodology is that it should be adjusted to better reflect the likely causal drivers of corporate overheads. More specifically, WaterNSW's proposed approach is based on allocating corporate overheads in proportion to the direct costs "within the region" (i.e., costs that are attributable to projects that are in turn able to be allocated to either the Greater Sydney region or the Rural region). In doing this, WaterNSW has excluded "within the region" overhead costs from the costs that are used to create the allocation percentages for corporate overheads.

Our view is that WaterNSW's approach may inappropriately allocate more costs to a business that has a higher proportion of direct costs, even though they may have a much lower proportion of "within the region" overhead costs, which the review team believe will also drive the need for those corporate overheads to be incurred in the first place.

WaterNSW has re-run their models, and concluded that the percentage share to Greater Sydney would change from 53% to 55% if this adjustment were made.

It is important to note that:

- the change cost allocation of overheads from 53 to 55% for Greater Sydney would mean that this part of the business will obtain an increased proportion of the merger savings

However:

- the general proportioning of overheads for the new business would also need to be revised so that 55% of the total overheads are allocated to Greater Sydney, prior to the assessment of any savings.

The first step in this change has been calculated and presented as part of the efficiency savings. However, the net result of both steps needs further modelling by WNSW. We suggest this be undertaken if IPART agrees with the review team's draft recommendation.

Portfolio Risk Assessment

WaterNSW has included forecasts for additional portfolio risk assessment costs for 20 metropolitan dams excluding Warragamba and Tallowa dams. The review team believe the additional expenditure appears to be prudent, given WaterNSW's argument that undertaking the PRA will enable the business to take a more holistic and risk based approach to dam safety management. In terms of efficiency, the review team recommends a reduction in the allowance for the PRA. In our view, the proposed cost estimates are too conservative, particularly with regard to contingencies.

Appendix A – Capital projects detailed review

7.1. Hydrometric Renewals Program WEM001

7.1.1. Project description

The Hydrometric Renewals Program is a 5 year rolling program of renewals to WaterNSW's hydrometric monitoring network which consists of approximately 270 monitoring sites spread throughout its area of operations. The monitoring network is integral to meeting WaterNSW's operational needs and meeting obligations relating to environmental flows, which requires WaterNSW to monitor inflow and outflow of designated water storages.

The program identifies equipment that is obsolete, unsupported or otherwise unable to perform reliably for replacement with more appropriate equipment. Some instrumentation has reached the end of its useful life resulting in less accurate data and/or increased data loss. Assets typically have an economic lifespan of 7 to 10 years, beyond which they become too expensive to maintain or too unreliable.

The scope includes annual updates of 'Hydrometric condition assessment reports' performed by hydrometric field services contractors, and consultation with stakeholders to target high priority sites. The renewals program will progressively replace the oldest equipment or equipment before it becomes unsupported.

7.1.2. Assessment type and documentation

Assessment type

The assessment is of actual and forecast expenditure within the current regulatory period and proposed future expenditure within the next regulatory period.

Documentation reviewed

A number of documents were provided and reviewed for this project, as summarised in the table below. In addition, an interview was undertaken with WaterNSW officers in Sydney on 8 October 2015.

Table 38 Documentation provided for WEM001

Document title	Reference
Business Case - Hydrometric Renewals Program 2011-2016 – CPO218 (WaterNSW, November 2010)	D2010/04289
Business Case (draft) – Hydrometric Renewals Program 2016-2020 – 18218000 (WaterNSW, July 2015)	D2015/2603
Water Monitoring Program 2015-2020 (WaterNSW, July 2015)	CD2011/179
Example Hydrometrics Data Capture 08102015 (WaterNSW, October 2015)	N/A
Example Hydrometrics Monthly Report 150710_MHLMonthlyReport (Manly Hydraulics Laboratory for SCA, July 2015)	N/A

7.1.3. Project need

The project driver is categorised by WaterNSW as meeting Existing Mandatory Standards.

The program forms part of the Existing Mandatory Standards, assisting WaterNSW to respond to operational needs including flood prediction and long term planning and enabling compliance with the Operating Licence, water licences and approvals, bulk water supply agreements and the National Water Initiative. Having reliable telemetry equipment and instrumentation and accurate data is essential to fulfilling WaterNSW's operating licence and other obligations.

While not the primary driver, there is also an element of a business efficiency driver behind the project. In recent years the operational expenditure required for unplanned attendance to equipment has dropped dramatically; previously expenditure on unplanned maintenance was similar to planned maintenance (within the range of $60,000 and $100,000 per month) whereas unplanned maintenance expenditure is now typically less than $10,000 per month.

7.1.4. Options investigated

Under the original business case prepared for the current regulatory period, WaterNSW investigated several options. This process is being repeated for the forthcoming regulatory period, using essentially the same set of options.

- Base Case – The base case is a replace when fail approach. This option has no programmed expenditure, but funds will be required on a case-by-case basis to address breakdowns as they occur. By adopting this option the instruments installed in the field will continue to age and WaterNSW will suffer increased loss of data from its network and a reduction in the quality of the data collected. It will also be stuck with obsolete technology for a longer period.
- Option 1 – This option involves the immediate replacement of equipment that is currently at the end of its expected life. This option will address immediate instrumentation issues but makes no allowance for ongoing replacement.
- Option 2 – This option is a program of scheduled replacement of equipment based on their economic service life, to ensure the instrumentation at site is reliable and contemporary. The renewals program will focus on the older/obsolete equipment and equipment in unacceptable condition with the aim of replacing all instruments on a seven year cycle (with the exception of some meteorological equipment which will be replaced on a ten-year cycle).

- Option 3 – Under this option, the hydrometric monitoring network is renewed at a rate quicker than in Option 2. That is, before individual pieces of equipment reach the end of their economic service life.

WaterNSW chose Option 2 on the basis it was expected to provide the greatest return on investment and meet the need. A financial assessment was undertaken calculating the Net Present Value of the options with Option 2 found to have the highest benefit cost ratio.

7.1.5. Procurement

For the current and future pricing period, the majority of renewals will be performed by existing Hydrometric Monitoring and Sampling Field Services contractors under existing WaterNSW's (formerly SCA's) contract agreements. This approach was chosen for benefits such as avoidance of costs associated with managing multiple contractors and making use of the existing contractors' knowledge of existing infrastructure, catchments, systems and process.

In each case, quotations will be sought that include full details of resources, material and time required to complete the job and work will only commence once appropriate approvals are provided.

In some cases, WaterNSW may engage a third party to carry out renewal work, typically work requiring extensive civil, mechanical or electrical work. These larger and one-off items of work will be procured through a competitive tendering process.

7.1.6. Costs and delivery

WaterNSW has forecast expenditure $3.668 million in the current regulatory period and $3.660 million in the next regulatory period.

Delivery of the program is expected to be fairly steady from year to year in the forthcoming regulatory period.

There was a spike in expenditure in the 2014-15 financial year, with $1.438 million, approximately double that of previous years. WaterNSW provided an explanation behind what drove this spike; a volume of 'LDS' replacements which are typically more expensive than other equipment and had to be replaced that year. Future expenditure is forecast to be fairly consistent.

7.1.7. Assessment of prudence and efficiency

Prudence

The past and forecast expenditure proposed under this project is considered to be prudent:

- WaterNSW has established a clearly defined need for this project, with reliable telemetry equipment and instrumentation and accurate data being essential to fulfilling WaterNSW's Operating Licence, water licences and approvals, bulk water supply agreements and the state's commitments under the National Water Initiative.
- WaterNSW's past expenditure and proposed expenditure is to be made no earlier than is necessary to meet the need, with the program to replace assets at their economic service life and focusing on older/obsolete equipment and equipment in unacceptable condition first.
- The investment aligns with corporate policies, strategies and objectives.

- As noted the planned renewal of hydrometric assets has resulted in significantly lower operational expenditure due to unplanned maintenance activities.
- The expenditure is in line with that forecast as part of the current regulatory period which was approved.

Efficiency

The expenditure to date and proposed under this renewals program is considered to be efficient:

- The option chosen is the highest NPV of the available options, with both costs and benefits included in the calculation where appropriate, on a whole of life basis.
- The scope of the selected project is no more than is needed to meet the identified need, with the program to replace assets at their economic service life and focus on older/obsolete equipment and equipment in unacceptable condition first.
- The proposed procurement method is considered to be likely to result in unit costs based on competitive market rates.
- Synergies with other projects, such as the merger of WaterNSW and State Water has not been quantified at this stage, but is not expected to be material in the next regulatory period. The needs and initiatives of other government organisations, with whom the collected data is shared, have been considered in defining the project.

It is noted that there is currently no asset management plan in place for the hydrometric assets though WaterNSW has advised it has been initiated and existed in a draft form before being put on hold. In our experience, having an asset management plan is integral to a risk-based approach to asset renewals option, replacing assets based on their criticality, asset performance and condition. This may lead to a reduced scope while still meeting the project need; experience suggests that this can reduce expenditure. This is considered to be immaterial in this case. The review team recommends that IPART consider putting in place an output measure for the next review to ensure that an asset management plan is in place.

7.1.8. Recommended expenditure

The following tables contain the recommended expenditure and compares this with WaterNSW's actual, forecast and proposed expenditure.

Table 39 WEM001 actual, forecast and recommended capital expenditure ($000s, $2015/16)

	Current reg period 2012/13	Current reg period 2013/14	Current reg period 2014/15	Current reg period 2015/16	Total
WaterNSW actual/forecast expenditure	760	628	1,438	842	3,668
Recommended expenditure	760	628	1,438	842	3,668
Variance	-	-	-	-	-
Variance (%)	-	-	-	-	-

Source: All data sourced from 'SIR Capex 2' Tab of AIR/SIR excel file provided by IPART on 8 September 2015 (WaterNSW Greater Sydney 2015 Price Submission - Annual and Special Information Return 2015.xlsx (8/9/2015, 2:47pm)).

Table 40 WEM001 proposed and recommended capital expenditure ($000s, $2015/16)

	Next reg period 2016/17	Next reg period 2017/18	Next reg period 2018/19	Next reg period 2019/20	Total
WaterNSW actual/forecast expenditure	910	912	903	935	3,660
Recommended expenditure	910	912	903	935	3,660
Variance	-	-	-	-	-
Variance (%)	-	-	-	-	-

Source: All data sourced from 'SIR Capex 2' Tab of AIR/SIR excel file provided by IPART on 8 September 2015 (WaterNSW Greater Sydney 2015 Price Submission - Annual and Special Information Return 2015.xlsx (8/9/2015, 2:47pm)).

7.2. Tallowa Dam Preliminary Risk Assessment and Design WEM009

7.2.1. Project description

Tallowa Dam was commissioned in 1976 and located on the Shoalhaven River at its junction with the Kangaroo River, approximately 20 km west of Nowra. The dam forms an impoundment (Lake Yarrunga) that provides suction storage for the WaterNSW's Shoalhaven pumping scheme and for the operation of a peak electricity generation facility. The catchment area is 5,750 square kilometres with total storage capacity 90,000 ML and active storage of 35,300 ML.

Following reviews of flood hydrology and dam stability assessments WaterNSW has determined that remedial works are required to the Tallowa Dam to meet dam safety obligations. Comprehensive condition assessments and options assessments have arrived at a scope of work to undertake work on two abutment blocks, and undertake some erosion protection works for the right hand side abutment.

Prior to having undertaken more detailed investigations which included obtaining concrete core samples and testing for tensile strength, the scope of works was significantly larger with five abutment blocks to have remedial work.

The project is currently towards the end of the 'Stage 2' phase, i.e. investigations / concept design, with the business case for 'Stage 3' under preparation, due to be finalised in 2015.

7.2.2. Assessment type and documentation

Assessment type

This assessment considers future expenditure in the current and future regulatory periods.

Documentation reviewed

A number of documents were provided and reviewed for this project, as summarised in the table below. In addition, an interview was undertaken with WaterNSW officers in Penrith on 7 October 2015.

Table 41 Documentation provided for WEM009

Document title	Reference
Tallowa Dam IPART's capex review consultants - Reply Intermediate follow up request for documentation, WaterNSW, October 2015	N/A
Presentation originally presented on 7 October 2015- Tallowa Dam Preliminary Risk Assessment and Design Background and Update, WaterNSW, October 2015	N/A
Tallowa Dam Stability Assessment For Existing Dam Final Report, WaterNSW, April 2008	DC06119
Tender document excerpt, Environmental Flow Release and Fish Passage, WaterNSW, January 2008	N/A
Project Brief form, WaterNSW, 2009	N/A
Review of Probable Maximum Flood for Tallowa Dam, WaterNSW, February 2006	N/A

7.2.3. Project need

The project driver is categorised by WaterNSW as meeting 'existing mandatory standards (dam safety)'.

WaterNSW has obligations under the NSW Dam Safety Act. To meet these obligations WaterNSW periodically undertakes reviews of flood hydrology and dam stability assessments. For Tallowa Dam both have been undertaken along with a risk assessment which has resulted in a need to undertake some remedial works by 2020 to ensure dam safety.

The dam was designed for a probable maximum flood (PMF) of 20,813 m3/sec while the most recent flood study indicated an applicable PMF of 40,000 m3/sec. WaterNSW has undertaken investigations over several years to determine the condition of the dam wall and ancillary structures and their adequacy. WaterNSW determined that upgrade works were required, to be focused on the abutment blocks to address potential instability at the dam/foundation interface and to protect abutment erosion during large floods. This initial study carried out in 2008 used an assumption of a concrete tensile strength of 0 whereas testing carried out in May 2015 found tensile strength of 1.4 MPa which is considered favourable.

7.2.4. Options investigated

As the proposed expenditures are for remedial works to address deterioration of the two abutment blocks, and some erosion protection works, options are limited to technical solutions that address these specific issues. Solutions have changed over time as the initially conservative assumptions have either been validated or able to be discounted, with the scope becoming more clear and generally decreasing.

This process has resulted in a decrease in scope required to meet the same need as more detailed site and asset information has become known, which is discussed in more detail below.

7.2.5. Procurement

WaterNSW intends to deliver the works via a public tender under a design and construct contract.

7.2.6. Costs and delivery

WaterNSW proposed expenditure of $13.825 million in the forthcoming regulatory period and a forecast $0.577 million in the current regulatory period, a total of $14.402 million.

It was stated at the relevant interview and clarified in writing later that due to recent investigations carried out since the pricing proposal was prepared, the scope reduced significantly, with the proposed capital expenditure reduced to approximately $3.1 million. No explicit contingency allowance was made.

WaterNSW plans to undertake further concept design work, to be completed April 2016. Followed by going to market (e.g. request for tender) by the end of the 2015-16 financial year with construction to take place from 2016-17.

7.2.7. Assessment of prudence and efficiency

Prudence

The revised expenditure proposed under this project is considered to be prudent:

- Compliance with dam safety obligations is understood to be mandatory; WaterNSW have undertaken analysis and investigations to best determine how to meet these obligations.
- WaterNSW has demonstrated to the review teams' satisfaction the need to undertake remedial works to meet dam safety obligations.
- The timing is appropriate and based on dam safety risk assessments, hydrologic modelling, and informed by comprehensive condition assessments.
- The investment is consistent with WaterNSW's asset management plan for dams.

Efficiency

The initial proposal by WaterNSW to spend $14.4million was found to contain some unnecessary expenditure, following additional testing undertaken recently by WaterNSW. The conservative assumptions underpinning the initial capital expenditure forecast resulted in excessive scope not required to meet the project need once the results of subsequent testing in May 2015 of the dam's concrete (tensile strength) were considered.

The recent scope changes appear to have followed a sound process, in line with WaterNSW and industry standard processes and based on a more detailed condition assessment of the existing concrete structure. Had WaterNSW proceeded without undertaking the comprehensive condition assessment of the concrete structure, works on all blocks would have been required. A reduced scope of remedial works was possible once the results of the tests were incorporated in the risk assessment.

A revised expenditure of approximately $3.1 million proposed under this project is considered to be efficient:

- A lengthy options assessment does not appear to have been carried out for the proposed works however it is clear that in this case there are no credible alternatives to meet the required need.
- Having undergone works at the same site in recent years WaterNSW has a reasonably high confidence in the costs and risks involved in carrying out the works and should be able to have the construction carried out in a safe and reliable manner within the next regulatory period.

WaterNSW will deliver the works via a public tender. Based on the information reviewed, the unit rates underpinning the estimate are not excessive and the cost estimate has been prepared on a reasonable basis.

7.2.8. Recommended expenditure

The following table contains the recommended expenditure and compares this with WaterNSW's proposed expenditure.

Table 42 WEM009 actual, forecast and recommended capital expenditure ($000s, $2015-16)

	Current reg period 2015-16	Next reg period 2016-17	Next reg period 2017-18	Next reg period 2018-19	Total
WaterNSW actual/forecast expenditure	577	1,061	6,442	6,322	14,402
Recommended expenditure	577	1,061	1,462	-	3,100
Variance	-	0.000	-4,980	-6,322	-11,302
Variance (%)	-	0.0%	-77.3%	-100.0%	-78.5%

Source: All data sourced from 'SIR Capex 2' Tab of AIR/SIR excel file provided by IPART on 8 September 2015 (WaterNSW Greater Sydney 2015 Price Submission - Annual and Special Information Return 2015.xlsx (8/9/2015, 2:47pm)).

7.3. Warragamba Dam Reliability Upgrade WEM013

7.3.1. Project description

WaterNSW has previously undertaken a Risk and Reliability Review, which involved detailed study of all dam safety critical components of Warragamba Dam to ensure that neither the dam nor its key components have an unacceptable risk of failure. Review objectives were associated with assessing reliability of spillway gates, gauging impacts on flood handling capacity of the dam; and assessing adequacy of the dam to withstand contemporary design loadings, including expected flood and seismic loadings.

Following the investigations and risk assessments several assets were identified as requiring remedial work or replacement. These include the drum and radial gates (together the crest gates), the subject of this project. The radial gates have been found to be unreliable in their current state and to overcome this limitation require replacement of the drive train mechanism; and the radial gates themselves were found to require replacement. A drum gate is also proposed to be replaced. There are separate risks relating to seismic issues that impact upon other assets at the dam including the main structure, however that is outside the scope of this project.

7.3.2. Assessment type and documentation

Assessment type

The assessment is of actual and forecast expenditure within the current regulatory period and proposed future expenditure within the next regulatory period.

Documentation reviewed

A number of documents were provided and reviewed for this project, as summarised in the table below. In addition, an interview was undertaken with WaterNSW officers in Penrith on 7 October 2015.

Table 43 Documentation provided for WEM013

Document title	Reference
Discussion paper: The Future of Warragamba Dam A Strategic Approach, WaterNSW, July 2015	N/A
Warragamba Dam Risk and Reliability Summary Report, WaterNSW, August 2015	D2015/87222
Drive Train Options Study Report, URS, November 2014	42061185/R001/1
DPI Water letter to IPART, Submission on IPART price review issues papers, DPI Water, October 2015	BN15/7167
Response to additional capital expenditure queries received on 20 October 2015 Warragamba Dam Reliability Upgrade, Upper Canal Refurbishment, WaterNSW, October 2015	N/A

7.3.3. Project need

The driver for this project is categorised by WaterNSW as meeting existing mandatory standards (dam safety).

Warragamba Dam is the primary source of Greater Sydney's water supply, storing approximately 80% of available water. The dam was commissioned in 1960, has a capacity of 2,069 GL, and is categorised as an 'Extreme Consequence' dam by the NSW Dams Safety Committee (the state's Dam Safety Regulator) due to its size and location, only 20 km above the major population centre of Western Sydney.

WaterNSW has obligations under the NSW Dam Safety Act relating to dam safety, along with Operating Licence obligations to ensure reliability of supply. Warragamba Dam is included within the NSW Dams Safety Committee's 'Dams under special review' list which comprises the State's highest risk dams; Warragamba Dam is on this list due to potential inadequate earthquake structural resistance.

The specific need of this project is for maintaining dam safety rather than supply reliability; a contributor to dam safety is the reliability of assets including dam gates and supporting mechanisms. Dam gates have been identified as playing an important role in being able to draw down the water storage level following seismic activity (e.g. earthquake). Analysis and practice has shown that should the gates be inoperable the dam safety risks increase considerably and are unacceptably high.

In a submission to a WaterNSW Board committee in August 2015, it was stated that further work will be required once the seismic loading is determined to confirm the exact project need. “Once the final seismic loadings are determined, further more detailed analysis will be required for the dam and the gates and other ancillary structures to determine their adequacy or otherwise against all load cases as have been defined by this project.”

7.3.4. Options investigated

Investigations have taken place to identify options for meeting the various needs arising from the Risk and Reliability Review. Some needs such as maintaining reliability of the trunnion bearings are being met through operational measures without a need for capital expenditure.

To address the need of radial gate reliability, it has been determined that the drive trains for the gates require replacement, with no other options available to meet that particular reliability need. WaterNSW has identified and investigated four options for this replacement:

- Cylinder hoist with wire rope
- Wire rope hoist with electric drive
- Wire rope hoist with hydraulic drive
- Hydraulic cylinder hoists with hydraulic drive.

Following an assessment making use of Australian and international expertise WaterNSW’s review concluded wire rope hoists were the most appropriate solution though has not yet made a decision on what type of drive to use.

For the actual radial gates themselves, it was determined that a full replacement is required of each gate with no remedial options being suitable to meet the need. For replacement of the drum gate options to undertake remedial strengthening works to the gate were investigated. It was recommended that once final seismic loadings are determined the options be reassessed.

Other works may be required to address reliability of the Warragamba Dam however are outside the scope of the expenditure requested for this project.

7.3.5. Procurement

WaterNSW intends to deliver construction works via a public tender. Further expenditure of consultants for further design and cost estimation work may be necessary and would be engaged in accordance with WaterNSW procurement policies.

7.3.6. Costs and delivery

Expenditure commenced in 2014/15, while WaterNSW has proposed expenditure of $31.058 million in the next regulatory period and a forecast $1.679 million in the current regulatory period, with expenditure forecast to be completed by 2017/18.

The works are proposed to commence this current financial year with most expenditure to take place in the next period. This is in line with the determination and assessments undertaken of the projects in

the last pricing review with some minor slippage. In the business case material, a contingency amount was also included[140].

Following the interview WaterNSW provided a revised forecast for the current financial year, with forecast expenditure of $500,000, with the balance ($1.063 million) shifted into 2016-17. This was then included within WaterNSW's December 2015 reforecast for all projects in 2015-16.

7.3.7. Assessment of prudence and efficiency

Prudence

The proposed expenditure on this project is considered to be prudent:

- The need has been clearly defined and demonstrated by WaterNSW, satisfying a dam safety driver.
- Risk analysis and assessments carried out in accordance with dam safety regulations have identified the problem and a thorough process has been undertaken to find the most appropriate way of managing the risks.
- The identification of the need and process undertaken to identify options has been carried out in accordance with WaterNSW's procedures including the asset management strategy and the asset management plan for dams.

It was noted by the review team that this project was proposed as part of the last pricing review, and had approximately $15 million of planned expenditure for seismic works deferred in IPART's decision. The reasoning behind the deferral given by IPART's consultant Halcrow which proposed deferring most expenditure was as follows:

- *Whilst the need to ensure the structural integrity and safety of Warragamba Dam is undeniable, the prudence of the proposed upgrade, as it currently stands, is questionable. Halcrow believes that the SCA has adopted a prudent approach to the current investigation work, funding it as Operating Expenditure, however, does not consider it appropriate to make a significant capital allowance in the upcoming determination period for work that has not yet been defined.*
- *On the basis that improvement works have already been completed, providing some protection against the revised impacts of PMF and seismic activity, Halcrow considers that it may be appropriate to defer the majority of the proposed capital expenditure to the next price determination period. The lead in time for projects of this nature are likely to be significant, therefore Halcrow considers it would be prudent to make some allowance for nominal capital expenditure during the upcoming determination, in order to complete any investigations, define the actual scope of works and commence the procurement process for the delivery of the defined scope. This will enable the SCA to present a project estimate of high confidence in its next pricing submission.*

Further, IPART in its determination made the following comments:

- *In the draft report, we accepted Halcrow's recommendation to defer $18 million of the expenditure proposed for the Warragamba Dam upgrade to the next determination period to allow better scoping of this capital project.*

[140] Note that the contingency value has been removed at the request of WaterNSW due to being commercial-in-confidence.

- *SCA's view is that the crest gate component of the Warragamba Dam Upgrade Project should not be deferred to the next determination period, as it has experienced some issues with the operation of the gates in the recent flood event. SCA recommends deferring about $15 million of the expenditure proposed for seismic work, but adding approximately $3 million to its capital expenditure allowance to allow work to start on the reliability of the crest gates (ie, SCA wishes to delay the project by one year instead so that capital expenditure commences in 2014/15).*
- *We consider SCA's proposal reasonable and accept deferring the expenditure profile for this project by one year. We note that this increases capital expenditure by about $3 million from the draft report and has a negligible impact on prices.*

The review team is of the view that the timing of the proposed expenditure is now prudent therefore the issues from the previous review have now been addressed.

There is a possibility that the new assets may be made redundant if the outcomes of the Hawkesbury-Nepean Valley Flood Management Review show that major dam alterations are required, or that further seismic testing will change the nature of the works required. The review team note the intention of the NSW Government to make the outcomes of the flood review known by mid-2016, however, based on discussions with DPI Water the review team anticipate any changes could take at least 5 to 10 years to be implemented. To delay the proposed works for this period would appear to be not prudent, given the identified risks.

Should the NSW Government make recommendations in early 2016 that do materially affect the prudence of undertaking the works, then WaterNSW would be in the position to make scope or timing adjustments. However, the review team believes that the expenditure should be considered prudent at this point in time.

Efficiency

The Warragamba Dam Risk and Reliability Summary Report presented to a WaterNSW Board committee refers to an approximate cost of $30 million which correlates with what is in WaterNSW's proposal. While confidence in accuracy of the cost estimates is stated as being 'low' in the Commercial-in-Confidence Appendices to WaterNSW's proposal, further work on developing probabilistic cost estimates is being or will be carried out by WaterNSW. The estimates prepared to date are sound with the estimates provided not using excessive rates. We believe that they are the best estimates available at this time. The works will be procured under a public tender therefore market rates will apply.

Project planning is following a sound process in line with WaterNSW and the former SCA's policies and procedures. The project scope and investigations carried out to date to identify and analyse options to meet the need are also consistent with the asset management plan for dams. This process is ensuring that the selected scope is no greater than that required to meet the dam safety need.

A relatively high allowance is made for contingency though no reduction is proposed for this individual project. The issue of contingency allowance is discussed in Section 4.5.15.

Following this assessment, the proposed expenditure on this project is considered to be efficient notwithstanding the findings on contingencies.

7.3.8. Recommended expenditure

The following table contains the recommended expenditure and compares this with WaterNSW's proposed expenditure. For the purposes of assessing the prudence and efficiency of this project, no

re-phasing has been accounted for in the recommendation as it has been included at the program level.

Table 44 WEM013 proposed and recommended capital expenditure ($000s, $2015/16)

Financial year ($2015/16)	Current reg period 2014-15	Current reg period 2015-16	Next reg period 2016-17	Next reg period 2017-18	Next reg period 2018-19	Total
WaterNSW proposed expenditure	116	1,563	13,120	17,938	-	32,737
Recommended expenditure	116	1,563	13,120	17,938	-	32,737
Variance	-	-	-	-	-	-
Variance (%)	-	-	-	-	-	-

Source: All data sourced from 'SIR Capex 2' Tab of AIR/SIR excel file provided by IPART on 8 September 2015 (WaterNSW Greater Sydney 2015 Price Submission - Annual and Special Information Return 2015.xlsx (8/9/2015, 2:47pm)).

7.4. Metropolitan Dams Electrical system (stage 3) WEM028

7.4.1. Project description

WaterNSW operates a number of dams to provide the raw water supply for Greater Sydney, Wollondilly Shire and the Macarthur and Illawarra regions. Five such dams are Nepean, Cataract, Cordeaux, Avon and Woronora, collectively referred to as the 'metropolitan dams'. Electrical assets are integral to the operation of these dams.

WaterNSW has carried out a series of investigations into the suitability of the existing electrical assets at each dam, and arrived at a scope of work to renew and upgrade critical electrical systems at the five dams. The scope of work is primarily to replace aged assets (74 to 108 years old) that in some cases present significant safety risks; it also involves upgrades to capabilities enabling less labour intense monitoring, and provides improved reliability. Electrical equipment to be replaced includes electrical, control, SCADA and communication systems.

WaterNSW has to date carried out 'Stage 1' and 'Stage 2' works and proposes to commence the 'Stage 3' work e.g. design and implementation phase in the current regulatory period, with the majority of expenditure occurring in the next regulatory period. The project has the following objectives:

- Provide a safer environment for the workforce and wider public
- Reduce the likelihood of electrical asset failures leading to water supply interruptions
- Facilitate cost effective asset management processes

Provide efficient and effective dam safety monitoring processes

7.4.2. Assessment type and documentation

Assessment type

The assessment is of forecast expenditure within the current regulatory period and the next regulatory period.

Documentation reviewed

A number of documents were provided and reviewed for this project, as summarised in the table below. In addition, an interview was undertaken with WaterNSW officers in Penrith on 6 October 2015.

Table 45 Documentation provided for WEM028

Document title	Reference
Business Case - Metropolitan Dams Electrical Systems Upgrade Stage 2 Works – Documentation Preparation Phase	D2012/7637
Metro Project Brief Form 2014/15 of Stage 3 works	N/A
Metropolitan Dams Electrical Systems Upgrade Stage 3 Business Case	D2014/75921

7.4.3. Project need

The project driver is categorised by WaterNSW as meeting existing mandatory standards - other.

Existing electrical systems at each of the dams is approaching the end of useful life, which is causing difficulties for WaterNSW to manage. Specific drivers leading to the project need are as follows:

- Aged electrical equipment that is in poor condition, poses a risk to a safe and reliable water supply
- Manual intervention required to undertake dam monitoring including for dam safety and relating to environmental flows obligations
- Bushfire vulnerability of overhead wiring poses a risk to providing a reliable water supply.

Delivery of the project will realise safety, reliability and efficiency benefits.

7.4.4. Options investigated

WaterNSW investigated the following options in detail in the most recent phase of the project ranging from essentially maintaining the status quo with minimal remedial or renewal work and an increasing cost of maintenance, and four other options comprising a range of capital works each addressing a combination of safety, reliability or efficiency needs. The options are listed below:

- Option 1: Base Case
- Option 2: Upgrade to improve safety
- Option 3: Upgrade to improve reliability
- Option 4: Safety and Reliability Upgrade

- Option 5: Safety, Reliability, and Efficiency Upgrade

WaterNSW also examined other options that were eliminated earlier on in the process: Closing all dam sites to the public; demand management solution; on-site generation capacity.

Ultimately Options 4 and 5 were short-listed, with Option 5 being selected following consideration of financial and non-financial factors.

7.4.5. Procurement

WaterNSW proposes to deliver the project construction via a public tender.

7.4.6. Costs and delivery

WaterNSW provided proposed expenditure for the forthcoming regulatory period and forecasts for the current regulatory period, however these figures were removed due to being commercial-in-confidence. In the business case material, two types of contingency allowance were made[141]:

- "Contingency (to P50)" and
- "Management Reserve (to P90)"

WaterNSW is progressing the project with construction works possibly to begin in the current financial year. Further work is required before arriving at a final works program including sequencing. WaterNSW will potentially undertake works at only one or two sites initially as a pilot before ramping up the program to deliver work at the other sites. WaterNSW will also ensure works are coordinated with other projects such as the Warragamba Pipeline valves and controls project.

7.4.7. Assessment of prudence and efficiency

Prudence

The expenditure proposed under this project is considered to be prudent:

- With ages between 74 and 108 years, condition reports on these electrical and communication assets show that they represent a risk to the reliability and safety of dam operations and should be replaced; the need has been clearly demonstrated.
- Following the options investigation, WaterNSW chose to proceed with Option 4 which was the more prudent choice than Option 5 which would have over-delivered against the identified need.
- The timing of the investment is appropriate and no earlier than necessary to meet the need, though WaterNSW may wish to consider a more even spread across the four years of the next regulatory period given expenditure on other projects.

Some aspects of the business case are lacking in robustness but these do not appear to affect the proposed expenditures. For example:

- The reason for the timing of the preferred option (all works over a 4 year period) has not been stated. The condition reports state a period of 5 years, but it is evident that a delay in the works

[141] Contingency values were also removed at the request of WaterNSW due to being commercial-in-confidence.

would lead to an increased risk of failure and hence spreading the works over a longer time period would appear to be not prudent.

- Aspects of the proposed expenditures are driven by different drivers – reliability/safety and operational improvements. While the reliability/safety aspects are fully discussed, the costs and benefits of the operational improvements have not been separately assessed. Nevertheless, it appears that the operational improvements would bring the assets to modern day standards and that these would be most cost effectively undertaken in conjunction with the replacement works.

WaterNSW has also identified non-quantifiable benefits that strengthen the case to undertake the works. Better communication to the relatively remote dam sites may also reduce the need for field staff to travel into regional offices in order to obtain sufficient IT network connectivity.

It is noted that the project claims benefits in terms of reduced operating costs in the future though WaterNSW has stated this has not been taken account of in the Operating Cost forecasts for the forthcoming pricing period; it was stated at interviews that the project would not necessarily decrease operating expenditure but ensure operating expenditure did not increase due to increased maintenance required should the assets not be replaced. Following completion of the project operating costs should be better known and WaterNSW should be able to take account of any efficiencies in following pricing periods.

Efficiency

The expenditure proposed under this project is considered to be efficient:

- A thorough process has been undertaken to establish the most appropriate option with an appropriate scope of work to deliver the project needs at the least whole of life cost. WaterNSW has analysed a suite of options over several years, choosing the option that has the highest net present value, in addition to conducting a qualitative multi-criteria analysis to select the preferred option.
- WaterNSW has undertaken probabilistic cost estimates for the preferred option to gain confidence in the accuracy of the project to the proposed budget.
- Design and construction costs are based on the industry knowledge of WaterNSW's cost consultant plus experiences of a recent construction project at Warragamba Dam for a similar scope of works. Construction work will be procured via a public tender.
- With a gated approach project planning is following a sound process, in line with WaterNSW and the former SCA's processes.
- Work undertaken to date has provided WaterNSW with a high level of confidence in delivering the project outcomes to budget in a safe and reliable manner.

It is a project not without execution risk, requiring careful planning and sequencing to manage transition, integration and change risks during construction, commissioning and operation. By staging the process of initiation (Stage 1), investigation/concept design (Stage 2) and finally detailed design/implementation (Stage 3) these risks are now well understood and planned for.

While the underlying estimate is considered efficient, the allowance for contingency is considered too high[142]; a consideration was made whether to recommend a reduction in expenditure on this project to

[142] Note that the contingency value has been removed at the request of WaterNSW due to being commercial-in-confidence.

reduce the contingency however given evidence was found of systemic over-conservatism due to excessive contingencies, the review team decided to deal with this at a portfolio level.

7.4.8. Recommended expenditure

The following table contains the recommended expenditure and compares this with WaterNSW's proposed expenditure.

In isolation the project timing appears appropriate however WaterNSW may find it prudent to investigate options to defer some expenditure until the final year of the next period (e.g. 2019-20) during which WaterNSW has forecast a drop in expenditure in the overall capital program. This project is one of several coincidental projects with peak expenditure during years 2016-17 and 2017-18; WaterNSW's executive and Board will be best place to make the judgement on how to smooth out some of the peaks in expenditure with a more even spread.

Table 46 WEM028 proposed and recommended capital expenditure ($000s, $2015-16)

	Current reg period 2015-16	Next reg period 2016-17	Next reg period 2017-18	Next reg period 2018-19	Total
WaterNSW proposed expenditure	*	*	*	*	*
Recommended expenditure	*	*	*	*	*
Variance	-	-	-	-	-
Variance (%)	-	-	-	-	-

Source: All data sourced from 'SIR Capex 2' Tab of AIR/SIR excel file provided by IPART on 8 September 2015 (WaterNSW Greater Sydney 2015 Price Submission - Annual and Special Information Return 2015.xlsx (8/9/2015, 2:47pm)).

Note: * Denotes content removed at the request of WaterNSW due to being commercial-in-confidence.

7.5. Catchment security and fencing program WDS002

7.5.1. Project description

WaterNSW has an established program to undertake capital works to upgrade or repair fit for purpose security barriers including fencing within designated special areas in order to protect water quality, water security, public safety and avoid expenditure for clean-up due to illegal dumping of refuse. The program has been in place since 2011-12 and is proposed to carry on into the next regulatory period and beyond.

The scope of work includes identification and prioritisation of fencing needs including undertaking risk assessments; any planning or environmental approvals required; stakeholder negotiations; and finally procurement and handover of the assets.

No significant changes are proposed by WaterNSW to the program for the forthcoming regulatory period compared to the current program though the volume of work has increased.

7.5.2. Assessment type and documentation

Assessment type

This assessment considers past and future expenditure in the current and future regulatory periods.

Documentation reviewed

A number of documents were provided and reviewed for this project, as summarised in the table below. In addition, an interview was undertaken with WaterNSW officers in Sydney on 8 October 2015.

Table 47 Documentation provided for WDS002

Document title	Reference
Business Case – Special Areas and Braidwood Lands Fencing 2012-2016, WaterNSW, 2011	D2011/38490
Business Case (Draft) – Special Areas and Braidwood Lands Fencing 2017-2022, WaterNSW, 2015	N/A
SCA Healthy Catchments Strategy 2012-2016, WaterNSW, 2012	N/A
WaterNSW Healthy Catchments Program 2014-15, WaterNSW, 2014	N/A
Catchment Fencing and Security – Breakdown of works, WaterNSW, 2015	N/A

7.5.3. Project need

The project driver is categorised by WaterNSW as meeting 'discretionary standards'.

Fit for purpose fencing and other security measures is required to:

- Secure and protect water quality, land and other assets
- Enforce the Sydney Water Catchment Regulation 2013
- Meet lease and licence requirements for WaterNSW land that is leased or licenced
- Reduce unplanned operating expenditure borne by WaterNSW due to unauthorised entry including damage to assets and dumping of refuse including asbestos cement sheeting.

WaterNSW published the Healthy Catchments Strategy in 2012, which contains a number of strategic actions to reduce risks to water quality for the Greater Sydney area. The Healthy Catchments Program contains a number of specific initiatives and programs for WaterNSW to meet this strategy one of which involves Barriers and Fencing.

The condition of many boundary fence lines has deteriorated through age, wildfire and frequent vandalism and they are therefore beyond their serviceable life. Some types of fencing are no longer fit for purpose and require fencing of a different standard.

Many of the special areas were originally commissioned in sparsely populated areas; urban encroachment has resulted in a different risk profile. Urbanisation poses a significant and unacceptable risk to water quality and water security, with some assets presenting a safety risk to surrounding population or those who enter illegally. In some locations unauthorised access is made

for recreational activities such as driving, swimming or fishing, while in others it is for the illegal dumping of refuse including asbestos.

Operational expenditure is used to maintain existing barrier assets, however sufficient additional sites have been identified to justify a targeted and accelerated capital works based barrier control program. This program will provide a mechanism to protect water quality and catchment lands and meet stakeholder expectations

7.5.4. Options investigated

For both the current and future pricing periods the following options were investigated:

- **Base Case** – The base case is to not upgrade existing fences and barriers and to not install any new fences / barriers. This approach would still require maintenance of existing structures and the operational budget for fence repairs would increase in addition to staff time for management of small repair contracts. The risks of unauthorised entry remain and therefore this option did not meet the basic need and not a realistic option.
- **Option 1** – Install Chain-link fence with attached cable in all areas. This option involves installing chain-link fencing with attached cable in all areas, based on estimated lengths. It also includes a general allowance for ancillary costs such as Environmental Impact Assessment preparations, freight and vegetation clearing.
- **Option 2** – Install fence standard appropriate to the location and the relevant risk posed. This option involves installing a fence standard appropriate to the location, determined for individual sites based on assessed risk, threat type and landscape features. For parts of the Special Area with a history of unauthorised vehicle access, cable fencing will be installed. In rural landscapes where stock control is the primary focus, rural fencing will be installed. Any fencing type installed will be based on specific standards detailed in the Guide to Barriers, Fences and Gates.

WaterNSW chose Option 2, which was less than half the estimated capital cost of Option 1, and meets the need with the most appropriate standard of fencing, barrier or deterrent.

7.5.5. Procurement

For the current pricing period, procurement of services is through an existing panel arrangement with two contractors providing all work. This panel was established following a public tender process. For the future pricing period the existing panel contracts will continue to be used though will have to be retendered at some point.

7.5.6. Costs and delivery

WaterNSW has forecast expenditure of $1.792 million in the current regulatory period and proposed $3.013 million in the next regulatory period. No explicit contingency allowance was made.

Delivery in the current regulatory period is generally in line with the forecast contained within the business case. Works are being prioritised so that areas with the greatest need are carried out first.

7.5.7. Assessment of prudence and efficiency

Prudence

The expenditure incurred under this project during the current regulatory period is considered to be prudent as is the proposed expenditure:

- The need has been demonstrated by WaterNSW and is considered to be necessary to protect water quality, maintain security of water supply, and for public safety reasons.
- There is also a business efficiency driver, with unplanned operating expenditure for clean-up of illegally dumped material being considerable.
- Expenditure is being undertaken no earlier than to meet the need, appropriately staged over several years, rather than embarking on an unsustainable accelerated program.
- The program meets WaterNSW's obligations under the Healthy Catchments Strategy to reduce risks to water quality.

Some aspects of the business case are lacking in robustness but these do not appear to affect the proposed expenditures. For example, different options to stage the works are not explicitly considered though it is understood from the material and from the interviews that optimal timing has been considered. The review team recommends that WaterNSW develops an optimised implementation plan for roll out of the project over the next regulatory period.

Efficiency

The expenditure to date and proposed under this program is considered to be efficient:

- WaterNSW is following a process to prioritise expenditure that considers relative risk of each candidate project though it is not as developed or mature as some other asset renewal or replacement programs WaterNSW has. Given the size of the program is relatively small, in the order of $700,000 per year, this is not a major concern.
- Expenditure is fairly consistent from year to year which has a benefit for WaterNSW as their two contractors are able to plan their work accordingly and provide competitive pricing. Unit rates used are consistent with similar works undertaken by others and established via a competitive procurement process. It is noted that WaterNSW has two contractors in place, maintenance of competitive tension between the two would be desirable, with periodic retendering of the contract required.

While this did not impact the assessment of efficiency it was noted the proposed expenditure in the next four year period is greater than in the past. This was explained by WaterNSW as being due to a slightly greater scope of work being included within the program. WaterNSW has made a decision to undertake a slight ramp-up in work before a reduction is forecast in 2020-21 and beyond, the reasoning provided that it will realise benefits earlier. A more thorough and robust approach would have been to include several different options within the business case and calculation of the benefits of each for comparison.

7.5.8. Recommended expenditure

The following tables contain the recommended expenditure and compare this with WaterNSW's proposed expenditure.

Table 48 WDS002 actual, forecast and recommended capital expenditure for current regulatory period ($000s, $2015/16)

	Current reg period 2012-13	Current reg period 2013-14	Current reg period 2014-15	Current reg period 2015-16	Total
WaterNSW actual/forecast expenditure	472	305	574	441	1,792
Recommended expenditure	472	305	574	441	1,792
Variance	-	-	-	-	-
Variance (%)	-	-	-	-	-

Source: All data sourced from 'SIR Capex 2' Tab of AIR/SIR excel file provided by IPART on 8 September 2015 (WaterNSW Greater Sydney 2015 Price Submission - Annual and Special Information Return 2015.xlsx (8/9/2015, 2:47pm)).

Table 49 WDS002 proposed and recommended capital expenditure for next regulatory period ($000s, $2015/16)

	Next reg period 2016-17	Next reg period 2017-18	Next reg period 2018-19	Next reg period 2019-20	Total
WaterNSW actual/forecast expenditure	752	753	740	768	3,013
Recommended expenditure	752	753	740	768	3,013
Variance	-	-	-	-	-
Variance (%)	-	-	-	-	-

Source: All data sourced from 'SIR Capex 2' Tab of AIR/SIR excel file provided by IPART on 8 September 2015 (WaterNSW Greater Sydney 2015 Price Submission - Annual and Special Information Return 2015.xlsx (8/9/2015, 2:47pm)).

7.6. Warragamba Pipeline valves and controls upgrade WDS003

7.6.1. Project description

This project is to replace valves and actuators on the Warragamba Pipeline, leading to increased reliability, improved safety, and allow remote operation of key valves.

The stage of the project subject to this assessment is 'Stage 3', that is Design/Implementation. It will see detailed design, construction, commissioning and handover completed for the full scope of works. Stage 1 was completed in 2012 which involved a comprehensive condition assessment of the major valves and controls on the pipeline. The conclusion of Stage 1 was that in the order of $10 million of works would be required over a proposed eight year program.

Stage 2 involved further investigations to confirm in more detail existing asset conditions to refine the scope of work required and develop options to deliver the outcomes required. Concept design was carried out along with a cost estimate. Further, with each valve installation costing several hundred thousand dollars, WaterNSW carried out a value engineering exercise to challenge the logic of each valve replacement or installation proposed before arriving at a final scope of work and cost estimate.

The final Business Case for Stage 3 works was not available at the time of this review though a presentation was provided outlining the latest developments and cost estimates.

7.6.2. Assessment type and documentation

Assessment type

The assessment is of actual and forecast expenditure within the current regulatory period and proposed future expenditure within the next regulatory period.

Documentation reviewed

A number of documents were provided and reviewed for this project, as summarised in the table below. In addition, an interview was undertaken with WaterNSW officers in Penrith on 7 October 2015.

Table 50 Documentation provided for WDS003

Document title	Reference
Warragamba Pipelines Valves and Controls Upgrade Program (scope communication document, and to inform Output Measure 7), WaterNSW, December 2012	D2012 114371
Business Case - Warragamba Pipelines Valves & Controls Upgrade Stage 2, WaterNSW, 2013	N/A
Warragamba Pipeline Valves Project - Scope of Works Ma (marked up PFD), WaterNSW, 2015	N/A

7.6.3. Project need

The driver for this project is categorised by WaterNSW as meeting discretionary standards.

Warragamba Dam provides the primary source of Greater Sydney's water supply, storing approximately 80% of available water. The dam was commissioned in 1960, has a capacity of 2,069 GL. It is located approximately 20km from the major population centre of Western Sydney. Water from the dam is transferred to Sydney Water's Ferrers Road Outlet Works (Prospect Water Filtration Plant and storage dam) via the Warragamba Pipeline, which comprises two parallel pipelines each approximately 27km long and ranging in diameter from 2100mm to 3000mm.

The pipelines were constructed in the 1950s and 1960s, with valves on the pipeline dating back to the same era with some ad-hoc works being carried out. Ad-hoc works carried out include selective repairs and localised modifications, provision of actuation and remote telemetry/operation via SCADA. Valves in use range in age, design standard, configuration and condition, and are mostly at or beyond their design age. The level of automation also varies, though in general most are manually operated. There is also a sub-optimal number of valves for maintenance purposes meaning there is often no 'double isolation' available to perform maintenance activities requiring man-entry safely without requiring onerous and expensive management measures. Some valves are housed within chambers subject to stormwater ingress. Many valves are simply unable to be relied upon to operate when required.

With the pipeline accounting for approximately 80% of Sydney's water supply the inherent risks of pipeline unavailability due to valve failure are significant. WaterNSW is required to identify risks to

continuity of supply and has identified the need for this project. WaterNSW has demonstrated the project need to replace existing valves with new valves that have actuation able to be operated remotely. This will introduce a standardised set of operating valves reducing risks of unscheduled outages of the Warragamba pipeline, allow maintenance to be undertaken safely, and enable remote operation not requiring operators to travel to and from the physical locations of the valves. Finally WaterNSW has stated the project is part of its Operating Licence obligations to consider the capability of assets to deliver required services by following a risk based asset management approach.

7.6.4. Options investigated

Options investigated to meet the project need are:

- Base case option. No planned replacement, continue to maintain pipeline under current maintenance strategy, deal with any incidents that may occur. Refurbish valves on an unplanned ad-hoc basis. Maintenance costs expected to rise along with safety risks. Risks considered unacceptable and option not considered further.
- Option 1. Refurbishment of valves only, each valve provided with replacement electrical or hydraulic (manually) operated actuator. Disadvantages include the relatively low life extension achievable, and no improved ability to remotely operate valves. Maintenance costs would be better than the 'base case' option but still relatively high and increasing over subsequent years.
- Option 2. Refurbishment of valves only, each valve provided with new or replacement electric actuator to enable remote operation. Disadvantages include the relatively low life extension achievable. Maintenance costs would be better than the 'base case' option and better than option 1 by introducing all electrical remote actuation.
- Option 3. Replacement of most valves, refurbishment of others where cost effective to do so. Mostly involves replacing hydraulically operated valves and refurbishment of existing electrically operated valves; and replacement of all actuators with electric actuators. Disadvantages are that refurbished valves won't have as long remaining life as the replaced valves. Provides greatest benefit in meeting all three needs of safety, reliability and efficiency.

Option 3 was adopted following consideration of financial and non-financial factors; Option 3 had the best cost benefit ratio, the least capital cost and highest NPV of the three options. Refurbishment options were similar in cost to replacement so the additional asset life obtained through full replacement was demonstrated to be worthwhile.

7.6.5. Procurement

WaterNSW intends to deliver the works via a public tender under a design and construct contract.

7.6.6. Costs and delivery

WaterNSW has proposed expenditure of $10.137 million in the forthcoming regulatory period, forecast expenditure of $1.175 million in the current regulatory period, and $428,000 in 2020-21, a total of $11.74 million. Expenditure incurred to date is $727,000 with a further $448,000 forecast in the 2015-16 financial year. An allowance for contingency was also made within the business case, however this has been removed at the request of WaterNSW due to being commercial-in-confidence.

Further preparatory work will be undertaken in the final year of the current regulatory period with design and construction works to commence in the 2016-17 financial year, with most expenditure in the forthcoming regulatory period followed by final commissioning in the 2020-21 financial year.

7.6.7. Assessment of prudence and efficiency

Prudence

The proposed capital expenditure is considered prudent:

- The need has been clearly demonstrated by WaterNSW, satisfying a number of criteria including meeting licence obligations, reducing the risk of pipeline outages, delivering a safer working environment when man-access is required into the pipeline, and business efficiencies through enabling automated remote operations.
- While not a reason alone to replace an asset, the valves are quite old and following a number of activities over the years to extend their life they will soon be uneconomic to maintain.
- The timing is appropriate and no earlier than required to meet the need.
- The identification of the need and process undertaken to identify options has been carried out in accordance with the former SCA and now WaterNSW's policies and procedures including the asset management strategy and the asset management plan for pipelines.

The outcome of the Hawkesbury-Nepean Valley Flood Management Review may influence the project, as noted by DPI Water in their submission in response to IPART's WaterNSW price review Issues Paper. However, it is expected that in the event the outcomes of that review had implications for the valve works, that impacts would be minor and could be taken into account by WaterNSW during detailed design. WaterNSW may need to make adjustments to the project scope depending upon the outcome of the review, which is expected to be known by the second quarter of 2016.

Efficiency

The expenditure as proposed by WaterNSW is considered efficient with no adjustments considered necessary:

- Cost estimates have been prepared based on competitive market rates and have been prepared on a probabilistic manner. A number of options were considered and evaluated, with net present value analysis undertaken to inform selection of the preferred option.
- Procurement for design and construction will be undertaken through a public tender.
- Project planning is following a sound process, in line with WaterNSW and the former SCA's processes. Work undertaken to date has provided WaterNSW with a high level of confidence in delivering the project outcomes to budget in a safe and reliable manner.
- The work undertaken to challenge the project scope via a value management study and revisit whether to refurbish or replace individual valves provides confidence the scope is not more than required to achieve the project need. The work to date was carried out within budget.

The project is considering interdependencies and synergies with other projects in terms of ability to take modules of the pipeline offline while works are undertaken, noting works on the Upper Canal for example which also may impact supply capacity to Sydney. WaterNSW will also review the scope following the outcome of the Hawkesbury-Nepean Valley Flood Management Review to ensure the same specifications remain relevant.

While the underlying estimate is considered efficient, the allowance for contingency is considered too high[143]; a consideration was made whether to recommend a reduction in expenditure on this project to reduce the contingency however given evidence was found of systemic over-conservatism due to excessive contingencies, the review team decided to deal with this at a portfolio level.

7.6.8. Recommended expenditure

The following tables contain the recommended expenditure and compares this with WaterNSW's proposed expenditure.

Table 51 WDS003 actual, forecast and recommended capital expenditure ($000s, $2015/16)

	Current reg period 2012-13	Current reg period 2013-14	Current reg period 2014-15	Current reg period 2015-16	Total
WaterNSW actual/forecast expenditure	133	52	542	448	1,175
Recommended expenditure	133	52	542	448	1,175
Variance	-	-	-	-	-
Variance (%)	-	-	-	-	-

Source: All data sourced from 'SIR Capex 2' Tab of AIR/SIR excel file provided by IPART on 8 September 2015 (WaterNSW Greater Sydney 2015 Price Submission - Annual and Special Information Return 2015.xlsx (8/9/2015, 2:47pm)).

Table 52 WDS003 proposed and recommended capital expenditure ($000s, $2015/16)

	Next reg period 2016-17	Next reg period 2017-18	Next reg period 2018-19	Next reg period 2019-20	Future reg period 2020-21	Total
WaterNSW proposed expenditure	2,221	3,225	2,401	2,290	428	10,565
Recommended expenditure	2,221	3,225	2,401	2,290	428	10,565
Variance	-	-	-	-	-	-
Variance (%)	-	-	-	-	-	-

Source: All data sourced from 'SIR Capex 2' Tab of AIR/SIR excel file provided by IPART on 8 September 2015 (WaterNSW Greater Sydney 2015 Price Submission - Annual and Special Information Return 2015.xlsx (8/9/2015, 2:47pm)).

[143] Note that the contingency value has been removed at the request of WaterNSW due to being commercial-in-confidence

7.7. Catchment upgrade and replacement of plant and equipment WDS008

7.7.1. Project description

WaterNSW owns and maintains a suite of plant and equipment used for firefighting and other proactive hazard reduction works. This includes mobile plant such as firefighting appliances, front-end loaders, lawn mowers, along with portable equipment such as chainsaws, pumps, radios, spray units for weed management and trailers. To ensure these assets are fit for purpose and turned over in a sustainable manner WaterNSW has an ongoing replacement program, that has been in place during the current regulatory period and will continue into the future with no significant changes in approach proposed.

The plant and equipment identified for replacement under the program includes portable equipment and some larger appliances; other vehicle mounted appliances are procured under this program while the vehicles themselves are procured under the Motor Vehicle program.

7.7.2. Assessment type and documentation

Assessment type

This assessment considers past and future expenditure in the current and future regulatory periods.

Documentation reviewed

A number of documents were provided and reviewed for this project, as summarised in the table below. In addition, an interview was undertaken with WaterNSW officers in Sydney on 8 October 2015.

Table 53 Documentation provided by WaterNSW to the review team during this expenditure review relating to the project

Document title	Reference
Business Case – Catchment Plant and Equipment Renewals 18002000, WaterNSW, 2011	TBA
Business Case (Draft) – Catchment Plant and Equipment Upgrades, WaterNSW, 2015	D2015/35173
Catchment Plant Replacement – Capital Plant Schedule 2012-2022, WaterNSW, 2015	N/A

7.7.3. Project need

The project driver is categorised by WaterNSW as meeting ‘discretionary standards’.

WaterNSW has a responsibility under the Rural Fire Act 1997 to prevent the occurrence of wildfires on land under its control or management. WaterNSW has a number of staff trained in the response to wildfires and undertaking Hazard Reduction works. Many of the items identified for replacement through this program are primarily for fire management activities and therefore provide staff with the appropriate plant and equipment manufactured and maintained to the safety standards determined by

NSW Rural Fire Services. The plant and equipment identified for replacement includes specialised items such as fire response appliances, spray units for weed management, trailers and general equipment such as chainsaws, generators and pumps.

The expenditure is required to ensure WaterNSW's continued compliance with the Rural Fire Act 1997. It is also part of competent land management, and demonstrates a sustainable approach to replacement or refurbishment of mobile plant and equipment assets beyond their economic useful life or uneconomical to repair. WaterNSW's prioritisation of which assets to replace and when is aligned with the asset management framework.

WaterNSW has stated the program will provide the following benefits:

- Improved reliability and optimised life cycle costs of WaterNSW assets
- Safer and more efficient operation of assets
- Better value for money for funds spent on asset renewals

WaterNSW has stated the avoided impacts include:

- Greater risk of asset failure, with a resulting impact on water quality or quantity supplied
- Increased costs associated with repairs and the replacement of assets which breakdown
- Significant peaks and troughs in renewals expenditure due to lack of planning
- Non-compliance with the Capitalisation of Expenditure policy as assets may be replaced using funds from operational budgets.

7.7.4. Options investigated

For both the current and future pricing periods the following options were investigated:

- **Base Case** – The 'base case' investigated would have no planned asset renewals. Assets are replaced or refurbished when assets are below operational requirements or the asset has failed and consequently the risk of disruption and injury to staff is much higher. Renewals would also be carried out using operational expenditure.
- **Option 1** – This option involves a program of planned renewals each financial year using a budget based on condition assessments. The value of renewals is the sum of the replacement values of the assets that are expected to reach the end of their useful lives during that year.
- **Option 2** – This option considers the hire of various items of plant and equipment. The option would require no capital funding with the maintenance of any hired assets being undertaken by the hire companies.

In both business cases Option 1 was adopted on the basis of it being the least whole of life cost to meet the required need.

7.7.5. Procurement

For the current pricing period, the following procurement hierarchy will be used by WaterNSW:

- State Contract Control Board contracts
- Local Government Panel Contracts (minor plant and equipment panel contract)

- Existing WaterNSW contracts (if feasible) e.g.: CME Contract (Transfield).
- Utilisation of other NSW Government Agency Contracts (NSW RFS)
- Open or Selective Tender

Where it is economically beneficial, the WaterNSW may purchase items in its own right for installation through service contracts.

For the future pricing period, WaterNSW proposes to continue to use its supported procurement strategies. This involves government contracts for large fire appliances (Cat 1 and 7), and open tender for Front end loaders and small fire appliances (Cat 9).

7.7.6. Costs and delivery

WaterNSW has forecast actual expenditure of $1.113 million in the current regulatory period and $2.786 million in the next regulatory period. Expenditure forecasts are provided beyond this out to 2024-25. No explicit contingency allowance was made.

Expenditure typically ramps up and down from year to year, with a limited ability to or value from smoothing expenditure. This is driven by the program renewing assets on an age and condition basis, optimising the residual value available.

Delivery in the current regulatory period is generally in line with the forecast contained within the business case.

7.7.7. Assessment of prudence and efficiency

Prudence

The expenditure incurred to date and that proposed is considered to be prudent:

- Retaining the assets is essential to WaterNSW meeting its obligations under the Rural Fire Act 1997.
- Expenditure was carried out under an approved business plan that was contained within WaterNSW's previous pricing proposal. Works have been carried out in accordance with this plan in terms of budget and replacing the plant and equipment required.
- Replacement of assets on the basis of either when they reach end of useful life or when they will achieve an optimised trade-in price is sound and appropriately risk based and in accordance with WaterNSW's asset management strategies.

Some aspects of the business case are lacking in robustness, but these do not appear to affect the proposed expenditures. For example the 'base case' option which is a do nothing option does not meet the identified need and therefore is not a valid option.

Efficiency

The expenditure to date and proposed under this renewals program is considered to be efficient:

- WaterNSW is following an appropriate process to prioritise renewals expenditure and ensure it is carried out based on evidence of asset performance and condition.

- WaterNSW is optimising the financial outcome by taking into account likely residual values of plant and equipment, which results in an overall lower capital cost once resale or trade-in value is realised.
- Wherever possible competitive procurement processes are being used.
- Synergies with other expenditure, e.g. the Motor Vehicle Fleet procurement, are being considered.

7.7.8. Recommended expenditure

The following tables contain the recommended expenditure and compare this with WaterNSW's proposed expenditure.

Table 54 WDS008 actual, forecast and recommended capital expenditure ($000s, $2015/16)

	Current reg period 2012-13	Current reg period 2013-14	Current reg period 2014-15	Current reg period 2015-16	Total
WaterNSW actual/forecast expenditure	157	480	345	131	1,113
Recommended expenditure	157	480	345	131	1,113
Variance	-	-	-	-	-
Variance (%)	-	-	-	-	-

Source: All data sourced from 'SIR Capex 2' Tab of AIR/SIR excel file provided by IPART on 8 September 2015 (WaterNSW Greater Sydney 2015 Price Submission - Annual and Special Information Return 2015.xlsx (8/9/2015, 2:47pm)).

Table 55 WDS008 proposed and recommended capital expenditure ($000s, $2015/16)

	Next reg period 2016-17	Next reg period 2017-18	Next reg period 2018-19	Next reg period 2019-20	Total
WaterNSW actual/forecast expenditure	744	845	240	957	2,786
Recommended expenditure	744	845	240	957	2,786
Variance	-	-	-	-	-
Variance (%)	-	-	-	-	-

Source: All data sourced from 'SIR Capex 2' Tab of AIR/SIR excel file provided by IPART on 8 September 2015 (WaterNSW Greater Sydney 2015 Price Submission - Annual and Special Information Return 2015.xlsx (8/9/2015, 2:47pm)).

7.8. Upper Nepean Transfer Scheme - Upper Canal Refurbishment WDS010

7.8.1. Project description

The Upper Canal Refurbishment is a multi stage project to refurbish the Upper Canal, which is deteriorating and impacting on WaterNSW's ability to supply water to Sydney. The Upper Canal is the primary method of transferring water from the four Upper Nepean dams to the Prospect Water Filtration Plant, supplying on average approximately 20% of Greater Sydney's water.

This project is for 'Stage 1' of the short term works for which expenditure is occurring within the current regulatory period. Another project (WDS023) is for Stage 2 of the short term works to occur primarily in the forthcoming regulatory period, and is subject to a separate assessment.

The WaterNSW Board approved a scope change for the project in November 2014 which brought forward some works from the Upper Canal Interim Works – Stage 2 into this Upper Canal Interim Works – Stage 1 project.

7.8.2. Assessment type and documentation

Assessment type

The assessment is of past and forecast expenditure within the current regulatory period. Expenditure for Stage 2 works of the Upper Canal project is assessed as part of the Stage 2 assessment (WDS023).

Documentation reviewed

A number of documents were provided and reviewed for this project, as summarised in the table below. In addition, an interview was undertaken with WaterNSW officers in Penrith on 6 October 2015.

Table 56 Documentation provided for WDS010

Document title	Reference
Upper Canal Strategy, WaterNSW, April 2013	D2013/38355
Upper Nepean Transfer Scheme, Upper Canal Interim Works, WaterNSW Business Case, March 2013	N/A
Metro Project Brief Form 2014/15, Upper Canal Works Phase 2, WaterNSW, 2015	N/A
Upper Canal Interim Works, Stage 2 – Concept and Documentation (Phase 1) Business Case, WaterNSW, February 2015	N/A
Upper Nepean Transfer Scheme, Investigations and Business Cases for Rehabilitation and Replacement of Upper Canal, Current Condition and Risk Assessment, SKM, February 2010	N/A
Contingency plan, Upper Canal – High Flows (>500 MLD), WaterNSW, 2014	D2014/63759
Upper Nepean Transfer Scheme, Investigations and Business Cases for the Rehabilitation and Replacement of the Upper Canal, Project Overview Report, SKM, March 2010	N/A
Approval to Spend, Upper Canal Interim Works Stage 1, WaterNSW, November 2014	N/A
Response to additional capital expenditure queries received on 20 October 2015 Warragamba Dam Reliability Upgrade, Upper Canal Refurbishment, WaterNSW, October 2015	N/A

7.8.3. Project need

The project is categorised by WaterNSW as meeting 'discretionary standards'.

Constructed in the 1880s, the Upper Canal is vital for Sydney's water supply security. It comprises 65 km of mostly open canal along with some sections of tunnel and aqueduct. The condition of the Upper Canal is poor in many sections and requires an increasing level of maintenance resulting in relatively high operating expenditure. It has also meant that the volume of water able to be transferred on a daily and annual basis is only approximately 500 ML/D which is less than the original design flow of 680 ML/D and is less than will be required in future, hence it is adversely affecting available system yield. In future it may also need to play a role in transferring greater quantities of water from the Shoalhaven Scheme.

Originally constructed in sparsely populated areas, urban encroachment has also resulted in a different risk profile for the Upper Canal. Urbanisation increases risks to water quality and water security, while the Upper Canal itself poses a safety risk to surrounding populations.

WaterNSW has developed The Upper Canal Strategy to address the range of issues associated with the canal, including system yield, workplace health and safety and public safety risks, which are primarily to do with the asset condition. The strategy was published in April 2013. The strategy comprises a series of short term works referred to as 'Interim Works' to address current risks and provide for an acceptable service provision until 2035, along with medium term (2020-2035) actions. The medium term strategy is an 'adaptive monitor and response' approach which will involve proactive surveillance and maintenance with some non-routine maintenance activities as required.

Longer term (beyond 2035) the canal may require complete replacement; this depends to a large degree on future iterations of the Metropolitan Water Plan.

WaterNSW demonstrated the need for the project through a lengthy and thorough process involving consultation on, and public release of the Upper Canal Strategy. Production of the Strategy was a key output measure.

7.8.4. Options investigated

In developing the Upper Canal Strategy, WaterNSW investigated a number of options for the Upper Canal, including:

- Rehabilitation (including 2 stages of works in addition to subsequent monitoring and response)
- Refurbishment (including for a 25 year and 50 year horizon)
- Replacement (including single pipeline, staged pipeline and tunnel options)

Its assessment concluded the rehabilitation option was most appropriate, given the need to address identified risks and reinstate the canal in the short term, regardless of the long term solution adopted. The most economically viable rehabilitation option was to undertake a series of shorter term works to ensure the asset can be fit for purpose until 2035 with some recurrent maintenance expenditure.

In the two years since the strategy was published, WaterNSW has undertaken an options investigation and evaluation process. Stage 1 works are being progressed (this project) while Stage 2 (WDS023) has been subject to further investigation and review.

Stage 1 is primarily to address needs of canal structural limitations which requires in-canal rehabilitation works for higher priority locations. The business case for Stage 1 considered two options in detail:

- Option 1 - minimum refurbishment works and installation of mechanically operated penstocks.
- Option 2 - minimum refurbishment works and installation of automated penstocks.

The only difference between the options is the type of penstock supplied. The ‘minimum refurbishment works’ under each option involves essential repairs to canal walls, rehabilitation of stormwater drainage and roads in the vicinity of the canal, and some fencing improvements. It will also involve installation of replacement penstocks. Following an assessment of the acceptable level of risk and the operational requirements WaterNSW adopted Option 1. Having capability of the automated penstocks did not result in benefits significant enough to warrant the additional capital and ongoing costs.

7.8.5. Procurement

WaterNSW has delivered major works via a public tenders in accordance with WaterNSW procurement policies. Some minor works can be delivered by WaterNSW maintenance contractor under their existing contract within approved spending limits under the rules of that contract and WaterNSW procurement policies.

7.8.6. Costs and delivery

WaterNSW has incurred expenditure to date of $5.869 million and proposes expenditure of $6.907 million in 2015/16, a total forecast expenditure of $12.776 million. This includes an amount of approximately $4.85 million for works brought forward from Stage 2.

WaterNSW made a decision to bring forward some works from Stage 2 to this stage, which resulted in an over-expenditure for the project although this will result in less expenditure required in the next regulatory period. While not alluded to in WaterNSW's pricing proposal, in the Authority to Spend submission to the WaterNSW Board in November 2014 it is stated that:

- "The additional $4.85M budget allocation to this project will be sourced from saving within the existing Capital Investment Program and will result in no increase to the SCA's total Capital Investment Program.
- It should also be noted that the additional works have been brought forward from future planned works on the Upper canal and will result in no net difference in scope of the two Interim Works projects planned for the Upper Canal. The additional scope outlined within this ATS was scheduled to occur within the next Stage of the Upper Canal Interim Works program."

Within the ATS, an allowance was also made for a contingency, however this has been removed due to being commercial-in-confidence.

7.8.7. Assessment of prudence and efficiency

Prudence

The expenditure proposed under this project is considered to be prudent:

- The Upper Canal is critical for conveyance of up to 20% of Sydney's water supply. Supply from the Upper Canal is currently the only substantial source for Sydney if the Warragamba storage and pipelines are taken off line, providing valuable redundancy to the system in response to unexpected events (e.g. water quality incidents in Warragamba)
- The project was previously reviewed as part of the regulatory proposal for the current regulatory period and found to be prudent. Works are being carried out in accordance with the approved expenditure and the Upper Canal Strategy.
- WaterNSW reviewed the scope of works before commencing and reaffirmed the approach.
- Condition assessments have been used to justify timing of the works.
- The more recent decision to bring forward work appears to be prudent and based on a clear need to reduce risks, and also for efficiency reasons.

As there are multiple drivers for the project (including delivering on core obligations and managing external risks), WaterNSW has consulted widely on the strategic approach culminating in the public release and widespread endorsement of the Upper Canal Strategy, demonstrated the multiple benefits from carrying out the works.

There is a risk that at some time in the future, the Upper Canal may be replaced entirely with a pipeline or tunnel due to significant urban encroachment and possibly associated with increased transfer capacity required if the Shoalhaven scheme or other system changes proceed. This could mean current works are rendered redundant. However, these replacement options are much more expensive (in the order of $593 million for a '50 year' option and $790 million for a complete replacement with a pipeline) and given the various risks and constraints associated with the canal's

current condition, WaterNSW has demonstrated the value in ensuring that the canal remains in acceptable working order. We understand that the project would allow WaterNSW to meet system requirements without loss of yield until 2035.

Efficiency

The expenditure is considered efficient:

- Works appear to have been carried out in an efficient manner with competitive procurement processes being used for the majority of works undertaken, e.g. at market rates.
- Replacement of the canal in the short or even medium term was found to be inefficient, with WaterNSW choosing a cost effective way of extending the life of the Upper Canal at least cost.
- The process for the scope and budget change appears to be in line with WaterNSW policies and has been justified. The cost estimate for the brought-forward works contains little detail of precise quantities or unit rates but appears to be reasonable and not inefficient expenditure. Efficiency is likely to be higher by completing the works in conjunction with an existing project in the same location.

The past expenditure and that forecast for the remainder of the current regulatory period is considered efficient with no adjustments considered necessary.

The allowance made for contingency was found to be high however given much of the expenditure has already taken place a reduction was not considered necessary in this case.

7.8.8. Recommended expenditure

The following table contains the recommended expenditure and compares this with WaterNSW's actual and proposed expenditure.

Table 57 WDS010 proposed and recommended capital expenditure ($000s, $2015-16)

	Current reg period 2012-13	Current reg period 2013-14	Current reg period 2014-15	Current reg period 2015-16 (forecast)	Total
WaterNSW proposed expenditure	242	4,080	1,548	6,907	12,776
Recommended expenditure	242	4,080	1,548	6,907	12,776
Variance	-	-	-	-	-
Variance (%)	-	-	-	-	-

Source: All data sourced from 'SIR Capex 2' Tab of AIR/SIR excel file provided by IPART on 8 September 2015 (WaterNSW Greater Sydney 2015 Price Submission - Annual and Special Information Return 2015.xlsx (8/9/2015, 2:47pm)).

7.9. Upper Nepean Transfer Scheme - Upper Canal Refurbishment Stage 2 WDS023

7.9.1. Project description

The Upper Canal Refurbishment is a multi-stage project to refurbish the Upper Canal, which is deteriorating and impacting on WaterNSW's ability to supply water to Sydney. The Upper Canal is the primary method of transferring water from the four Upper Nepean dams to the Prospect Water Filtration Plant, supplying on average approximately 20% of Greater Sydney's water.

This project is for 'Stage 2' of the short term works for which expenditure is proposed largely within the forthcoming regulatory period. Another project (WDS010) is for Stage 1 of the short term works to occur primarily in the current regulatory period, and is subject to a separate assessment.

Stage 2 is the more substantive of the two stages, and is itself divided into two phases - Phase 1 (Concept and documentation), and Phase 2 (Design and Construct).

The scope of work required under Stage 2 includes the balance of work identified in the Upper Canal Strategy to enable WaterNSW to operate the canal at an acceptable level of service until 2035. Works include repairs to canal walls, access platforms, stormwater cross drains, aqueduct inlet and outlet, provision of props to support canal walls, installation of control gates and trashracks, replacement of valves and some civil works to roads and bridges. It also includes provision of new fit for purpose fencing.

7.9.2. Assessment type and documentation

Assessment type

The assessment is of proposed future expenditure. Past expenditure for the Upper Canal project is assessed as part of the Stage 1 assessment (WDS010).

Documentation reviewed

A number of documents were provided and reviewed for this project, as summarised in the table below. In addition, an interview was undertaken with WaterNSW officers in Penrith on 6 October 2015.

Table 58 Documentation provided for WDS023

Document title	Reference
Upper Canal Strategy, WaterNSW, April 2013	D2013/38355
Metro Project Brief Form 2014/15, Upper Canal Works Phase 2, WaterNSW, 2015	N/A
Upper Canal Interim Works, Stage 2 – Concept and Documentation (Phase 1) Business Case, WaterNSW, February 2015	N/A
Upper Nepean Transfer Scheme, Investigations and Business Cases for Rehabilitation and Replacement of Upper Canal, Current Condition and Risk Assessment, SKM, February 2010	N/A
Contingency plan, Upper Canal – High Flows (>500 MLD) , WaterNSW, 2014	D2014/63759
Upper Nepean Transfer Scheme, Investigations and Business Cases for the Rehabilitation and Replacement of the Upper Canal, Project Overview Report, SKM, March 2010	N/A
Approval to Spend, Upper Canal Interim Works Stage 1, WaterNSW, November 2014	N/A
WaterNSW Response to additional capital expenditure queries received on 20 October 2015 Warragamba Dam Reliability Upgrade, Upper Canal Refurbishment, WaterNSW, October 2015	N/A

7.9.3. Project need

Constructed in the 1880s, the Upper Canal is vital for Sydney's water supply security. It comprises 65 km of mostly open canal along with some sections of tunnel and aqueduct. The condition of the Upper Canal is poor in many sections and requires an increasing level of maintenance resulting in relatively high operating expenditure. It has also meant that the volume of water able to be transferred on a daily and annual basis is only approximately 500 ML/D which is less than the original design flow of 680 ML/D and is less than will be required in future, hence it is adversely affecting available system yield. In future it may also need to play a role in transferring greater quantities of water from the Shoalhaven Scheme.

Originally constructed in sparsely populated areas, urban encroachment has also resulted in a different risk profile for the Upper Canal. Urbanisation increases risks to water quality and water security, while the Upper Canal itself poses a safety risk to surrounding populations.

WaterNSW has developed The Upper Canal Strategy to address the range of issues associated with the canal, including system yield, workplace health and safety and public safety risks, which are primarily to do with the asset condition. The strategy was published in April 2013. The strategy comprises a series of short term works referred to as 'Interim Works' to address current risks and provide for an acceptable service provision until 2035, along with medium term (2020-2035) actions. The medium term strategy is an 'adaptive monitor and response' approach which will involve proactive surveillance and maintenance with some non-routine maintenance activities as required. Longer term (beyond 2035) the canal may require complete replacement; this depends to a large degree on future iterations of the Metropolitan Water Plan.

WaterNSW discussed the need for the project through a lengthy and thorough process involving consultation on, and public release of the Upper Canal Strategy. This current expenditure proposal

also follows previous stages of works, approved under the previous pricing review, and is consistent with the overall strategy.

7.9.4. Options investigated

In developing the Upper Canal Strategy, WaterNSW investigated a number of options for the Upper Canal, including:

- Rehabilitation (including 2 stages of works in addition to subsequent monitoring and response)
- Refurbishment (including for a 25 year and 50 year horizon)
- Replacement (including single pipeline, staged pipeline and tunnel options)

Its assessment concluded the rehabilitation option was most appropriate, given the need to address identified risks and reinstate the canal in the short term regardless of the long term solution adopted. The most economically viable rehabilitation option was to undertake a series of shorter term works to ensure the asset can be fit for purpose until 2035 with some recurrent maintenance expenditure.

In the two years since the strategy was published, WaterNSW has undertaken an options investigation and evaluation process. Stage 1 works are being progressed while Stage 2 (this project) has been subject to further investigation and review, including an additional separate business case for Stage 2.

The Stage 2 business case re-considered whether the proposed works were prudent given the medium and longer term strategies, and given the work completed as part of stage 1. It compared the costs and benefits of a base case of stage 1 works being completed but no stage 2 works, against other options as highlighted in the Upper Canal Strategy, including rehabilitation and replacement.

The business case concluded that continued rehabilitation (completion of Stage 2) was the most appropriate option, as it provides an acceptable level of interim work that will maintain and improve the canal's ability to safely and reliably transfer the required quantity and quality of water in the short to medium term. It also minimises investment, and mitigates the risk of over-investment in assets that may become redundant if the canal was replaced in the long term.

The strategy of proceeding with the original 'Stage 2' works was confirmed.

7.9.5. Procurement

WaterNSW will deliver the construction works via a public tender in accordance with WaterNSW procurement policies. Some minor works can be delivered by WaterNSW maintenance contractor under their existing contract, while any further engagement of consultants will be undertaken in accordance with procurement policies.

7.9.6. Costs and delivery

WaterNSW provided its proposed expenditure for the forthcoming regulatory period and for the current regulatory period, and an allowance for contingency was also made, however these figures have been removed at the request of WaterNSW due to being commercial-in-confidence.

Some of the works proposed for Stage 2 will be carried out under Stage 1, after WaterNSW made a decision to bring forward some works from Stage 2. It is proposed that the Stage 2 works are carried out by 2019/20.

Some inconsistencies were identified in proposed spending amounts from the documentation reviewed[144]. For example, the 'approval to spend' submission to the WaterNSW Board in November 2014 stated the revised cost of Stage 2 as higher than the Stage 2 business case dated February 2015. Finally the WaterNSW proposal contained a proposed capital expenditure that was higher than both the preceding estimates.

These matters were put to WaterNSW who provided a response that:

- The costing from the Draft Stage 2 business case dated February 2015 is likely to be in $14/15
- The Draft Stage 2 business case dated February 2015 excludes the corporate overhead allocation of $1.297 million ($15/16); and
- WaterNSW's proposed expenditure for the Stage 2 project in its submission to IPART did not appear to have been reduced for the transfer of the $4.85m ($14/15) to Stage 1.

The matter of the transfer of the $4.85m is addressed under the Stage 1 project assessment.

WaterNSW undertook additional analysis and confirmed that the forecast capital expenditure contained within the proposal was incorrect, and should have been, $4.972 million less.

7.9.7. Assessment of prudence and efficiency

Prudence

The expenditure proposed under this project is considered to be prudent:

- The Upper Canal is critical for conveyance of up to 20% of Sydney's water supply. Supply from the Upper Canal is the only substantial source for Sydney if the Warragamba storage and pipelines are taken off line, providing valuable redundancy to the system in response to unexpected events (e.g. water quality incidents in Warragamba)
- The current condition of many parts of the Canal is poor posing a range of water related and WHS risks. Condition assessments have been used to justify timing of the works.
- The works are supported as part of the 2010 Metropolitan Water Plan.
- The earlier stage of the project was supported by IPART in the 2012 determination.

As there are multiple drivers for the project (including delivering on core obligations and managing external risks), WaterNSW has consulted widely on the strategic approach culminating in the public release and widespread endorsement of the Upper Canal Strategy, demonstrated the multiple benefits from carrying out the works.

There is a risk that at some time in the future, the Upper Canal may be replaced entirely with a pipeline or tunnel due to significant urban encroachment and possibly associated with increased transfer capacity required if the Shoalhaven scheme or other system changes proceed. This could mean current works are rendered redundant. However, these replacement options are much more expensive (in the order of $593 million for a '50 year' option and $790 million for a complete replacement with a pipeline) and given the various risks and constraints associated with the canal's current condition, WaterNSW has demonstrated the value in ensuring the canal remains in acceptable

[144] Note that proposed spending amounts have been removed at the request of WaterNSW due to being commercial-in-confidence.

working order. We understand that the project would allow WaterNSW to meet system requirements without loss of yield until 2035.

Efficiency

As noted above, a discrepancy was observed in WaterNSW's submission, and WaterNSW has responded to this. This means there is a an adjustment of $4.972 million required, to account for some Stage 2 works that WaterNSW undertook as part of Stage 1.

The process for the scope and budget change appears to be in line with WaterNSW policies and has been justified. The cost estimate for the brought-forward works contains little detail of precise quantities or unit rates but appears to be reasonable and not inefficient expenditure. Efficiency is likely to be higher by completing the works in conjunction with an existing project in the same location.

Cost estimates developed during the Upper Canal Strategy process followed a robust process with no excessive scope. Estimates provided are sufficiently detailed given the stage of the project. Preparation of the Upper Canal Strategy as noted has been quite thorough and has undertaken analysis of a wide range of real options to meet the needs in different ways including short, medium and long term timeframes. Replacement of the canal in the short or even medium term was found to be inefficient, with WaterNSW choosing a cost effective way of extending the life of the Upper Canal at least cost.

Notwithstanding the adjustment of $4.972 million required, the proposed expenditure is considered efficient following an assessment of the scope and underpinning assumptions used in preparing the estimates.

The allowance for contingency is considered too high[145]; a consideration was made whether to recommend a reduction in expenditure on this project to reduce the contingency however given evidence was found of systemic over-conservatism due to excessive contingencies, the review team decided to deal with this at a portfolio level.

7.9.8. Recommended expenditure

The following table contains the recommended expenditure and compares this with WaterNSW's proposed expenditure.

[145] Note that the contingency value has been removed at the request of WaterNSW due to being commercial-in-confidence.

Table 59 WDS023 proposed and recommended capital expenditure ($000s, $2015-16)

	2015-16	2016-17	2017-18	2018-19	2019-20	Total
WaterNSW proposed expenditure	*	*	*	*	*	*
Recommended expenditure	*	*	*	*	*	*
Variance	-	-	*	-	-	*
Variance (%)	-	-	-25.2%	-	-	-7.2%

Source: All data sourced from 'SIR Capex 2' Tab of AIR/SIR excel file provided by IPART on 8 September 2015 (WaterNSW Greater Sydney 2015 Price Submission - Annual and Special Information Return 2015.xlsx (8/9/2015, 2:47pm)).

Note: * Denotes content removed at the request of WaterNSW due to being commercial-in-confidence.

7.10. IT Assets Renewals Program WDS025

7.10.1. Project description

WaterNSW has had a program in place for renewal of what it calls Information Management and Communication Technology (IM&CT), referred to herein as IT, prior to the current regulatory period beginning. The program generally replaces assets once they reach their depreciation age, which for desktop PCs is four years, laptop computers three years and for servers and network equipment (e.g. routers) it is five years.

An unchanged approach from the current regulatory period is proposed for the next regulatory period. The works program is based on retiring all IT assets and replacing with new once the standard age is reached.

7.10.2. Assessment type and documentation

Assessment type

This assessment considers past and future expenditure in the current and future regulatory periods.

Documentation reviewed

A number of documents were provided and reviewed for this project, as summarised in the table below. In addition, an interview was undertaken with WaterNSW officers Penrith on 7 October 2015.

Table 60 Documentation provided for WDS025

Document title	Reference
Business case and management plan for IT assets renewal program, 2011/12 to 2015/16, WaterNSW, 2011	D2011/8755
Approval to spend, IT Assets Renewals Program July 2016 – June 2026, WaterNSW, 2015	N/A
Review of Lease and Purchase Options for IT and Fleet Assets - 2005 and Savings (Internal WaterNSW file note) , WaterNSW, 2005	N/A

7.10.3. Project need

The project is categorised by WaterNSW as meeting discretionary standards.

The primary need of this renewals program is to ensure the IT assets are fit for purpose and provide WaterNSW with reliability such that their core business is not impaired. WaterNSW also has a business efficiency driver, to retire and replace IT assets prior to them becoming a risk to operational performance, and becoming uneconomic to maintain.

In the 'approval to spend' submission for the future program, WaterNSW has provided the following expected benefits for the program:

- Improved reliability of WaterNSW - Metro IM&CT assets
- Optimised lifecycle costs for IM&CT assets (equipment covered by warranty)
- More efficient operation of WaterNSW information systems
- Assist with the implementation and management of a Standard Operating Environment
- Allow the further rationalisation of the PC equipment fleet following organisation restructure.

WaterNSW has stated the avoided impacts of undertaking the program include

- Greater risk of IM&CT asset failure which in turn will impact upon the operation of WaterNSW
- Increased WHS risk for staff that rely on communication equipment and information systems when working in remote locations.

7.10.4. Options investigated

In the Approval to Spend for the ten year period from 2016-17, similar to other renewals expenditure, WaterNSW considered several options:

- A 'base case' involving no planned renewals at all, with assets replaced where performance deteriorates or the asset fails.
- Option 1, with replacement of 'all' PC equipment e.g. desktop PCs and laptops in the first year of the program, and staging replacement of servers according to the standard age profile assumptions.

- Option 2 is effectively the status quo of a planned renewals program based on replacement once the age reaches that of a standard replacement year, which is taken to be based on "the ATO in the Taxation Ruling for effective life of depreciating assets".
- Option 3 is similar to Option 2 but adds an additional year to the assumed life of each asset. WaterNSW has determined a disadvantage of this option is that it would delay implementation of a standard operating environment (SOE) by one year; along with expected non-routine maintenance required due to asset failures.

The business case provided by WaterNSW within the approval to spend recommends Option 2 to best meet the need at the least whole of life cost.

7.10.5. Procurement

WaterNSW has advised it procures all IT assets under Whole of NSW Government supply panels, with the exception of Microsoft products, this exception due to a contractual arrangement.

7.10.6. Costs and delivery

WaterNSW has forecast expenditure of $4.928 million in the current regulatory period, and proposes $8.673 million in the next regulatory period. No explicit contingency allowance was made.

There is a forecast increase in expenditure compared to the current period. WaterNSW has advised this is simply due to the types of assets that are due for renewal. During the interview WaterNSW advised that no consideration had been made yet regarding any change in IT infrastructure required as a result of the SCA-State Water merger, as it is too early to know the precise future workforce makeup and mobility requirements. In early December provided some high level analysis of the impact of the merger indicating potential savings in the order of $37,500 per annum.

7.10.7. Assessment of prudence and efficiency

Prudence

The expenditure undertaken in the past and that proposed is considered to be prudent:

- The need is demonstrated; provision of fit for purpose IT infrastructure is necessary for most if not all WaterNSW operations including field based operations staff.
- The expenditure was approved as part of the last review, and was demonstrated to be necessary to support WaterNSW operations.
- The investment is consistent with WaterNSW's asset management strategy.

Some aspects of the most recent business case are lacking in robustness but these do not appear to affect the proposed expenditures. For example:

- There is no consideration of actual condition or performance of the assets other than to consider bringing forward replacement if performance deteriorates.
- The age at which assets are replaced has not been justified.

When challenged whether it was prudent to revisit the assumed age at which assets such as desktop PCs and laptops are replaced, when they may be functioning currently and fit for purpose, WaterNSW stated that a key consideration in determining the replacement age is the available warranty period,

particularly for desktop PCs and laptops. This is consistent with statements made in some of the documentation reviewed though there is no evidence this was investigated recently and what the economic case is of retaining desktop PCs or laptops for longer and procuring an extended warranty.

As the cost of buying extended warranties and the cost of reacting to an increased number of failures would offset the cost saving of an increase in asset age, the adoption of options to extend asset lives is not likely to materially affect the overall expenditures required.

Efficiency

The expenditure undertaken in the past is considered to be efficient:

- Expenditures were made generally in accordance with the approved expenditure from the last review.
- An options assessment was carried out, choosing the optimal option after considering NPV.
- The purchasing approach makes use of whole of NSW government negotiated pricing wherever possible with the exception of some software.

Proposed future expenditure is also considered efficient for the current workforce composition; however WaterNSW has proposed operational expenditure savings through a reduction in staffing as a result of the State Water-SCA merger. This will logically lead to a reduced need for desktop PCs, laptops and the like from 2016-17. The review team believes there will be a minor impact of any reduction in headcount for the year 2015-16. Expenditure proposed for desktop PCs and laptops represents a small proportion (approximately 20%) of the proposed expenditure. Although a reduction in capital expenditure under this program is difficult to quantify, given the merger is proceeding and staff reductions are planned or underway, savings of 5% for 2016-17 and 10% in the following years could reasonably be assumed for the desktop PCs/laptops component, equating to between approximately $19,000 and $61,000 per year. This would represent a small proportion, in the range of 1-2%, of the overall proposed expenditure for this program. This is broadly in line with WaterNSW's high level estimate of an average annual saving of $37,500 which the review team recommends adopting.

7.10.8. Recommended expenditure

The following tables contain the recommended expenditure and compare this with WaterNSW's proposed expenditure.

Table 61 WDS025 actual, forecast and recommended capital expenditure ($000s, $2015/16)

	Current reg period 2012-13	Current reg period 2013-14	Current reg period 2014-15	Current reg period 2015-16	Total
WaterNSW actual/forecast expenditure	1,006	853	719	2,578	4,928
Recommended expenditure	1,006	853	719	2,578	4,928
Variance	-	-	-	-	-
Variance (%)	-	-	-	-	-

Source: All data sourced from 'SIR Capex 2' Tab of AIR/SIR excel file provided by IPART on 8 September 2015 (WaterNSW Greater Sydney 2015 Price Submission - Annual and Special Information Return 2015.xlsx (8/9/2015, 2:47pm)).

Table 62 WDS025 proposed and recommended capital expenditure ($000s, $2015/16)

	Next reg period 2016-17	Next reg period 2017-18	Next reg period 2018-19	Next reg period 2019-20	Total
WaterNSW proposed expenditure	1,929	2,105	3,051	1,588	8,673
Recommended expenditure	1,892	2,068	3,014	1,551	8,523
Variance	-37.5	-37.5	-37.5	-37.5	-150
Variance (%)	-1.9%	-1.8%	-1.2%	-2.4%	-1.7%

Source: All data sourced from 'SIR Capex 2' Tab of AIR/SIR excel file provided by IPART on 8 September 2015 (WaterNSW Greater Sydney 2015 Price Submission - Annual and Special Information Return 2015.xlsx (8/9/2015, 2:47pm)).

7.11. Shoalhaven transfer works WGP003

7.11.1. Project description

The 2010 Metropolitan Water Plan (MWP) for Sydney identified options for the next major augmentations to the water supply for Greater Sydney. At the time the Shoalhaven transfer works was identified as the preferred option, and would increase the overall system yield from Sydney's water supplies by up to 30 GL per year.

The scope of work is to construct a 3.2 metre diameter, 20 kilometre long gravity tunnel from Burrawang to Avon Dam, and would also involve increasing the system supply level trigger for initiating Shoalhaven transfers. The project would address current constraints to additional pumping from the Shoalhaven system to the main metropolitan system.

The project results from previous detailed investigations into a number of alternative supply option configurations within the Shoalhaven system. The project has been estimated to take six years to complete from the time of approval.

While the next iteration of the MWP was to have been completed by 2014, the Metropolitan Water Directorate (MWD) is currently working towards a deadline some time in 2016.

Since submitting the proposal for the next regulatory period in June 2016 and following the series of interviews held in early October, WaterNSW has reconsidered its approach to Shoalhaven and withdrawn its initial proposal to progress the design, approvals and commence construction, and instead focus its investment only upon design and approvals of Shoalhaven, with the potential to alter this for an alternative water supply augmentation project should that be the outcome of Government.

7.11.2. Assessment type and documentation

Assessment type

This assessment is of proposed future expenditure.

Documentation reviewed

A number of documents were provided and reviewed for this project, as summarised in the table below. In addition, an interview was undertaken with WaterNSW officers in Penrith on 6 October 2015.

Table 63 Documentation provided for WGP003

Document title	Reference
16511000 Shoalhaven Transfer Works Project Summary, WaterNSW, 2015	D2015/39064
Shoalhaven Transfer Works Metro Project Brief Form, WaterNSW, 2015	N/A
Economic appraisal for Shoalhaven transfer options, BDA Group / Gillespie Economics, March 2009	N/A
Greater Sydney's Water Balance, WaterNSW, undated (likely 2015)	N/A
Metropolitan Water Plan 2005, Shoalhaven Transfer Options, Options Review Paper, SCA/NSW Department of Commerce, 2005	N/A
Cost Estimates for Supply Options FINAL Report for Metropolitan Water Directorate, Advisian, May 2015	N/A
Projected cashflow for Burrawang to Avon Tunnel, WaterNSW, October 2015	N/A
Revised Option 1 Template Estimate, WaterNSW, October 2015	N/A
Gantt chart for Burrawang to Avon Tunnel, WaterNSW, October 2015	N/A
Gantt chart for Burrawang to Avon Tunnel with costs, WaterNSW, October 2015	N/A

7.11.3. Project need

The project is categorised by WaterNSW as meeting 'government programs'.

The primary need is to provide an increase in yield for Greater Sydney's water supply to meet growth in demand forecast by DPI Water in its 2010 MWP and to also counteract potential loss of yield in other parts of the system. The 2010 MWP identified the Shoalhaven Transfer Works as the preferred infrastructure solution to meet the forecast demand.

A major driver for the inclusion of the Shoalhaven Transfer Project in WaterNSW's proposal is commitment to the initiative in the 2010 Metropolitan Water Plan (MWP, p. 7):

> *Dams – long-term plans to augment the Shoalhaven water supply transfer system. The timing of this initiative will depend on factors such as future climate predictions, population growth and demand. These factors will be reviewed between now and 2014 with a view to having an augmented system operational around 2025.*

Other drivers for the project's inclusion in WaterNSW's proposal for the next regulatory period include WaterNSW's view that Sydney Water's demand projections have historically been lower than actual demand. Under a high water use scenario developed by WaterNSW, and with potential changes to system yield resulting from responses to the Hawkesbury-Nepean Valley Flood Management Review, and implementation of environmental flows for Warragamba dam, WaterNSW has estimated that demand could exceed supply earlier than 2025. Given this, WaterNSW considers it to be prudent to

include the Shoalhaven transfer in the next regulatory period, with planning and design work occurring 2016-17 to 2018-19, and construction beginning in 2019-20.

The next edition of the MWP was due to be released in 2014, however this has been delayed until early 2016. The results of any review of supply or demand factors mentioned in MWP 2010 is not known, and a final decision has not been made on whether Shoalhaven Transfer remains the preferred augmentation. Outcomes of the Hawkesbury-Nepean Valley Flood Management Review are also not expected until early 2016.

DPI Water's submission to IPART's issues paper acknowledged the role that both environmental flows from Warragamba dam, and NSW Government responses to the Hawkesbury-Nepean Valley Flood Management Review could have on supply augmentation planning. However, DPI Water has stated that:[146]

> *At this stage, no decision has been made regarding the nature or timing of the next supply augmentation. There are a number of potential augmentation options being assess through the MWP analysis, including the Shoalhaven upgrade.*

DPI Water also suggested in its submission that the outcomes of the next MWP would be unlikely to trigger construction works in the next price determination period, and that it would be premature to include major capital investment until the NSW Government has considered the outcome of the flood review and Metropolitan Water Plan in early 2016.

These matters were discussed during the course of this review, including the need for WaterNSW to be able to effectively respond to direction in the new MWP during the next regulatory period. This may include undertaking further detailed assessment or investigation work. While DPI Water has advised it is premature to include capital expenditure for construction, DPI Water has suggested an allowance may need to be made for further investigation and analysis of water supply options to occur, to support a decision on the preferred supply augmentation in time for the next MWP review.[147]

7.11.4. Options investigated

The former SCA and then NSW Department of Commerce arrived at a shortlist of three options for supply augmentation and undertook evaluation of all three. These options were:

- Option 1. 3.2-metre diameter 20 km tunnel from Burrawang to Avon Dam
- Option 2. 1.8 metre diameter 22 km long underground pipeline from Wingecarribee Reservoir to Avon Dam
- Option 3. 1.8 metre diameter underground pipeline, 4.2 km to 7.6 km long, from Wingecarribee Reservoir to the Nepean River; upstream of the Nepean Dam.

Option 1 was deemed to be the preferred option at the time (2010). No work has been carried out to assess these options recently. WaterNSW has based its forecast for expenditure in the next regulatory period on developing the conceptual designs and obtaining approvals for Option 1.

[146] DPI Water Submission on IPART price review issues papers, 6 October 2015.
[147] Ibid.

7.11.5. Procurement

WaterNSW is no longer proposing to undertake any construction works this regulatory period. WaterNSW will however be procuring external services such as environmental specialists, hydrologists, geotechnical and engineering consultants, and commercial advisors for business case preparation. WaterNSW's procurement policies will dictate how these services are procured; based on the forecast expenditures it is likely that the majority of procurement will be via a public tender or via an existing supply panel.

7.11.6. Costs and delivery

In its original proposal WaterNSW proposed expenditure of $113.116 million in the upcoming regulatory period, including approximately $100 million in the final year of the period, for the first year of project construction. This was aimed to bring forward the scheduled completion time relative to that documented in the Metropolitan Water Plan 2010 on the basis that there are additional risks to Sydney's water system yield associated with planning decisions outside the control of WaterNSW.

While investigations in the past have been lengthy there has not been much work in recent years on the design, costs and delivery of the works. The most recent body of work was by a consultant (Advisian) engaged by the MWD to prepare a report that reviewed cost estimates prepared in previous years for ten different water supply options, and to update each estimate with the same assumptions for cost of labour, materials, and other key input measures.

WaterNSW's recently revised proposal for Shoalhaven is for expenditure of $24.295 million over the four year period. This expenditure allows for completion of sufficient investigatory work to progress with a concept design, feasibility study and to prepare a business case. It includes expenditure on environmental studies, and a considerable allocation for geotechnical investigations ($6.9 million). No explicit contingency allowance was made.

7.11.7. Assessment of prudence and efficiency

Prudence

Construction related expenditure for the Shoalhaven project is not considered prudent in the next regulatory period. While the project is in the 2010 MWP, this is now out of date and under active review. There is uncertainty regarding government requirement for the project in the absence of a revised MWP, in addition to indications from DPI Water that other augmentation options may still be under active consideration.

If the Shoalhaven Transfer was the preferred option arising from a 2016 MWP, there remains insufficient evidence to suggest construction needs to occur in the upcoming regulatory period. DPI Water does not support construction costs being included in the next regulatory period, and an up to date business case was not able to be supplied by WaterNSW. If the project does turn out to be required, it could potentially be built in sufficient time if all planning, approvals and design work was completed in the next regulatory period, with construction expenditure occurring from 2020-21.

Given the importance of maintaining long term system yield, and in the absence of any other methods to enable the pass through of necessary pre-construction capital expenditure required to implement the next revision of the MWP, the review team views it as prudent to allow WaterNSW to undertake conceptual design and approvals for Shoalhaven transfers, during the next regulatory period, based on the assumption that the WaterNSW Board would approve a new business case.

We note that there is some uncertainty regarding our recommendation to allow the planning studies to proceed. As described above, there is significant uncertainty concerning long term supply-demand planning and resultant augmentations for Sydney. In the absence of any recent guidance from the NSW Government, WaterNSW had little choice but to include the Shoalhaven Transfer Scheme in the capital plan based on the 2010 Metropolitan Water Plan. However it is unclear that this will be the preferred augmentation and uncertainty regarding the appropriate timing.

It is likely that WaterNSW will need to undertake some planning or investigations over the next four years in order to meet supply requirements. On this basis we have recommended some capital allowance for the next tranche of investigations on the Shoalhaven Transfer Scheme. In reality, three options could eventuate:

1. no catchment related augmentation is required;

2. Shoalhaven proceeds and the planning studies are required;

3. other catchment project(s) require initial investigation by WaterNSW.

Our recommended approach enables option 2 and 3 to proceed however option 3 would likely be considered operating expenditure by WaterNSW. If option 1 eventuates, then over-recovery of revenue in the next regulatory period would occur. However this is limited to return on and of the recommend amount for the next series of planning studies and investigations (approximately $20.3 million of total capital expenditure). Other options available to IPART include: rejecting all capital expenditure on supply augmentations, or; providing an operating expenditure allowance to cover potential planning studies and investigations on other options.

Efficiency

With regards to the original proposal that WaterNSW has now withdrawn, while the preparation of project scope and cost estimates has followed a reasonably sound process it was clear that a considerable amount of investigation and concept design work was necessary in order to provide a more accurate cost estimate with high confidence. Estimates were prepared several years ago, more recently updated by Advisian to enable the MWD to compare various water supply options.

It should be noted however the cost estimates contained within the Advisian report are for a final design and construction, and not broken down into the same phasing as that proposed by WaterNSW, and were for comparative purposes to inform the MWP.

Expenditure proposed under the revised proposal of $24.295 million over the next regulatory period appears to be inefficient and contains expenditure that should not be required until detailed design and construction phase; namely expenditure on geotechnical investigations. $6.9 million is proposed to be spent on geotechnical investigations in the first two years, which is considered to be appropriate for a detailed design however not for the purposes proposed by WaterNSW – the documented need of this phase in the project is to prepare a concept design and business case in readiness for a future decision to proceed with detailed design and construction. For the geotechnical investigations a figure in the range of $2 to $2.9 million is considered more appropriate and would be considered efficient expenditure; accordingly the review team recommend a reduction of $4 million from WaterNSW's forecast, allowing $2.9 million for the geotechnical investigations. This adjustment is proposed for the 2017/18 year.

Other elements of expenditure proposed appear reasonable and are considered efficient:

- The allowances made for various tasks e.g. prepare concept design, survey, environmental studies, appear reasonable and appropriate for procurement of consultancy services.

- WaterNSW's procurement policies dictate that expenditure of the magnitude forecast would in most cases require competitive process via a public tender or existing panel.

7.11.8. Recommended expenditure

The following table contains the recommended expenditure and compares this with WaterNSW's actual and proposed expenditure.

Table 64 WGP003 proposed and recommended capital expenditure ($000s, $2015/16)

	Next reg period 2016-17	Next reg period 2017-18	Next reg period 2018-19	Next reg period 2019-20	2020-21 and beyond	Total
WaterNSW proposed expenditure (original)	3,477	7,708	16,527	103,404	479,620	610,736
WaterNSW proposed expenditure (revised)	2,645	9,526	8,165	3,959	-	24,295
Recommended expenditure	2,645	5,526	8,165	3,959	-	20,295
Variance	-	-4,000	-	-	-	-4,000
Variance (%)	-	-42.0%	-	-	-	-16.5%

Source: WaterNSW Submission to the Independent Pricing and Regulatory Tribunal, Prices for the Greater Sydney Area from 1 July 2016, June 2015 and WaterNSW document, 'Supplementary Information : Burrawang to Avon Dam Tunnel – Revised Cost Projections' (16/10/2015 4:52 pm)).

7.12. Bendeela Recreational Area Upgrade Project WGP004

7.12.1. Project description

This project is for the Upgrade of the Bendeela Recreation Area owned and managed by WaterNSW in the Kangaroo Valley on Lake Yarrunga. This camping and day use site is popular with campers with 2000-3000 campers at peak times but has a range of management issues such as antisocial behaviour, overcrowding and vandalism particularly in the peak use periods. There is currently no charge for users of the facility, the cost of upkeep ultimately being borne by WaterNSW customers.

The NSW Government as part of the Stage 1 Metropolitan Water Plan (2006) committed to the upgrade of the site. As part of the proposed upgrade, WaterNSW is planning to improve safety for staff and users, improve cost efficiencies by changing site management and introducing camping fees, and enhancing existing and providing additional facilities.

The project was approved as part of the previous pricing review, and the pricing review prior to that, with WaterNSW conducting investigations into the upgrade since 2008-09. The project is currently towards the end of Stage 2 - the Investigations / Concept design phase, which is to be completed in the current regulatory period. Stage 3 - Detailed Design / Implementation is forecast for the next regulatory period, with construction to occur in 2016/17.

7.12.2. Assessment type and documentation

Assessment type

This assessment considers past and future expenditure in the current and future regulatory periods.

Documentation reviewed

A number of documents were provided and reviewed for this project, as summarised in the table below. In addition, an interview was undertaken with WaterNSW officers in Sydney on 8 October 2015.

Table 65 Documentation provided for WGP004

Document title	Reference
Business Case – Bendeela Recreational Area Upgrade Stage 2 – 16343000, WaterNSW, 2015	D2014/54666
Bendeela Recreational Area – Draft Masterplan (for public exhibition), WaterNSW, April 2014	N/A
Bendeela Recreational Area – Community Consultation Report , WaterNSW,– January 2015	N/A
Bendeela Recreation Area Draft Masterplan Financial Appraisal, Tony Charters and Associates, August 2014	N/A
Email from Ed Chan, dated Friday, 23 October 2015 2:36 PM, clarifying proposed treatment of capital expenditure and revenue	N/A

7.12.3. Project need

The project is categorised by WaterNSW as meeting a 'government programs' driver.

Bendeela recreational area came into being following the 1996 Metropolitan Water Plan, originally as an offset for a proposal to remove another camping area due to a proposal at the time to raise the level of an existing dam. The dam works ultimately did not occur but the facility was opened and has since been managed by WaterNSW.

The NSW Government as part of the Stage 1 Metropolitan Water Plan (2006) committed to the upgrade of the site.

The ongoing management of the site has been identified as providing safety risks to WaterNSW staff, contractors and visitors from these issues. WaterNSW currently carries significant operating and staff costs (>$350,000 per year) in the management of this site without any cost recovery through charging arrangements for users. A large proportion of these costs are for provision of temporary toilet facilities, collection of rubbish, and general clean-up and repairs. WaterNSW has stated that this cost is likely an under-estimate as not all time spent by WaterNSW officers is accounted for.

WaterNSW has investigated and challenged whether it should continue to be the responsible body for the Bendeela recreation area, given it is not normally core business for a water corporation to own and manage such a facility. It was determined that there being no viable alternative WaterNSW would continue to manage the facility but will seek through an expression of interest process a manager who is likely to come from the private sector.

WaterNSW has stated that the current situation with the Bendeela recreational reserve is not sustainable and cannot continue with a significant financial impost upon WaterNSW along with the public safety issues. The drivers for the overall upgrade project align with five Key Focus Areas of the ex SCA Corporate Sustainability Strategy 2010 – 2015 and are defined by the Project Objectives:

- Meet NSW Government commitment in the Metropolitan Water Plan (2006) to upgrade the site
- Protect water quality and foreshore riparian areas
- Improve staff and visitor safety
- Improve management of visitor numbers and behaviour
- Recognise that Bendeela Recreation Area is a valuable community asset
- Ensure that Bendeela Recreation Area continues to provide a good primitive camping experience for visitors

WaterNSW commenced the project to investigate the upgrade to the site in 2008-09. As part of developing the master plan for Bendeela in Stage 1 of the project, WaterNSW undertook an extensive public consultation process, and this is ongoing. To date around 90 submissions had been received, many of them regarding the fees proposed though not many opposing the project altogether.

7.12.4. Options investigated

For both the current and future pricing periods the following options were investigated:

- **Base Case** – Do nothing and manage the Bendeela Recreation Area as is currently undertaken with limited restrictions on camper numbers, no bookings or fees or changes of facilities. This option did not meet the project need to meet the NSW Government commitment to upgrade the site, so this option was discarded.
- **Option 1 –** Upgrades of site facilities without any management changes
- **Option 2 –** Detailed Design, development approval and operational documentation for Masterplan as proposed. This option is based on a forecast 25% drop in campers initially after introduction of user-pay system and then an increase thereafter.
- **Option 3 –** Transfer Bendeela site to another group (private or agency) without upgrade works
- **Option 4 –** closure of Bendeela Recreation Area
- **Option 5 –** expansion and modification of site and adjacent WaterNSW lands for a wide range of options and uses
- **Option 6 –** Undertake design and construct as a single stage for Bendeela Recreation Area; essential the same as Option 2 but would have seen WaterNSW make a final investment decision after ‘stage 1’ work, bypassing stage 2.

Following a detailed options analysis process considering Net Present Value (including capital expenditure, cashflow from camping fees, incurred and avoided operating expenditure) and benefit cost ratio. The benefit cost ratio was the highest for options 2 and 6, while the NPV was third largest. WaterNSW adopted Option 2 as the preferred option based on the high benefit cost ratio, meeting the project need and meeting WaterNSW’s standard project development lifecycle.

7.12.5. Procurement

WaterNSW has proposed to engage a contractor to produce contract technical specifications for the works and this will be tendered publically to engage a qualified consultant with landscaping, construction / building and environmental planning expertise to undertake the detailed design.

Should the project proceed into Stage 3 for construction, the work will be publically tendered.

7.12.6. Costs and delivery

WaterNSW provided its proposed expenditure for the forthcoming regulatory period and a forecast for the current regulatory period, however these figures have been removed at the request of WaterNSW due to being commercial-in-confidence. Capital expenditure is proposed to be included within WaterNSW's RAB. An amount was proposed for contingency, however this has also been removed at the request of WaterNSW due to being commercial-in-confidence.

7.12.7. Assessment of prudence and efficiency

Prudence

The expenditure proposed under this project is considered to be prudent:

- The need has been established, with the current situation with the Bendeela recreation reserve being unsustainable and the NSW Government as part of the Stage 1 Metropolitan Water Plan (2006) being committed to the upgrade of the site.
- The project has several benefits, it effectively mitigates the public safety and water quality risks, it may reduce WaterNSW management costs, and provides an enhanced service to campers.
- WaterNSW demonstrated that options that involve a lesser capital investment such as closing the camping ground altogether would not be achievable and would not meet obligations for the camping ground to be maintained.

The review team did question the inclusion of this past (and future) capital expenditure in the RAB, given:

- the potential for it to generate unregulated revenue
- it is largely providing recreational services that, on face value, may not appear to be consistent with WaterNSW's responsibilities, and
- the historical capital expenditure has not yet led to the construction of a capital asset.

In response, WaterNSW stated that:

> *capital expenditure relating to Bendeela Recreational area upgrade was part of our 2011 submission to IPART. IPART did not make any adjustments to our proposed expenditure for this project in its final determination in 2012.*

Further, WaterNSW stated

> *"It is our view that the treatment of expenditure in the current price path as capital expenses is consistent with our policy of capitalising works from 'Stage 2' onwards. For this project, there is no equivalent of 'Stage 1' where scoping studies or issue identification was done. The upgrade was clearly identified as a commitment*

tied to the operation of the Shoalhaven Scheme and the expenditure thus far has been for the development of the Master Plan. The Master Plan preparation can be seen as 'Stage 2a' where we provide an outline of the upgrade works. The Masterplan also provides a clear indication of WaterNSW's intent to proceed with the project. The draft business case provided should be seen as documentation for 'Stage 2b' where we develop detailed documentation and finalise development approvals."[148]

The review team accepts this logic regarding the prudence of the expenditure and its capitalisation.

Efficiency

The expenditure is considered to be efficient:

- A detailed economic analysis has been carried out considering whole of life costs on an NPV and benefit cost ratio basis.
- The economics of the investment are based on assumptions that are considered to be sound, ie. the investment being more than recouped via the user charges, along with cost savings from reduced damage, clean-up/dumped rubbish, and provision of temporary toilet facilities.
- The cost estimates for the Stage 2 (Investigations / Concept design) phase, which includes engagement of external expertise and internal resources, are considered efficient.
- The cost estimates provided for the Stage 3 construction works are also considered efficient; the scope matches the descriptions within the master plan and unit rates are not excessive.
- Given the work is not routine for a water corporation it is expected WaterNSW will have a more detailed probabilistic cost estimate prepared during Stage 2 to gain a higher confidence prior to making a final investment decision.

The review team questioned WaterNSW about the regulatory treatment of likely revenue generated from camping fees at the upgraded site. WaterNSW response is as follows:

EOI process. As discussed at the capex interview, we are currently seeking expression of interest from external parties to operate the recreational facilitates on our behalf once the upgrade is completed.

Intended operating model. It is our current intention that the external party will operate the recreational area on a licenced operator basis where they will be responsible for managing their own revenue and expenses. A licence fee will be payable to WaterNSW for the ability/approval to operate in the area. The 'net operating result' in the business case therefore reflect the estimated profit the operator will earn and not the amount attributable to WaterNSW.

Likely licence fee. The licence fee has not been determined as the EOI process is still ongoing. Therefore, we have not included the fee in our forward estimate of unregulated income in our submission. In any case, the annual licence fee is likely to be small given the estimated profit is less than $100k/year in the first 5 years of the site's operation. We are probably talking about amount in the thousands rather than tens of thousands here.[149]

[148] Email from Ed Chan (WaterNSW) to Chris Olszak (Aither), dated 23 October 2015 (3:29pm).

[149] Email from Ed Chan (WaterNSW) to Chris Olszak (Aither), dated 23 October 2015 (3:29pm).

Given the uncertainty regarding the income projections, and the likelihood that they will be relatively immaterial, the review team accepts the project as efficient. The review team does recommend that IPART and WaterNSW ensure the appropriate regulatory treatment applies to any non-regulated income or licence fees generated through this capital investment which is being added to the regulated asset base and recovered from customers.

The proposed allowance for contingency within the proposed expenditure is considered high[150]; no reduction for this project specifically is recommended in lieu of an action at a portfolio level.

7.12.8. Recommended expenditure

The following tables contain the recommended expenditure and compares this with WaterNSW's proposed expenditure.

Table 66 WGP004 actual, forecast and recommended capital expenditure ($000s, $2015/16)

	Current reg period 2012-13	Current reg period 2013-14	Current reg period 2014-15	Current reg period 2015-16	Total
WaterNSW actual/forecast expenditure	*	*	*	*	*
Recommended expenditure	*	*	*	*	*
Variance	-	-	-	-	-
Variance (%)	-	-	-	-	-

Source: All data sourced from 'SIR Capex 2' Tab of AIR/SIR excel file provided by IPART on 8 September 2015 (WaterNSW Greater Sydney 2015 Price Submission - Annual and Special Information Return 2015.xlsx (8/9/2015, 2:47pm)).

Note: * Denotes content removed at the request of WaterNSW due to being commercial-in-confidence.

Table 67 WGP004 proposed and recommended capital expenditure ($000s, $2015/16)

	Next reg period 2016-17	Next reg period 2017-18	Next reg period 2018-19	Next reg period 2019-20	Total
WaterNSW actual/forecast expenditure	*	*	*	*	*
Recommended expenditure	*	*	*	*	*
Variance	-	-	-	-	-
Variance (%)	-	-	-	-	-

Source: All data sourced from 'SIR Capex 2' Tab of AIR/SIR excel file provided by IPART on 8 September 2015 (WaterNSW Greater Sydney 2015 Price Submission - Annual and Special Information Return 2015.xlsx (8/9/2015, 2:47pm)).

Note: * Denotes content removed at the request of WaterNSW due to being commercial-in-confidence.

[150] Note that the contingency value has been removed at the request of WaterNSW due to being commercial-in-confidence.

7.13. Minor Assets Renewals Program WBE002

7.13.1. Project description

The Minor Assets Renewals Program, also known in some WaterNSW documentation as Water Supply Asset Renewals, is an ongoing program in place since 2011 to replace 'minor' assets on a prioritised basis once they reach end of life. The program from 2011-12 included civil, mechanical and electrical assets, predominantly for water supply only.

Delivery of the works is primary by the Civil, Mechanical and Electrical Maintenance (CMEN) Contract that has been in place for approximately five years following a public tender process. The program did not include any renewal of hydrometric assets, property assets, IT assets or assets related to catchment operations.

The renewals program is typically planned at least twelve months in advance so that the CMEN contractor is able to plan their resourcing and in turn provide an efficient and economic service to WaterNSW. Each individual work order is quoted on a standalone basis subject to review by a WaterNSW officer, and WaterNSW reserves the right to market test or seek a re-quote if it is not satisfied the price is competitive.

The scope for the program changed midway through the current regulatory period; as documented in a change request form. Additional expenditure was identified with the program now having responsibility for 'canals and pipelines' such as buildings and structures and fencing and barriers. At this stage the name of the program was changed to Water Supply Asset Renewals.

7.13.2. Assessment type and documentation

Assessment type

This assessment considers past and future expenditure in the current and future regulatory periods.

Documentation reviewed

A number of documents were provided and reviewed for this project, as summarised in the table below. In addition, an interview was undertaken with WaterNSW officers in Penrith on 6 October 2015

Table 68 Documentation provided for WBE002

Document title	Reference
WaterNSW Asset Reliability & Maintenance Strategy, WaterNSW, June 2015	CD2007/23[v2]
Approval to spend, Water Supply Asset Renewals Program 2016-17 to 2020-21, WaterNSW, 2015	N/A
Change request, Minor Asset Renewals Program, WaterNSW, March 2014	N/A
Business Case and Program Management Plan Minor Asset Renewals Program 2011/12 to 2015/16, WaterNSW, October 2010	D2010/04212
Business Case and Program Management Plan Water Supply Asset Renewals Program Greater Sydney Area FY2016/17 to FY2020/21, WaterNSW, April 2015	D2014/107791
Work order examples, WaterNSW, 2015	N/A

7.13.3. Project need

The project is categorised by WaterNSW as meeting a 'business efficiency' driver.

WaterNSW has asset management policies, procedures and systems. WaterNSW has an overarching Asset Management policy and a strategy relating to this program developed more recently called Asset Reliability & Maintenance Strategy (ARMS). ARMS among other things provides direction in how assets are to be managed over their life cycle including asset planning and development, how they are maintained and monitored, when to undertake minor works and when to renew the asset. WaterNSW is in the process of having its Asset Management System certified to ISO 55001.

An asset management information system (AMS) has been in place for several years, based on the Maximo platform. Most assets including all water supply infrastructure are in the AMS, containing information on the asset type, age, condition, and maintenance regime. Renewals under this program are heavily influenced by the information in the AMS, which is kept up to date by provision of updated condition information.

Together this framework, systems and tools enables WaterNSW to determine when assets are no longer economic to retain and require replacement; that is the cost of upkeep or costs of an asset failing are of such magnitude it is more economic to retire that asset and replace or refurbish it. Renewal of assets takes place on a prioritised basis, using asset condition data to make an informed decision.

7.13.4. Options investigated

For the 2011-12 to 2015-16 period WaterNSW looked at several options for renewal of ageing assets:

- Do nothing / base case option. No planned asset replacement program - assets replaced where performance deteriorates or the asset fails. Resourcing for such a method of asset renewals would be hard to plan for with it likely to fluctuate from month to month and year to year.
- Option 1. Prepare a program of asset renewals on a rolling annual basis based on asset condition information from WaterNSW's AMS.
- Option 2. As for option 1 but an accelerated program, renewing ten years' worth of renewals over a five year period.

After considering the economics and undertaking a risk assessment WaterNSW elected to adopt Option 1. The economics and risk of the do nothing option were too great whereas Option 2 was an over-investment for little additional benefit.

The business case for the forthcoming regulatory period undertook a similar analysis to that undertaken previously but only had two options, a 'base case' of no renewals and an option of a planned asset renewals program (the status quo). The planned renewals program 'option 2' was adopted.

7.13.5. Procurement

WaterNSW has delivered and will continue to deliver the majority of renewals works via the CMEN contractor. It is noted the CMEN contract is currently due to expire in May 2016, after which a new form of contract may be in place.

7.13.6. Costs and delivery

WaterNSW has proposed expenditure of $6.795 million in the forthcoming regulatory period and a forecast $6.401 million in the current regulatory period. This also included a contingency allowance, however this has been removed at the request of WaterNSW due to being commercial-in-confidence.

WaterNSW's asset management tools are used to drive the program and are used to determine which assets require renewal on a rolling 12 month program using an evidence-based approach to prioritise expenditure. This enables the program to fit within budgeted expenditure and manage risks.

7.13.7. Assessment of prudence and efficiency

Prudence

The expenditure undertaken in the current regulatory period and that proposed is considered to be prudent:

- The need is clearly defined need. WaterNSW is being proactive in renewing assets as they reach their retirement age, prior to there being any catastrophic failure therefore avoiding consequential costs and impacting reliability of water supply, water quality or safety.
- The annual budget is based on a model that uses asset condition and criticality information stored in Maximo including the expected number of years remaining before the asset needs to be replaced. This data is updated via condition assessments conducted by the maintenance contractor, staff and other contractors engaged.
- The expenditure profile proposed is consistent with past expenditure giving some confidence WaterNSW is not over-forecasting: with expenditure undertaken on a condition basis this often leads to an over-estimation of expenditure as it is found not as many assets need to be replaced as predicted.
- Timing of the asset renewals are being optimised.
- A process is in place to determine whether an asset is still required, therefore retired from the asset base and not renewed.
- The program is supported by WaterNSW's corporate asset management strategy and policies.

The change to the scope of the project to include 'canals and pipelines' was carried out in accordance with WaterNSW policies and procedures applicable at the time and appears to be prudent.

Efficiency

The expenditure to date and proposed under this renewals program is considered to be efficient:

- With contractors being used to deliver the works, cost of future works are forecast based on market rates.
- The use of long term contracts makes it likely that contractors can make appropriate investments in staff and systems to deliver the works efficiently. WaterNSW is establishing a medium term works program to allow their contractor to plan their works accordingly and enable efficient pricing.
- Synergies with other proposed projects are being considered, avoiding redundant expenditure; where possible projects with different drivers are combined.
- WaterNSW is following an appropriate process to prioritise renewals expenditure and ensure it is carried out based on evidence of asset performance and condition. Replacement of assets when they reach end of useful life is sound and appropriately risk based.

The types of assets being renewed or replaced are fairly unique and non-routine with little repeat work; WaterNSW is consequently obtaining individual quotes per work order with WaterNSW officers reviewing each quotation prior to approving. The contract being used is due for renewal some time in 2016. While there may be an argument for WaterNSW to establish set rates in lieu of having a unique quotation prepared for each work order from the documentation reviewed, most work orders are unique and the benefits would be limited other than for certain types of assets.

While the underling estimates and expenditure to date is considered efficient, the allowance for contingency is considered high[151]; no reduction for this project specifically is recommended in lieu of an action at a portfolio level.

7.13.8. Recommended expenditure

The following tables contain the recommended expenditure and compares this with WaterNSW's proposed expenditure.

[151] Note that the contingency value has been removed at the request of WaterNSW due to being commercial-in-confidence.

Table 69 WBE002 actual, forecast and recommended capital expenditure ($000s, $2015/16)

	Current reg period 2012-13	Current reg period 2013-14	Current reg period 2014-15	Current reg period 2015-16	Total
WaterNSW actual/forecast expenditure	1,726	1,378	1,685	1,611	6,401
Recommended expenditure	1,726	1,378	1,685	1,611	6,401
Variance	-	-	-	-	-
Variance (%)	-	-	-	-	-

Source: All data sourced from 'SIR Capex 2' Tab of AIR/SIR excel file provided by IPART on 8 September 2015 (WaterNSW Greater Sydney 2015 Price Submission - Annual and Special Information Return 2015.xlsx (8/9/2015, 2:47pm)).

Table 70 WBE002 proposed and recommended capital expenditure ($000s, $2015/16)

Financial year ($2015/16)	Next reg period 2016-17	Next reg period 2017-18	Next reg period 2018-19	Next reg period 2019-20	Total
WaterNSW proposed expenditure	1,693	1,695	1,685	1,722	6,795
Recommended expenditure	1,693	1,695	1,685	1,722	6,795
Variance	-	-	-	-	-
Variance (%)	-	-	-	-	-

Source: All data sourced from 'SIR Capex 2' Tab of AIR/SIR excel file provided by IPART on 8 September 2015 (WaterNSW Greater Sydney 2015 Price Submission - Annual and Special Information Return 2015.xlsx (8/9/2015, 2:47pm)).

7.14. Motor vehicle fleet procurement WBE005

7.14.1. Project description

WaterNSW maintains a motor vehicle fleet for the Greater Sydney Area of approximately 87 vehicles made up of pool, operational and package vehicles. WaterNSW owns and maintains the vehicles outright and has had a program in place since prior to the current regulatory period to replace vehicles once they are a certain age (2 years) or travel a certain distance (40,000 km), whichever comes first. Vehicles are changed over on a like for like basis via two Penrith based car dealerships which take the older vehicle as a trade-in. No changes are proposed from the current program for the forthcoming regulatory period.

7.14.2. Assessment type and documentation

Assessment type

This assessment considers past and future expenditure in the current and future regulatory periods.

Documentation reviewed

A number of documents were provided and reviewed for this project, as summarised in the table below. In addition, an interview was undertaken with WaterNSW officers in Penrith on 7 October 2015.

7.14.3. Project need

The project is categorised by WaterNSW as meeting a 'business efficiency' driver.

With a significant operational footprint for the Greater Sydney area, in order to operate effectively WaterNSW has a requirement for a fleet of motor vehicles for use by front-line operational staff, with a handful available for office-based staff. It is likely that the need for vehicles will change following the State Water-SCA merger to create WaterNSW though the impact is not currently known. This would arise from a reduction in staff levels due to duplication of roles, along with some potential to combine pool vehicles.

7.14.4. Options investigated

WaterNSW has determined an optimal time to replace vehicles in order to achieve a balance between purchase costs, maintenance costs and resale value. Little documentation has been provided by WaterNSW during this expenditure review, however explanation was provided during the interview process and the documentation that was reviewed supports the statements made.

Some years ago the SCA used to change over vehicles every 9 months or 15,000 km, which following an internal investigation was found to be not efficient. Costs of fitting vehicles with equipment and down time due to changing over vehicles were significant, and have now been significantly reduced. Options to lease vehicles was also examined at the time and found to be not cost effective.

7.14.5. Procurement

WaterNSW previously had a panel arrangement in place with two Penrith based dealers. While this panel has now expired these two dealers continue to be used, who provide vehicles at the equivalent rates of those provided under Whole of NSW Government supply panels. It is expected this arrangement will continue though it may change under the combined WaterNSW organisation once the new fleet management policy is in place. At the time of the interviews, a timeline for a new fleet management policy was not yet known.

7.14.6. Costs and delivery

WaterNSW has proposed expenditure of $9.752 million in the forthcoming regulatory period and a forecast $9.896 million in the current regulatory period. No explicit contingency allowance was made.

WaterNSW has assumed a set changeover cost per vehicle and an estimated number of vehicles to be replaced in a given financial year, however these figures have been removed at the request of WaterNSW due to being commercial-in-confidence.

7.14.7. Assessment of prudence and efficiency

Prudence

The expenditure undertaken in the past and proposed for the future is considered to be prudent:

- The need is demonstrated; provision of fit for purpose motor vehicles is necessary for WaterNSW operations including field based operations staff, in addition to meeting staff entitlements.
- Expenditure has been carried out in accordance with the approved business case and in line with the expenditure forecasts within the current pricing period.
- Optimisation has been undertaken iteratively, with policies on replacement being varied to minimise the cost to WaterNSW.

Some aspects of the project justification are lacking in robustness but these do not appear to affect the proposed expenditures materially. No evidence of any recent options investigation was presented (e.g. determine if prudent to retain vehicles for longer, up to 3 years instead of 2 years or leasing vehicles), with the process and policies evidently unchanged for at least the last five years. It was however stated there were plans to conduct a fresh options assessment approximately 12 months ago however the merger put this activity on hold. It was advised the new WaterNSW fleet manager will likely undertake such a review early in their tenure, with this position expected to be filled in coming months with recruitment processes under way. This is considered acceptable and should not impact the prudency of the forecast expenditure.

Efficiency

The expenditure undertaken in the past is considered to be efficient:

- It was carried out in accordance with the budget made within the 2012 determination.
- WaterNSW is optimising the financial outcomes by achieving a balance between the cost of new vehicles and the residual (trade-in) value achieved; WaterNSW estimates an 87% resale value is being obtained under the current policy of changing vehicles every 2 years or 40,000 km.
- WaterNSW is making use of NSW Whole of Government procurement panels to obtain the best price for the chosen vehicles.
- Synergies with the Catchment Upgrade and Replacement of Plant and Equipment have been considered. There is some interdependencies between the two programs where plant and equipment is fitted to motor vehicles.
- Proposed future expenditure is consistent with that incurred in the past and supported by a schedule of vehicles and proposed changeovers provided.

However the proposed future expenditure has not clearly been demonstrated as efficient considering the likely future workforce composition of WaterNSW as a result of the State Water-SCA merger. Considering the operational expenditure savings resulting from the merger, it seems reasonable that a reduction in capital expenditure under this program is likely:

- In the short term (1-2 years), should it find it has surplus vehicles, WaterNSW would be expected to dispose of the vehicles.
- In the medium term (2-4 years) it would be expected that WaterNSW would have fewer vehicle changeovers per year.

Given the high likelihood of the merger resulting in staff reductions, savings of 5-10% for each year from 2016-17 could reasonably be assumed, corresponding to a reduction in vehicle changeovers of

4 to 6 vehicles on average per year using WaterNSW's average price of $48,000 per vehicle. WaterNSW advised the review team that savings of $120,000 per annum over the four year period from 2016-17 could be expected, which supported the review team's view. Accordingly a reduction of $480,000 is recommended.

7.14.8. Recommended expenditure

The following table contains the recommended expenditure and compares this with WaterNSW's proposed expenditure.

Table 71 WBE005 actual, forecast and recommended capital expenditure for current regulatory period ($000s, $2015/16)

	Current reg period 2012-13	Current reg period 2013-14	Current reg period 2014-15	Current reg period 2015-16	Total
WaterNSW actual/forecast expenditure	1,745	2,715	1,918	3,519	9,896
Recommended expenditure	1,745	2,715	1,918	3,519	9,896
Variance	-	-	-	-	-
Variance (%)	-	-	-	-	-

Source: All data sourced from 'SIR Capex 2' Tab of AIR/SIR excel file provided by IPART on 8 September 2015 (WaterNSW Greater Sydney 2015 Price Submission - Annual and Special Information Return 2015.xlsx (8/9/2015, 2:47pm)).

Table 72 WBE005 proposed and recommended capital expenditure for next regulatory period ($000s, $2015/16)

Financial year ($2015/16)	Next reg period 2016-17	Next reg period 2017-18	Next reg period 2018-19	Next reg period 2019-20	Total
WaterNSW proposed expenditure	2,120	2,688	2,160	2,784	9,752
Recommended expenditure	2,000	2,568	2,040	2,664	9,272
Variance	-120	-120	-120	-120	-480
Variance (%)	-5.7%	-4.5%	-5.6%	-4.3%	-4.9%

Source: All data sourced from 'SIR Capex 2' Tab of AIR/SIR excel file provided by IPART on 8 September 2015 (WaterNSW Greater Sydney 2015 Price Submission - Annual and Special Information Return 2015.xlsx (8/9/2015, 2:47pm)).

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