WaterNSW rural bulk water services expenditure review

A review of capital and operating expenditure

A Final Report prepared for the Independent Pricing and Regulatory Tribunal

February 2017

AITHER

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Abbreviations

AIR	Annual Information Return
ANCOLD	Australian National Committee on Large Dams
Capex	Capital expenditure
CPI	Consumer price index
BRC	Dumaresq-Barwon Border Rivers Commission
IPART	Independent Pricing and Regulatory Tribunal
ML	Megalitre (one million litres)
ML/d	Megalitres per day
MDB	Murray-Darling Basin
MDBA	Murray-Darling Basin Authority
NPV	Net present value
NSW	New South Wales
Opex	Operating expenditure
RAB	Regulated Asset Base
SIR	Special Information Return
SWC	State Water Corporation

Executive summary

Aither, and its subcontractors Oakley Greenwood, WSP | Parsons Brinckerhoff, and Australian Dams & Water Consultants (the review team), were engaged by the New South Wales (NSW) 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 rural bulk water services component of the WaterNSW business.

The key tasks for the review were to:

- undertake a strategic review of long-term investment planning and asset management systems
- undertake a detailed review of capital and operating expenditure
- assess WaterNSW's performance against stipulated output measures during the previous determination period, and propose new output measures for the next period (if appropriate)
- assess the rationale for and cost recovery and reflectivity of several specific water charges.

Summary of key findings and recommendations

The review team's overall findings are:

- Strategic management processes and documentation appear to be robust and generally effective – there is evidence of efficiencies and synergies resulting from the merger, certification of different processes is proceeding, and approaches to dam safety are appropriate and compliant with regulations. However, the review team did identify some issues with asset renewals, including aspects of forecasting and modelling, and a lack of robust assessments of project need and options assessment.
- Past (current regulatory period) capital expenditure is considered generally prudent and efficient. There has been underspend relative to the ACCC allowance to date - WaterNSW provided updates for 2016-17 reflecting its attempts to make up the underspend, which in part may be attributed to delays caused by the merger, and reprioritising capital spending following the ACCC determination. The revised projections for capital expenditure in the current period is lower than in WaterNSW's pricing submission due to changes in costs for one major project, as advised by WaterNSW.
- WaterNSW's proposed capital expenditure for the next period is substantially higher than its actual and forecast expenditure for the current determination period, with most of this increase attributable to asset renewals. The review team is not convinced the level of capital expenditure proposed by WaterNSW is prudent and efficient – the recommended capital expenditure is $153.2m ($33.4 million less than proposed by WaterNSW). This lefvel is still higher than WaterNSW's average actual/forecast expenditure in the current period in recognition that WaterNSW has increased needs in some areas.
- It is unlikely that the previous State Water's operating expenditure was efficient during the current regulatory period, but assessment is complicated by the merger that has occurred, which has

[1] Financial years 2012-13 to 2016-17, assessment of 2016-17 is based on WaterNSW forecasts.

[2] Financial years 2017-18 to 2020-21.

clearly driven efficiency gains later in the current period. For the current period, overall operating expenditure has been substantially lower than the ACCC allowance.

- WaterNSW has proposed significant reductions in operational expenditure as a result of organisational transformation. This proposed operational expenditure is generally deemed to be prudent and efficient. Only two downward adjustments are recommended, independent of the broader opex assessment. These are tied to capex projects that were not sufficiently justified. The downward adjustments recommended for opex are not considered material in this context.
- Targets associated with output measures in the current period have largely been met, noting that measures were not specified for certain years given the deferred review of prices. In areas where measures were not fully met, this has been adequately explained, including where there were issues with the output measures themselves, or WaterNSW made strategic decisions to defer works to reduce costs or improve delivery.
- Most of the miscellaneous water charges reviewed appear to have a robust rationale for their existence, however the review team do recommend changes for some, including to tariff arrangements or prices set based on the review team's assessment of their cost-recovery approaches or degree of cost-reflectivity, or other principles associated with ensuring economically efficient outcomes.

Table ES1 WaterNSW proposed, and review team recommended capital and operational expenditure ($000's, $2016-17)

	2017-18	2018-19	2019-20	2020-21
Capital expenditure[1]				
WaterNSW proposed[2]	59,404	59,052	35,463	32,630
Recommended	52,264	50,075	26,472	24,356
Operating expenditure				
WasterNSW proposed	40,442	38,731	38,282	37,481
Recommended	40,079	38,315	37,907	37,152

Notes: 1) User and government share. 2) Proposed level following revisions made by WaterNSW during course of review.

About the review

IPART is reviewing maximum prices that WaterNSW can charge for its rural bulk water services from 1 July 2017. For valleys in the Murray-Darling Basin (MDB), the ACCC undertook the current determination for the former State Water. The current determination commenced on 1 July 2014 and set prices until 30 June 2017. For the coastal valleys, prices from IPART's 2010 determination have been extended with prices held constant in nominal terms since 2013-14. WaterNSW submitted their pricing proposal for the period from 1 July 2017 to IPART in June 2016. Maximum prices determined by IPART for the new determination period will cover a period of up to 5 years.[3]

The purpose of this review is to help IPART determine prices which reflect the prudent and efficient costs of delivering WaterNSW's rural bulk water services.

[3] WaterNSW has proposed that prices be set for four years.

Objectives and scope

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

- a strategic review of WaterNSW's rural bulk water related investment plans and asset management systems and practices
- a detailed review of WaterNSW's 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
- a review of water take measurement charges and miscellaneous charges including the rationale for imposing charges, cost recovery basis and reflectivity, and efficiency of costs.

Review delivery and methods

The review was undertaken from September to December 2016, and drew on a range of public and confidential information, supported by interviews with WaterNSW officers and executives, and WaterNSW responses 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; the WaterNSW pricing submission to IPART, and; various internal documents and spreadsheets supplied by WaterNSW. Interviews with officers and executives were undertaken in Sydney in October 2016.

- 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 achieving prudent and efficient investment decisions.
- 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 realised. Future expenditure review utilised several methods, including a detailed review of individual capital projects and reviews of asset condition assessment and renewals forecasting approaches.
- The review of operating expenditure included understanding the factors driving WaterNSW's costs, and ascertaining assumptions and reviewing methods WaterNSW adopted to translate those into operational expenditure forecasts. A range of specific assumptions, methods, or issues were considered and analysed, with particular consideration given to implementation of the organisational redesign that was reviewed as part of the Greater Sydney expenditure review.

Review context

WaterNSW

On 1 January 2015, the NSW Government formed WaterNSW by merging the former State Water Corporation (SWC) and the former Sydney Catchment Authority. 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 rural bulk water services component of the business, which is similar to the former State Water Corporation's role. While some time has passed since the formal merger, WaterNSW is still resolving the amalgamation of policies, procedures, and operating practices of the two legacy organisations in some areas. Certain elements of proposed spending (e.g. new approaches to corporation wide ICT) also reflect this.

Key policy issues

Aside from the impact of the merger, two key policy areas of particular relevance to this review include Dam Safety requirements, and the recent transfer of Water Administration Ministerial Corporation (WAMC) functions from DPI Water to WaterNSW.

WaterNSW is required to meet minimum operational, maintenance and safety standards for its dams. This includes the requirements of the NSW Dams Safety Committee under the *Dams Safety Act 1978*. In 2013, an independent review of the *Dams Safety Act 1978* was undertaken, which made recommendations for improvement of the management of dam safety in NSW. In September 2015, the NSW Government introduced revised dam safety legislation (Dam Safety Bill 2015) to facilitate implementation of these recommendations. This has implications for deciding if, when, and what capital investments to make in relation to WaterNSW dams to meet modified or new requirements.

The *Water NSW Amendment (Staff Transfers) Act* 2016 transfers a range of functions previously undertaken by DPI Water on behalf of the Water Administration Ministerial Corporation (WAMC) to WaterNSW. The objective is to reduce duplication and improve service delivery and to enable DPI Water to focus on policy, water market regulation and providing oversight on major government funded water infrastructure projects. Functions moved to WaterNSW include customer transactions, compliance investigation, licensing administration and billing, water quality monitoring, hydrometric assessment and metering operation. IPART recently determined maximum prices for these services, which WaterNSW has proposed to follow for the next period.

Strategic review

The strategic component of the review assessed WaterNSW's organisational objectives and structure, and its approach to: asset management; capital planning; procurement; program and project management; asset operations and maintenance; risk management; dam safety, and; heritage management.

Corporate planning and strategic direction

Following the formation of WaterNSW, its corporate objectives and strategy are still transitional, with several areas of corporate focus to transform the organisation and define the culture post amalgamation. The review team consider the revised organisational structure and strategy to be sound in meeting business objectives and obligations and there is evidence the amalgamation is working well at a high level. This is supported by identified savings and efficiencies highlighted in WaterNSW Pricing Proposal to IPART for Rural Bulk Water Services.

WaterNSW has agreed a Statement of Corporate Intent with its Shareholding Ministers which sets out its performance targets and key strategic focus areas which include value creation for its customers with more agile and innovative services and it also includes an action statement to deliver the organisation's nine strategic priorities.

The review team considers this to be a sound strategic focus for the organisation as it beds down the amalgamation and targets areas of efficiency savings and a customer focused business, supported by a large and diverse asset base. The key drivers of proposed expenditure appear to come from WaterNSW's nine strategic priorities focusing primarily on asset health and improved business systems.

Asset Management Strategy and capital investment decisions

WaterNSW has a comprehensive set of documented procedures and plans in its Asset Management Strategy and these form a logical and integrated framework for asset investment decision making from the strategic to the procedural. The capital project planning processes are well documented and there are several iterations and internal reviews as asset plans and works programs are developed and refined. The review team considers that this high-level approach to asset management and capital investment planning is generally sound.

However, the review team found issues with implementation of some aspects of the process, primarily around asset renewals assessment and forecasting. This has linkages with WaterNSW's proposal to 'change' the approach to seeking approval for capital expenditure,[4] where it has suggested it requires approval of a funding envelope from the regulator. The review team note that we were not asked by IPART to approve individual projects but rather recommend a prudent and efficient overall level of expenditure. To do this, the review team needs to be satisfied that the evidence provided supports the level of expenditure proposed as being prudent and efficient. A consequence of the revised approach being taken by WaterNSW is that the justification and documentation for proposed future capital expenditure is limited in some areas (mainly renewals), partly because more robust assessment of the need for expenditure (and exploration of alternatives) is planned to occur post the determination. This is best illustrated by Figure ES1 below, with the green chevron indicating where WaterNSW currently is in the process.

Source: WaterNSW response to Aither Initial Information Request

Figure ES1 Simplified representation of the process of developing and delivering the renewals program

A key aspect of process in relation to this is the use of WaterNSW's 'Assetbank' model or tool, which contains asset condition (and other) information, and is a major component in developing the forward capital plan. In principle, the use of such a tool is likely to be beneficial to and appropriate for the overall approach to identifying capital investment needs and assessing those (creating and sorting a 'long-list'), however the review team have concerns about aspects of the model and its implementation.

This includes reservations about how it may result in spending proposals being included in the forward capital plan that may not have been subjected to a sufficiently rigorous process to ensure they are prudent and efficient. The review team has reservations about the Assetbank model's ability to provide this assurance, due to reservations about the treatment of risk and other model parameters. The review team also observed that Assetbank may not include costings with an appropriate level of confidence. Overall, the process results in a 'long list' of spending proposals forming the basis of the pricing submission, many of which are immature in their development and

[4] WaterNSW advised in comments on the draft report that this change only relates to maintenance capital works, as characterised by the Maintain Capability program.

costings. Outputs of the Assetbank model are subject to a workshop based assessment however there was no substantiation of this process, nor were any 'before and after' artefacts from this process made available to the review team that could substantiate the outcomes.

The review team believe this results in significant potential for inflated expenditure, risking overinvestment or higher than necessary revenue requirements, which could impact customers. It also has the potential to shift the emphasis of expenditure reviews to ex-post analysis, further increasing risks for regulators or customers. In addition, as has been articulated by stakeholders in submissions and hearings, the process is not viewed favourably in terms of its transparency because stakeholders and customers have little line of sight to what specific expenditure is proposed or is likely to proceed.

While the review team appreciate the desire for WaterNSW to have flexibility, this is still provided via the approval of a headline level of capital expenditure. In terms of process, it may be more desirable for WaterNSW to have more well developed proposals completed for at least the first and second years of the forward period, while having some proposals less fully developed for the final years (with forecasts for these still having some logical and defendable basis).

The review team do acknowledge that WaterNSW has undertaken more robust options assessments and prepared business cases for some larger capital works (outside the renewals area), which we believe is appropriate. We also acknowledge the difficulties (and potential inefficiency) associated with undertaking detailed options assessments for large numbers of small value projects such as those contained in a renewals program (and it is not our suggestion that this be done). However robust assessments of the need for expenditure (be they business cases, options assessments or similar processes and documentation) could be undertaken at an aggregate program or thematic level. Other regulated utilities, including WaterNSW for their Greater Sydney area, have evaluated the business case of asset replacements at the program level.[5]

Approach to dam safety and management

WaterNSW has a dam safety program comprising two key elements – routine dam safety activities and remediation of identified dam safety deficiencies, with both these elements consistent with the requirements of the NSW Dams Safety Committee, ANCOLD and other major dam owners in Australia.

WaterNSW is undertaking work to ensure previous portfolio risk assessments of its two legacy businesses are in a consistent format to allow confidence in future program definition. WaterNSW rural dams are now at the end of a 10 year, approximately $420m capital works dam safety risk reduction program with the crest post-tensioning works on Keepit Dam the final identified project. Any further works on any of WaterNSW's rural dams will be subject to clarification of the regulatory requirements under the 2015 Dam Safety Bill. Capital expenditure for these further works are contained within WaterNSW's forward capital expenditure program from 2021-22 onwards, and are therefore not subject to this expenditure review.

WaterNSW has identified an inconsistent approach to assessment of risk and treatment of identified dam safety deficiencies between its two legacy organisations, and is proposing to review this position to ensure consistency and defensibility in the short term. It has also identified that three dams (Nepean, Warragamba – former SCA and Hume – MDBA) are currently at or above the Limit of

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[5] See: *WaterNSW Greater Sydney expenditure review, Aither February 2016*, https://www.ipart.nsw.gov.au/files/sharedassets/website/shared-files/pricing-reviews-water-services-metro-water-legislative-requirements-sydney-catchment-authority-pricing-investigation-commencing-from-1-july-2016/consultants_report_-_aither_-_waternsw_greater_sydney_expenditure_review_-_february_2016.pdf

Tolerability and will require some level of dam safety remediation in the future. Potential dam safety deficiencies have also been recently identified at Fitzroy Falls Dam and WaterNSW is seeking to clarify these.

Capital expenditure

WaterNSW's capital expenditure is broadly characterised by: an underspend in the past (current) regulatory period relative to the ACCC determination, which according to WaterNSW has been driven by reprioritisation of spending following the ACCC determination and the impacts of the merger on delivery, and; a substantial increase (again relative to ACCC) for the future period, largely driven by asset renewals.

Key points of the capital expenditure review include:

- WaterNSW has proposed a significant step up in expenditure for the next determination period, which produces an increase in the User Share of approximately 149%
- Expenditure in the current determination period is prudent and efficient
- WaterNSW's proposed expenditure for the next determination period is found to be higher than the review team's assessment of prudent and efficient expenditure required
- The largest category of expenditure is for maintaining capability, asset renewals, for which the basis for forecasting is conservative with a bias for capital intervention

No reductions were identified for capital expenditure for the current period, but a reduction in proposed future capital expenditure is recommended.

Review of past expenditure (current determination period)

WaterNSW is forecasting a significant uplift in capital expenditure in the final year of the current determination period, 2016-17, than that incurred in 2014-15 and 2015-16. Overall, in MDB Valleys WaterNSW has forecast capital expenditure of approximately $29.9 million less than the amount of capital expenditure the ACCC determination was based upon. In Coastal Valleys, during the 2010-11 to 2013-14 determination period WaterNSW overspent by approximately $1.7 million.

WaterNSW underwent a period of adjustment to reprioritise the capital expenditure program given their original program was based on a higher level of expenditure. WaterNSW has suggested that the merger of State Water and SCA contributed to a much lower level of expenditure occurring than forecast even with the lower level of approved expenditure (given organisational change and merger related priorities). There is evidence of good decisions being made to defer expenditure such as on business information systems that otherwise may have turned out to be imprudent or inefficient given the merger.

The level of capital expenditure judged to be prudent and efficient for the current regulatory period, for MDB valleys, is provided in the table below. No change is recommended to the level of capital expenditure for Coastal Valleys.

Table ES2 Recommended capital expenditure (MDB Valleys, User and Government Shares, current determination period, $000s, $2016-17)

	2014-15 actual	2015-16 actual	2016-17 forecast	Total
ACCC determination	41,830	31,374	46,707	119,911
WaterNSW actual/forecast expenditure	19,943	28,697	49,436	98,076
WaterNSW addition 30/9/2016	-	-	1,620	1,620
WaterNSW revised actual/forecast 30/9/2016	19,943	28,697	51,056	99,696
WaterNSW revised actual/forecast 11/10/2016	19,943	28,697	41,358	89,999
Recommended adjustments	-	-	-	-
Total recommended capital expenditure[a]	19,943	28,697	41,358	89,999

Source: All data sourced from WaterNSW Pricing Proposal to the Independent Pricing and Regulatory Tribunal, Regulated prices for the NSW Rural Bulk Water Services from 1 July 2017 to 30 June 2021, 2016, Figure 27 p.126, since revised by WaterNSW. The reforecast was provided by WaterNSW on 30 September 2016.

Note: a) Aither was asked by IPART to provide a recommendation on the prudence and efficiency of WaterNSW's past capital expenditure and to recommend a value for any capital expenditure considered imprudent or inefficient.

Review of proposed expenditure (next determination period)

WaterNSW is proposing approximately $186.5 million in capital expenditure for the next determination period, after accounting for adjustments provided during the review. WaterNSW's expenditure is comprised of five categories which reflect 'capability' drivers. These categories are closely aligned with previous WaterNSW categories but have been renamed by WaterNSW to better reflect the drivers. The majority of expenditure is allocated to the 'Maintaining capability' category (62%), which typically means activities involving asset renewals or replacement. The next largest category is 'augmenting' (14.8%), followed by regulatory dam safety (14.5%).

On a total and User Share basis, the forecast for the next determination period represents a significant increase in expenditure from the current determination period – the average annual User Share for the next determination period is more than twice the current period. Most of the Government Share in the next determination period comprises the Keepit Dam upgrade. Compared to the current determination period there is a significant change in the mix of capital expenditure, with only $17.6 million (average $5.9 million per annum) allocated to the equivalent 'Maintaining capability' category in the current determination period versus a proposed $115.6 million ($28.9 million per annum) for the upcoming period.

Renewals expenditure

With such a large portion of WaterNSW's proposed capital expenditure related to renewals expenditure (62%), an assessment was made of the processes and tools used to forecast asset renewals. This was also supported by three detailed reviews of 'per valley' renewals programs. The detail for both is contained in Section 8.

Within each of the valleys where renewals programs were reviewed in detail, there were a small number of identified works that had undergone some level of investigation and design but typically no work had been carried out to validate the need, identify and assess options or undertake cost benefit

analysis. This is because the majority of the forecast asset renewal expenditures have not yet been subjected to the rigor of a business case development and approval process. According to WaterNSW's capital planning process, only expenditures that pass this process are considered to be prudent and efficient. Hence, it is not necessarily the case that all of the forecast expenditures will proceed.

WaterNSW's approach to forecasting expenditure required for asset renewals was found to be inherently conservative leading to a bias to intervention with capital works rather than identify and implement other less costly solutions, effectively 'buying out' risk. The practice of advancing a condition score when the risk score exceeds a pre-set dollar value means that options to manage the risk are not considered. This can affect the type of remediation undertaken and the timing of that remediation. As a result, the review team are recommending a reduction in capital expenditure be made across all 'per valley' renewals expenditures from that proposed by WaterNSW, totalling approximately $21.0 million in the next determination period.

Review of sample capital expenditure

The review team also considered a sample of individual capital expenditure proposals, whether specific projects, or other spending line items in the forward capital plan. The selection of items was designed to meet a range of criteria, such as coverage of major spending items, project types, valleys, and other criteria. The detailed assessment of these projects is contained at Section 8. In addition to the three asset renewals projects assessed 14 other capital items were reviewed. Of the 14 examined the review team found that 8 were not prudent and efficient in their current form.

The review team found there was little demonstration by WaterNSW that the expenditure is justified, with two critical steps in the Asset Management process still to occur: the 'risk based prioritisation/substitution' and 'approval to spend (business case)' steps. The list of works has been identified via a budgeting process without the justification of the expenditure. In most cases no options had been developed nor any basic analysis of the costs and benefits. Expenditures within the Augmenting category were generally better justified, such as in the case of ICT/business systems expenditure, than within the 'Maintaining' category. Operational technology expenditures such as SCADA within the Maintaining category were poorly justified. Total 'reductions' following the review of sample capital expenditure was $12.4 million.

Summary assessment and recommended level of future capital expenditure

Overall WaterNSW proposed a significant increase in capital expenditure that is in excess of the review team's assessment of the level of prudent and efficient expenditure required. The majority of proposed expenditure was for renewal of assets determined largely by a modelling process that was found to be conservative leading to over-estimates of expenditure. Other significant items of expenditure were shown to be immature in their development with little certainty over the need for the expenditure or that proposed scope and therefore expenditure is no more than that required to meet the stated need.

The assessment does allow for an increase in capital expenditure based on WaterNSW's actual/forecast expenditure in the current determination period, and recognises that WaterNSW has an increasing burden of expenditure required compared to the past determination period to renew assets that are beyond their useful life and in some cases posing unacceptable business and WHS risks. Assets constructed several decades ago are reaching the stage in life where they require remedial work or in some cases replacement. It also recognises that WaterNSW requires significant investment in business systems in order to help unlock efficiencies from the merger, which have been accounted for in operational expenditure forecasts.

The evidence provided by WaterNSW did not demonstrate capital expenditure of $186.5 million was prudent and efficient, with the review team recommending instead approximately $153.2 million as being the prudent and efficient expenditure required – a difference of $33.4 million. This is comprised

of $20.7 million on valley-based asset renewals, and the balance on other expenditure. The average recommended capital expenditure by the review team is $38.3 million per annum which is higher than WaterNSW's actual/forecast expenditure of $31 million per annum in the current period, though less than the $46.6 million per annum average proposed by WaterNSW.

Table ES3 Recommended capital expenditure (All Valleys, User and Government Share, next determination period, $000s, $2016-17)

	2017-18 proposed	2018-19 proposed	2019-20 proposed	2020-21 proposed	Total
WaterNSW original proposed expenditure	63,747	49,690	47,641	32,630	193,708
WaterNSW adjustment 30/9/2016	1,839	219	0	0	2,058
WaterNSW revised proposed expenditure 30/9/2016	65,586	49,909	47,641	32,630	195,766
WaterNSW revised proposed expenditure 11/10/2016	59,404	59,052	35,463	32,630	186,549
Recommended adjustments	(7,140)	(8,977)	(8,992)	(8,274)	(33,383)
Recommended capital expenditure	52,264	50,075	26,472	24,356	153,166

Source: All data sourced from WaterNSW Pricing Proposal to the Independent Pricing and Regulatory Tribunal, Regulated prices for the NSW Rural Bulk Water Services from 1 July 2017 to 30 June 2021, 2016, p.126, revised by WaterNSW. The reforecast was provided by WaterNSW on 30 September 2016.

Operating expenditure

Operating expenditure can be characterised by significantly lower than allowed for expenditure in the past (current) determination period, which has been driven by restructuring, and lower contracting and consultancies and plant and equipment costs. Proposed operating expenditure is lower than the current period and forecast to decline over the next period.

Past operating expenditure

WaterNSW is expecting to out-perform the allowance set by the ACCC for MDB valleys by around $14.8m, or 12%. In its submission, WaterNSW stated that the key reasons for this are restructuring within the organisation resulting in lower expenditure on salaries and wages and employee related costs; reduction in the use of contractors and consultancies, and; reduction in the cost of materials, plant and equipment. However, WaterNSW did over spend the operating allowances set by IPART in its last determination for coastal valleys by around $200,000 per annum in each valley.[6]

The review team were generally able to validate WaterNSW's statements about the lower MDB costs. In addition, it appears that the reductions did not materially impact on deliver of WaterNSW's services, which was verified by data in relation to a number of metrics on items such as non-complying orders,

[6] WaterNSW's pricing submission (page 136-137) explains the drivers behind this include the Dam Safety Committee not allowing reductions in surveillance which impacted on staff travel costs, and timing differences for major periodic maintenance.

time flow targets, orders rescheduled, calls answered within set timeframes, as well as customer satisfaction surveys.

Collectively, despite the slight over-expenditure in Coastal Valleys, the information provided indicates to the review team that WaterNSW (and the former State Water) responded to the underlying incentives in the regulatory framework to seek out efficiencies over the regulatory period, without materially compromising the levels of service it delivered to its customers.

However, this does not automatically mean that WaterNSW's actual operating expenditure over the current regulatory period was prudent and efficient. It could be that WaterNSW's (or more specifically, the former State Water's) underlying starting cost structure was in fact too high, and therefore, its outturn expenditure was higher than prudent and efficient levels, despite it outperforming its benchmarks.

The restructure of SCA and State Water has led to efficiency savings, but this was not completed prior to the current regulatory period. In addition, WaterNSW indicated during the Greater Sydney review that not all proposed savings related to the merger of the legacy organisations, which we believe also applies to the rural business. Given these points, it was not possible for the review team to conclude that WaterNSW's outturn expenditure for its rural valleys was prudent and efficient over the entirety of the current regulatory period.

Proposed expenditure

WaterNSW is proposing total operating expenditure of $154.9 million from 2017-18 to 2020-21. WaterNSW is forecasting declining operating expenditures for its rural business in real terms. This is despite WaterNSW's forecasts including an allowance from 2017-18 onwards for a new risk management product that it is proposing to purchase.[7]

The approach to reviewing the operating expenditure forecasts included assessing forecasts for materially higher levels than historic or changes at a faster rate than might be reasonable; reviewing a benchmarking study that informed the organisational redesign; reconciling starting operating expenditure figures with labour costs that were approved under the Greater Sydney review; checking for double-counting or over-recovery of costs across three price determinations; assessing the approach to labour cost forecasts; assessing non-labour forecasts; assessing impacts on service, and whether costs allocation between users and government is consistent with the prescribed IPART framework. In relation to key areas reviewed:

- the review team accepted the FTEs WaterNSW proposed under the new organisational structure, noting that WaterNSW has demonstrated that its outturn labour cost figures for 2016 are reconcilable with its hypothetical organisational structure.
- the review team found that WaterNSW's starting costs for both labour and non-labour costs are not unreasonable, given its proposed organisation structure, and how this aligns with its existing revealed organisation structure, and historic levels of expenditure on non-labour costs
- the review team believes that IPART should approve the split of overhead costs proposed by WaterNSW as part of its rural valleys submission
- our recommendation is that IPART make no allowance for the potential impact that the WAMC functions might have on WaterNSW's future corporate costs, and the amount of corporate costs it allocates to its rural business

[7] Consideration of this product was not included in the scope of this expenditure review.

- the review team do not recommend that any adjustments be made to forecast labour costs
- the review team do not recommend any adjustments to forecasts for electricity, nor any change as a result of matters related to consultancies and contractors, related party transactions, or growth in outputs,
- regarding service levels, the review team is satisfied the changes to meter reading (including associated reductions in opex) are reasonable, but while the review team believe 20 year infrastructure strategies are prudent, the costs associated with them are not considered efficient. SCADA operating expenditure forecasts are recommended to be reduced by 25%, consistent with the recommendation made to reduce the capex on this item,[8] while fishways opex proposals are considered reasonable.
- there is nothing in the information provided by WaterNSW that leads the review team to believe it has not allocated costs between Users and Government in accordance with the previously agreed framework.

Overall, the review concludes that some (relatively small) reductions should be made to WaterNSW's proposed operating expenditure forecast, with reductions and the recommended level shown below.

Table ES4 Proposed reductions and recommended level for WaterNSW's operating expenditure ($000's, $2016-17)

	2017-18	2018-19	2019-20	2020-21
WasterNSW proposed expenditure	40,442	38,731	38,282	37,481
Proposed reductions	(362.7)	(415.9)	(374.6)	(329.0)
Recommended operating expenditure	40,079	38,315	37,907	37,152

Outside of these changes, it is the review team's view that WaterNSW's overall operating expenditure forecast is likely to represent a reasonable forecast of what a prudent and efficient service operator would need to incur in order to operate a similar business. We do not view the level of these cuts as having any material impact on levels of service.

Notwithstanding the fact that we believe the above discrete changes need to be made to WaterNSW's forecasts, the quantitative information provided by WaterNSW in support of its overall forecasts, as well as a number of the qualitative statements it has made (if taken on face value) may indicate that if anything, WaterNSW's forecasts could represent a challenging and ambitious agenda to achieve. We do however acknowledge WaterNSW's efforts to tighten expenditure and reduce costs to customers, and WaterNSW did not suggest during the review that the proposed opex levels were not realistic, including having stated that it will be able to continue to deliver the levels of service its customers have been accustomed to.

Output measures

WaterNSW has reported to the review team regarding its performance across the output measures specified in the ACCC determination. The measures included milestone dates for major projects; the percentage of maintenance jobs reported on the facilities maintenance and management system; reporting of State Water's existing asset conditions, and; environmental output measures to assess

[8] See Sections 5.10.3 and 8.7.

fish passage and reduced cold water pollution. Due to the rollover over the previous prices some output measures were not specified for certain years, or no longer remain relevant. In summary:

- the results reported for the facilitates maintenance management system (FMMS) measures show relatively good performance with some exceptions (such as high backlogs in certain years)
- there were some shortfalls against the asset condition profile measures, but there were issues with the output measure itself and WaterNSW's capacity (at the time) to report against it
- in most cases WaterNSW successfully delivered against the dam safety output measures, however this was not always within the specified time target
- WaterNSW continues to implement telemetry technology, however the extent to which this has been done (relative to target levels of implementation) is not clear through the output measures
- there has been a gradual increase in the total length of river open to fish, but many of the associated output targets were not met; the cold water pollution output measure did not appear to be practically achievable, but WaterNSW has sought to address the issue through other means
- based on the information provided for the water delivery output measure, it was not possible to comment on the effectiveness of WaterNSW's actions in meeting the measure requirements, however their actions appear to have met requirements by developing and implementing a reporting process for measuring performance for water delivery.

As requested by IPART, the review team have developed proposed new output measures for the forthcoming determination period. These relate to asset renewals and condition, the proposed ERP, regulatory health and safety, the Keepit Dam project, dam safety, and dam security. The review team have recommended these be further refined by WaterNSW and IPART directly.

Water take and miscellaneous charges

The review team considered six separate water charges imposed by WaterNSW for specific services. Consideration was given to the rationale for the charge, the cost recovery basis, and the efficiency of costs and alignment with charges. In general, the review found most charges have a sound basis (rationale) but changes are recommended to some of the charges, based on other criteria. In summary, the review team:

- Agree with the rationale for applying the **water take measurement charges** (meter service charge), however have recommended adjustment to its calculation based on revised information (updated asset failure rates). Overall, this has resulted in an increase to the proposed MSC, however the changes to the calculation of the replacement annuity will ensure that the charge is lower in the future.
- Agree with the rationale for the **trade processing charge**, however view the current tariff structure as not cost reflective. We recommend the structure of the charge be changed to a single, fixed charge applied to each application. This would reflect the costs incurred by WaterNSW, as there is a correlation between its costs and the number of applications it receives. The review team have calculated and proposed the level of the fixed charge for 2017-18 of $50.36.
- Consider that the **environmental gauging station charge** is appropriate, however have revised elements of the charge to derive our proposed price for the charge. This is based on changes associated with non-SLA sites, estimated useful lives of instruments, and calculation of the annuity.

- Agree with the rationale for the **refundable meter accuracy deposits charge**, but propose that WaterNSW not be able to recover any costs in excess of the deposit as this would confuse pricing signals and mitigate against the incentive of providing the discounted deposit charge. We also propose that the refundable deposit for the verification and testing in situ be set either equal to or less than the laboratory verification refundable deposit charge.
- Conceptually agree with WaterNSW's proposed approach for **connection and disconnection charges for the Fish River Scheme**, but propose slight modifications to calculation of the charge related to overheads on labour and escalation rates.

1. Introduction

1.1. Overview

Aither, and its subcontractors Oakley Greenwood, WSP | Parsons Brinckerhoff and Australian Dams & Water Consultants (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 rural bulk water services. 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 can charge for rural bulk water services from 1 July 2017.

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 that are recovered through water charges are prudent and efficient.

IPART's role is to set prices that 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 that do not reward inefficient investment and asset management decisions, or inefficient operations and practices.[9]

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.

2017 price review

IPART is conducting a review of the maximum prices that WaterNSW can charge for providing rural bulk water services to its customers from 1 July 2017. 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.[10]

[9] IPART Scope of Work.

[10] Ibid.

The current price determination for rural bulk water services provided by the former State Water Corporation (now WaterNSW) commenced:

- On 1 July 2014 and set prices until 30 June 2017 for Murray-Darling Basin valleys (with prices set by the ACCC[11])
- On 1 July 2010 and set prices until 30 June 2014 for coastal valleys (with prices set by IPART[12]). Prices for the coastal valleys have since been held constant in nominal terms (at 2013/14 levels) following several deferrals of IPART's next price review.[13]

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. A review of the WaterNSW operating licences was undertaken concurrently with this expenditure review.[14]

1.2.2. About WaterNSW

Business overview

WaterNSW is the major supplier of raw water in NSW. It plans, develops, operates and maintains infrastructure to provide water supply that is reliable and, where provided to customers for drinking, safe.[15] WaterNSW manages and operates major infrastructure to deliver bulk water to approximately 6,300 licensed water users across 14 regulated river systems in rural NSW, as well as owning and operating 20 dams and more than 280 weirs and regulators that deliver water for town water supplies, industry, irrigation, stock and domestic use, riparian use and environmental flows.[16]

WaterNSW is also responsible for the Fish River Water Supply Scheme (Fish River Scheme), a former Government Trading Enterprise that comprises a pipe and pump distribution network supplying raw and filtered water from Oberon Dam and Rydal Dam to three major customers (EnergyAustralia, Lithgow City Council and Oberon Council) and 280 smaller customers. The Fish River Scheme may also provide bulk water transfers to the Greater Sydney system as a balancing measure to ensure the long-term availability of water in that supply system.

In providing rural bulk water services, WaterNSW supplies water to a range of customers:

- Private irrigators and irrigation companies
- Environmental water holders (incorporating responsibility for delivering environmental flows on regulated rivers)
- Local councils

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11 ACCC, *Final Decision on State Water Pricing Application: 2014-15 – 2016-17*, June 2014.

12 IPART, *Review of bulk water charges for State Water Corporation from 1 July 2010 to 30 June 2014*, June 2010.

13 IPART Scope of Work.

14 See: https://www.ipart.nsw.gov.au/Home/Industries/Water/Reviews/Licensing-WaterNSW/Review-of-the-WaterNSW-operating-Licences

15 WaterNSW Pricing Submission.

16 Ibid.

- Local communities (stock and domestic users).

Including the Fish River Scheme, WaterNSW's operational area is divided into 13 valleys across the state. These are defined by a geographic area, water management area or water source and include nine valleys in the Murray-Darling Basin and three coastal valleys (see Table 1).

Table 1 Division of WaterNSW area of operations

MDB valleys	Coastal valleys
Border	Hunter
Gwydir	North Coast
Lachlan	South Coast
Lowbidgee	
Macquarie	
Murray	
Murrumbidgee	
Namoi	
Peel	

Source: WaterNSW Pricing Submission.

In supplying and delivering bulk water in regional areas, WaterNSW's role includes:

- Delivering bulk water across regional NSW
- Maintaining a water allocation account for each water access licence
- Processing water trade applications
- Processing orders for supplementary water announcements approved by DPI Water
- Monitoring water quality and quantity
- Preparing annual water balances by valley, for each of the regulated river systems
- Providing updates to customers on water delivery and availability
- Reading customers' meters
- 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, and relevant legislation

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 SWC and Sydney Catchment Authority. WaterNSW now provides the services of these organisations, and as a result comprises rural and urban related business components.

The merger impacts the way IPART regulates 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.

IPART's current review of rural bulk water services will set prices for the MDB valleys (under accreditation from the ACCC, who conducted the previous determination for these inland areas) as well as prices in the coastal valleys (which have been held constant in nominal terms since IPART's 2010 determination).

The merger has implications for allocation of costs between the two main components of the business, and the distribution of efficiencies and savings associated with the merger. The merger involved an organisational redesign, which has recently been implemented. As is discussed further later in the report, WaterNSW has also recently taken on certain responsibilities from DPI Water.

Operating licence and legislative arrangements

WaterNSW's current operating licence for the rural bulk water functions is the *State Water Corporation Operating Licence 2013-2018*.[17] This licence sets minimum performance standards WaterNSW must meet as well as obligations in relation to water quality and quantity, assets, customer service, and environmental performance. WaterNSW provides its services in accordance with the following legislative instruments:

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

1.3. About WaterNSW's pricing proposal

WaterNSW has provided a pricing proposal to IPART outlining the prices it proposes to charge from 1 July 2017 to 30 June 2021 for its bulk water services.[18] It also provides further evidence to support the proposed prices and information on the approach it will take to delivering its services over the forthcoming determination period.

The pricing proposal does not cover pricing for the provision of services for Greater Sydney, nor does it include the Water Administration Ministerial Corporation (WAMC) functions which have been

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[17] See: https://www.ipart.nsw.gov.au/files/sharedassets/website/shared-files/licensing-public-water-business-licence-legislative-requirements-end-of-term-review-of-operating-licence-2012-2017-water-nsw/licence_-_state_water_operating_licence_2013_-_2018_-_23_june_2016.pdf

[18] WaterNSW Pricing Proposal to IPART 2017-2021

recently transferred to WaterNSW under the *Water NSW Amendment (Staff Transfers) Bill 2016*, and were the subject of a separate IPART pricing determination (See also Section 3.2.4).

In its submission WaterNSW has proposed an operating expenditure of $154.9 million over the four-year regulatory period. From WaterNSW's calculations this is lower than the current period, with expenditure in 2020-2021 set to be 20% lower in real terms when compared to 2016-17 expenditure. WaterNSW's attributes this reduction to the integration and restructure of State Water and SCA.

WaterNSW has proposed a total (gross) capital expenditure program of $195.8 million. This represents a substantial increase in capital expenditure relative to the immediate prior determinations. One of the major features of the proposed capital program is a revised approach to capital planning and expenditure which has implications for the expenditure review and is discussed further below.

Revised approach to capital expenditure

WaterNSW's pricing proposal has outlined new internal approaches to planning for and seeking approval for capital expenditure. WaterNSW has sought approval for a headline amount of capital expenditure but has not provided substantive information or justification regarding specific projects, programs or activities upon which that will be spent during the determination period. WaterNSW has stated that this is a consequence of it seeking greater flexibility and ability to adapt to changing capital requirements across a determination period (e.g. asset renewal requirements may be different at the end of a determination period than when they were first forecasted at the beginning).

This approach has important implications for this and subsequent expenditure reviews. It is the role of the reviewer to recommend a prudent and efficient level of expenditure, and this is made more difficult if there is a lack of robust evidence and documentation upon which to make judgements. It therefore has implications for the regulatory process (the ability for expenditure reviews to fulfil their purpose), but also for stakeholders (given the potential lack of transparency around proposed spending) and potentially also the business (in terms of having well developed plans that help to ensure successful and timely delivery).

1.4. Previous expenditure reviews and pricing determinations

There are three separate, previous pricing determinations and associated expenditure reviews of relevance to this current expenditure review.

1.4.1. Murray-Darling Basin Valleys

Under the *Water Act 2007* (Cwlth), the Australian Competition and Consumer Commission (ACCC) is responsible for approving or determining water prices that apply to rural water service providers in the Murray-Darling Basin.[19] In June 2014, the ACCC delivered its final decision on State Water's bulk water pricing application. The final decision set prices to apply from 1 July 2014 to 30 June 2017 in the Border, Gwydir, Namoi, Peel, Lachlan, Macquarie, Murrumbidgee and Murray valleys and in the Lowbidgee Flood Control and Irrigation District. Findings from the determination and supporting expenditure review are summarised below.

[19] The ACCC can also accredit state-based regulators to set prices as it has with IPART for the 2017 determination.

Expenditure review

The 2014 ACCC determination was informed by an independent expenditure review. The major findings included that:

- In general, State Water's estimated capital costs were reasonable; however, some projects were removed and reduced contingencies and modified timing was recommended for the Environmental Planning and Protection program. In total, the independent review recommended a reduction in State Water's proposed capital expenditure of $26.5 million over the determination period, which equated to a 14 per cent reduction on State Water's proposed capital expenditure of $195.9 million[20]. The total recommended capital expenditure was $169.4 million.
- A small increase in operating expenditure was recommended compared to previous levels, although not to the extent sought by State Water. In total, the independent review recommended a reduction in State Water's proposed operating expenditure of $7.2 million over the determination period which equated to a 6 per cent reduction on State Water's proposed operating expenditure of $126.3 million. The total recommended operating expenditure was $119.1 million.

Pricing determination

The major findings of the ACCC's final determination were that:

- State Water's operating and capital expenditure forecasts presented in the pricing application were too high, as was its estimation of the required rate of return on capital. The ACCC applied reductions to these building blocks based on an assessment of State Water's costs in the regulatory period and giving consideration to information provided by State Water in response to the ACCC's draft decision.
- Reductions made by the ACCC to proposed capital and operating costs and the rate of return on capital were offset to some extent by the rate of depreciation of assets, which the ACCC revised up compared to State Water's forecast.
- Overall the ACCC's final decision resulted in lower revenues than those proposed by State Water.
- Bills were expected to fall for the majority of customers in all valleys except the Murray and Murrumbidgee valleys and the Peel Valley.[21]

1.4.2. Coastal Valleys

In the coastal valleys (North Coast, South Coast and Hunter), prices have been 'rolled over' from IPART's 2010 determination. In practice, this means that the prices that were due to expire on 30 June 2014 have been maintained in nominal terms since then. Findings from the 2010 IPART determination and 2009 independent expenditure review that specifically relate to the coastal valleys are summarised below.

Expenditure review

The 2009 independent expenditure review recommended:

[20] Deloitte/Aurecon, 2013, Expenditure forecast review State Water Corporation, Final Report.

[21] ACCC Final Decision on State Water Pricing Application: 2014-15 – 2016-17.

- An increase in State Water's proposed capital expenditure of $3,000 in the North Coast valley and $77,000 in the Hunter Valley to account for environmental works for fish passages and cold water pollution.
- A decrease in State Water's proposed capital expenditure of $2,000 in the South Coast Valley.[22]
- A decrease in operating expenditure of $935,000 in the Hunter Valley, $139,000 in the North Coast and $123,000 in the South Coast Valley attributed to a reallocation of fish passage costs to valleys in which the benefits are realised and the capitalisation of some heritage costs.[23]

Pricing determination

IPART's 2010 pricing determination resulted in:

- An estimated increase in customer bills over the determination period of 46 per cent in the North Coast and South Coast Valleys and 14 per cent in the Hunter Valley respectively.[24]

1.4.3. Water Administration Ministerial Corporation

As part of its role, IPART determines, through a separate determination process, maximum prices for the monopoly water management services provided by the Water Administration Ministerial Corporation (WAMC). Historically, DPI Water has delivered these services on behalf of WAMC, however, some WAMC functions have recently been transferred to WaterNSW (See Section 3.2.4).

Expenditure review

The 2016 independent review of DPI's actual and forecast expenditure for water planning and management activities found that:

- Overall, DPI Water's forecast expenditure aligns with the service obligations and strategic priorities contained in the submission. However, DPI Water had not met the standard set for it by IPART in the previous review.
- Areas for concern included:
  - difficulties in forecasting, managing and reporting costs at an activity level
  - DPI Water not routinely mapping external funding which complicated their capacity to determine which costs are to be recovered through water planning and management charges and which costs have already been funded
  - insufficient evidence of strategic frameworks for determining optimal service levels.
- DPI Water's operating expenditure had declined and was forecast to decline in real terms (inflation adjusted). Over a ten year period (2011/12 to 2020/21) the overall trend was for an average cost reduction of 3.4% real each year.
- DPI Water's submission forecast FTEs to increase to 292 by 2020/21, an additional seven FTEs compared to 2015/16. The projected increase in FTEs was at odds with the forecast decline in

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22 Atkins Cardno, 2009, Strategic Management Overview and Review of Operating and Capital Expenditure of State Water Corporation 2009.

23 Ibid.

24 Assuming a 500 ML WAL and 60 per cent allocation over the determination period.

expenditure and the proposed cost reduction implied that cost savings were to be made through means other than remuneration savings.

- Efficiency initiatives that DPI Water has initiated over the current determination include:
  - rationalisation of the hydrometric network
  - staff training to enable a more flexible workforce
  - improvements to corporate information systems
  - proactive engagement with customers; and
  - development of a customer service charter.[25]

Pricing determination

In the 2016 pricing determination, IPART:

- Set total efficient costs (or notional revenue requirement) below that proposed by DPI Water, which in turn is below that allowed in the 2011 Determination.
- Reduced the expected average annual revenue that DPI Water collects from customers by $3.89 million ($41.44 million) compared to DPI Water's proposed $45.33 million per year.
- Noted that generally, and excluding the effects of inflation, this is expected to result in lower prices and lower typical bills by 2019/2020, compared with the current year (2015/16).
- Noted that users in unregulated rivers and groundwater users experience the largest decrease in prices and bills.
- Decided to make the minimum annual charge more cost-reflective, increasing it from its current level of $105 to $150 in 2016/17, and then transitioning it to $200 per year by 2019/20. This would mean a number of smaller users would face an increase in their bill.[26]

1.5. Review objectives and scope

1.5.1. Review objectives

The objectives of this review, as set out in IPART's scope of works were to undertake:

- a strategic review of WaterNSW's investment plans (minimum of 10 years) and asset management systems and practices for its rural bulk water services
- a detailed review of WaterNSW's past and proposed operating expenditures and capital expenditures for its rural bulk water services
- a review of performance against past output measures and to propose any new output measures for the next determination period
- a review of the rationale, cost recovery basis, and efficient costs associated with the water take measurement charges, and miscellaneous charges.

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[25] Synergies Economic Consultants, 2016, DPI Water Expenditure Review.

[26] IPART, 2016, Review of prices for the Water Administration Ministerial Corporation from 1 July 2016.

1.5.2. Scope of review

Strategic considerations

The strategic component of the review includes consideration of WaterNSW's rural 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 and proposed expenditure. This includes assessing any variance from that allowed under the previous determinations, 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 is 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 seven output measures for the current period which relate to capital projects or programs. Recommendations were also made for output measures for the next period.

Water take measurement charges and miscellaneous charges

In addition to setting WaterNSW's bulk water prices, IPART will set prices for a number of different WaterNSW charges. As such, the review considered these charges, including their rationale, basis for cost recovery, and the efficient costs of providing services associated with the charges. The charges included the water take measurement charges, including meter service charges and water reading and water assessment service charges, and miscellaneous charges including: water trading charges (trade processing charges, allocation assignment charges); environmental gauging station charges; refundable meter accuracy deposits, and Fish River connection and disconnection charges.

1.6. 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 Section 8).
- **Section 5** documents the results of the operating expenditure review, including past and proposed expenditure, and explores issues such as the merger and the transfer of WAMC functions.
- **Section 6** documents the results of the review of output measures, and proposes future output measures.
- **Section 7** documents the results of the review of water take and miscellaneous charges.
- **Section 8** contains analysis on the asset renewals forecasting approach and detailed summaries of the reviews undertaken of specific capital expenditure projects or 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 information requests, confirming the evaluation criteria and approach, and undertaking initial meetings with WaterNSW staff
- **Analysis and review** – completing analysis in support of the major components of the review, undertaking further strategic or detailed project level 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,
- progress against agreed output measures, and recommend future output measures, and
- the rationale for and efficient costs associated with water take and management charges.

The review was undertaken from September to December 2016.

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 publicly available documentation
- initial introductory meetings and with WaterNSW
- preparation and submission of information requests to IPART
- receipt of data and information from WaterNSW
- strategic and project or program level interviews with WaterNSW staff
- review and analysis of data and other information received
- report drafting
- follow up information requests and telephone discussions
- 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's longer term capital expenditure program for bulk rural water services.[27]

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's proposed expenditure represents the best and most cost effective way of meeting the community's need for the relevant services.[28]

2.4. Information sources

The major information sources that have informed the review include:

- The WaterNSW pricing submission to IPART
- A list of individual projects or programs that comprise the 5 and 10 year capital spending proposals of WaterNSW
- Various documents supplied by WaterNSW, including
    - Corporate and strategic documents covering high level organisational objectives, goals and processes
    - Strategies, including for risk management, asset management, program and project management for delivery of works, operations and maintenance, procurement and capital planning
    - Dam safety management documents, including portfolio assessments and processes for monitoring and identifying upgrades

[27] IPART Scope of Work, p.5.

[28] Ibid.

- Site specific strategic action plans, maintenance plans, and asset renewal plans (including examples for dam safety works)
- Project business cases
- Estimates of expenditure including the Capital Investment Plan and operating expenditure documents
- Output measures reporting results
- A variety of direct responses by WaterNSW to questions presented by the review team in relation to both operating and capital expenditure.

- The results of discussions with WaterNSW staff
  - Interviews with WaterNSW staff took place in Sydney on 7, 10 and 13 October 2016.
  - Meetings for overall capital planning and individual capex projects in the review sample were held on 7 and 10 October
  - Meetings for operational expenditure were held on 13 October.

2.5. Review of strategic management

The review of strategic asset management was primarily undertaken on a qualitative basis, and focused on WaterNSW processes, including its approach to asset management for delivery of rural bulk water services. 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 strategic considerations that may influence large capital investments.
- WaterNSW's approach to asset management including whole of lifecycle planning, risk, asset condition assessment and reporting, asset life, and similar matters.
- WaterNSW's capital investment strategy, including over short and longer term horizons, and alignment, risks and efficiency of the strategy.
- Systems or processes 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.
- Providing WaterNSW with a detailed questionnaire related to their operating expenditure forecasts. 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.
    - 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.
- Conducting interviews with WaterNSW to discuss their operational expenditure forecasts, and
- Developing a draft report for comment and feedback.

2.7. Assessment of capital expenditure

2.7.1. Overview

An assessment was made of the prudence and efficiency of past and proposed capital expenditure for the period 2010/11 to 2021/22 for coastal valleys and 2014/15 to 2021/22 for inland valleys, 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 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 that should be applied to the balance of expenditure not sampled.

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 IPART, including identifying what the prudent level should have been.

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 to assessment of prudence and efficiency of past capital expenditure (current determination period)

Under the scope of work for this expenditure review, the review team must:[29]

> *assess, report and provide recommendations on the prudence and efficiency of past capital expenditure for the period 2010-11 to 2016-17 for coastal valleys and 2014-15 to 2016-17 for inland valleys.*

The approach to assessment of actual and forecast expenditure within the current determination period is to examine any variances between the planned and actual expenditure. For the MDB valleys it was readily apparent from WaterNSW's pricing submission that there was significant variance with expenditure being much less than the ACCC decision was based upon while for the Coastal valleys there was over-expenditure. WaterNSW was asked to provide information to substantiate on individual items of capital expenditure in addition to how the capital expenditure program was changed following the ACCC decision.

2.7.3. Approach to assessment of prudence and efficiency of proposed capital expenditure (next determination period)

The review approach was to examine individual elements of proposed expenditure, to gain a view of the reasonableness of the proposed capital expenditure program, with findings either applying to individual expenditure items or applying across the program as a whole.

The availability of documentation to support proposed expenditure is indicated in the tables below, to illustrate the approaches used in the assessment. Where an acceptable level of documentation was available a conventional assessment method could be used, where it was not a custom approach was required. This is summarised in Table 2 below.

[29] IPART scope of work for the expenditure review.

Table 2 Expenditure assessment method

Type of expenditure	Level of documentation and maturity	Approach
Asset renewals	Low, relies on a WaterNSW model known as 'Assetbank'	Audit/review of Assetbank Review of specific expenditure items where possible (e.g. Fish River pipeline replacement)
Automation and Communications Renewals & Upgrades; Electrical upgrades	Low	Review of early stage documentation Review of previous expenditure for similar needs and asset classes
Business systems	Medium to high	Review of specific documentation relating to the expenditure
Major capital expenditure	Medium to high	Review of specific documentation relating to the expenditure
Corporate renewals including ICT, motor vehicles	Low	Absence of robust information to justify an increase, based on previous levels of expenditure
WHS related renewals	Medium (some) Low (most)	Base on assessment of valleys with reasonable level of documentation apply to other valleys

2.7.4. Approach to sampling

A sample of proposed future spending (i.e. individual projects or programs) was selected from WaterNSW's overall capital plan. Samples of items from the project list provided by WaterNSW were chosen based on materiality, and to ensure a diverse spread of expenditures so that a view of prudent and efficient expenditure can be made. The sample sought to capture a diversity of valleys, expenditure types (hard assets, electrical/SCADA, corporate expenditure), and drivers. The sample was designed to capture the majority of expenditure categories across the wider program so that any findings can be applied to the 'unsampled' expenditure.

Documentation provided included the following types of information, which related to both the current and next determination periods:

- project charters
- business cases
- approval to spend
- board submissions including papers and strategies
- correspondence from external stakeholders such as the NSW Dam Safety Committee
- project plans
- risk registers
- portfolio risk assessment.

Sample expenditure items for the next determination period were chosen to capture the majority of expenditure categories across the wider program so that any findings can be applied to the 'unsampled' expenditure. For example the findings from a review of one proposed dam safety inspection were applied across the other eight items in other valleys. If the recommended capital expenditure for that item was different to what WaterNSW proposed, the same proportional change was made to other items within that grouping. Where there is no applicable sample, consideration was given to findings from the overall program, what the historical level of expenditure in that grouping was (for example on motor vehicles or ICT renewals), and the materiality of the expenditure proposed.

Groupings for future capex are presented in the Table below along with sample expenditure relevant to that grouping. The majority (88.6%) of expenditure groupings have directly relevant sample capex to draw on for the assessment.

Table 3 Expenditure groupings and sample capital expenditure mapping

Grouping (by Review Team)	Samples reviewed
5 year inspection	Lachlan - Carcoar 5 year Inspection
Automation and Communications Renewals & Upgrades, CCTV	Macquarie - Automation and Communications Renewals & Upgrades
Dam Surveillance Instrumentation Upgrades	Macquarie - Dam Surveillance Instrumentation Upgrades
Electrical Switchboard and power upgrades	Lachlan - Electrical Switchboard and power upgrades
ICT Communications	Corporate - Communications Strategy & Implementation
ICT Enterprise Architecture	Corporate - Water NSW ERP - P6
ICT ERP	Corporate - Water NSW ERP - P6
ICT Minor	N/A not sampled
ICT Renewals	Corporate - ICT Renewals & Replacement
ICT Other	N/A not sampled
Instrumentation renewals	Macquarie - Automation and Communications Renewals & Upgrades
Major Capex	Keepit Dam Upgrade Stage 1
Minor Capex	N/A not sampled
Motor Vehicles	N/A not sampled, base on historic
OT SCADA	Corporate- Operational Systems Programme
PRA outcome	N/A not sampled
Renewals safety	Lowbidgee WHS Renewals plus the Assetbank review
Renewals	Fish River, Hunter & Murrumbidgee Renewals; Renewal & Replacement Asset Engineering; plus the Assetbank review

Documentation was provided by WaterNSW for more than 45 capital expenditure items within the current determination period.

2.7.5. Assessment of capital expenditure inside and outside sample

An assessment was carried out of the selected capital expenditure items for prudency and efficiency. This was carried out by a combination of a desktop review of corporate documents obtained as part of the strategic review, desktop review of documents specific to each project, and interviews with WaterNSW staff.

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.
- 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 based on market rates or otherwise shown to be efficient; are costs benchmarked; or, are efficiency savings recommended?
- Are synergies with other projects considered?

As outlined in the approach, the capital expenditure sampling was designed to capture the majority of expenditure groupings across the wider program so that any findings could be applied to the 'unsampled' expenditure. This was carried out as planned, with findings from assessment of one expenditure item applied to others within that grouping.

2.8. Assessment of water take and other charges

The water take measurement and miscellaneous charges were assessed for:

- the adequacy of the rationale for imposing each charge (i.e., is it appropriate that WaterNSW have this charge separate from general charges)
- the basis of cost recovery (i.e., is the application of the tariff structure an appropriate method of cost recovery for the service); and
- the efficient cost of providing the relevant services funded by the charges (i.e., are the proposed costs for the service appropriate).

This assessment applied to:

- Water take measurement charges: meter service charges (water reading and water assessment service charges were not considered as they are not charged for separately); and
- Miscellaneous charges: Water trading charges, including trade processing charges, allocation assignment charges; environmental gauging station charges; refundable meter accuracy deposits, and Fish River connection and disconnection charges.

In undertaking this assessment, the review team relied on:

- Information from WaterNSW relating to:
  - Justifications of the rationale for the charges;
  - The specific charges themselves, how they are applied and how the charges are derived;
  - Cost drivers for the services; and
  - Expenditure and demand forecasts.
- The review team's own expertise in economic regulation, specifically in relation to:
  - Underlying economic principles for user-pays charges;
  - Alignment of pricing signals to customers with underlying cost drivers; and
  - Forecasting demand and expenditure for specific services.

2.9. Assessment of output measures

The review of output measures was undertaken by requesting information from WaterNSW on whether the output measures had been completed, and further information regarding any measures not completed.

WaterNSW provided a summary table of output measures with responses recorded against each output. This document, titled *Outputs template – WaterNSW 2015/16*, was used as the basis for assessing performance against output measures.

Furthermore, the information provided was compared against the output measures and reporting requirements stepped out in ACCC's *Final Report – Review of Bulk Water Charges for State Water Corporation 2010 - Appendix D*. While the output measures information provided by WaterNSW did include information against each output measure (including further explanation where measures had not been completed), the robustness of the assessment was constrained by the limited evidence provided to support the results. Accordingly, further evidence on potential issues or shortfalls in the information provided and the consequences are also included in the output measures assessment section.

For the new output measures, consideration was given to past output measures, including any that should be rolled over or continued, the issues raised in this expenditure review, including both broad or project specific issues, and any that may need monitoring to ensure they are addressed, as well as specific project based outcomes that would be expected from the expenditure, as well as dam safety issues.

2.10. Dollar values and inflation rates

Throughout this report, all expenditure has been reported in consistent dollar values following advice from IPART, including:

- forecast costs and prices from 1 July 2017 are presented in $2016/17 values
- historical costs are converted to $2016-17 values unless noted otherwise
- aggregate figures for the current determination period are expressed in $2016/17 values.

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

Table 4 Inflation rates

	$2009-10 into $2010-11	**$2010-11 into $2011-12**	**$2011-12 into $2012-13**	**$2012-13 into $2013-14**	**$2013-14 into $2014-15**	**$2014-15 into $2015-16**	**$2015-16 into $2016-17**
Inflation factor	3.5%	1.2%	2.4%	3.0%	1.5%	2.2%	2.5%

Source: As advised by correspondence from IPART to Aither.

3. Strategic review

3.1. Overview

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 itself, 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 following the merger between the former SCA and State Water to form WaterNSW in early 2015. Since the review of the Greater Sydney component of WaterNSW's business[30], various aspects of the merger have been more fully implemented. This includes an organisational redesign of the new business, which had implications for both capital and operating expenditure.

3.2.1. WaterNSW; the SCA and State Water merger

In March 2014 the NSW State Government announced its intention to merge State Water and the Sydney Catchment Authority. The driver of the merger was stated as a desire to ensure the provision of 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.

This expenditure review only relates to the rural bulk water related functions of WaterNSW.[31]

3.2.2. Operating framework

WaterNSW's activities are guided and regulated by:[32]

- 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.

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30 See: https://www.ipart.nsw.gov.au/Home/Industries/Water/Reviews/Metro-Pricing/Prices-for-WaterNSW-%E2%80%93-Greater-Sydney-area-from-1-July-2016-Sydney-Catchment-Authority

31 However, some of the strategic and operating documentation reviewed is intended to, or is already being applied across the organisation (i.e. applies to both rural and metro functions).

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

- Water sharing plans (WSP) – which determine the balance of water available for environmental and consumptive use in different catchments or WSP areas, and under which water access licences and other approvals are issued to allow WaterNSW (and others) 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.
- Price determinations – which are made by IPART, and determine the maximum prices that may be charged by WaterNSW over specific regulatory periods. For rural water, WaterNSW is currently operating under the ACCC's 2014 determination for regulated systems in the Murray Darling Basin and IPART's 2010 determination for coastal valleys.[33]
- *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.

Operating licence

Following the merger and subsequent formation of WaterNSW, a substitute licence was issued to WaterNSW to amend the previous operating licence under which State Water operated. The substitute licence was issued on 1 July 2016 and remains in force until 30 June 2018.[34] The licence includes provisions or requirements relevant to this expenditure review, including that WaterNSW must:

- take all reasonable steps to conserve water and minimise water losses
- read each of its customers' meters
- prepare water balance reports for each of the Valleys in which it operates, in accordance with the Reporting Manual
- develop, and fully implement by 30 June 2018, an Asset Management System that is consistent with:
  - the International Standard ISO 55001: 2013 Asset Management – Management systems - Requirements; or
  - any revised conditions to WaterNSW's operating licence or identified compliance shortfalls following the 2015/16 Operating Licence Audit (to be released March 2017),
- develop, and fully implement by 30 June 2018, an environmental management system which is consistent with the Australian Standard AS/NZS ISO 14001:2004
- comply with reporting obligations set out in its Licence and in the Reporting Manual.

Service standards

In providing rural bulk water services, WaterNSW must, under its operating licence, establish and maintain a customer service charter. The customer service charter must be developed in consultation with valley-based customer service committees. The customer service charter outlines the mutual

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[33] In July 2014, IPART agreed to a request from WaterNSW (then State Water Corporation) to defer for two years any new prices for the three coastal valleys and Lithgow and Oberon councils.

[34] http://www.waternsw.com.au/about/legislation/operating-licences

responsibilities and obligations of WaterNSW and its customers (excluding Fish River Water Scheme customers) consistent with the operating licence and relevant legislation.

3.2.3. Dam Safety

Dam Safety obligations

WaterNSW is required to meet minimum operational, maintenance and safety standards for its dams. This includes the requirements of the NSW Dams Safety Committee under the *Dams Safety Act 1978*. The Dams Safety Committee is the State's regulator for dam safety and is responsible for developing and implementing policies and procedures for effective dam safety management to protect life, property and the environment from dam failures. Effective management of WaterNSW's prescribed dams is a compliance requirement for the WaterNSW Operating Licences.

Review of the Dam Safety Act 1978

In 2013 the NSW Department of Trade and Investment, Regional Infrastructure and Services commissioned KPMG (with specialist dam engineering sub-consultant GHD) to undertake an independent review of the *Dams Safety Act 1978* and the Dams Safety Committee (DSC). The review made 14 specific recommendations for improvement of the management of dam safety in NSW to improve clarity, transparency, independence and resource utilisation. In September 2015, the NSW Government introduced revised dam safety legislation (Dam Safety Bill 2015) to facilitate implementation of these recommendations. Work on implementation is continuing with the intention of modernising dam safety standards and the approach to dam safety regulation in line with other jurisdictions. Pending finalisation of the current consultation period for the proposed amendments to the legislation, the provisions of the Dams Safety Act 1978 remain.

3.2.4. Transfer of functions from DPI Water (Water Administration Ministerial Corporation)

The *Water NSW Amendment (Staff Transfers) Act* 2016 transfers a range of functions previously undertaken by DPI Water on behalf of the Water Administration Ministerial Corporation (WAMC) to WaterNSW. The objective is to reduce duplication and improve service delivery and to enable DPI Water to focus on policy, water market regulation and providing oversight on major government funded water infrastructure projects.

WAMC is responsible for a range of in-field services relating to groundwater and surface water, with costs recovered through customer charges. DPI Water has typically delivered these services and lead cost recovery activities in the past. This responsibility has now largely been moved to WaterNSW with the following services transferred:

- Customer transactions (excluding corporate customers)
- Compliance investigations for customers (excluding compliance activities for major or corporate customers, such as compliance relating to local water utilities, water corporations, major utilities, mining companies and state significant developments)
- Licensing administration and billing (excluding licencing activities for major customers such as licensing of major utilities and mining projects)
- Water quality monitoring
- Hydrometric assessment
- Metering operation.

These services are monopoly services, and as a result WAMC charges have been subject to economic regulation in the form of pricing determinations by IPART (similar to other state owned monopoly service providers).

The most recent determination (June 2016) and the transfer of WAMC functions to WaterNSW have both recently commenced. The applicability of the determination to other parties was raised by IPART as part of the previous determination:[35]

> *We note that activities related to these services could be delivered by other parties on behalf of WAMC, such as WaterNSW, through methods such as service agreements, amendments to WaterNSW's operating licences, and other arrangements. If that is done, we consider that our determination would nonetheless set appropriate maximum prices. That is because we have assessed the prudent and efficient costs of delivering the relevant services, regardless of who delivers them.*
>
> *However, if WAMC's functions are formally transferred from WAMC to WaterNSW and the relevant services are provided by WaterNSW under its independent statutory functions (rather than on behalf of WAMC), IPART would consider whether there is a need for a new determination.* pp. 27-28.

In WaterNSW's pricing proposal to IPART, WaterNSW proposed that the recent WAMC pricing determination remained appropriate and should be used for setting WaterNSW prices for WAMC functions. WaterNSW will handle all customer transactional dealings, including for services provided by DPI Water, and has proposed that IPART endorse separate DPI Water and WaterNSW prices for WAMC functions to provide transparency.[36]

WaterNSW has also noted that their pricing proposal does not cover pricing for the provision of services for WAMC functions (as preparation of the pricing proposal commenced prior to the transfer of functions) and that the cost of these functions has been allocated to a separate cost centre.

3.2.5. Water Sharing Plans

WaterNSW is required to operate in accordance with WSPs as a condition of their operating licence. In July 2016 all initial WSPs (established in 2004) were replaced, and additional plans were also developed for coastal regions. WSPs are established under the *Water Management Act 2000* and are developed, audited and reviewed by DPI Water. They influence the activities of WaterNSW by setting rules for the sharing of water resources between consumptive users (customers) and the environment. WaterNSW's water take is regulated through the water access licences and approvals that are informed through WSPs. WSPs establish rules for sharing water for environmental purposes as well as for town supply, rural domestic supply, stock watering, industry and irrigation, and therefore apply to the rural bulk services that WaterNSW supplies.

[35] Review of prices for WAMCs water management services (currently provided by DPI Water)

[36] WaterNSW Pricing proposal to IPART 2017-2021

3.3. Organisational management

3.3.1. Organisational objectives and structure

Statutory objectives

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

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

WaterNSW's Corporate Strategic Objectives

Table 5 summarises WaterNSW's Corporate Strategic Objectives, which are designed to enable WaterNSW to deliver on its legislated obligations, shareholder and customer expectations and establish itself as an effective and efficient organisation.[37]

Table 5 WaterNSW Corporate Strategic Objectives

Focus area	Strategic initiative
Safety excellence	To improve our safety performance for employees, contractors and the public.
Business transformation	To reform the business' organisation structure, culture and its processes in core functional areas to enable it to achieve its other Strategic Objectives.
Customer value creation and responsiveness	To improve customer value.
Growing the capabilities of our people	To enable performance through our people.
Capability to develop and evaluate infrastructure solutions	To pro-actively scope, develop and propose infrastructure solutions that address identified deficiencies in the quantity and reliability of metropolitan and rural raw water supply.
Asset health and capability management	To improve the efficiency of our asset management processes and activities and our asset development projects' performance.
Water quality research and expertise	To improve our understanding of water quality causes and effects so that we continue to deliver high quality water to customers.

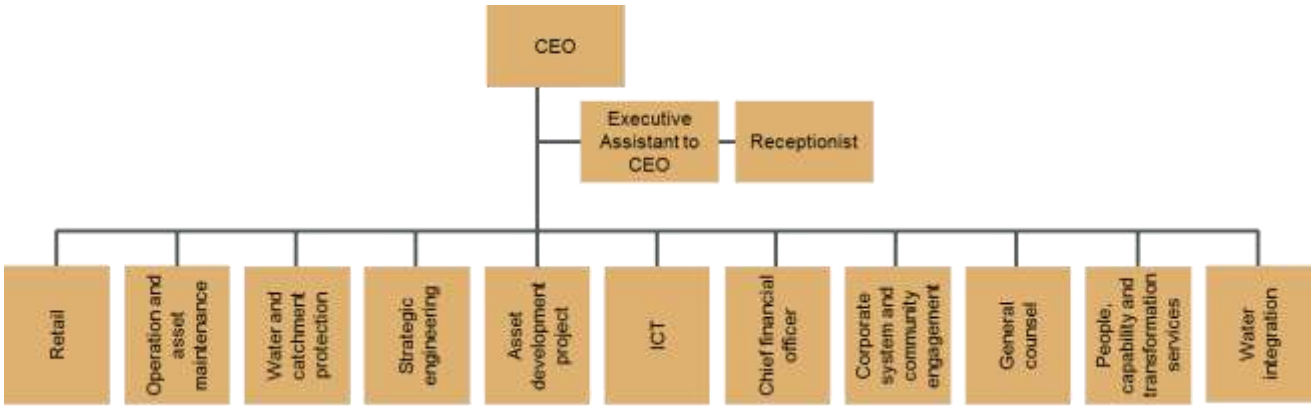
[37] WaterNSW Statement of Corporate Intent 2015-16.

Better business systems	To improve the efficiency of our processes through the use of technology and to provide information to our customers that assists them in improving their business and being more profitable.
Knowledge management	To systematically capture all of the company's mission critical and mission important know-how, methods and outcomes (knowledge) and have that knowledge readily accessible to all employees and in a form that is usable across multiple functional areas.

Source: WaterNSW Statement of Corporate Intent 2015/16.

WaterNSW's organisational structure

WaterNSW's organisational structure consists of a Chief Executive Officer and Executive Assistant who sit above a group of Executive Managers, a Chief Financial Officer, and a General Counsel, each of whom manage discrete sections of the business. This can be seen in Figure 1. There is also a WaterNSW Board consisting of a Chair and five directors who guide the executive team.



Source: Aither adaptation from WaterNSW Organisation Chart (1)

Figure 1 WaterNSW organisational structure

These subdivisions of WaterNSW reflect the broad services and functions performed. Since the SCA and State Water amalgamation, the new organisational structure has enabled re-scoping and refining of roles and responsibilities to better meet objectives.

Strategic Action Plans

As described in the expenditure review report for the urban part of the WaterNSW business,[38] several Strategic Action Plans were developed to help guide the amalgamation of Sydney Catchment Authority and the State Water Corporation into WaterNSW. We understand these have further evolved or been refined over time as the business has progressively implemented actions established under them.

[38] See: https://www.ipart.nsw.gov.au/files/sharedassets/website/shared-files/pricing-reviews-water-services-metro-water-legislative-requirements-sydney-catchment-authority-pricing-investigation-commencing-from-1-july-2016/consultants_report_-_aither_-_waternsw_greater_sydney_expenditure_review_-_february_2016.pdf

3.3.2. Overview of Asset Management Process

WaterNSW has an overarching process for asset management that is supported by a range of procedures and manuals, which aim to align the planning for and management of its assets with the business objectives and functions of the organisation.

The process begins with the Strategic Asset Management Plan (SAMP), which provides a framework for infrastructure planning and management. The Capital Investment Strategy (CIS) is then used to support the delivery of the SAMP by guiding investment planning and decisions:

> *The CIS defines how the capital program is formulated and designed, and identifies factors that influence and/or constrain capital allocation and spending. It therefore contains the broad program level rationale for the investment plan.*[39]

In addition to the CIS, all capital projects are to be implemented through a gated process which covers project initiation through to execution. This planning process is captured in the Asset Project Planning Process Flowchart, and proposed projects are generally entered into the planning process based on:

- risks identified from various sources of information, but particularly asset health data stored in AssetBank;
- customer requests which may identify the need for a new capability; and
- strategic risks identified in the asset base which may lead to planning for new capability.

The need to proceed with an investment can also be tested using data from WaterNSW's Assetbank tool, to model the need and importance of a project. This is designed to help prioritise and sort projects which are then intended to be subject to further feasibility considerations.

Once a project is approved, WaterNSW has a series of project management processes that are adopted to deliver the project successfully. This includes discrete procurement frameworks and project delivery frameworks that aim to ensure successful project execution.

3.3.3. Asset management

WaterNSW approach to asset management

Following the amalgamation of SCA and State Water, various Asset Management (AM) strategies or plans from each entity are being integrated into a unified approach. This has largely been completed and the unified Asset Management Strategy (AMS) is to be certified to ISO 55001 by December 2016.

The AMS consists of the following documents:[40]

- Strategic documents:
  - Strategic Asset Management Plan (SAMP)
  - Capital Investment Strategy
  - Asset Planning Manual

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[39] WaterNSW Summary of Asset Management Process p. 1.

[40] Based on presentation slides from IPART 2015-16 Annual Audit Update - Asset Management System Progress

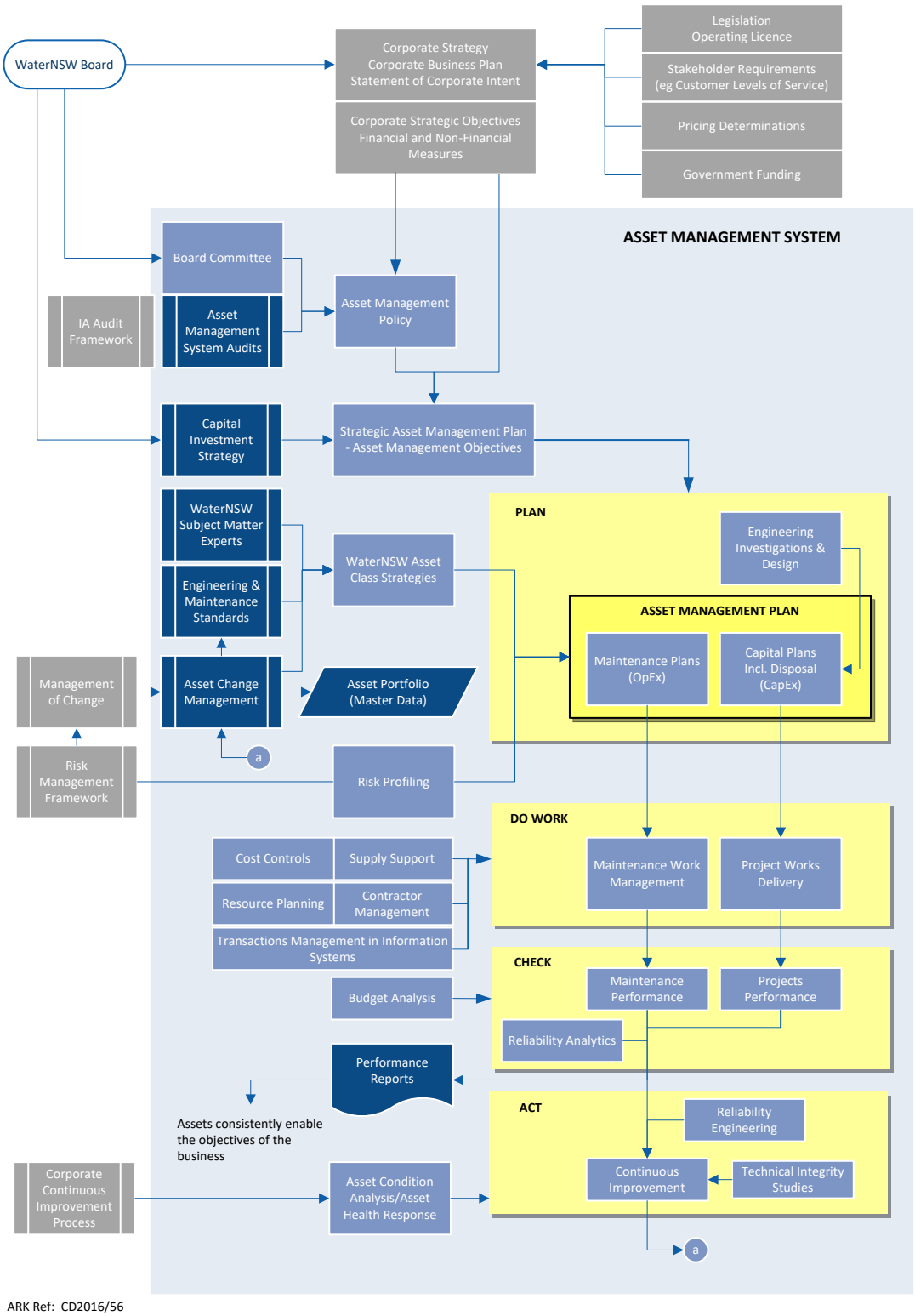
- Asset Performance Evaluation Manual
- Asset Management Plan

- Procedural documents:
  - Asset Planning Process Map
  - Asset Change Management
  - Asset Condition and Capability
  - Maintenance Work Management Process maps

Operationalising WaterNSW's approach to asset management

WaterNSW considers the effective management of large, long-life water infrastructure assets to be a primary objective for sustaining the business as a whole. The asset management approach is underpinned by the principle that assets exist to deliver value to customers, shareholders and the organisation.[41] This approach is pursued through a series of policy documents and manuals which comprise the AMS (see Figure 2 for AMS overview).

[41] See Asset Management Policy: Actions



ARK Ref: CD2016/56

Source: WaterNSW Strategic Asset Management Plan.

Figure 2 WaterNSW Asset Management Framework

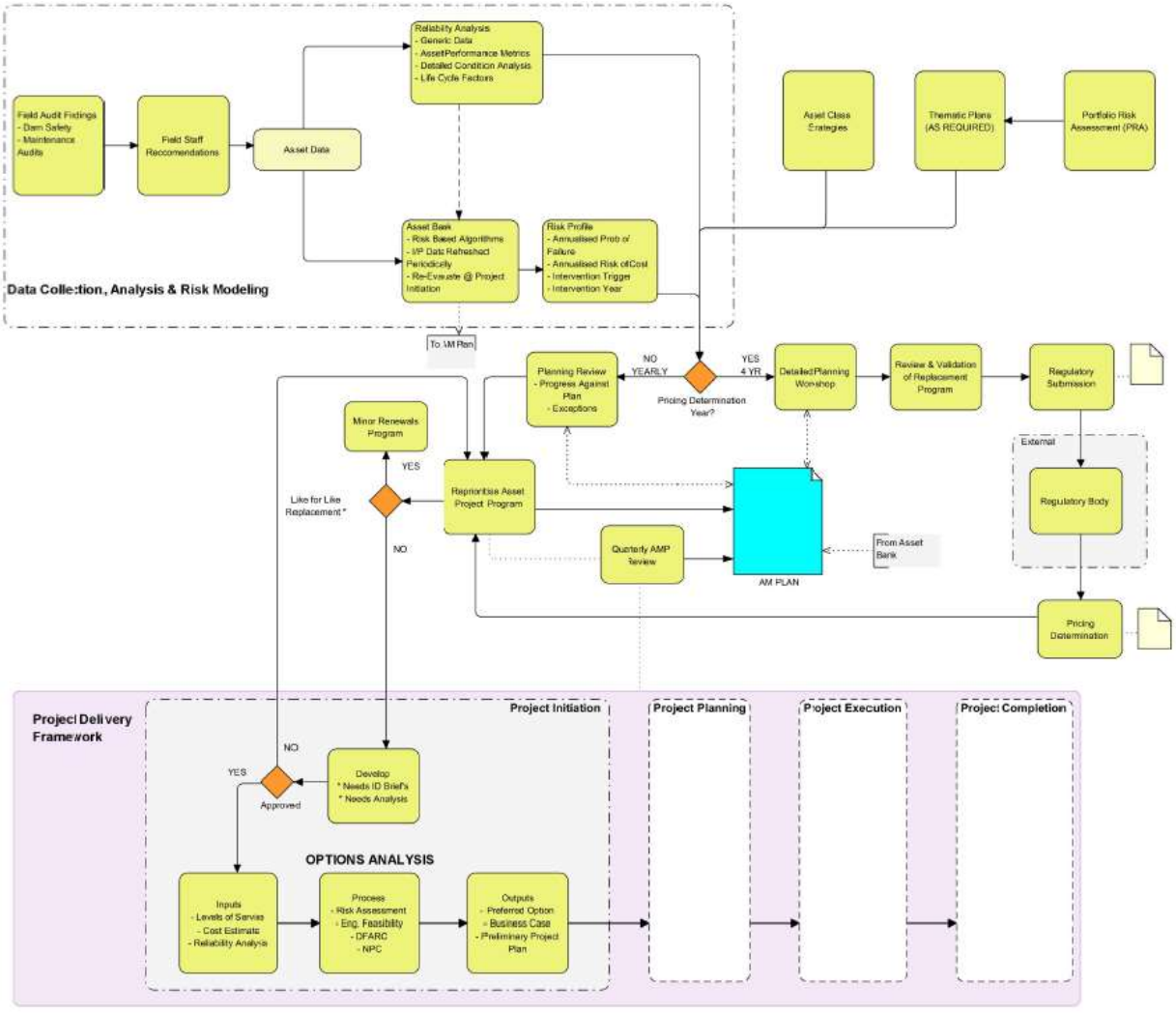
According to WaterNSW the SAMP is the central AMS document and acts as the blueprint for the WaterNSW asset management approach. It serves as a system manual and links to more detailed management documents and relevant corporate systems. The SAMP also steps out accountabilities

for operationalising WaterNSW's AMS, including defined responsibilities and roles for employees across the organisation.

The Asset Planning Manual is a subordinate manual of the SAMP and describes the WaterNSW asset planning process in more detail, covering:

- responsibilities for different staff
- key stakeholders and engagement processes
- risk management, including prioritisation through risk profiling (Assetbank)
- requirements for, and control of planning activities
- specification of procedures.

The Asset Planning Manual also includes the following Asset Planning Process Map (Figure 3), which shows the planning process in more detail:



Source: WaterNSW Asset planning process map.

Figure 3 WaterNSW Asset planning process map

The asset planning process is informed by and relies upon the Assetbank model (also shown in Figure 3) which is a tool that WaterNSW has developed to help model the need for capital projects

(mainly related to asset repair and renewals). According to WaterNSW the tool is informed by asset condition data and is used to inform which capital investments should be considered and prioritised. The modelling plays a major role in determining capital expenditure forecasts, and was relied upon by WaterNSW to develop the capital plan that forms the basis of the current pricing proposal.

Lastly, at the procedural level, WaterNSW uses a series of shorter documents for more discrete processes and protocols for managing different aspects of asset management.

Implications of asset management approach on asset management and other decisions

The AMS is comprised of a series of strategies, policies, manuals and procedures which aim to link the legislative, stakeholder and government imposed operating requirements to the management of assets.

The AMS articulates this process and the means by which it is to be implemented. This is best summarised in Figure 2. The asset management approach influences decisions around investment in assets, particularly for renewals, because it collects asset condition information and feeds this into investment prioritisation. There is therefore a strong relationship between the AMS and capital and operating expenditure decisions.

3.3.4. Capital planning

WaterNSW approach to capital planning

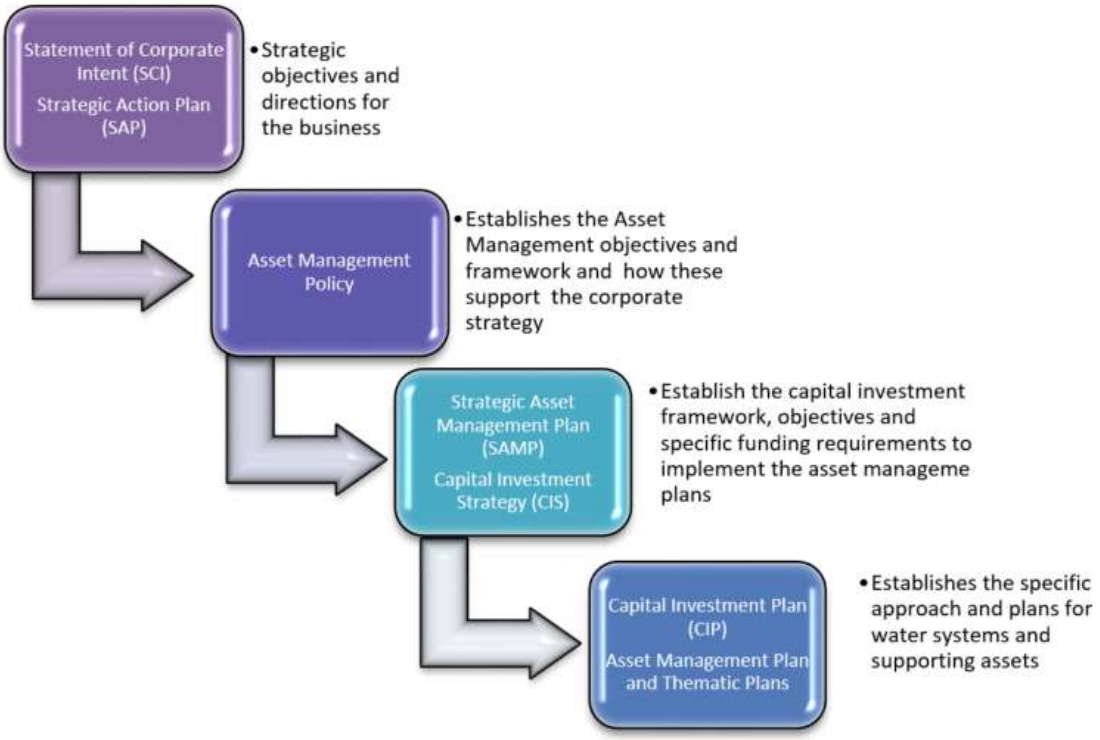
Capital planning is considered by WaterNSW within the life-cycle approach to asset management adopted under the AMS. This is achieved through the approach outlined in the WaterNSW Capital Investment Strategy (FY2017- 2021) (CIS), which in turn informs the 20 year WaterNSW Capital Investment Plan. The purpose of capital investment is articulated in the Capital Investment Strategy as being about:

- reduction of risk of asset related failure to the organisation, customers, and the community
- maintaining the required levels of service to customers
- reduction in health and safety related risks to staff, customers and community
- reduction of risks associated with non-compliance with regulatory requirements.

To achieve this, WaterNSW's approach to capital planning is based on the following principles of capital expenditure (as stated in the CIS p.11):

- All investment is justified against a "do nothing" scenario. This means that capital investment projects are required to "pay their way"
- Investment analyses considers whether an asset is still needed. Retirement or disposal is always a possibility
- WaterNSW adopts a policy of "latest possible intervention" whilst being sensitive to asset criticality, regulatory compliance requirements, and life cycle costing considerations
- Customer interests are always considered - *'should our customers be paying for this?'* is a core consideration of the capital planning process.

The manner in which WaterNSW aims to integrate capital planning into broader asset management and organisation-wide objectives can be seen in Figure 4.



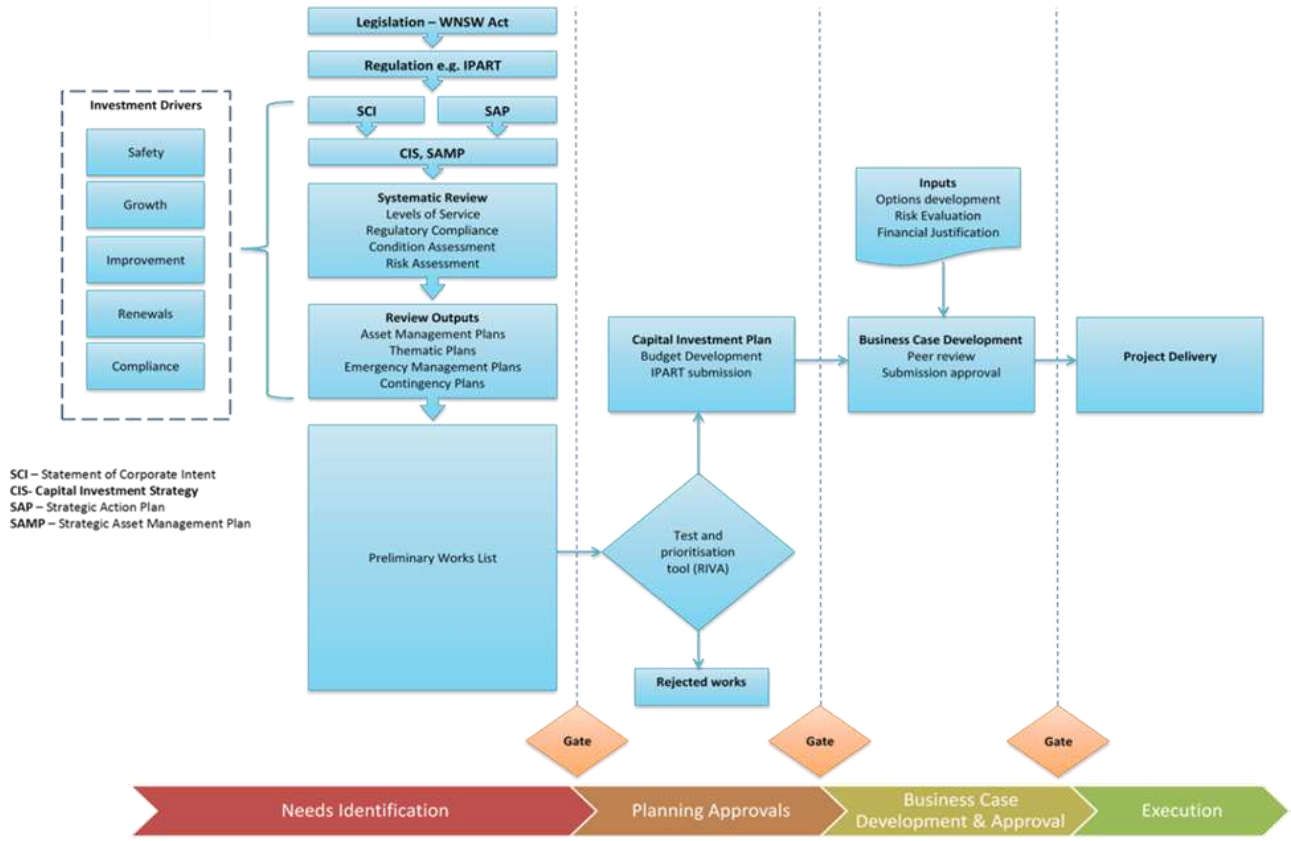
Source: WaterNSW Capital Investment Strategy (FY2017- 2021) p. 5

Figure 4 Investment process and strategy relationships

Operationalising WaterNSW's approach to capital planning

The manner in which WaterNSW operationalises its approach to capital planning consists of a gated process which can be notionally divided into: (1) high-level planning related to long-term asset management, drivers for investment and overarching strategy; and (2) planning, assessment and implementation of specific investments.

This is shown in Figure 5, with the 'needs identification' process and related documents shown on the left-hand side and the assessment and implementation process shown on the right-hand side.



Source: WaterNSW Capital Investment Strategy (FY2017- 2021 p. 5)

Figure 5 Capital investment process within the AMS

Ensuring planning for capital investment that is prudent and efficient

The process outlined in Figure 5 is designed to ensure capital investment is prudent and efficient through two different tranches. Firstly, the overarching AMS and CIS provide the linkage between WaterNSW requirements (e.g. legislative or regulatory requirements) and the identification and prioritisation of capital investments. This process aims to ensure efficient and prudent expenditure through identifying and filtering the most important projects.

For the majority of the maintaining capability category, WaterNSW adopts a system of reporting on asset condition to help identify required capital works. Asset condition information is entered into the Assetbank model, which helps to identify and prioritise key capital projects. Additionally, new capital projects are identified and added to a rolling Capital Investment Plan[42] along with renewals and other works. The plan includes a list of the capital projects and proposed capital expenditure over the next 8 years and is updated at least annually, but according to WaterNSW it is generally updated more frequently than this.[43] Types of asset renewals not subject to the Assetbank approach are SCADA, electrical, ICT and motor vehicles. These are developed via different processes not subject to the same framework although they do go through the same approvals process.

The second component of planning relates to the economic assessment and approval of discrete capital investments. This follows the initial identification of needs, and includes further prioritisation of options and assessment of investments prior to implementation. Depending on the scale of the project

42 Titled 'Project List Consultant' in documents provided to the Reviewer

43 Capital Investment Strategy p. 17.

this may include (for major projects) a cost-benefit analysis and detailed business case, or less detailed assessments for minor projects.

Proposed changes to capital planning

In their pricing proposal to IPART, WaterNSW has proposed an alternative approach to capital planning that does not seek approval for individual projects over the determination period. Instead, WaterNSW has proposed setting prudent, efficient and sustainable levels of expenditure for renewals for each valley based on identified needs, related to known and predicted asset condition, risks and operational concerns.[44] It should be noted however, that the expenditure review team was tasked by IPART to recommend a prudent and efficient level of expenditure, not to approve (or disallow) individual projects. Reaching conclusions about the prudent and efficient level of expenditure necessarily requires detailed review of proposed spending, which as was described in Section 2, requires (in part) review of proposed projects to reach broader conclusions.

The intent of the 'change' proposed is described by WaterNSW as being required to ensure that appropriate funding is available, whilst providing WaterNSW with the flexibility to substitute and reprioritise projects based on need. WaterNSW suggests that this will help avoid issues that typically arise towards the end of the pricing period, where emergent needs and changed operational priorities render reconciliation to a baseline plan (from the pricing submission) a non-value adding exercise.[45] WaterNSW sees this as an important step to prevent the deferral of critical renewals beyond the optimal point of intervention (as per the capital planning strategy outlined above).

The review team notes that in previous determinations the regulator has generally not approved specific capital expenditure projects but set prices based on a view about the overall level of prudent and efficient capital expenditure. The key difference with this current review is that WaterNSW did not develop and provide the same level of detail and documentation on identified projects as with other determinations. While it is not necessarily reasonable that a regulated business have firm, fixed plans far into the future (depending on the nature of the project or investment), the review team considers it reasonable to have well documented and justified intentions for at least the early years (year 1 to 2) of a determination, with planning and documentation very well advanced for delivery of any expenditure in year 1 of the determination (in this case beginning 1 July 2017).[46]

The revised approach proposed by WaterNSW also includes new categorisation of expenditure costs based on the drivers of expenditure, rather than the previous categories of expenditure.

Development of 5 and 10 year capital programs

As described above, WaterNSW maintains a Capital Investment Plan that contains a list of capital projects and investment proposals into the future. The list is informed through the AMS via asset condition reporting requirements embedded in a number of processes, for example Asset Management Plans and Emergency Management Plans. The list is also informed by medium term emerging risks, opportunities and regulatory changes, and categorises each project under the four

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[44] WaterNSW Pricing proposal to IPART 2017-21, see section 13.5.

[45] Ibid.

[46] In response to this paragraph in the draft report, WaterNSW made the following comment:

"Aither's comments on the adequacy of project specific documentation provided by WaterNSW fail to recognise how the changed approach undertaken in our submission is appropriately reflected in our documentation. Aither's expectation that business cases would be on hand for works for the first two years of the determination represents, in WaterNSW's opinion, an imprudent approach to asset planning as business cases should be developed closer to the execution of the works to accommodate more current representation of needs."

The review team clarifies that it is not necessarily expecting two years' worth of business cases to be developed in advance, but stands by the need for more fully developed plans for the early years of a determination.

revised capital driver categories (maintaining capability, new capability, augmenting capability and regulatory requirements).

While proposed expenditure totals are included in the list (by year), there is less clarity around the costings, estimation and assumptions that inform the capital plan, and the processes for selecting and prioritising projects that go into the plan, or subsequently selecting investments from the plan that must proceed.

3.3.5. Procurement

WaterNSW approach to procurement

WaterNSW's procurement process is covered under the WaterNSW Procurement Framework (the Procurement Framework) which is a mandatory framework that must be used by all WaterNSW Purchasers. According to WaterNSW, the Procurement Framework has been developed to be consistent with the NSW Government Procurement Policy Framework. The Procurement Framework covers the following:

- procurement principles and definitions
- purchasing guidelines
- sourcing strategies and market engagement
- procurement approaches, purchasing transaction methods and payments
- compliance with policies and contract management.

The procurement approach is in the process of being updated and is a key feature of the new approach to capital planning. WaterNSW has stated that the approach is still being completed in conjunction with KPMG, and the estimated completion date is February 2017.

In WaterNSW's pricing proposal to IPART[47] it was acknowledged that:

> *WaterNSW recognises that in order to ensure prudent and efficient delivery of the expanded program of works, an alternative procurement and delivery approach is needed to complement the new asset management and planning approach.* (p. 91)

The new strategy will aim to achieve this through the following design components:

- integration with the project initiation process to ensure efficient packaging of work
- maximising combined purchasing power of WaterNSW, whilst
- allowing flexibility for the organisation to respond to changing needs[48].

Operationalising WaterNSW approach to procurement

According to the Procurement Framework, different measures may be used in the procurement process depending on the size and type of the engagement. To ensure efficient procurement larger engagements are sought through competitive tender, with successful tenders selected based on best 'value for money', which considers past performance of prospective suppliers, risk, fitness of purpose,

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47 WaterNSW Pricing Proposal to IPART 2017-2021

48 Ibid, p. 93.

flexibility to adapt to changes as well as financial considerations (see page 9 of the Procurement Framework).

The Procurement Framework also refers to a range of pro forma contracts and documents that have been developed to streamline the procurement process. These include more detailed and comprehensive processes for risky or large projects, and simpler processes for smaller engagements. For more complex or risky engagements, the Procurement Framework also provides a process for utilising legal support (from WaterNSW Legal).

WaterNSW also expects that procurement process will benefit further from the implementation of the Information Management System, which should allow for further improvement of procurement, contract management and administration processes.

Interaction with expenditure proposals and other decisions

WaterNSW's Procurement Framework aims to ensure that expenditure is prudent, efficient and maximises value. This is notionally achieved through the use of competitive tendering, selection of tenders based on maximising value as well as effective contract management and negotiation.

This should therefore drive cost effective decision-making and help ensure that goods and services are procured in alignment with the broader objectives of WaterNSW. It is worth noting that the effectiveness of the procurement strategy and additional development of procurement processes is incorporated as an important part of the revised capital planning and delivery approach proposed by WaterNSW, and that the strategy is not yet complete. To this end, it is important to consider the strengths and limitations of procurement in capital planning and implementation more broadly as these will not necessarily substitute for effective capital planning and investment. For example, competitive tendering and maximising value for a capital investment that is not prudent, still yields an imprudent (and potentially inefficient) outcome. As a result the review team has taken care to separate the extent to which the procurement process itself is prudent and efficient, and the extent to which the procurement process can influence prudent and efficient outcomes.

3.3.6. Program and project management

WaterNSW approach to program and project management

WaterNSW's approach to program and project management is stepped out in the Project Delivery Framework.[49] The Project Delivery Framework seeks to ensure that every project undertaken in the organisation will deliver outcomes that are consistent with approved objectives through a standard, scalable guidance framework focused on the development, execution and hand-over project lifecycle.[50]

The Project Delivery Framework identifies five key project lifecycle phases and provides guidance and instruction for project delivery across these five segments. This is shown in Figure 6.

[49] WaterNSW Project Delivery Framework - User Guide

[50] WaterNSW Project Delivery Framework – User Guide, p. 7.

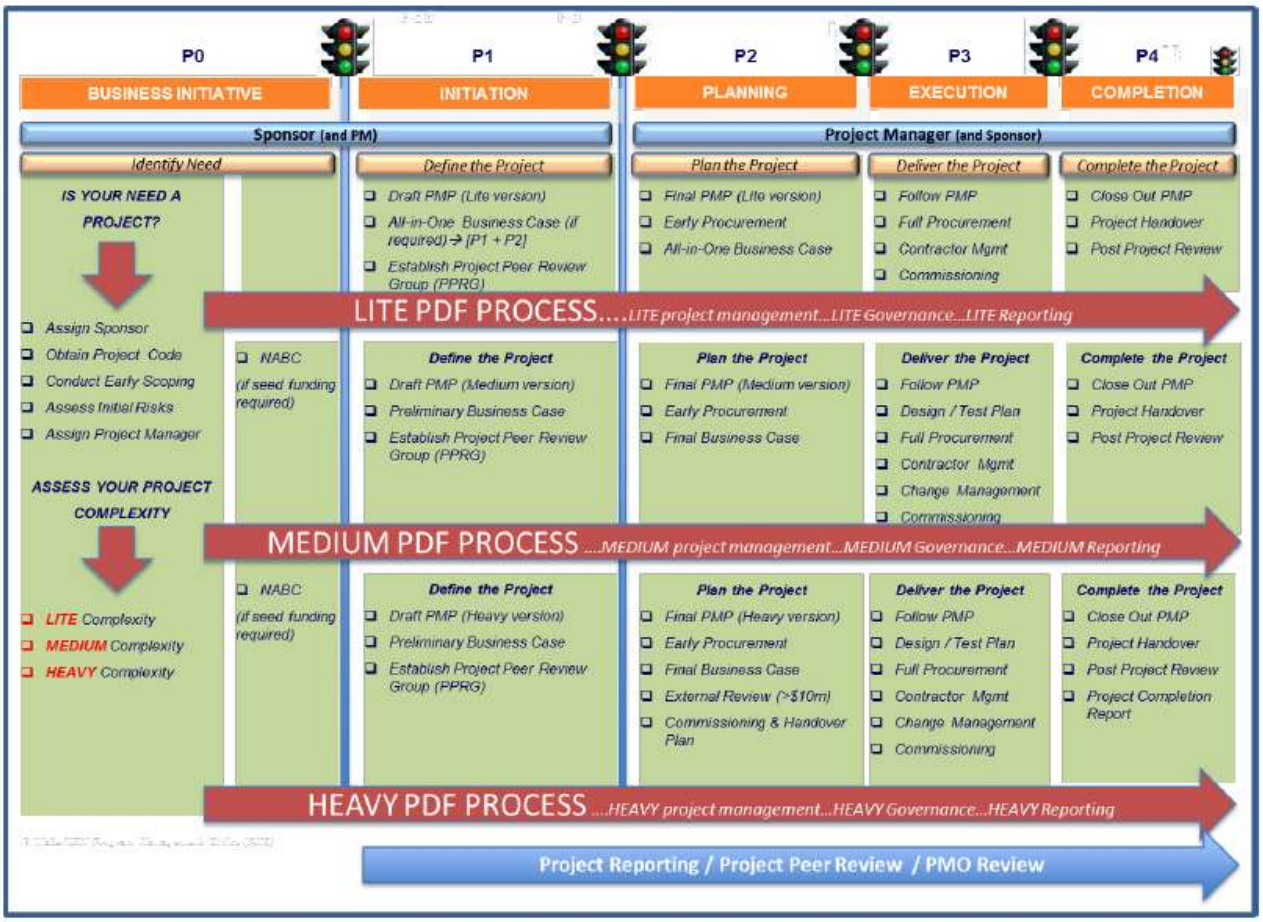
Source: Project Delivery Framework – User Guide, p. 8.

Figure 6 Project Delivery Framework Phases

Operationalising WaterNSW approach to program and project management

WaterNSW's Project Delivery Framework must be used for all projects and prescribes three paths for delivery based on project complexity ('lite', 'medium' and 'heavy'). The Project Delivery Framework is structured as a user guide and outlines governance structures for project delivery and the roles for each project delivery team member.

Figure 7 below shows the project phases and different paths for delivery.



Source: Project Delivery Framework, p 20.

Figure 7 Project phases

Interaction with expenditure proposals and other decisions

Having a clear project delivery process in place helps to ensure that projects are delivered efficiently and that they meet the strategic and operational objectives of WaterNSW (as set by the range of supporting procedures, policies and strategies applied across the organisation). The Project Delivery Framework attempts to provide this function through a clear, step-by-step procedure for delivery of projects.

3.3.7. Asset operations and maintenance

WaterNSW approach to asset operations and maintenance planning

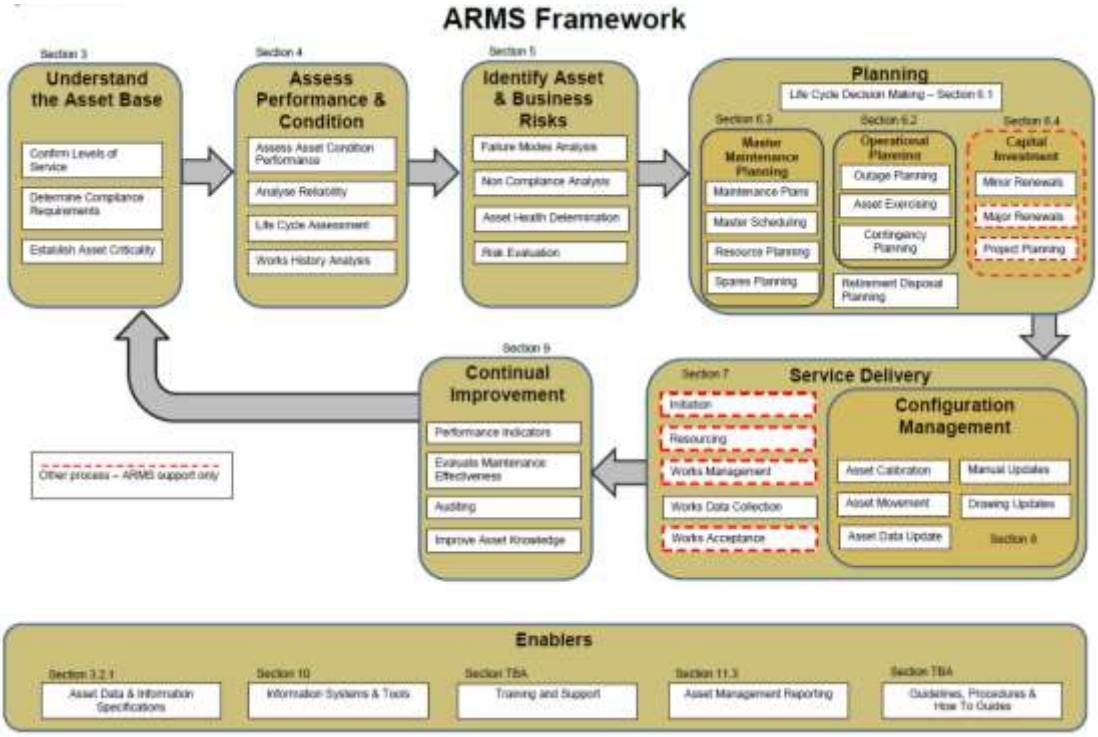
WaterNSW has a series of plans and strategies in place that support the detailed planning and implementation of its operations and maintenance activities. A key part of the overarching Asset Management Policy and embedded AMS is the Asset Reliability and Maintenance Strategy (ARMS). This strategy is designed to support maintenance through a whole of lifecycle approach that minimises the lifetime costs of asset ownership and operation. It does this by balancing performance, risk and cost across asset lifetime.[51]

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.

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.

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



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

Figure 8 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 their ongoing management. 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. A 5 tier asset criticality rating system is used to record the criticality of different assets, which is then used to inform operations and maintenance activities where they are most needed / of most benefit. This in turn guides financial investment decision-making for asset upgrades, rehabilitation and replacements.

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. This process is to be carried out by asset managers and must follow the Asset Condition Assessment Guidelines. To encourage consistency with the water and other industries, the Asset Condition Assessment Guidelines have been aligned with:

- International Infrastructure Management Manual (IIMM) – International Edition 2011
- Condition Assessment & Asset Performance Guidelines – IPWEA – Practice Note 7, v2, 2014 – Water Supply & Sewerage.

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 below. Striking an appropriate balance between performance, risk and cost is designed to help ensure maintenance operations and investment decisions are made in a prudent and efficient manner.

3.3.8. Risk management

WaterNSW approach to risk

The WaterNSW approach to risk management is embedded in the Risk Management Framework. The Risk Management Framework (the Framework) 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 31000:2009 – Risk Management.[52]

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.[53] 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.

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 on an annual basis to formally review its activities and events that may affect its ability to achieve its objectives.[54] 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.

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52 Risk Management Framework, p.4.

53 Ibid.

54 Ibid.

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 9 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 with assets or processes, and therefore informs capital and operating expenditure decisions that might be made in order to address certain risks.

WaterNSW is working towards a risk-based approach to asset management, reflected in the broader AMS. Determination of asset health is a fundamental aspect of asset management that also takes 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.

Implications for expenditure proposals and other decisions

The approach WaterNSW takes to evaluating and managing risk is important in the context of developing its forward capital plan. For example, the level of risk that WaterNSW is willing to accept in relation to assets (including of different types) will inform if, and when, remediation works may be undertaken. This feeds into expenditure proposals, as assessments of risks will inform which works need to be prioritised, and for which funding is then sought. The approach to risk will inform both relative priorities and the sequencing of works over time. An example of this seen with Assetbank is that if the risk score exceeds pre-set thresholds ($10,000 and $100,000), the observed condition of the assets is downgraded by 1 or 2 increments respectively, triggering remediation before the condition score alone would suggest. Alternative solutions to managing or mitigating risk rather than 'buying out' risk with capital expenditure can also potentially defer capital works, and therefore delay expenditure requirements, should cost-benefit analysis indicate this as the lowest total life cost option.

3.3.9. Dam Safety

WaterNSW approach to dam safety

WaterNSW implements its Dam Safety Management Program to embed dam safety values across the organisation. The Dam Safety Management Program consists of a range policies, procedures, and investigations that aim to minimise risk of dam failure.[55]

Dam safety is driven by a range of regulatory and compliance obligations set at the state and national level that are applicable to WaterNSW and its operations. WaterNSW's Dam Safety Management Program follows the recommendations of ANCOLD and consists of the following key elements:

- operations and maintenance
- surveillance (routine, immediate and comprehensive)
- special inspections (emergencies)
- safety reviews
- risk assessments
- education and training
- information management
- emergency preparedness.

Operationalising dam safety

WaterNSW has a dedicated Dam Safety Team who are responsible for managing dam safety across WaterNSW's dam portfolio. Their responsibilities include surveillance and monitoring, safety inspections, periodical reporting to the NSW Dam Safety Committee, dam safety advice and technical advice for capital upgrade projects.

WaterNSW recently completed (March 2015) the Portfolio Risk Assessment (Rural) 2012-2014 Update (PRA Update), which provided a systematic review of WaterNSW's rural dams. According to WaterNSW, the PRA Update has provided WaterNSW with a confident understanding of the risk profile of its rural dams. The PRA Update and initial Portfolio Risk Assessment conducted in 2002 have been used as the basis for the WaterNSW dam safety works program. When intolerable dam safety risks are identified, the following approach to risk reduction is taken to prioritise actions:

> *The primary objective of prioritising the risk mitigation projects is to achieve the most economic risk reduction pathway by maximising the risk reduction per unit of cost. Prioritisation is heavily weighted towards addressing high public safety risks but also considers the level of certainty of the risk assessment and the practicalities of addressing the risk.*[56]

Once discrete capital works are identified WaterNSW manages and executes projects through the broader AMS and dam safety upgrade work is now proposed to be undertaken at Keepit Dam. WaterNSW has previously implemented a number of changes under Phase 1 of the Rural Dam Safety program and in addition to the proposed works at Keepit Dam will now focus on reviewing its existing separate risk portfolios from the two predecessor organisations into one consolidated risk profile and

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55 See WaterNSW Dam Safety Presentation for IPART Audit 2016

56 WaterNSW Board Meeting – 29 June 2016 – Dam Safety Compliance – Agenda Item 12.1b; p. 6.

on reducing risks on a further three dams (Nepean, Warragamba and Hume), plus further investigating potential deficiencies in one additional dam (Fitzroy Falls).

Dam Safety Upgrade Projects

WaterNSW adopts the ANCOLD and NSW Dams Safety Committee approach of adopting a portfolio approach to managing dam safety risks and prioritisation of major upgrade projects to address identified deficiencies. Several dam upgrade projects have been completed to reduce identified life safety risks to a level described by ANCOLD as below the "Limit of Tolerability". These are seen as interim risk positions pending further review and assessment to determine whether the residual position can be considered to be As Low As Reasonably Practicable (ALARP).

This approach is consistent with current industry practice and represents a progressive reduction in overall risk over time within organisational resource constraints. The current review of the dam safety regulatory environment in NSW may impact on the determination of tolerable risk position and ALARP considerations, and therefore WaterNSW has elected to limit dam safety works on its dams over the proposal period until the regulatory requirements become clearer.

Implications for expenditure proposals and other decisions

Dam safety compliance is an important part of WaterNSW's operations. Dam failures can cause significant impacts and losses, including economic, social and environmental impacts. Dam safety works can also be significant and require substantial capital investment. As such, the manner in which WaterNSW approaches dam safety has a direct impact on expenditure and other decisions that can affect the business and the services it provides.

Currently WaterNSW adopts a dam safety approach that appears to broadly capture regulatory dam safety requirements and risk management, as well as developing a process for responding to dam safety issues that aims to address risks in a prudent and efficient manner in general accordance with accepted industry practice.

3.3.10. Heritage management and planning

WaterNSW approach to heritage management and planning

WaterNSW is a significant landowner and items of heritage value are commonly located on its catchment and operational lands. These assets require ongoing protection.

The Heritage Management Action Plan (HMAP) aims to provide a balance between conservation and operation. The HMAP utilises programs to assist in the management of assets in a manner that affords due consideration of identified (or potential) European or Indigenous heritage values. To this end, the HMAP sets out a process to identify, protect and manage the heritage values of assets owned and operated by WaterNSW or located on WaterNSW land.

WaterNSW's heritage management planning process is subordinate to the AS/NZS ISO 14001-Environmental Management System (EMS) which ensures that relevant risks are controlled and managed. The HMAP also integrates heritage management into the wider management of WaterNSW assets.

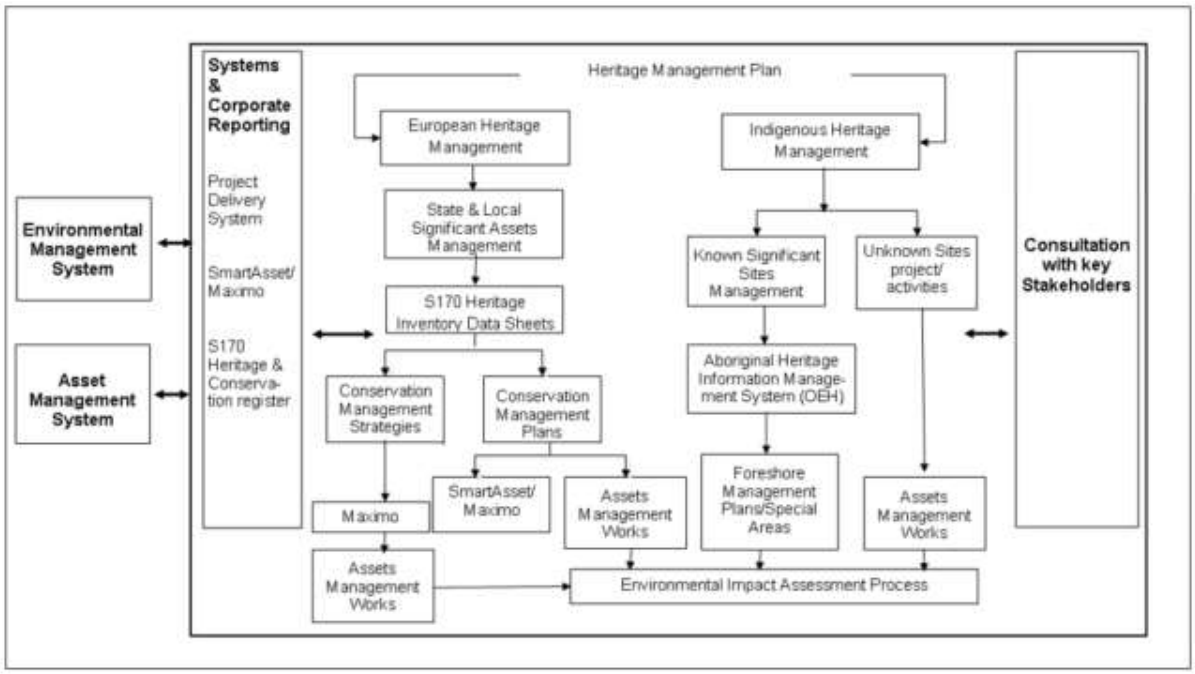
Heritage management is a legal obligation for WaterNSW with several legislative instruments imposing a number of requirements and responsibilities on WaterNSW with respect to cultural and European heritage management. This covers different types of heritage assets including relating to:

- Indigenous heritage

- Natural heritage
- Landscape heritage
- Cultural heritage.

Operationalising heritage management and planning

WaterNSW operationalises its heritage and planning activities through the process set out in the HMAP. The HMAP is also integrated across other operational and procedural documents to create a holistic approach to asset management. This can be seen in the HMAP framework shown in Figure 10.



Source: WaterNSW Heritage Management Action Plan p. 10.

Figure 10 WaterNSW Heritage Management Action Plan Framework

The HMAP also specifies the roles of different areas of WaterNSW and their responsibilities in managing heritage assets.

Implications for expenditure proposals and other decisions

Heritage management and planning may have an impact on capital expenditure and planning as it has the potential to restrict or limit certain investments or proposals.

3.4. Assessment of WaterNSW's strategic planning and asset management

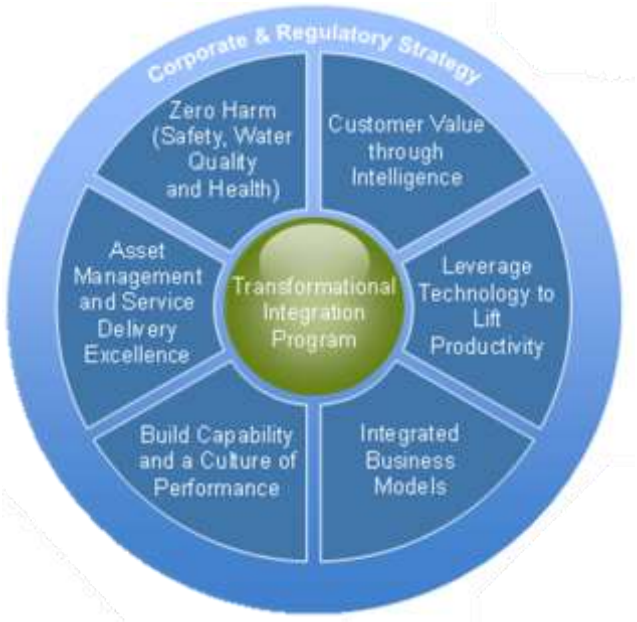
This section considers the appropriateness of WaterNSW's approach to strategic planning and asset management and in particular:

- the efficiency of its capital investment strategy and supporting procedures,
- key assumptions driving expenditure,
- consistency of WaterNSW's proposed 4-year capital program with its longer term program,

- the robustness of linking asset management decisions with future performance requirements; and
- the management of risk.

3.4.1. Corporate planning and strategic direction

Following the recent formation of WaterNSW its corporate objectives and strategy are still considered to be transitional with several areas of corporate focus to transform the organisation and define the culture post amalgamation. This is illustrated by WaterNSW in Figure 11 below.



Source: WaterNSW Aither briefing – WaterNSW pricing NSW Rural Bulk Services (presentation slide pack – Slide 8).

Figure 11 WaterNSW Corporate and regulatory strategy

The review team consider the revised organisational structure and strategy to be sound and agile in meeting business objectives and obligations and there is evidence that the amalgamation and new operation of WaterNSW is working well at a high level. This is supported by identified savings and efficiencies highlighted in WaterNSW Pricing Proposal to IPART for Rural Bulk Water Services including:

- doing more with less (net reduction of 100 FTEs)
- over-delivered on Stage 1 efficiency benefits
- 'reskilled' with two thirds of the leadership group new recruits
- a forecast 20% reduction in operational costs and an 11% decrease in revenue requirement over the 4 year planning period
- stronger customer focus and engagement
- seeking further advancement through improving capability (e.g. consolidation of information management system and IT system improvement program)
- further efficiency gains to be made through establishing a unified enterprise agreement.

WaterNSW has agreed a Statement of Corporate Intent with its Shareholding Ministers which sets out its performance targets and key strategic focus areas which include value creation for its customers

with more agile and innovative services and it also includes an action statement to deliver the organisation's nine Strategic Priorities of:

1. Safety excellence
2. Business transformation
3. Customer value creation and responsiveness
4. Growing the capabilities of its people
5. Capability to develop and evaluate infrastructure solutions
6. Asset health and capability management
7. Water quality research and expertise
8. Better business systems, and
9. Knowledge management

The review team considers this to be a sound strategic focus for the organisation as it beds down the amalgamation and targets areas of efficiency savings and a customer focused business, supported by a large and diverse asset base.

The key drivers to proposed expenditure appear to come from WaterNSW's nine strategic priorities focusing primarily on asset health and improved business systems.

3.4.2. Asset Management Strategy and capital investment decisions

WaterNSW has a comprehensive set of documented procedures and plans underpinning its Asset Management Strategy and these form a logical and integrated framework for sound asset investment decision making from the strategic to the procedural. The capital planning processes are well documented and there are several iterations and internal reviews as asset plans and works programs are developed and refined. This should result in higher priority projects being identified early in the process and delivered in rational and reasonable timeframes. The review team considers that this high-level approach to asset management and capital investment planning is sound.

WaterNSW's 'New approach to capital planning and delivery' does not, however, demonstrate the prudency and efficiency of the majority of forecast capital expenditures at the present stage in the process. Reasoning for this is described in detail in sections 4.4.2 and 8.1. In summary, this is because the majority of the proposed forecast expenditures have not yet been fully scoped or put through the 'Approval to Spend' step of the approval process. This has resulted in a proposed four year capital expenditure program with minimal detail on what is proposed, compared with the detail available in previous expenditure reviews for WaterNSW and in comparison with other regulated businesses. While there is a list of individual items that underpin the overall capital expenditure proposed, these are typically amalgamated at a higher program level. This amalgamation has been carried out either on a valley by valley basis (such as all renewals in the Hunter Valley) or across functions (such as electrical switchboard and power upgrades). In response to requests for documentation for the Fish River, Hunter, Lachlan and Murrumbidgee Valleys details on a handful of projects only were provided such as the Fish River pipeline, a water treatment plant within the Fish River Valley, coatings in the Murrumbidgee Valley and a crane replacement in the Hunter Valley. In respect to renewals, WaterNSW has stated:

The general approach to capital planning in this proposal is different from that of previous years in that approval is not being sought for individual projects over the determination period. This would mean that the plan will be a year old at the start of the period to which it applies and five years old by the completion of the period. This is not an approach that, in the opinion of WaterNSW, is effective for the management of a complex, widely dispersed and varied asset base.

Rather, a prudent, efficient and sustainable level of expenditure for renewals is proposed for each valley based upon identified needs, related to known and predicted asset condition, risks and operational concerns.

The intent of this change is to ensure that the appropriate level of funding is available, whilst providing the organisation the flexibility to substitute and reprioritise projects based upon need. This addresses issues which typically arise towards the end of the pricing period, where emergent needs and changed operational priorities render reconciliation to a baseline plan from the pricing submission a resource intensive, non-value adding exercise.

While the review team understands the logic of providing flexibility to undertake expenditure based on needs, which may change during a four or five year period, the approach taken by WaterNSW does appear to compromise both transparency around proposed spending, as well as accuracy of estimation and forecasting. Stakeholders such as Murrumbidgee Irrigation and the NSW Irrigators Council have expressed similar concerns at recent public hearings and in written submissions.[57] Given the long lived nature of water assets, the review team expected that the majority of the proposed forecast expenditures would either be in the form of defined projects, with clear scopes, pricing and timing or in the form of programs of work with clear trends and reasons for variations from trends. The revised approach to capital investment appears not to provide much in the way of justification at the project or program level.

The review team also enquired if WaterNSW had a firm view of needs and related capital expenditure for year 1 of the next determination period (e.g. beginning 1 July 2017), however this was generally found not to be the case across the program. With the exception of works that will already be in progress at the start of the determination period, WaterNSW has yet to go through full business cases and prioritisation prior to authorising any expenditure, which WaterNSW has pointed out may lead to some expenditure not going ahead. The timely delivery of works has some doubt.

A further concern is that WaterNSW intends to insert substitute projects where other projects have been deferred; that is projects may be elevated in priority. This would logically be done within a valley to match revenues, and as such has the potential to result in imprudent or inefficient expenditures if works are brought forward for no reason other than to make use of an allowance. For clarity, if WaterNSW has deemed the optimal intervention time to renew an asset is in 2020 (for example) but brings it forward to 2017 in order to make use of a capital expenditure allowance, on face value that is not prudent expenditure.

An important part of the asset management strategy is the central tool for developing asset programs. WaterNSW's proprietary Excel based model Assetbank tracks all significant assets within WaterNSW by using estimates of condition assessment, life expectancy, serviceability, risk and project costs for around 18,000 items. It is understood that consideration of asset failure and service delivery risk is an integral part of this assessment and data input into Assetbank. This model relies on a variety of input data and several levels of review and checking as asset management plans and prioritised annual

[57] See IPART website: https://www.ipart.nsw.gov.au/Home/Industries/Water/Reviews/Rural-Water/Prices-for-WaterNSW%E2%80%99s-Rural-Bulk-Water-Services-from-1-July-2017-formerly-State-Water-Corporation?qDh=2

works programs are developed. Assetbank is a complex tool because of its sheer size, and access and control is (correctly) closely monitored by WaterNSW. As a prioritisation tool and project database it appears a fit for purpose system which should provide a sound basis for initiation of future asset programs as a 'first pass' by identifying an initial 'long list' of potential renewal works. We note that WaterNSW undertakes a review process that validates the works priority in detail prior to finalising any future programs.

The review team notes that the risk assessment component of Assetbank relies on a coarse assessment of condition (only two categories represent assets in poor condition), and includes an advancement of works that are assessed as high risk without due consideration of ways to mitigate or manage the risk. We consider the risk assessment process to be overly risk averse, which may lead to inefficient expenditure forecasts.[58]

The review team spent some time with WaterNSW staff reviewing a number of projects within Assetbank and also the methodology and logic behind the assessment processes and while the system and process is sound, we were unable to determine the accuracy and validity of input data.[59] The review team is therefore concerned that if the input data cannot be independently verified (such as an external reviewer sighting a sufficient sample of this data and supporting information) then the output data, on which the asset programs are based, cannot necessarily be relied upon.

The review team also notes that WaterNSW has several internal approval and review processes prior to approval for project initiation. However it is difficult to justify (and for expenditure reviewers to confirm) expenditure proposals on the basis of pointing to such processes. While flexibility is important, the approach removes too much granularity and transparency around costings.

The review team considers that within the overall suite of asset management and capital investment planning documents and processes, WaterNSW's systematic approach to whole of life cycle planning and assessment of asset investment strategies is generally sound and in accordance with industry practice. WaterNSW also has a sound and comprehensive procurement strategy and documented system which is expected to result in efficiency in project delivery. The implementation of the asset management approach is, however, limited by coarse condition assessments, a lack of certainty in project scopes and in justification for programs of work, in many cases because the specific project details and anticipated costs are not well defined initially. A sound and competitive procurement process cannot be relied on to retrospectively demonstrate project prudency or efficiency. The approach to forecasting asset renewals expenditure is quite conservative when it comes to forecasting renewals with a bias to capital intervention; this is discussed further in sections 4.4.2 and 8.1.

3.4.3. Approach to dam safety and management

WaterNSW has a dam safety program comprising two key elements – routine dam safety activities and remediation of identified dam safety deficiencies. The review team believes that both these elements are compliant and consistent with the requirements of the NSW Dams Safety Committee, ANCOLD and other major dam owners in Australia.

The ANCOLD Guidelines on Dam Safety Management (2003) set out the recommended routine dam safety activities of:

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[58] See further detailed discussion in Section 8.1. The review team requested, but were not provided with adequate condition assessment information.

[59] In part, this was due to not seeing asset condition assessments, from which certain input data is obtained.

- Operations & Maintenance;
- Surveillance, comprising routine (daily/weekly), intermediate (annual) and comprehensive (5 yearly) inspections and instrumentation monitoring;
- Dam Safety Reviews;
- Risk Assessments;
- Reporting;
- Education & Training;
- Information Management, and
- Emergency Preparedness.

Any dam safety deficiencies identified under these routine dam safety activities should then be incorporated into remedial actions as also required by ANCOLD. The nature and extent of these actions should determine the urgency and extent of any required physical or non-structural works or modified management systems. Furthermore, these should be prioritised using a risk based approach across the whole dam portfolio and in accordance with ANCOLD and regulatory requirements which prioritises life safety over all other matters.

WaterNSW has demonstrated that it follows the ANCOLD and NSW Dams Safety Committee guidelines and requirements for the delivery of both its routine and remedial dam safety program, as demonstrated to the review team in Dam Safety Management Board Committee documentation.

In assessing and prioritising the tolerability of identified dam safety deficiencies, ANCOLD recommends the use of a risk assessment approach outlined in its 2003 Guidelines on Risk Assessment, and particularly in relation to the tolerability of life safety risks. The NSW Dams Safety Committee also provides guidance and recommendations for the use of risk assessment in dam safety decision making in its Guidance Note DSC1B June 2010 “Background to DSC Risk Policy Context”.

The primary determinant for the assessment of tolerability of life safety risks due to dam failure used by most dam owners in Australia is defined by ANCOLD as the “Limit of Tolerability” which is a measure of risk to life against several other hazardous industries and societal expectations of the management of these facilities. The Limit of Tolerability is plotted as a straight line on an F-N curve where F is the estimated cumulative number of fatalities due to dam failure and N is the annualised probability of failure of the dam which would be expected to result in N or more fatalities.

ANCOLD defines an identified risk position greater than the Limit of Tolerability as “intolerable” requiring action to reduce the risk, and that the target risk position for any dam should be below this limit line and as Low As Reasonably Practicable (ALARP). Most dam owners prioritise remedial works programs across their dam portfolios in accordance with this approach with dams of highest identified risk position addressed first, with an initial or interim target of reducing risks to below the Limit of Tolerability, before consideration of ALARP conditions. This leads to reasonably long-term structured programs of progressive improvements and risk reduction measures across the portfolio of dams, with many dams being subject to several discrete and non-continuous projects over time.

The approach being undertaken by WaterNSW is consistent with these requirements for both routine dam safety activities and for the remediation of dam safety deficiencies. WaterNSW is also undertaking work to ensure previous portfolio risk assessments of its two legacy businesses are in a consistent format to allow confidence in future program definition.

WaterNSW rural dams are now at the end of a 10 year, approximately $420m capital works dam safety risk reduction program with the crest post-tensioning works on Keepit Dam the final identified project. Any further works on any of WaterNSW's rural dams will be subject to clarification of the regulatory requirements under the 2015 Dam Safety Bill. Capital expenditure for these further works are contained within WaterNSW's forward capital expenditure program from 2021-22 onwards, not subject to this expenditure review, as indicated in Figure 12.

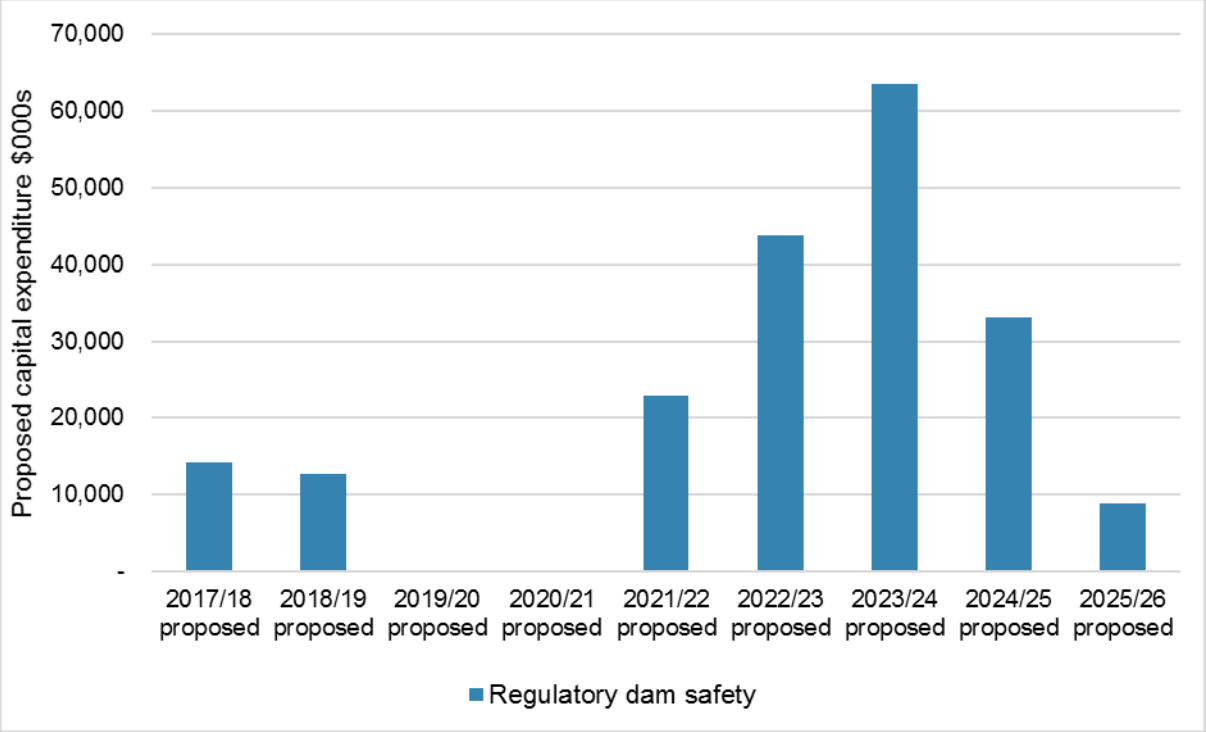


Figure 12 WaterNSW long term proposed capital expenditure, category Regulatory - Dam Safety, next determination period (2017-18 to 2020-21)

WaterNSW has identified an inconsistent approach to assessment of risk and treatment of identified dam safety deficiencies between its two legacy organisations, and is proposing to review this position to ensure consistency and defensibility in the short term.

3.5. Summary of key findings

WaterNSW has established a clear strategic direction and focus for the emerging organisation which is well supported by an integrated series of documented procedures, asset management systems, internal management controls, project reviews and approvals processes and procurement strategies to determine and approve future asset investment programs.

This process and the supporting systems and documented framework are regarded by the review team as of good quality and industry standard tools that should lead to sound investment decision making. A key operational component of this process is the proprietary Excel based management tool Assetbank which is used to capture, sort and produce program data on asset condition, risk, serviceability and future project requirements (including costs). This system is used by WaterNSW to manage around 18,000 individual assets and there are a series of management systems and reviews in place to use it to derive works programs.

The implementation of the asset management approach is at this time, however, limited by coarse condition assessments, a lack of certainty in project scopes and in justification for programs of work, in many cases because the specific project details and anticipated costs are not well defined initially. We were unable to confirm the accuracy or validity of the input data to Assetbank and therefore we do not have confidence that the output data can necessarily be relied upon in developing a forecast for future capital expenditure, and are of the view that elements of Assetbank lead to over-estimation of the expenditure required.[60]

Additionally, the program wide approach taken by WaterNSW means that it is difficult for WaterNSW to justify individual projects or to be able to clearly demonstrate prudency and efficiency of the proposed forecast capital expenditures.

WaterNSW's approach to its dam safety program for both routine activities and remediation of identified dam safety deficiencies is compliant with current NSW Dams Safety Committee requirements, ANCOLD recommendations and Australian industry standard practice. Phase 1 of its major upgrade works on its rural dams will be complete following delivery of the Keepit Dam wall post-tensioning works, with further work on these dams subject to assessment and clarification following application of the requirements of the Dam Safety Bill 2015 when it is enacted. In the meantime, WaterNSW is acting in accordance with the existing regulatory environment.

[60] See Section 8.1 for more detail.

4. Capital expenditure

4.1. Overview

This section outlines WaterNSW's reported actual/forecast expenditure for the current determination period, WaterNSW's proposed expenditure for the next determination period, the review team's review of this expenditure, and the review team's recommendation for the level of prudent and efficient expenditure.

The review was carried out on WaterNSW's past and proposed capital expenditure following the method outlined in Section 2.7.

Capital expenditure comprises a 'User Share' funded by customers via tariffs and a 'Government Share' where government directly funds all or a portion of certain capital works. Capital expenditure has been presented on a User Share only or Total (User and Government Shares) basis depending on the context. Where available the User Share only portions have been reported otherwise capital expenditure is reported on a Total basis only.

WaterNSW has based their forecasts on government meeting funding needs for the following categories of expenditure at the specified percentages; except for the Fish River and Lowbidgee Valleys which are 100% User Share for all expenditure:

- Regulatory environmental – 50%
- Maintaining capability – 10%
- Regulatory dam safety (Dam safety compliance on pre 1997 capital projects) – 100%

On 29 November 2016 WaterNSW provided an updated forecast for 2016-17 that has an additional $7.77 million of capital expenditure on top of the forecast dated 11 October 2016. This included bringing forward $5.41 million of works from the next determination period including $4.66 million allocated to the protective coatings program, originally planned to take place in 2017-18 or later years. As this was submitted late in the review process, after substantive analysis and report drafting have been completed, and without specific information on changes to the next determination period, these specific expenditures have not been reviewed. This report and its underpinning analysis is based on the forecast as of 11 October 2016.

4.2. WaterNSW past and proposed expenditure

4.2.1. Current determination period

WaterNSW's actual and forecast 'past' capital expenditure for the current determination period is presented in Table 6 for MDB valleys only, compared with the ACCC determination. In Table 7 this actual/forecast expenditure is presented by User and Government shares compared to the ACCC determination. As can be seen there was a significant amount of Government funding in the determination period for MDB Valleys, actual expenditure of approximately $47 million. Both tables include the modification made by WaterNSW to include estimated expenditures for fishways at Walgett Weir and other locations in 2016-17, and the re-forecast for works at Keepit Dam.

Table 6 WaterNSW actual/forecast capital expenditure (MDB Valleys, User and Government Share, current determination period, $000s, $2016-17)

	2014-15 actual	2015-16 actual	2016-17 forecast	Total
ACCC determination	41,830	31,374	46,707	119,911
WaterNSW actual/forecast expenditure	19,943	28,697	49,436	98,076
WaterNSW addition 30/9/2016	-	-	1,620	1,620
WaterNSW revised actual/forecast 30/9/2016	19,943	28,697	51,056	99,696
WaterNSW revised actual/forecast 29/11/2016	19,943	28,697	41,358	89,999

Source: All data sourced from WaterNSW Pricing Proposal to the Independent Pricing and Regulatory Tribunal, Regulated prices for the NSW Rural Bulk Water Services from 1 July 2017 to 30 June 2021, 2016, Figure 27 p.126. 2016-17 forecast was originally reported as $49.4 million in WaterNSW's Pricing Proposal; since revised by WaterNSW. Reforecasts were provided by WaterNSW on 30 September 2016 and 11 October 2016..

Table 7 WaterNSW actual/forecast capital expenditure (MDB Valleys, User and Government Share, current determination period, $000s, $2016-17)

	2014-15 Actual	2015-16 Actual	2016-17 Forecast	Total
ACCC Determination				
User Share	9,230	14,053	23,966	47,249
Gov Share	32,600	17,321	22,741	72,662
Total MDB Valleys	41,830	31,374	46,707	119,911
WaterNSW actual/forecast				
User Share	5,957	6,840	30,232	43,029
Gov Share	13,986	21,857	11,126	46,969
Total MDB Valleys	19,943	28,697	41,358	89,999

Source: All data sourced from Table 103 of WaterNSW Pricing Proposal to the Independent Pricing and Regulatory Tribunal, Regulated prices for the NSW Rural Bulk Water Services from 1 July 2017 to 30 June 2021. Reforecasts were provided by WaterNSW on 30 September 2016 and 11 October 2016.

Presented in Table 8 is actual/forecast expenditure in the Coastal Valleys, compared to the IPART determination where relevant, on a User Share basis only, with both User and Government Shares presented in Table 9.

Table 8 WaterNSW actual and forecast capital expenditure (Coastal Valleys, User Share only, current determination period, $000s, $2016/17)

	2010-11 actual	2011-12 actual	2012-13 actual	2013-14 actual	2014-15 actual	2015-16 actual	2016-17 forecast	Total
IPART determination	908	561	438	213	N/A	N/A	N/A	
WaterNSW actual/forecast expenditure	983	882	1,275	805	347	507	1153	5,953

Source: All data sourced from WaterNSW Pricing Proposal to the Independent Pricing and Regulatory Tribunal, Regulated prices for the NSW Rural Bulk Water Services from 1 July 2017 to 30 June 2021, 2016, Figure 27 p.126.

Table 9 WaterNSW actual and forecast capital expenditure (Coastal Valleys, User and Government Share, current determination period, $000s, $2016/17)

	2010-11 actual	2011-12 actual	2012-13 actual	2013-14 actual	2014-15 actual	2015-16 actual	2016-17 forecast	Total
User Share	983	882	1,275	805	347	507	1153	5,953
Government Share	42	-	68	80	-	41	830	1,061
Total WaterNSW actual / forecast expenditure	1,025	882	1,343	885	347	548	1,984	7,013

Source: All data sourced from WaterNSW Pricing Proposal to the Independent Pricing and Regulatory Tribunal, Regulated prices for the NSW Rural Bulk Water Services from 1 July 2017 to 30 June 2021, 2016, Figure 27 p.126.

Combined actual/forecast capital expenditure for MDB and coastal valleys is presented in Table 10 to enable comparisons with the next determination period, split into User and Government Share. Government Share made up 51.5% of the total capital expenditure over this three year period.

Table 10 WaterNSW actual/forecast capital expenditure (All Valleys, User and Government Share, current determination period, $000s, $2016-17)

	2014-15 Actual	2015-16 Actual	2016-17 Forecast	Total
WaterNSW actual/forecast				
User Share	6,304	7,347	31,385	45,036
Gov Share	13,986	21,898	11,957	47,841
Total all valleys	20,290	29,245	43,342	92,877

Source: All data sourced from WaterNSW Pricing Proposal to the Independent Pricing and Regulatory Tribunal, Regulated prices for the NSW Rural Bulk Water Services from 1 July 2017 to 30 June 2021. Reforecasts were provided by WaterNSW on 30 September 2016 and 11 October 2016.

4.2.2. Next determination period

WaterNSW's proposed capital expenditure over the next determination period, 2017-18 to 2020-21, is summarised in Table 11. This includes the modification made by WaterNSW on 30 September 2016 to include estimated expenditures for fishways at Walgett Weir and other locations in 2017-18 and 2018-19. This is presented on a User Share and Government Share basis in Table 12. Compared to the current determination period, the proportion of government funding is much reduced- 19.7% of the total capital expenditure, compared with 51.5% in the current determination period.

Table 11 WaterNSW proposed capital expenditure (All Valleys, Government and User Share, next determination period, $000s, $2016-17)

	2017-18 proposed	2018-19 proposed	2019-20 proposed	2020-21 proposed	Total
WaterNSW original proposed expenditure	63,747	49,690	47,641	32,630	**193,708**
WaterNSW adjustment 30/9/2016	1,839	219	0	0	**2,058**
WaterNSW revised proposed expenditure 30/9/2016	65,586	49,909	47,641	32,630	**195,766**
WaterNSW revised proposed expenditure 11/10/2016	59,404	59,052	35,463	32,630	**186,549**

Source: All data sourced from WaterNSW Pricing Proposal to the Independent Pricing and Regulatory Tribunal, Regulated prices for the NSW Rural Bulk Water Services from 1 July 2017 to 30 June 2021, 2016, p.126. Reforecasts were provided by WaterNSW on 30 September 2016 and 11 October 2016..

Table 12 WaterNSW proposed capital expenditure (All Valleys, Government and User Share, next determination period, $000s, $2016-17)

	2017-18 proposed	2018-19 proposed	2019-20 proposed	2020-21 proposed	Total
User Share	41,977	43,833	33,314	30,586	**149,711**
Government Share	17,427	15,219	2,149	2,044	**36,838**
Total	59,404	59,052	35,463	32,630	**186,549**

Source: All data sourced from WaterNSW Pricing Proposal to the Independent Pricing and Regulatory Tribunal, Regulated prices for the NSW Rural Bulk Water Services from 1 July 2017 to 30 June 2021, 2016, p.126. Reforecasts were provided by WaterNSW on 30 September 2016 and 11 October 2016.

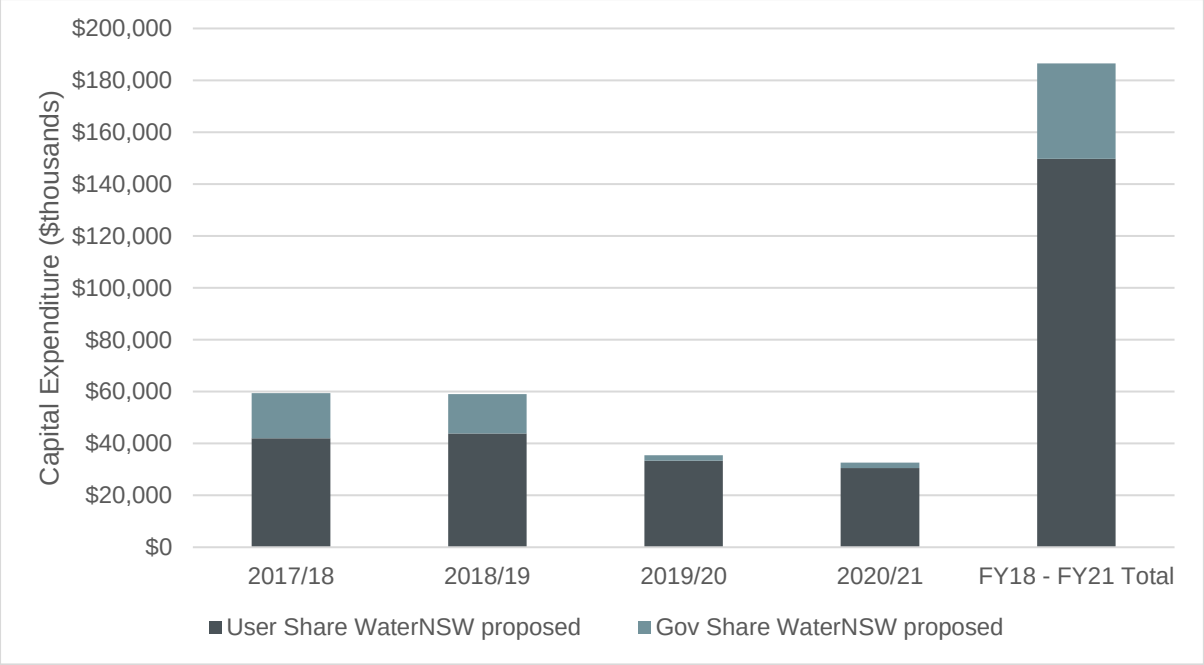


Figure 13 WaterNSW proposed capital expenditure by Government and User Share, next determination period (2017-18 to 2020-21)

WaterNSW's expenditure comprises four categories which reflect 'capability' drivers. These categories are closely aligned with previous WaterNSW categories but have been renamed by WaterNSW. The previous and new categories are outlined in Table 13 below, with approximate mapping indicated. The share basis is the same as have been in place for the current determination period.

Table 13 WaterNSW previous and new capability drivers

Previous	New	Government Share*	User Share*
Dam safety compliance – pre 1997 construction	Regulatory compliance activities – dam safety	100%	0%
Environmental planning and protection	Regulatory compliance activities - environmental	50%	50%
Renewals and replacements	Maintaining capability	10%	90%
Renewals and replacements	Regulatory Health and Safety	10%	90%
Water delivery and other operations	Augmenting capability	0%	100%
Water delivery and other operations	New	0%	100%

Source: All data sourced from WaterNSW Pricing Proposal to the Independent Pricing and Regulatory Tribunal, Regulated prices for the NSW Rural Bulk Water Services from 1 July 2017 to 30 June 2021, 2016, p.126. Reforecasts were provided by WaterNSW on 30 September 2016 and 11 October 2016.. * For Fish River and Lowbidgee, these valleys are 100% User Share..

Proposed capital expenditure per category is outlined in Figure 14. The majority of expenditure is allocated to the 'Maintaining capability' category, which typically means activities involving asset renewals or replacement. The top four items of expenditure and the remaining balance per category is provided in Table 15.

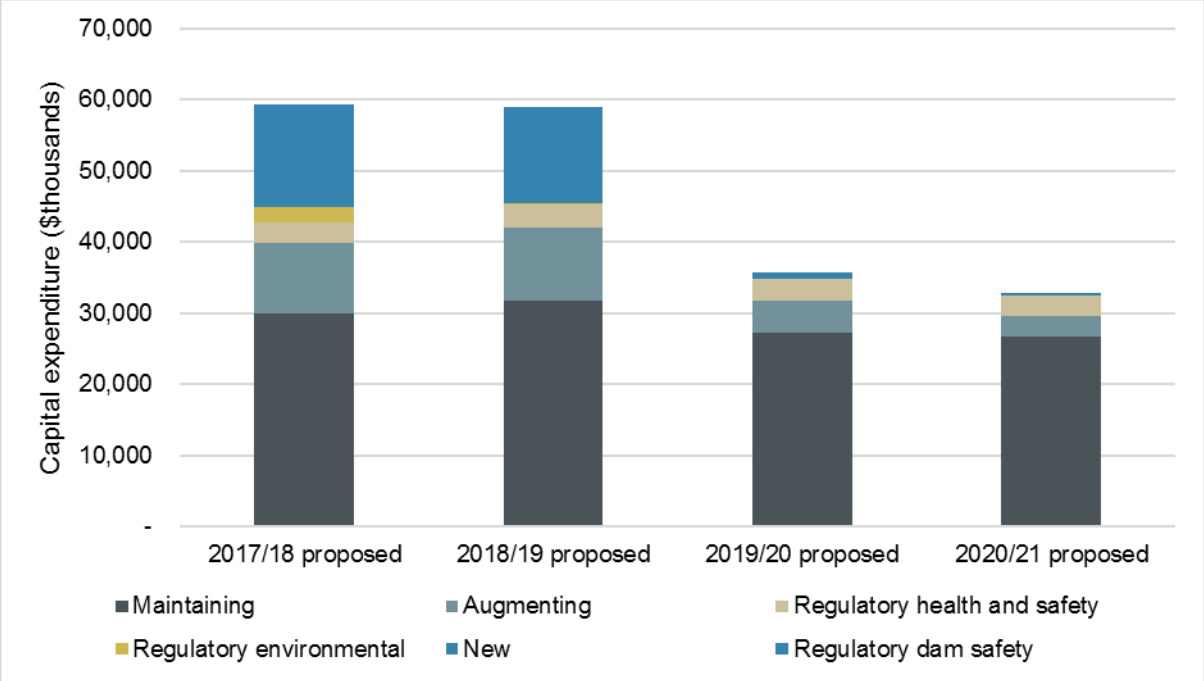


Figure 14 WaterNSW proposed capital expenditure by category, next determination period (2017-18 to 2020-21)

Table 14 WaterNSW proposed capital expenditure by category (All Valleys, Government and User Share, next determination period, $000s, $2016-17)

Category	2017-18	2018-19	2019-20	2020-21	Sub-Total	% of Total
Augmenting	9,998	10,252	4,435	2,966	27,652	14.8%
Maintaining	29,885	31,812	27,305	26,630	115,632	62.0%
New	261	857	705	155	1,978	1.1%
Regulatory dam safety	14,299	12,677	10	10	26,996	14.5%
Regulatory environmental	2,099	219			2,318	1.2%
Regulatory health and safety	2,862	3,235	3,009	2,868	11,974	6.4%
Total	**59,404**	**59,052**	**35,463**	**32,630**	**186,549**	

Source: All data sourced from WaterNSW Pricing Proposal to the Independent Pricing and Regulatory Tribunal, Regulated prices for the NSW Rural Bulk Water Services from 1 July 2017 to 30 June 2021, 2016, p.126. Reforecasts were provided by WaterNSW on 30 September 2016 and 11 October 2016.

Table 15 WaterNSW proposed capital expenditure- top expenditure items by category (All Valleys, Government and User Share, next determination period, $000s, $2016-17)

Maintaining	Augmenting	New	Regulatory dam safety	Regulatory environmental	Regulatory health and safety
Asset Renewals by valley (86,959)	Operational Systems Programme (6,179)	Automation and Communications Renewals Upgrades (*)	KEPT Upgrade (35,167)	Walgett Weir (1,620)	LOWB Renewals – Safety (3,802)
Motor vehicles (6,760)	CO WMAWAS - Separation and Rewrite (7,768)	*	*	Fishway strategic (438)	MRRB Renewals – Safety (3,348)
ICT Renewals (6,189)	Communications Strategy & Implementation (5,471)	Capacity review & expansion Rural (*)	*	LBRW - Erosion Protection Embankments (*)	LACH Renewals – Safety (1,228)
Electrical Switchboard and power upgrades (4,064)	Dam Surveillance Instrumentation Upgrades (3,752)	Manual data collection review & enhancement (*)	*		MACQ Renewals – Safety (822)
Balance (11,660)	Balance (4,482)	Balance (729)	Balance (312)		Balance (2,773)

Source: All data sourced from 'Sheet 1' of 'Project list - draft selection.xlsx' MS Excel file provided by WaterNSW September 2016.

Note: * Denotes redactions made at the request of WaterNSW.

4.3. Review of capital expenditure in current determination period

In the current determination period – 2014-15 to 2016-17 for MDB Valleys and 2010-11 to 2013-14 for Coastal Valleys – WaterNSW has forecast capital expenditure of approximately $29.9 million less in MDB Valleys than the amount of capital expenditure the ACCC determination was based upon while in Coastal Valleys WaterNSW overspent by approximately $1.8 million. The majority of the underspend within the MDB Valleys is for the Government Share ($25.7 million), with the underspend on a User Share basis $4.2 million, or 8.9%.

Following the ACCC decision which contained $44 million less in nominal terms than what the former State Water had forecast, WaterNSW undertook a reprioritisation exercise for the three year capital expenditure program. This sought to prioritise more critical needs, match the ACCC pricing determination totals and annual phasing, and give emphasis to expenditure activities and valleys. In essence the actual and remaining forecast expenditure within the MDB valleys is quite different from that proposed in the pricing proposal and the ACCC final decision. The review aim was to determine whether expenditure decisions made by WaterNSW in re-planning their capital expenditure program were prudent, and whether the expenditure was efficient.

WaterNSW has forecast a significant uplift in capital expenditure in the final year of the current determination period, 2016-17, than that achieved in 2014-15 and 2015-16.[61] This uplift is to get closer to delivering on the originally planned capital expenditure was due to the review process following the ACCC decision, and following the merger. Both events required reprioritisation of capital expenditure, and there was significant change within WaterNSW.

As alluded to WaterNSW underwent a period of adjustment to reprioritise the capital expenditure program given their original program was based on a higher level of expenditure. WaterNSW has suggested that the merger of State Water and SCA contributed to much lower level of expenditure occurring than forecast even with the lower level of approved expenditure (given organisational change and merger related priorities). There is evidence of good decisions being made to defer expenditure such as on business information systems that otherwise may have turned out to be imprudent or inefficient given the merger. An overview of the actual and forecast capital expenditure for MDB valleys and Coastal Valleys is shown in Table 16 and Table 17.

The review team examined a range of material provided by WaterNSW including Board papers relating to the overall program reprioritisation, approval to spend-business case documentation for individual projects, and outcomes of projects, and concludes that nothing has come to its attention to show that the capital expenditure in the current determination period is not prudent and efficient.

On 11 October 2016 WaterNSW provided an up to date forecast for the major project at Keepit Dam, and consequently a modification was made for 2016-17.

The review team has not found any reason that actual and forecast remaining expenditure within the current determination periods for the MDB or Coastal Valleys should not be considered prudent and efficient. The review team's recommended capital expenditure is detailed in Table 21, taking into account the review of sample capital expenditure, WaterNSW's overall processes and procedures, and the deliverability of the capital expenditure. It is important to note this does not include consideration of the reforecast WaterNSW provided on 29 November 2016 which includes bringing forward expenditure that was planned to take place in the next determination period.

[61] Based on WaterNSW's forecast for 2016-17 as of 11 October 2016.

Table 16 WaterNSW actual and forecast capital expenditure (MDB Valleys, User and Government share, current determination period, $000s, $2016/17)

	2014-15 actual	2015-16 actual	2016-17 forecast	Total
ACCC determination	41,830	31,374	46,707	119,911
WaterNSW revised actual/forecast 11/10/2016	19,943	28,697	41,358	89,999

Source: All data sourced from WaterNSW Pricing Proposal to the Independent Pricing and Regulatory Tribunal, Regulated prices for the NSW Rural Bulk Water Services from 1 July 2017 to 30 June 2021, 2016, Figure 27 p.126. Reforecasts were provided by WaterNSW on 30 September 2016 and 11 October 2016.

Table 17 WaterNSW actual and forecast capital expenditure (Coastal Valleys, User Share only, current determination period, $000s, $2016/17)

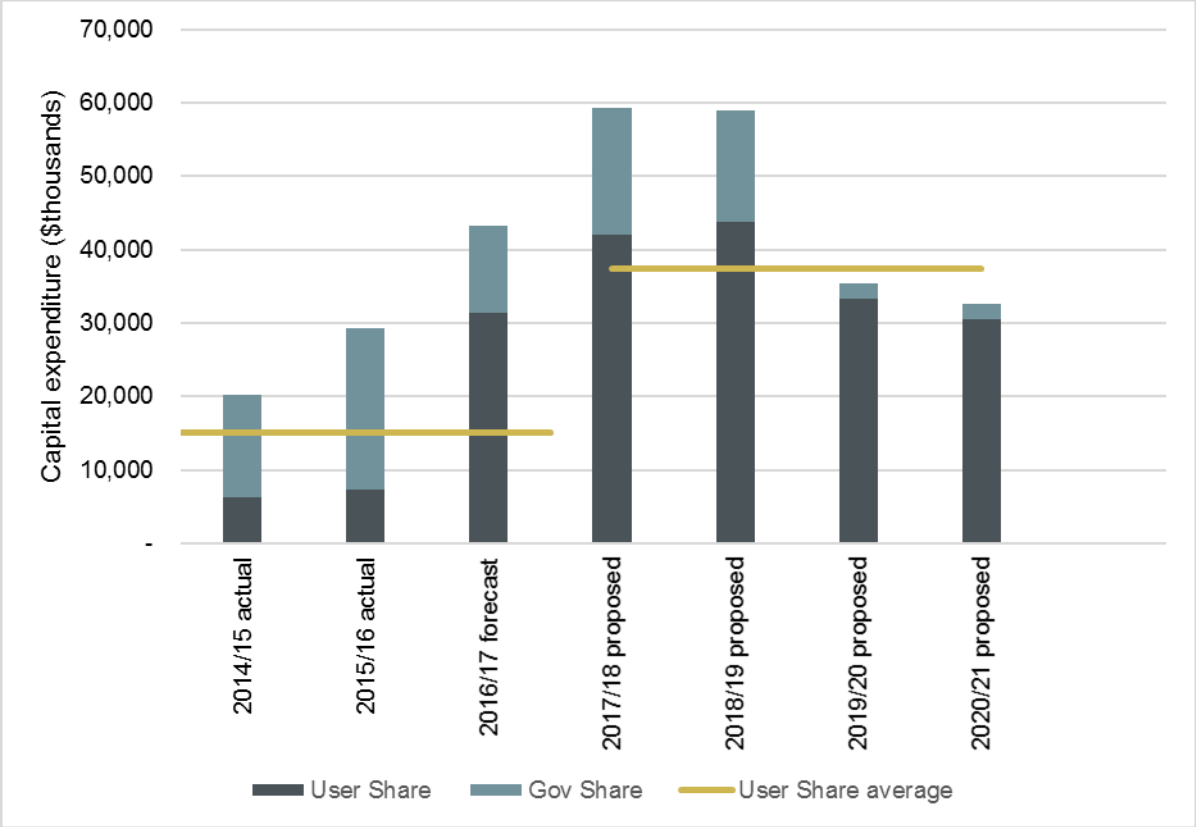
	2010-11 actual	2011-12 actual	2012-13 actual	2013-14 actual	2014-15 actual	2015-16 actual	2016-17 fore-cast	Total
IPART determination	908	561	438	213	N/A	N/A	N/A	
WaterNSW actual / forecast expenditure	983	882	1,275	805	347	507	1,153	5,953

Source: All data sourced from WaterNSW Pricing Proposal to the Independent Pricing and Regulatory Tribunal, Regulated prices for the NSW Rural Bulk Water Services from 1 July 2017 to 30 June 2021, 2016, Figure 27 p.126.

4.4. Review of proposed capital expenditure in next determination period

4.4.1. Characteristics of expenditure profile and changes from previous determination period

WaterNSW's proposed capital expenditure over the next determination period, 2017-18 to 2020-21, is presented graphically in Figure 15 which also illustrates the historical capital expenditure over the years 2014-15 to 2016-17 for comparative purposes. On a Total and User Share basis the forecast for the next determination period represents a significant increase over expenditure in the current determination period. The proposed User Share of expenditure has increased significantly, as indicated by the trend line contained within Figure 15. The past three years includes a significant Government Share contribution ($47.8 million) leaving a total User Share contribution of $45.4 million, an annual average User Share of $15.0 million. The total Government Share over the next determination period is forecast to be approximately $36.8 million over the four year period, with a much greater total User Share contribution of $149.7 million, an annual average of $37.4 million. Most of the Government Share in the next determination period comprises the Keepit Dam upgrade, with some contributions to environmental works (50%) and renewal works (10% for all valleys except Fish River and Lowbidgee which are 100% User Share).



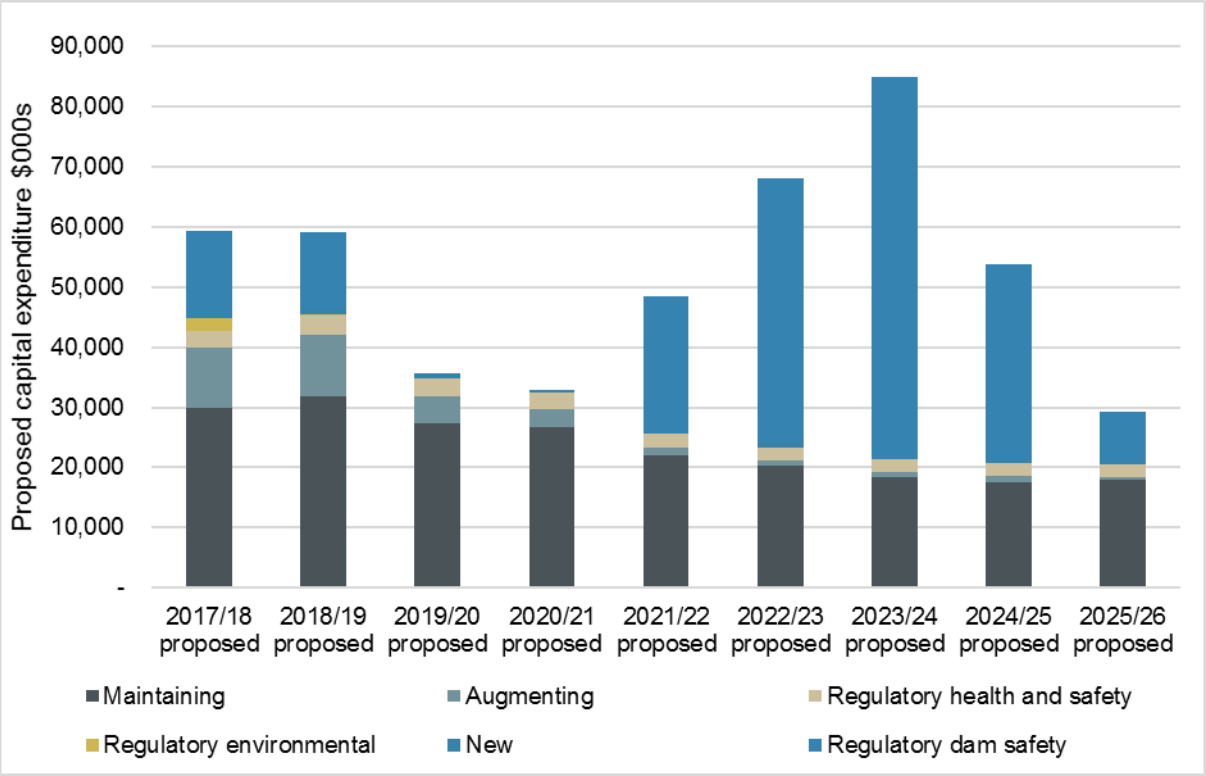
Source: All data sourced from WaterNSW Pricing Proposal to the Independent Pricing and Regulatory Tribunal, Regulated prices for the NSW Rural Bulk Water Services from 1 July 2017 to 30 June 2021, 2016, tables 102, 103, 104; Figure 33, and the 2016/17 forecast revision provided by WaterNSW. Reforecasts were provided by WaterNSW on 30 September 2016 and 11 October 2016.

Figure 15 WaterNSW actual and proposed expenditure by User Share and Government Share, 2014-15 to 2021-22

WaterNSW has provided a capital expenditure forecast out to 2025-26, which is illustrated in Figure 16 broken down by the expenditure categories however this is only broken down by Government and User Share until 2021-22. Average annual capital expenditure in the next determination period is $446.6 million, and $57 million from 2021-22 to 2025-26. Compared to the current determination period there is a significant change in the mix of capital expenditure, with only $17 million (average $5.9 million per annum) allocated to the equivalent 'Maintaining capability' category in the current determination period versus a proposed $115 million ($28.9 million per annum) for the next determination period. During interviews, WaterNSW explained that during previous determination periods asset renewals were often rolled up into other projects where the primary driver was augmentation or to provide new capability, and estimated this as 10% of major projects or about $25 million over the period. However, we were not able to validate this value and believe that it is more likely between $6.7 and $15.2 million over 3 years based on 10% of historical expenditures excluding renewals and other projects that may not have associated renewals work.

There is relatively little new capacity or environmental works planned, only 1.1% and 1.2% of the next determination period program respectively, though there remains a substantial level of expenditure allocated to augmenting capability (14.8%). WaterNSW advised there was no noticeable change in service degradation due to the current level of expenditure on renewals being less than originally planned, though advised that further delays in intervention may result in more costly interventions in future.

Excluding regulatory dam safety expenditure, which for each valley other than Fish River and Lowbidgee, is typically a 100% Government Share item, the average annual capital expenditure during the next determination period is $39.9 million, reducing to an average of $22.5 million for 2021-22 to 2025-26. In other words, User Share capital expenditure is forecast by WaterNSW to decline from 2021-22 onwards though still comfortably above the average in the current determination period (2014-15 to 2016-17).

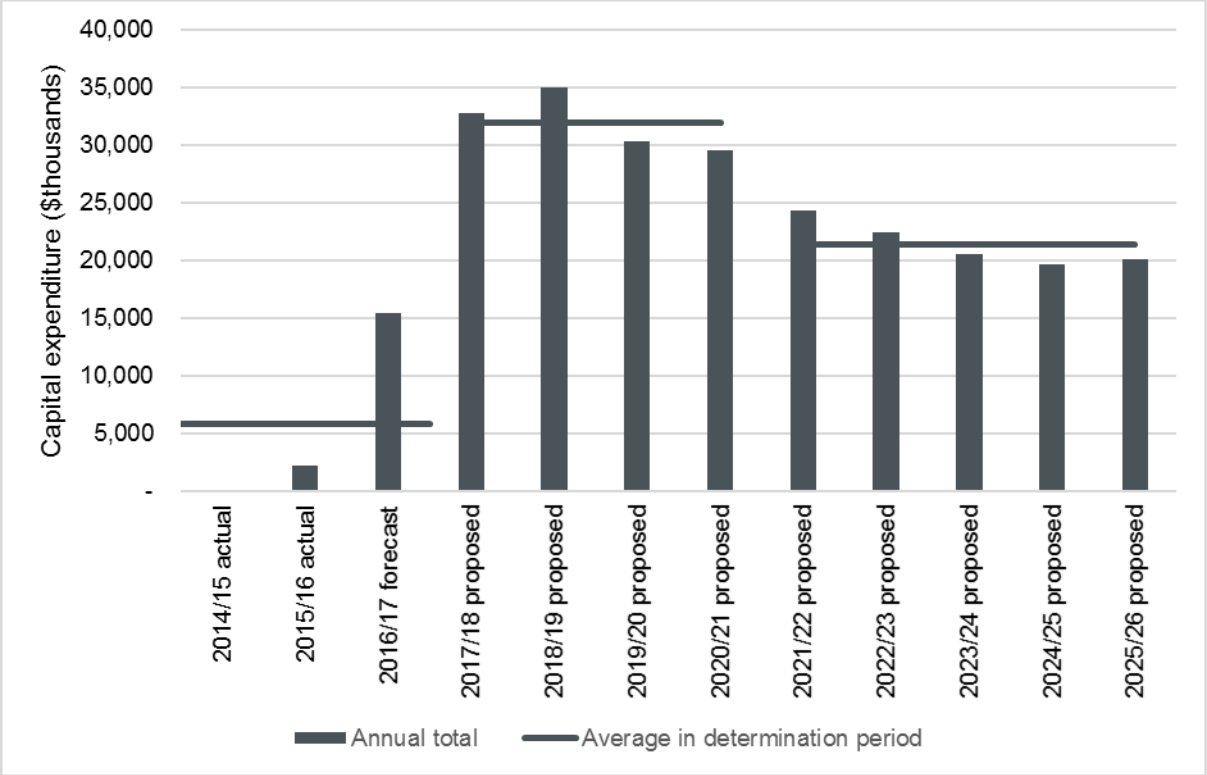


Source: WaterNSW's spreadsheet provided September 2016 with filename 'Project list - draft selection.xlsx.

Figure 16 WaterNSW long term proposed capital expenditure by category

Figure 16 shows that WaterNSW is proposing to spend most (62%) of the forecast expenditure during the next determination period on the 'maintaining capability' category. WaterNSW is forecasting expenditure on the 'augmenting capability' category to average $6.9 million per annum in the next determination period, dropping to an average of $0.9 million over the following five years.

The trend of expenditure on renewal and replacement expenditure including 'maintaining capability' and 'regulatory – health and safety' is illustrated in Figure 17. This shows the average annual expenditure on renewals is proposed to rise from approximately $5.9 million in the current determination period to $31.9 million in the next determination period, before reducing to $21.4 million thereafter. The uplift in expenditure is an annual average of $26 million or 443%



Source: WaterNSW's pricing proposal and spreadsheet 'WaterNSW Information request - 2017 Determination.xlsm' (for actual/forecast expenditure to 2016/17), and WaterNSW's spreadsheet provided September 2016 with filename 'Project list - draft selection.xlsx (proposed expenditure from 2017/18 onwards). Reforecasts were provided by WaterNSW on 30 September 2016 and 11 October 2016.

Figure 17 WaterNSW long term proposed capital expenditure; maintaining capability, all valleys

Allocations to the expenditure categories within the program are consistent with that seen in other water businesses across Australia, which (for the most part) all saw step changes in investment for new-build projects in response to the drought conditions experienced over the last decade and a half. Expenditures for other recent water pricing determinations across Australia have been weighted towards renewal (maintenance capital) of existing assets with few water augmentation projects planned.

Expenditure on dam safety is represented by the top column in Figure 16. The second highest expenditure is for 'regulatory dam safety', which is primarily comprised of a single project (Keepit Dam, $26.0 out of $27.0 million); WaterNSW has forecast a number of large projects from 2021-22 onwards, with average annual expenditure of $34.5 million. It should be noted that following discussions during interviews WaterNSW advised the need for many of these projects (in following determination periods, e.g. post 2020-21) is directly linked to current dam safety regulations. As these regulations are under review the need and scope of these major projects will undergo review once the regulatory changes are determined. Given this is not within the next determination period this is not material to the current review.

In the Regulatory Environmental category, works at Walgett Weir, introduced by WaterNSW as a change to the 2016-17 and 2017-18 programs, are estimated at $1.62 million in each of 2016-17 and 2017-18, with spending on fishways comprising a total of $438,000. This is a significant reduction in environmental expenditure compared to previous determination periods which contained numerous fishway projects. WaterNSW has worked closely with regulators and stakeholders to achieve optimal outcomes where works for 'offset' type works can be carried out in the most appropriate location achieving the same outcome for typically less expenditure.

In summary WaterNSW is forecasting a significant uplift in capital expenditure over the next determination period from the current determination period, particularly on a User Share basis. This is followed by what is likely to be a smaller program from 2021-22 onwards for remaining expenditure categories other than 'regulatory dam safety', dominated by 'maintaining capability', though still above the long term average. Key aspects of the proposal are:

- Capital expenditure on a 'User Share' basis to increase significantly from an annual average of $32.8 million in the current determination period to $37.4 million in the next. This is due primarily to an uplift in maintaining capability expenditure with a secondary driver expenditure on augmenting capability- primarily corporate systems expenditure.
- Renewal and replacement expenditure (including Maintaining Capability and regulatory – health and safety) is forecast to rise significantly from average annual expenditure of $5.9 million in the current determination, up to $31.9 million before falling to $21.4 million in following years, an average annual uplift of $26 million or 443%. This suggests a backlog of renewal works, a different forecasting approach, that works are being brought forward, or a combination; these issues are explored in more detail in the following section.
- Significant expenditure ($27.7 million) planned within the Augmenting Capability category during the next determination period, driven mainly by investment in new ICT systems; with little expenditure in the years following.
- Regulatory Dam Safety expenditure dominated by one project in the next determination period (Keepit Dam), with several other large projects in the forward plan but doubts remain over the need with dam safety regulations changing.
- Excluding Regulatory Dam Safety which is typically 100% Government Share the expenditure profile has a significantly higher expenditure average annual expenditure in the next determination period ($39.9 million) compared to the following years in the forward program, e.g. 2021-22 onwards ($22.4 million).
- A lack of expenditure in the 'New' category is consistent with that seen elsewhere in Australia.

4.4.2. Review of renewals expenditure

Within the overall 'Maintaining Capability' expenditure category ($115.6 million), WaterNSW has made an allocation within each valley for asset renewals totalling $82.2 million. This excludes a further $45.4 million allocated to other asset renewal works within WaterNSW's proposed capital expenditure program for corporate, workforce health and safety, SCADA and electrical renewals that are discussed in the next section.

WaterNSW's process for identifying asset renewals to include within the proposed capital expenditure program on this 'per valley' basis is illustrated by Figure 18 below, with the green chevron indicating where WaterNSW currently is in the process:

Source: WaterNSW response to Aither Initial Information Request Q14 Responses (numbers 1, 2, 4, 7, 10, 11, 15) – Capex Project Sample, provided 5 October 2016

Figure 18 Simplified representation of the process of developing and delivering the renewals program

With such a large portion of WaterNSW's proposed capital expenditure reliant on this process an assessment was made of WaterNSW's approach to forecasting asset renewals. The detail for this is

contained within Section 8.1. The review team found that the overall process for identifying and delivering asset renewals was sound and should lead to prudent and efficient expenditures being made. However, we note that the expenditure forecasts are made before the full process is completed and hence the process may not lead to prudent forecasts of expenditures.

Three of the thirteen 'per valley' renewals expenditure items were also reviewed in detail, the write-up for which is contained within Section 8. The items reviewed together with WaterNSW's proposed expenditure over the four year period are:

- Fish River - $11,628,000
- Hunter - $4,823,000
- Murrumbidgee - $30,445,000

The review team found that within each valley there were a handful of identified works that had undergone some level of investigation and design but typically no detailed work had been carried out to validate the need, identify and assess options or undertake cost benefit analysis beyond the review workshop undertaken during the budgeting process.[62] This is because the majority of the forecast asset renewal expenditures have not yet been subjected to the rigor of a business case development and approval process. According to WaterNSW's capital planning process, only expenditures that pass this process are considered to be prudent and efficient. Hence, it is not necessarily the case that all of the forecast expenditures will proceed.

WaterNSW's approach to forecasting expenditure required for asset renewals was found to be inherently conservative. This leads to a bias to forecasting intervention with capital works, rather than to identify and implement other less costly solutions that might be adopted when the 'Approval to Spend' step in the process is undertaken. This is due to a lack of granularity in the condition assessment and criticality as discussed in Section 8.1.

An assessment of the amount of forecast expenditure that might not proceed following the business case development and approval process was made by comparing historic expenditure with the forecast expenditures, adjusting for differences in expenditure classifications between the two periods and other factors detailed further in Section 8.1. As a result, the review team are recommending a reduction in capital expenditure be made across all 'per valley' renewals expenditures. WaterNSW's proposed expenditure and the review team's recommended expenditure is presented in the table below, the difference between the two totalling $21.0 million in the next determination period.

Table 18 All 'per valley' Renewals proposed and recommended capital expenditure ($000s, $2016/17)

Valley	FY18	FY19	FY20	FY21	Total
WaterNSW proposed					
Border	87	98	91	87	362
Fish River	2,779	3,141	2,922	2,785	11,628
Gwydir	728	823	765	730	3,046
Hunter	1,153	1,303	1,212	1,155	4,823
Lachlan	2,643	2,987	2,778	2,648	11,056

[62] In response to this statement in the draft report, WaterNSW stated that it considers the work carried out to date is appropriate for budgeting purposes, suggesting that needs validation has been carried out, and that cost benefit analysis is embedded in the (Assetbank) tool. However, the reviewers stand by the views presented here.

Valley	FY18	FY19	FY20	FY21	Total
Lowbidgee	1,483	1,676	1,559	1,486	6,203
Macquarie	1,768	1,999	1,859	1,772	7,398
Murray	394	445	414	394	1,647
Murrumbidgee	7,203	8,141	7,573	7,218	30,135
Namoi	844	954	888	846	3,533
North Coast	200	226	210	200	836
Peel	173	195	182	173	723
South Coast	183	207	192	183	766
Total	*19,638*	*22,194*	*20,646*	*19,677*	*82,155*
Recommended					
Border	64	73	68	65	270
Fish River	2,068	2,338	2,175	2,073	8,653
Gwydir	542	612	570	543	2,267
Hunter	858	970	902	860	3,589
Lachlan	1,967	2,223	2,068	1,971	8,228
Lowbidgee	1,103	1,247	1,160	1,106	4,616
Macquarie	1,316	1,487	1,384	1,319	5,505
Murray	293	331	308	294	1,226
Murrumbidgee	5,361	6,059	5,636	5,371	22,427
Namoi	628	710	661	630	2,629
North Coast	149	168	156	149	622
Peel	129	145	135	129	538
South Coast	136	154	143	136	570
Total	14,615	16,517	15,365	14,644	61,140
Adjustment	(5,023)	(5,677)	(5,281)	(5,033)	(21,014)

Source: All data sourced from 'Sheet 1' of 'Project list - draft selection.xlsx' MS Excel file provided by WaterNSW, September 2016.

4.4.3. Review of sample capital expenditure

In addition to the three asset renewals projects noted in the previous section 4.4.2, 14 capital expenditure items were selected for review. This section addresses this sampled capital expenditure relating to the next determination period, although some of these expenditure items also cover the current determination period.

Of the 14 items of expenditure examined the review team found that 8 were not prudent and efficient in their current form with the outcome summarised in Table 19 below. Of the 8 not found to be prudent and efficient, a partial finding was found for 7 of them. The reasoning for the findings are specified within the write-up of each item in Section 8.

The review team found there was little demonstration by WaterNSW that the expenditure is justified, with two critical steps in the WaterNSW process still to occur for the majority of the proposed works: the 'risk based prioritisation/substitution' and 'approval to spend (business case)' steps (refer Figure 18). We note that only a small number of renewal projects forecast to commence by 1 July 2017 have been through these processes. For the remainder, a list of works has been identified via a budgeting process without the justification of the expenditure. In most cases no options had been developed nor any basic analysis of the costs and benefits. Expenditures within the Augmenting category were generally better justified, e.g. in the case of ICT/business systems expenditure, than within the 'Maintaining' category. Operational technology expenditures such as SCADA within the Maintaining category were poorly justified without clear articulation of the needs and benefits of making the expenditures.

As detailed within the write-up of each sampled item (refer Section 8) a need was demonstrated to a high level for all expenditure sampled, except for the Dam Surveillance Instrumentation Upgrades. A need was often apparent to the review team as applicable to the group of rural valleys in a given program but specific needs at specific sites was not demonstrated; in this case the prudency was considered to have been partially demonstrated. During interviews with WaterNSW it was not apparent whether the project is of a business efficiency nature (e.g. with reductions in opex due to less site visits required), meeting current dam safety or security requirements, or meeting additional needs not currently being met. The efficiency of the proposed expenditure was not demonstrated well with most having no options identification or analysis carried out nor cost benefit analysis to prove that the expenditure would deliver claimed benefits or cost savings.

Within the sampled expenditures, the scope of works was generally not well defined and not demonstrated as being the appropriate scope to address the need. The optimal timing of the proposed expenditure was also not generally demonstrated. In most cases, WaterNSW stated that the scopes would be defined during the 'Approval to Spend' stage of each project's life cycle prior to seeking internal funding approval, but that these refinements are not available to inform the expenditure forecasts at this time, even for projects planned to commence in 2017.

In most cases the sampled expenditure related to other items of expenditure within the plan, so any adjustments deemed necessary were also applied to the other items within that grouping. In some cases a view was taken across all expenditure items within a group for example with Electrical Switchboards and Power Upgrades.

The review team's recommended capital expenditure is detailed in Section 4.8.2, taking into account the review of sample capital expenditure, the review of renewals undertaken in the previous section, WaterNSW's overall processes and procedures, and the deliverability of the capital expenditure. Where noted the recommended change in expenditure applies across not just the item reviewed but all items in the same grouping, with the total reduction across the group indicated. This amount is broken down in detail within Section 8.

Table 19 Outcome of prudency & efficiency review of sampled capital expenditure ($2016-17)

Item name	Valley	Prudency & Efficiency finding	Total recommended change in capital expenditure
Fish River Renewals - Safety	Fish River	Full	-
Redacted item	*	*	*
Lachlan - Carcoar 5 year inspection	Lachlan	Full	-

Item name	Valley	Prudency & Efficiency finding	Total recommended change in capital expenditure
Lachlan Valley - Electrical Switchboard & power upgrades	Lachlan	Partial	($1,016,000) (total applied across all electrical switch items)
Lowbidgee Safety Renewals	Lowbidgee	Full	-
Macquarie - Automation and Communications Renewals & Upgrades	Macquarie	Partial	($570,000) (total applied across all automation items)
Macquarie - Dam Surveillance Instrumentation Upgrades	Macquarie	Nil	($3,801,000) (total applied across all dam surv items)
Corporate wide project - Communications Strategy	Corporate wide	Fully	
Corporate wide project - ICT Renewals & Replacement	Corporate wide	Partial	($2,802,000) (only applies to this item)
Corporate wide project - Water NSW ERP - P6	Corporate wide	Fully	
Rural Valleys wide project - Operational Systems Programme	Rural wide	Partial	($2,018,000) (only applies to this item)
Rural Valleys wide project - Renewal & Replacement Asset Engineering	Rural wide	Fully	($1,780,000) (only applies to this item)
Rural Valleys wide project - Motor Vehicles	Rural wide	Fully	
TOTAL			**($12,368,000)**

Notes: Where noted the recommended change applies to all items within an expenditure grouping. * Denotes redactions made at the request of WaterNSW.

4.5. Heritage assets

IPART requested that the review team identify 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's Heritage Management Action Plan (Ref CD2015/40) identifies 45 assets across WaterNSW's business. WaterNSW advised the review team that it does not have any capital expenditure identified for heritage assets.

4.6. 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. In the WaterNSW (rural) Model for determination commencing 1 July 2017 WaterNSW has presented the average useful life of assets across each valley, for both new assets and for existing assets, as presented in Table 20. The regulatory framework provides for an allowance for regulatory depreciation, which provides a return of capital. In the 2014 determination final decision the ACCC applied a valley-by-valley approach to asset lives, which was a change from the previous State Water approach of using a single average asset age across all assets and all valleys. WaterNSW has used this same approach, updating remaining asset lives for existing assets and making an assessment of expected asset lives based on the proposed capital expenditure.

Table 20 Average asset lives (in years) reported by WaterNSW within the WaterNSW (rural) Model for determination commencing 1 July 2017

Valley	Remaining assets		New assets	
	User share	Gov share	User share	Gov share
Border	55	52	50	80
Gwydir	59	56	40	80
Namoi	58	57	31	100
Peel	64	72	41	92
Lachlan	48	55	60	83
Macquarie	55	56	58	80
Murray	44	42	56	80
Murrumbidgee	41	36	67	80
Lowbidgee	75	0	80	0
North Coast	74	77	62	80
Hunter	74	76	58	80
South Coast	74	81	68	80
Fish River	68		65	

Source: All data sourced from 'Water NSW (rural) Model for determination commencing 1 July 2017', worksheet 'Average life table' worksheet of the Excel file named 'Water NSW Model 2016.xlsm' provided by on 29 August 2016.

The unweighted average of all data within this table is approximately 65 years. For new assets the unweighted average is 69 years and 60 years for existing assets. 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'.

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 current determination, this is further supported by our understanding that the assets that WaterNSW

has constructed over this determination 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. not dams).

In the review team's view, adopting a single asset life for new assets per valley 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 determination periods. In turn, this impacts on the timing of depreciation related cash flows, and thus risks under or overcharging customers in any particular determination period.

On balance, the review team recommends the status quo be applied until IPART (and the ACCC) can agree on a modified approach that would apply industry wide. No recommendations for change are made with respect to this determination.

4.7. Deliverability of capital expenditure

The ability or perceived likelihood of WaterNSW to deliver on the proposed capital expenditure as planned, was considered. With the performance in recent years being that of under-expenditure and hence over-recovery of revenue, delivery of capital expenditure warrants examination, especially with a significant uplift planned in 2016-17 and beyond compared to expenditure in 2014-15 and 2015-16.

With a substantial proposed increase in capital expenditure on an average annual basis from that achieved in the current determination period, on face value WaterNSW's plans to achieve higher levels of capital expenditure are a challenge. A closer look reveals the expenditure proposed for 2017-18 was not much more than *forecast* in 2016-17 which gives more confidence that 2017-18 is not too much a stretch target. It is important to note this does not include consideration of the reforecast WaterNSW provided on 29 November 2016 which includes bringing forward expenditure that was planned to take place in the next determination period and adding additional expenditure for projects not previously identified.

When examining documentation provided by WaterNSW in response to request for information on individual items of capital expenditure it was clear many items of expenditure nominally listed for 2017-18 had not been advanced beyond being a line in the expenditure plan with a body of work required to advance individual projects or programs through the gated processes. Key exceptions include Keepit Dam which is well advanced, pipeline works at Fish River, and other selected renewals projects (Redbank Weir and Maude Weir coatings; Lowbidgee WHS renewals). ICT/business systems expenditure in general is also well documented and the review team has reasonable confidence of expenditure proceeding as planned.

In order to form a view on future performance the review team looked to WaterNSW's past performance. In the current determination period there was a period of around a year when WaterNSW took time to plan the capital expenditure program, undertake preliminary work and then take works to market and appoint contractors. When asked directly what would be the first expenditure undertaken from July 2017 the answer consistently was that there is no firm plans yet beyond the handful of projects such as Keepit Dam, Fish River pipeline and ICT/business system projects, and that all other expenditure has to go through the WaterNSW approval process, which is rigorous, before any expenditure could be confirmed. Another reason provided was that the procurement approach/strategy is still being worked on with assistance from KPMG.

There is an inherent risk that the proposal by WaterNSW for a 'front end loaded' capital expenditure program may be unrealistic in its current form given the past experiences with project delivery and

WaterNSW's admission that planning has yet to be advanced and the procurement strategy is still being refined. While expenditure could potentially be deemed prudent and efficient, it may not be realistic to expect delivery of a significant uplift in expenditure in year 1 followed by a downward trajectory (as has been proposed). The reforecast for 2016-17 provided by WaterNSW on 29 November 2016 included taking $5.41 million from future years illustrates that the capital expenditure program is quite fluid, subject to frequent changes. Mitigating and reducing these inherent risks somewhat is that expenditure for several larger projects is advanced, including Keepit Dam, Fish River pipeline works, and several ICT projects, and WaterNSW has a further six months to finalise delivery and procurement mechanisms for the balance of the program, particularly the renewal works.

The review team's conclusion is that the overall quantum of the program (at the level of expenditure recommended by the review team) should be achievable for WaterNSW over the four year period, while risks remain over whether expenditure will occur on the year to year basis outlined. Mitigating this, if there was any re-phasing that may occur with planned expenditure from 2017-18 pushing into subsequent years, this still leaves WaterNSW time to catch up with expenditure declining in each year of the next determination period. In summary the review team concludes the program is deliverable by WaterNSW based on the revised level of expenditure recommended.

4.8. Recommended capital expenditure

The review team's conclusions following the capital expenditure assessment are summarised in this section. The review team's recommended capital expenditure is less than that of WaterNSW forecast for the current determination period and that which has been proposed for the next determination period.

4.8.1. Current determination period

Under the scope of work for this expenditure review, the review team must: "assess, report and provide recommendations on the prudence and efficiency of past capital expenditure for the period 2010-11 to 2016-17 for coastal valleys and 2014-15 to 2016-17 for inland valleys."

Following the review of WaterNSW's actual and forecast capital expenditure, the review team was satisfied actual expenditure incurred, or forecast for the remainder of the 2016-17 financial year will be prudent and efficient, however this did not include assessment of the proposal by WaterNSW on 29 November 2016 for new and brought forward works. The ability of WaterNSW to deliver the works as planned was considered and appeared reasonable though 'at risk' with the planning by WaterNSW to bridge the gap indicating plans were generally 'on track' to deliver as forecast. The forecast is fluid however with quite a number of changes proposed since WaterNSW's forecast within the June 2016 pricing proposal. Recommended capital expenditure for the current determination period is as per Table 21 and Table 22 below.

Table 21 Recommended capital expenditure (MDB Valleys, User and Government Shares, current determination period, $000s, $2016-17)

	2014-15 actual	2015-16 actual	2016-17 forecast	Total
ACCC determination	41,830	31,374	46,707	119,911
WaterNSW actual/forecast expenditure	19,943	28,697	49,436	98,076
WaterNSW addition 30/9/2016	0	0	1,620	1,620
WaterNSW revised actual/forecast 30/9/2016	19,943	28,697	51,056	99,696
WaterNSW subtraction 11/10/2016	-	-	(9,698)	(9,698)
WaterNSW revised actual/forecast 29/11/2016	19,943	28,697	41,358	89,999
Recommended capital expenditure[a]	19,943	28,697	41,358	89,999
Difference between recommended and WaterNSW forecast/actual	0	0	0	0

Source: All data sourced from WaterNSW Pricing Proposal to the Independent Pricing and Regulatory Tribunal, Regulated prices for the NSW Rural Bulk Water Services from 1 July 2017 to 30 June 2021, 2016, Figure 27 p.126. Reforecasts were provided by WaterNSW on 30 September 2016 and 11 October 2016.

Note: a) Aither was asked by IPART to provide a recommendation on the prudence and efficiency of WaterNSW's past capital expenditure and to recommend a value for any capital expenditure considered imprudent or inefficient..

Table 22 Recommended capital expenditure (Coastal Valleys, User Share, current determination period, $000s, $2016-17)

	2010-11 actual	2011-12 actual	2012-13 actual	2013-14 actual	2014-15 actual	2015-16 actual	2016-17 forecast	Total
IPART determination	908	561	438	213	N/A	N/A	N/A	
WaterNSW actual/forecast expenditure	983	882	1,275	805	347	507	1153	5,953
Recommended capital expenditure[a]	983	882	1,275	805	347	507	1153	5,953
Difference between recommended and WaterNSW forecast/actual	0	0	0	0	0	0	0	0

Source: All data sourced from WaterNSW Pricing Proposal to the Independent Pricing and Regulatory Tribunal, Regulated prices for the NSW Rural Bulk Water Services from 1 July 2017 to 30 June 2021, 2016, p.126. 2016/17, since revised by WaterNSW. The reforecast was provided by WaterNSW on 30 September 2016.

Note: a) Aither was asked by IPART to provide a recommendation on the prudence and efficiency of WaterNSW's past capital expenditure and to recommend a value for any capital expenditure considered imprudent or inefficient.

The recommended expenditure on a User Share and Government Share basis is presented in Table 23.

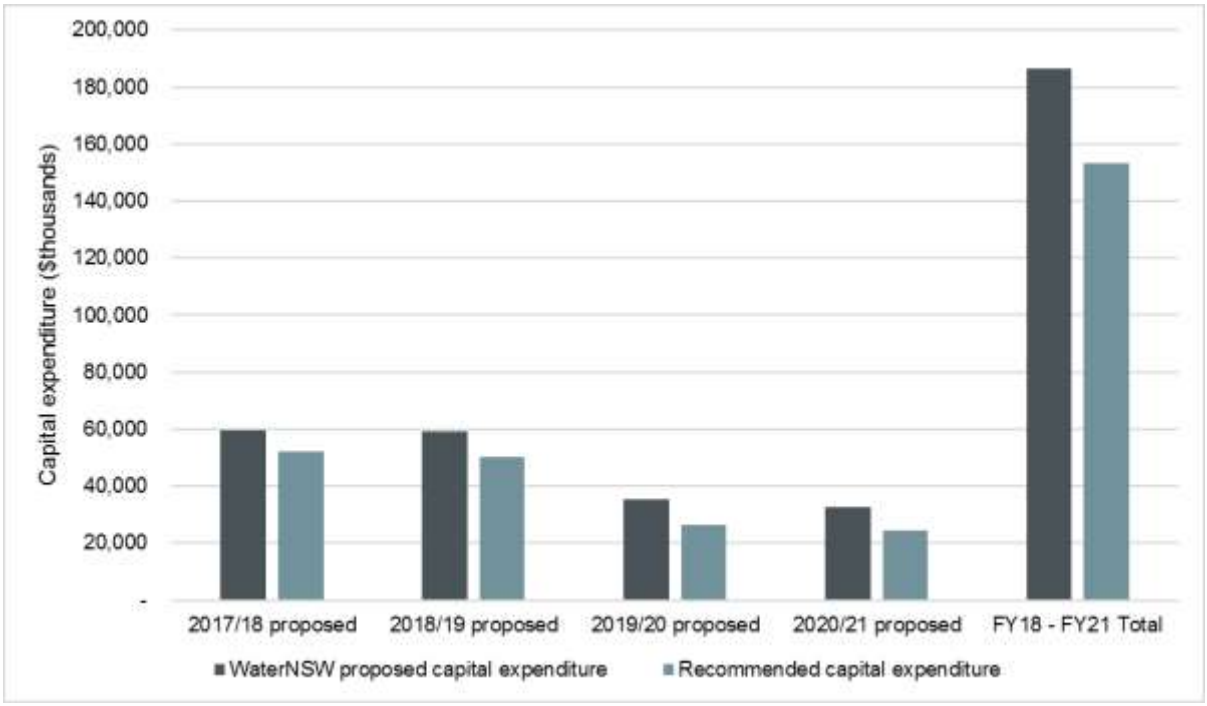
Table 23 WaterNSW actual/forecast and recommended capital expenditure (All Valleys, User and Government Share, current determination period, $000s, $2016-17)

	2014-15 Actual	2015-16 Actual	2016-17 Forecast	Total
WaterNSW actual/forecast				
User Share	6,304	7,347	31,385	45,036
Gov Share	13,986	21,898	11,957	47,841
Total	20,290	29,245	43,342	92,877
Review team recommended prudent and efficient expenditure				
User Share	6,304	7,347	31,385	45,036
Gov Share	13,986	21,898	11,957	47,841
Total	20,290	29,245	43,342	92,877

Source: All data sourced from Table 103 of WaterNSW Pricing Proposal to the Independent Pricing and Regulatory Tribunal, Regulated prices for the NSW Rural Bulk Water Services from 1 July 2017 to 30 June 2021. Reforecasts were provided by WaterNSW on 30 September 2016 and 11 October 2016.

4.8.2. Next determination period

Following the review of WaterNSW's proposed capital expenditure, the review team's recommended capital expenditure is less than that proposed by WaterNSW, as summarised in the tables below and in Figure 19. The review team was not satisfied the total capital expenditure proposed by WaterNSW would be prudent and efficient and is of the view that the actual capital expenditure required would be less than that forecast. Overall recommended capital expenditure is summarised in Table 24 and on a per valley basis in Table 26 and Table 27.



Source: All data relating to WaterNSW's proposed expenditure sourced from WaterNSW Pricing Proposal to the Independent Pricing and Regulatory Tribunal, Regulated prices for the NSW Rural Bulk Water Services from 1 July 2017 to 30 June 2021, 2016, Figure 27 p.126, since revised by WaterNSW. Reforecasts were provided by WaterNSW on 30 September 2016 and 11 October 2016

Figure 19 Recommended capital expenditure

WaterNSW proposed a significant increase in capital expenditure from the current determination period that is in excess of the review team's assessment of the level of prudent and efficient expenditure required. The program is front-end loaded with expenditure declining throughout the four year period, with the years following (2021-22 onwards) also having a significant drop off in expenditure for the maintaining and augmenting capabilities. The majority (62%) of proposed expenditure was for maintenance capital/renewal of assets, determined largely by a modelling process that was found to be conservative leading to over-estimates of expenditure. Other significant items of expenditure were shown to be immature in their development with little certainty over the need for the expenditure or that proposed scope and therefore expenditure is no more than that required to meet the stated need.

The review team's assessment does allow for an increase in capital expenditure based on WaterNSW's actual/forecast expenditure in the current determination period and recognises that WaterNSW has an increasing burden of expenditure required compared to the past determination period to renew assets that are beyond their useful life and in some cases posing unacceptable business and WHS risks. Assets constructed several decades ago are reaching the stage in life where they require remedial work or in some cases replacement. This includes the WHS related expenditure (approximately $12 million, 6.4% of the total program) which are categorised under the IPART expenditure category of 'renewal and replacement'.

The review team's assessment and recommendation recognises that WaterNSW requires significant investment in business systems in order to help unlock efficiencies from the merger, which have been accounted for in WaterNSW's operational expenditure forecasts.The evidence provided by WaterNSW did not demonstrate capital expenditure of $186.6 million was prudent and efficient however, with the review team recommending instead approximately $153.2 million as being the prudent and efficient expenditure required, a difference of $33.4 million. The average recommended capital expenditure by the review team is $38.3 million per annum which is higher than WaterNSW's

actual/forecast expenditure in the current determination period of $30.4 million per annum, though less than the $46.6 million per annum average proposed by WaterNSW. Of the approximate $33.4 million 'reduction', $21.0 million is related to valley-based asset renewals with the balance ($12.4 million) attributed to other expenditure.

The total recommended adjustments comprise the sum of all adjustments contained in Table 18 and Table 19, following the review of capital expenditure. This includes any adjustments on 'unsampled' capital expenditure based on findings from the review of sampled capital expenditure. No overall global top-down 'efficiency adjustment' or similar is proposed by the review team.

Table 24 Recommended capital expenditure (All Valleys, User and Government Share, next determination period, $000s, $2016-17)

	2017-18 proposed	2018-19 proposed	2019-20 proposed	2020-21 proposed	Total
WaterNSW original proposed expenditure	63,747	49,690	47,641	32,630	193,708
WaterNSW adjustment 30/9/2016	1,839	219	0	0	2,058
WaterNSW revised proposed expenditure 30/9/2016	65,586	49,909	47,641	32,630	195,766
WaterNSW revised proposed expenditure 11/10/2016	59,404	59,052	35,463	32,630	186,549
Recommended capital expenditure	52,264	50,075	26,472	24,356	153,166
Difference between recommended and WaterNSW proposed	(7,140)	(8,977)	(8,992)	(8,274)	(33,383)

Source: All data sourced from WaterNSW Pricing Proposal to the Independent Pricing and Regulatory Tribunal, Regulated prices for the NSW Rural Bulk Water Services from 1 July 2017 to 30 June 2021, 2016, p.126. Reforecasts were prvided by WaterNSW on 30 September 2016 and 11 October 2016. Total recommended adjustments are derived from the review team's recommended adjustments contained within Table 18 and Table 19 of this report.

Table 25 WaterNSW proposed and recommended capital expenditure (All Valleys, Government and User Share basis, next determination period, $000s, $2016-17)

	2017-18	2018-19	2019-20	2020-21	Total
WaterNSW proposed					
User Share	41,977	43,833	33,314	30,586	149,711
Government Share	17,427	15,219	2,149	2,044	36,838
Total	59,404	59,052	35,463	32,630	186,549
Review team recommended					
User Share	35,946	35,400	24,878	22,944	119,169
Government Share	16,171	14,727	1,642	1,458	33,997
Total	52,117	50,127	26,520	24,402	153,166

Source: All data sourced from WaterNSW Pricing Proposal to the Independent Pricing and Regulatory Tribunal, Regulated prices for the NSW Rural Bulk Water Services from 1 July 2017 to 30 June 2021, 2016, p.126. Reforecasts were provided by WaterNSW on 30 September 2016 and 11 October 2016.

Table 26 Recommended capital expenditure (By valley, User and Government Share, next determination period, $000s, $2016-17)

Valley	WaterNSW revised proposed expenditure	Recommended adjustments	Recommended capital expenditure
Border	1,137	(353)	784
Fish River	18,154	(3,678)	14,475
Gwydir	12,216	(2,095)	10,121
Lachlan	21,926	(4,584)	17,342
Lowbidgee	10,024	(1,603)	8,422
Macquarie	15,828	(3,736)	12,091
Murray	6,884	(777)	6,107
Murrumbidgee	42,872	(10,125)	32,746
Namoi	42,046	(3,076)	38,970
Peel	3,258	(521)	2,737
Total MDB Valleys	**174,345**	**(30,550)**	**143,796**
Hunter	8,826	(2,315)	6,511
North Coast	1,777	(283)	1,494
South Coast	1,601	(235)	1,365
Total Coastal Valleys	**12,204**	**(2,833)**	**9,371**
Total All Valleys	**186,549**	**(33,383)**	**153,166**

Source: All data sourced from WaterNSW Pricing Proposal to the Independent Pricing and Regulatory Tribunal, Regulated prices for the NSW Rural Bulk Water Services from 1 July 2017 to 30 June 2021, 2016, p.126. Reforecasts were provided by WaterNSW on 30 September 2016 and 11 October 2016. Recommended adjustments are derived from the review team's recommended adjustments contained within this report.

Table 27 Recommended capital expenditure (By year and valley, User and Government Share, next determination period, $000s, $2016/17)

Valley	WaterNSW proposed expenditure	Review team recommended capital expenditure				
		2017-18	2018-19	2019-20	2020-21	Total
Border	1,137	244	237	119	184	784
Fish River	18,154	4,121	4,829	2,829	2,696	14,475
Gwydir	12,216	3,384	3,060	2,152	1,525	10,121
Lachlan	21,926	5,568	4,891	3,673	3,210	17,342
Lowbidgee	10,024	2,022	2,273	2,113	2,014	8,422
Macquarie	15,828	3,718	3,539	2,191	2,644	12,091
Murray	6,884	1,741	1,787	1,321	1,258	6,107
Murrumbidgee	42,872	9,512	9,111	7,232	6,891	32,746
Namoi	42,046	18,882	16,298	2,080	1,711	38,970
Peel	3,258	987	796	488	465	2,737
Total MDB Valleys	**174,345**	**50,179**	**46,820**	**24,199**	**22,597**	**143,796**
Hunter	8,826	1,506	2,396	1,308	1,301	6,511
North Coast	1,777	326	480	454	234	1,494
South Coast	1,601	253	379	510	223	1,365
Total Coastal Valleys	**12,204**	**2,085**	**3,255**	**2,273**	**1,759**	**9,371**
Total All Valleys	**186,549**	**52,264**	**50,075**	**26,472**	**24,356**	**153,166**

Source: All data sourced from WaterNSW Pricing Proposal to the Independent Pricing and Regulatory Tribunal, Regulated prices for the NSW Rural Bulk Water Services from 1 July 2017 to 30 June 2021, 2016, p.126, since revised by WaterNSW. The reforecast was provided by WaterNSW on 30 September 2016. Total recommended adjustments are derived from the review team's recommended adjustments contained within Table 16 and Table 17 of this report.

5. Operating expenditure

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

5.1. Past operating expenditure

5.1.1. Objective of section

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, and
- provides the review team's opinion as to the prudency and efficiency of WaterNSW's historical expenditure, given the information available.

5.1.2. Review of past operating expenditure

The following table compares the allowed and actual operating expenditure for MDB valleys.

Table 28 Comparison of allowed and actual operating expenditure for MDB valleys ($2016-17, 000's)

	2014-15	2015-16	2016-17	TOTAL
ACCC opex allowance	41,639	41,530	41,021	124,190
WaterNSW actual opex	36,587	37,671	34,823	109,081
Difference	-5,052	-3,859	-6,198	-15,109
% Difference	-12%	-9%	-15%	-12%

Source: WaterNSW, Rural Regulatory Pricing Proposal, page 136

In summary, WaterNSW is expecting to out-perform the allowance set by the ACCC for MDB valleys by around $15.1m, or 12%. In its regulatory submission, WaterNSW states that the key reasons for the lower operating costs are:[63]

> *-restructuring within the organisation resulting in lower expenditure on salaries and wages and employee related costs*

[63] WaterNSW, *Rural Regulatory Pricing Proposal,* page 136

-reduction in the use of contractors and consultancies

-reduction in the cost of materials, plant and equipment.

The statements are corroborated by reviewing the combined P&L statement for Greater Sydney and Rural Valleys (see Figure 22 in later sections of this report), which shows a material decline in operating expenditure being spent on contractors and consultancies, and labour in particular, across the combined entity over the period being analysed.

That said, WaterNSW states in its submission that it has over-spent the operating allowances set by IPART in its last determination for coastal valleys by around $200,000 per annum in each valley. In its regulatory submission, WaterNSW explains the expenditure variances as follows:[64]

-North Coast: the IPART determination anticipated a reduction in staffing, from two to one with associated costs and reducing dam safety surveillance from seven to five days. The Dams Safety Committee did not allow for the reduction in surveillance and therefore costs increased as resources (staff) were required to travel from other storages to cover weekend shifts and days offs. Travel costs were greater than having two staff on site and thus the second staff member was reinstated

-South Coast: variations against the IPART determination are largely due to timing difference as to when major periodic maintenance needs to be incurred against the averaging of maintenance cost across the determination period.

Whilst we have not explicitly validated these statements, the inability to reduce staff to the levels assumed by IPART at the last review would explain much of the difference in outturn expenditure compared to approved expenditure – at least for North Coast.

In response to a specific question regarding whether or not the overall reduction in outturn costs impacted upon the level of service it provided its customers over the current period, WaterNSW has stated that:[65]

"WaterNSW continued to achieve full to high levels of compliance under the operating licence in 2014-15 and 2015-16 despite the reduction in operating expenditure"

This statement is generally verified by a review of the levels of service reported by WaterNSW in its regulatory submission for this period. For example, WaterNSW has achieved the following:[66]

- "Percentage of non-complying orders contacted within 1 day" – 99% and 100% for 2014-15 and 2015-16, both of which are very similar to previous years
- "Percentage of time flow targets met" – 89% and 99% for 2014-15 and 2015-16, the former was lower than previous years, but the latter was at levels consistent with previous years
- "Percentage of orders rescheduled notified within 1 day" – 41% (of only 17 orders) and 100% (of only 3 orders) for 2014-15 and 2015-16, which reflects a slight decline in the level of service, as compared to previous years, and
- "Actual % calls answered in 30 seconds" – 92% and 89% for 2014-15 and 2015-16, both up on previous years.

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64 WaterNSW, *Rural Regulatory Pricing Proposal,* page 137

65 WaterNSW, response to question 15

66 WaterNSW, *Rural Regulatory Pricing Proposal,* page 121 and page 122

WaterNSW also conducts customer satisfaction surveys every four years. The most recent survey was conducted by State Water in the first half of 2014. The results of the 2014 survey indicated that 92% of all customers surveyed were at least satisfied with the overall service provided, which was a slight improvement from 91% in 2010.[67]

Collectively, despite the slight over-expenditure in Coastal Valleys, this information indicates to us that WaterNSW (and the former State Water) responded to the underlying incentives in the regulatory framework to seek out efficiencies over the regulatory period, without materially compromising the levels of service it delivered to its customers. In particular, they have:

- sought out opportunities to reduce costs through more efficient processes and management initiatives – including via reduced contractors and consultancies, whilst
- continuing to provide levels of service that are broadly consistent with historic levels.

However, this does not automatically mean that WaterNSW's actual operating expenditure over the current regulatory period was prudent and efficient. It could be that WaterNSW's (or more specifically, the former State Water's) underlying starting cost structure was in fact too high, and therefore, its outturn expenditure higher than prudent and efficient levels, despite it outperforming its benchmarks.

To this end, the review team note that:

- The recent organisational restructure, in particular the merger of the former State Water and Sydney Catchment Authority, has led to efficiency savings, however this was not completed prior to the commencement of the current regulatory period. Prima facie, this indicates that WaterNSW's (or the former State Water's to be more accurate) outturn expenditure for its rural businesses in that first year *could not* have been consistent with levels of a prudent and efficient business, quite simply, because for that year, the structure of State Water was not efficient (i.e. technically, they were not adopting the most efficient organisational model or structure to deliver services to their customers) and
- During the Greater Sydney review process, WaterNSW indicated that not all of the proposed savings related to the greater economies of scale and scope that would result from merging the two legacy organisations, rather, some of the savings *would have been generated by management, even if the merger had not of occurred*. This appears to have been true in the case of the rural business.

Given both of these points, it is impossible for the review team to conclude that WaterNSW's outturn expenditure for its rural valleys was prudent and efficient **over the entirety of the current regulatory period**. However this observation is in part driven by the former structure of State Water, which, in many respects, was outside of the control of management.

5.2. Our understanding of WaterNSW's forecasting approach

Our understanding of WaterNSW's general approach to determining its proposed operating expenditure forecasts is as follows:

- It has relied on a benchmarking study to inform the development of its new organisational structure. This study, which WaterNSW provided to us as part of our review of its Greater Sydney regulatory proposal, was undertaken by Third Horizon. This organisation structure reflects the

[67] WaterNSW, *Rural Regulatory Pricing Proposal*, page 122

formation of WaterNSW on 1 January 2015, hence it reflects the efficiency savings (in terms of FTE's) they expect to achieve from the creation of the new entity.

- WaterNSW estimated the cost of every position in the new organisational structure for each year of the forthcoming regulatory period.
- Each staff member's time has been allocated to "Core", "Core Plus" and "Other" projects. All projects are in turn allocated to valleys (being rural valleys and Greater Sydney). The time allocation related to core projects[68] in each valley allows the determination of a dollar labour figure, using the labour rates for each position, for each valley.
- Time that has not been allocated to specific projects forms the basis of the "overhead"[69] cost pool, which in turn gets allocated between Greater Sydney and Rural Valleys based on a 55:45 split, which is consistent with the split assumed as part of the Greater Sydney review process.
- After accounting for any overhead that is capitalised, the remaining "net" overhead that has been allocated to rural valleys is further allocated to "Core", "Core Plus" and "Other", with only the amount related to "Core" projects being reflected in WaterNSW's rural pricing submission. This overhead is allocated to discrete valleys in proportion to the direct salary allocated to that valley.
- Other, non-direct labour related costs, such as contractors and consultants, electricity, chemicals etc. have been forecast by the relevant line managers based on a bottom-up forecasting approach.[70] This proposed operating expenditure is reviewed in detail by WaterNSW's finance team. This process includes challenging assumptions made by business units and if required adjustments (including reductions) are implemented and a final position is prepared.[71]

5.3. Approach to assessing forecast operational expenditure

Given the methodology that WaterNSW has adopted, our general approach to assessing WaterNSW's forecasting approach has been to:

- Undertake a high level analysis of WaterNSW's proposed future operating expenditure forecasts, to identify whether there are any particular areas of WaterNSW's operating expenditure forecast that are:
  - materially higher than historic levels, or
  - changing at a faster rate than might generally considered to be reasonable.
- Review, again, the Third Horizon benchmarking study that WaterNSW used to inform the development of its future organisational structure,
- Reconcile WaterNSW's starting operating expenditure figures with, in particular, the labour cost figures that were approved as part of the Greater Sydney review process earlier this year,

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68 WaterNSW defines "Core" projects as: "*Core - this segment consists of the regulated business activities of Greater Sydney and rural valleys (the subject of this pricing proposal). The direct costs of these businesses are tagged and allocated to each of rural valleys and Greater Sydney as appropriate.*" WaterNSW, *Rural Regulatory Pricing Proposal*, page 66

69 This can include both Corporate overheads such as HR and Finance, as well as "operational" or "indirect" overheads such as asset management.

70 WaterNSW, response to question 18

71 WaterNSW, *Rural Regulatory Pricing Proposal*, page 99

- Ensure that there is no double-counting or over-recovery of costs by WaterNSW across the three price determinations (Greater Sydney, Rural Valleys, and Water Administration Ministerial Corporation), by:
    - Confirming with WaterNSW that its forecasts did not include any costs associated with the Water Administration Ministerial Corporation ('WAMC'), the functions for which have recently transferred across to WaterNSW,[72] and
    - Seeking to ascertain whether or not WaterNSW's proposed approach for allocating overheads between its Greater Sydney and its Rural Valleys aligned with the methodology adopted as part of the Greater Sydney review, and where not, (a) the basis for any decision to adopt an alternative cost allocation approach, and (b) whether this might lead to a double-counting of costs (and hence an over-recovery) or an under recovery of costs across the Greater Sydney and Rural Valleys price determinations.
- Assess WaterNSW's approach to developing its labour cost forecasts,
- Assess at a high level, WaterNSW's non-labour cost forecasts, and where discrete components of those forecasts are either materially higher than historic levels, or changing at a faster rate than might otherwise be expected, review those components in more detail,
- Assess the impact on WaterNSW's proposed levels of service, and in particular, assess in detail, discrete categories of expenditure that are likely to impact on those levels of service, and
- Assess whether WaterNSW's proposed approach to allocating costs between Users and Government is reasonable, and consistent with the previous framework for allocation prescribed by IPART.

Each of these issues is discussed in more detail in the following sections

5.4. High level analysis of WaterNSW's forecast operating expenditure

The following figure is an extract from WaterNSW's regulatory submission regarding its operating expenditure forecasts.

[72] As part of enabling WaterNSW to carry out functions of WAMC in relation to delivering water, all customer transactional dealings, all in-field services and resource management for groundwater and surface water, there was a transfer of employees from DPI Water to Water NSW. This occurred on 1 July, 2016.

$'000	2015-16	2017-18	2018-19	2019-20	2020-21	Total	User Share
Water Delivery & Other Operations	5,654	7,101	6,563	6,337	5,970	25,972	100%
Flood Operations	291	0	0	0	0	0	50%
Hydrometric Monitoring	5,730	4,550	4,550	4,550	4,550	18,200	90%
Water Quality Monitoring	502	528	490	490	475	1,982	50%
Corrective Maintenance	3,393	2,943	2,777	2,777	2,708	11,204	100%
Routine Maintenance	12,084	9,758	9,058	9,058	8,802	36,676	100%
Asset Management Planning	3,104	1,536	1,528	1,483	1,532	6,079	100%
Dam Safety Compliance	4,749	5,157	5,084	4,971	4,793	20,005	50%
Environmental Planning & Protection	1,513	914	911	991	990	3,806	50%
Corporate Systems	0	708	682	531	629	2,550	100%
Renewals and Replacement	6	35	33	33	32	131	90%
Direct Insurances	443	0	0	0	0	0	100%
Customer Support , Compliance and Other	5,782	6,951	6,780	6,776	6,706	27,213	100%
Allowance for Debt Raising Costs*	0	263	276	286	293	1,118	n.a
Total	43,198	40,442	38,731	38,282	37,481	154,936	

* Debt raising costs are included in operating expenditure as per section 3.5 (page 43) of the ACCC pricing principles. These costs have been calculated using the IPART financial model. We have applied a debt raising cost benchmark of 0.096% per cent, which was applied by the ACCC in its 2014 Final Decision. Itemising debt raising costs as an operational expenditure line item has no effect on WaterNSW's revenues and shifts a small proportion of revenue from the return on capital to the operating expenditure allowance component of the building blocks model.

Source: WaterNSW pricing submission.

Figure 20 Proposed gross operating expenditure by high level activities ($2016-17$'000)

At a general level, WaterNSW is forecasting declining operating expenditures for its rural business in real terms. This is despite WaterNSW's forecasts including an allowance of $3.6m per annum[73] from 2017-18 onwards for a new risk management product that it is proposing to purchase.

WaterNSW has previously noted that it is difficult to draw definitive conclusions regarding trends in expenditure for some cost categories, as some costs have shifted between categories. For example, regarding the "*Water Delivery and Other Operations*" category, WaterNSW has stated that "*some maintenance and IT expenditure has shifted into the water delivery category due to changes in service unit functions and the revised organisation structure*"[74], hence why it has increased relative to historic levels.

That said, WaterNSW has provided a number of comments against a number of these categories, some of which have been reproduced in the following 5 tables.

[73] WaterNSW, *Pricing Proposal to IPART for Rural Bulk Water Services, Briefing to Aither,* 14 September, 2016, slide 41

[74] WaterNSW, *Pricing Proposal to IPART for Rural Bulk Water Services, Briefing to Aither,* 14 September, 2016, slide 34

Table 29 Flood operations ($2016-17)

$'000	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Flood Operations	256	117	0	0	0	0

Source: WaterNSW, Pricing Proposal to IPART for Rural Bulk Water Services, Briefing to Aither, 14 September, 2016, slide 34.

WaterNSW states that "expenditure in this category is nil as WaterNSW is unable predict the occurrence of a future flood event".

Table 30 Hydrometric monitoring ($2016-17)

$'000	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Hydrometric monitoring	4,654	4,629	4,550	4,550	4,550	4,550

Source: WaterNSW, Pricing Proposal to IPART for Rural Bulk Water Services, Briefing to Aither, 14 September, 2016, slide 34.

WaterNSW states that "our contracted costs to DPI Water was $4.55M. This will now be an internal cost to us which will be in the same order".

Table 31 Water quality monitoring ($2016-17)

$'000	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Water Quality Monitoring	506	884	528	490	490	475

Source: WaterNSW, Pricing Proposal to IPART for Rural Bulk Water Services, Briefing to Aither, 14 September, 2016, slide 34.

WaterNSW states that "expenditure is constant over the period and is broadly in line with average actual cost".

Table 32 Routine maintenance ($201617)

$'000	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Routine Maintenance	10,426	11,812	9,758	9,058	9,058	8,802

Source: WaterNSW, Pricing Proposal to IPART for Rural Bulk Water Services, Briefing to Aither, 14 September, 2016, slide 35.

WaterNSW states that "*routine and corrective maintenance comprise the most significant component of opex representing approximately 31 per cent of total opex*" and that "*this category shows a step change decrease over the period compared to the 2010-2017 average*". In rationalising this, WaterNSW has stated that "*in line with asset capability routine maintenance activities are performed before breakdown to optimise the life-cycle elements, costs, whilst taking into account work health safety requirements and maintenance audit recommendations*" and "*there are trade-offs to be made between capex and opex to obtain optimal life cycle outcomes. The principle of life cycle cost optimisation has been considered in the development of our expenditure program*".

Table 33 Corrective maintenance ($2016-17)

$'000	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Corrective Maintenance	3,151	2,725	2,943	2,777	2,777	2,708

Source: WaterNSW, Pricing Proposal to IPART for Rural Bulk Water Services, Briefing to Aither, 14 September, 2016, slide 36.

WaterNSW states that "*this category shows decreases across the period compared to the 2010-2017 average*".

5.4.1. Summary

This information provides a high level indication that WaterNSW has developed its operating expenditure forecasts in a way that may potentially be too low. There are specific examples that look to be overly ambitious - for example, in relation to flood operations, whilst WaterNSW states that "*expenditure in this category is nil as WaterNSW is unable predict the occurrence of a future flood event*", in reality, the expected value (probability times consequence) of this expenditure item will almost certainly be non-zero. Theoretically, WaterNSW could have, if it had so chosen to, included an operating expenditure forecast (or potentially a self-insurance allowance) based on an actuarial analysis of the risk of flooding and the subsequent consequences (i.e., increased operating costs).

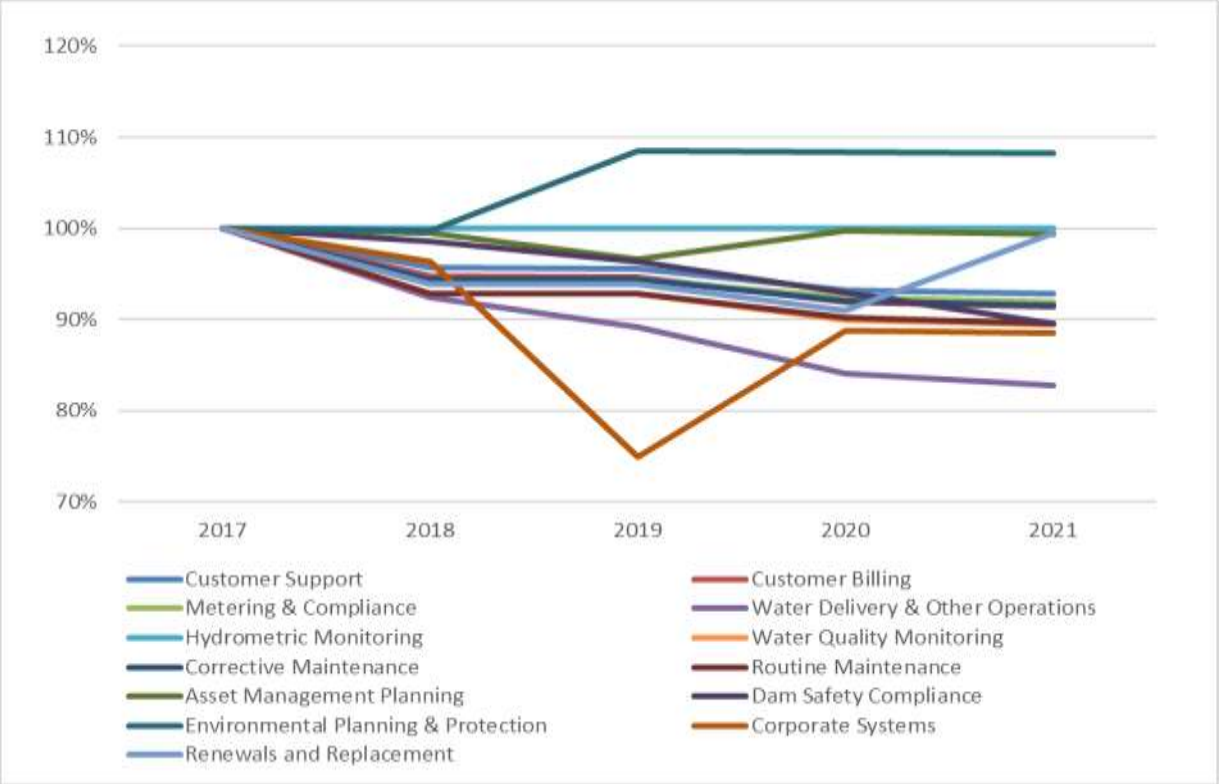
The following figure illustrates the percentage change in WaterNSW's operating expenditure forecasts – cut by the categories contained in the model accompanying its regulatory proposal[75] - over the regulatory period, relative to a base year of 2017. This analysis excludes WaterNSW's:

- Forecast cost of its proposed risk management product,[76] as it reflects a change in WaterNSW's risk profile, and is being assessed separately by IPART, and
- Allowance for debt raising costs.

[75] "WaterNSW Information request - 2017 Determination".xls

[76] Assessment of the proposed risk management product was not within the scope of this review.

Figure 21 Percentage change in OPEX over the regulatory period ($2016-17, base year 2017)



Source: OGW analysis, based on "WaterNSW Information request - 2017 Determination".xls

In real 2016-17 dollars, WaterNSW's submission only seeks an increase in one cost activity between 2017 and 2021, namely Environmental Planning, the dollar value of which is reasonably minor in the context of WaterNSW's overall operating expenditure forecast. All other activity areas are forecast to decline over the regulatory period in real terms.

On face value, this is likely to indicate that WaterNSW's basis for adjusting its operating expenditure forecasts over the regulatory period, may potentially be too low.

The same information was also reassessed by rural valley and is shown in the following table.

Table 34 Operating expenditure by valley ($2016-17)

$'000	2017-18	2018-19	2019-20	2020-21	2021-22	% annual change over period
Border	$1,256	$1,288	$1,292	$1,270	$1,257	**0.01%**
Fish River	$2,975	$2,954	$2,930	$2,857	$2,812	**-1.40%**
Gwydir	$3,818	$3,642	$3,626	$3,535	$3,520	**-2.01%**
Hunter	$3,345	$3,080	$3,090	$3,007	$2,952	**-3.07%**
Lachlan	$4,674	$4,258	$4,223	$4,105	$4,053	**-3.50%**
Lowbidgee	$381	$361	$359	$351	$349	**-2.14%**
Macquarie	$3,995	$3,823	$3,810	$3,718	$3,682	**-2.02%**
Murray	$2,737	$2,709	$2,679	$2,605	$2,573	**-1.53%**
Murrumbidgee	$6,872	$6,486	$6,169	$6,045	$5,996	**-3.35%**
Namoi	$3,904	$3,752	$3,740	$3,673	$3,640	**-1.74%**
North Coast	$812	$775	$769	$741	$738	**-2.36%**
Peel	$970	$926	$922	$903	$884	**-2.29%**
South Coast	$826	$786	$773	$763	$752	**-2.32%**
Total opex	**$36,564**	**$34,840**	**$34,382**	**$33,573**	**$33,207**	**-2.38%**

Source: WaterNSW, '*Information Request for the 2017 determination*', excludes debt raising costs and the risk transfer product and costs associated with the fishways strategy that was lodged subsequent to the lodgement of the regulatory proposal.

It can be seen that the expenditure forecasts that WaterNSW has included in its regulatory submission (again, excluding the risk management product and debt raising costs) are forecast to decline for every single valley, except Border (which increases very marginally).

Again, at a holistic level, this information would indicate that WaterNSW has adopted a basis for adjusting its operating expenditure forecasts over the regulatory period that may potentially be too low.

Further to the above, we analysed the information at an individual activity level to see whether there were any individual activities that were materially increasing over the regulatory period. This analysis was based on another spreadsheet that WaterNSW provided during the review process, titled: "17 RV Submission_opex calculations".xls.

Table 35 Detailed activities that are increasing by more than 3.5% per annum ($2016-17)

Detailed activity	2017-18	2018-19	2019-20	2020-21	2021-22	% annual change over period
20-year Infrastructure Strategy Fish River	$52,000	$61,346	$128,303	$140,051	$145,504	29.34%
20-year Infrastructure Strategy Macquarie	$65,536	$64,346	$132,593	$144,565	$150,128	23.03%
20-year Infrastructure Strategy Murray	$70,536	$69,346	$136,303	$148,051	$153,504	21.46%
Cold water pollution strategy	$51,661	$50,616	$85,891	$93,360	$95,578	16.63%
FRWS System - Metering & Compliance	$40,718	$65,859	$63,498	$63,507	$62,360	11.25%
20-year Infrastructure Strategy Peel	$31,406	$56,889	$38,995	$40,619	$40,317	6.44%
20-year Infrastructure Strategy Border	$130,883	$64,346	$132,593	144,565	$150,128	3.49%

Source: OGW, based on analysis of spreadsheet "17 RV submission_opex calculations.xls" provided by WaterNSW

To give context, Table 35 above reflects seven activity items (out of around 220) that are increasing by more than 3.5% per annum over that period. The 3.5% was used as a threshold test as to whether an activity's costs were increasing at potentially abnormally high rates.

When looked at collectively, the only key material activity area where WaterNSW is forecasting a significant increase in its operating expenditure over the regulatory period relates to its development of 20-year infrastructure strategies for each of its valleys. This will be discussed in more detail later in this section. The cold water pollution strategy and the metering and compliance costs are not overly material, when looked at both individually and collectively.

Again, at a holistic level, this information would indicate that WaterNSW has adopted an approach to the development of its operating expenditure forecasts for this regulatory submission that may potentially be too low.

5.5. Assessment of WaterNSW's proposed organisational structure

As mentioned earlier, WaterNSW commissioned a benchmarking study to inform the development of its organisational structure. This study, which WaterNSW provided to the review team as part of the

Greater Sydney review, was undertaken by Third Horizon. For that benchmarking study, Third Horizon used a reference group of comparable, Australian water utilities.[77]

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 a 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.

During our Greater Sydney review, WaterNSW responded to this line of questioning by stating that the Third Horizon benchmarking report:[78]

- 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.

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:[79]

> *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*

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77 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.

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

79 Ibid

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 as part of the Greater Sydney review, the review team needed to balance management's responsibility for creating an organisation that was fit-for-purpose - that is, one that could deliver on its overarching strategic objectives - versus the likelihood that those staffing levels might potentially be too high, relative to a prudent and efficient business faced within similar circumstances to WaterNSW.

In undertaking that assessment, the review team gave explicit consideration to the internal process that WaterNSW's management undertook to create the new organisation structure, their willingness as part of that review 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 the Greater Sydney review process, the review team broadly agreed with WaterNSW's position, in particular that:

- it is inappropriate to use 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 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 made a number of similar observations.[80]

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

In summary, as part of the Greater Sydney review process, the review team accepted that the FTEs WaterNSW were proposing under the new organisational structure were likely to be consistent with a prudent business, given the particular circumstances (environmental, geographical and functional) faced by WaterNSW. Our starting position in this review process is to reaffirm this recommendation, subject to WaterNSW being able to demonstrate that its outturn labour cost figures for 2016 are broadly reconcilable with its hypothetical organisational structure. This is discussed in more detail in the next section.

A summary of the FTE estimates from the benchmarking study and the levels proposed by WaterNSW are outlined below.

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[80] 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)

Table 36 Proposed FTE's as compared to external benchmarks and current levels

Current FTEs*	50th Percentile Benchmark[a]	Blended Benchmark – 50th Percentile Greater Sydney, 75th Percentile Rural[a]	Proposed FTEs (July 2015)[b]
663	478	487	*

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

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

* Redacted at the request of WaterNSW.

For completeness, WaterNSW provided the following information regarding its employee numbers as part of its rural valley submission.

Table 37 FTE's from WaterNSW's rural valley submission

	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Employee numbers (full time equivalent) at year end	650	595	573	565	547	547	547	547

Source: WaterNSW, 'Information Request for the 2017 determination', Table 1.1

5.6. Reconciliation of WaterNSW's proposed starting operating expenditure figures

Notwithstanding the above, as part of this review process, the review team sought to confirm that WaterNSW's actual expenditure in 2016 was broadly consistent with what would occur if the organisation structure that was approved as part of the last review (and discussed above) were to have materialised in full in that year. We did this to assure ourselves that the previously approved organisational structure was being adopted in practice. To this end, WaterNSW provided us with the following information in Table 38.

Table 38 Reconciliation between labour costs approved as part of Greater Sydney review and current estimate of costs ($000's)

Labour Cost Component	~1 Jan 16	October 16
Basic	*	*
On-Cost	*	*
Sub Total	*	*
Vacancy rate	*	*
New Positions	*	*
Total (assuming vacancies filled)	*	*

Source: Email from WaterNSW, 21/10/2016.

Note: * Denotes redactions made at the request of WaterNSW.

The two main columns in the table highlight the labour costs:

- Based on the organisation structure[81] as of "today" ("October 16"), and
- Based on the organisation structure as at "~1 Jan 16", which formed the basis of the rural valley price submission.

The key information that WaterNSW believes can be taken from the above information is that today's organisational structure:[82]

- (*Content redacted at the request of WaterNSW*).

WaterNSW states that the results indicate that if it:[83]

- (*Content redacted at the request of WaterNSW*).

Also of note are WaterNSW's other contextual observations that:[84]

- (*Content redacted at the request of WaterNSW*).

(*Content redacted at the request of WaterNSW*).

Overall, given the weighting of risk, and (*Content redacted at the request of WaterNSW*), this information provides us with a significant amount of assurance that WaterNSW's starting labour cost forecasts are reasonable, and if anything, overly ambitious (to the benefit of WaterNSW's customers).

Whilst this provides a high level reconciliation of WaterNSW's labour costs, it does not address or provide any level of assurance as to how WaterNSW's proposed non-labour costs reconcile with

81 Excluding WAMC transferred functions.

82 Email from WaterNSW, 21/10/2016

83 Email from WaterNSW, 21/10/2016

84 Email from WaterNSW, 21/10/2016

historic levels. To this end, WaterNSW provided us with a consolidated P&L statement for State Water and the SCA. An extract of this is provided below.

Source: WaterNSW, email from WaterNSW, 17/10/2016.

Note: Figure redacted at the request of WaterNSW.

Figure 22 Combined Statements of P&L

Of particular relevance to our assessment is the comparison of the combined entities' revealed operating expenditure for FY2016 (actual) and FY2017. These figures - $148.3m and $150.0m respectively – indicate that the 2017 budget for operating expenditure across the two entities, which also underpins WaterNSW's operating expenditure forecasts for its rural valley business, are very similar to its revealed costs in 2016.

Furthermore, for non-labour cost components such as contractors and consultancies, which are budgeted at the manager level within the business (but reviewed by corporate staff), WaterNSW's consolidated budget for 2017 is relatively similar to 2016.

Whilst it is difficult to draw definitive conclusions from this P&L statement as it reflects both Greater Sydney and Rural Valleys, it does provide us with some further assurance that WaterNSW has not forecast materially higher non-labour costs relative to its revealed costs.

Overall, both pieces of information provide the review team with a significant amount of assurance that WaterNSW's starting costs for both labour and non-labour costs are not unreasonable, given its:

- Proposed organisation structure, and how this aligns with its existing revealed organisation structure, and
- Historic levels of expenditure on non-labour costs.

5.7. Cost allocation issues

This section discusses:

- WaterNSW's basis for allocating overheads between its Greater Sydney and Rural Valleys business, and
- How WaterNSW has accounted for its Water Administration Ministerial Corporation functions in its rural valleys submission.

5.7.1. Basis for allocating overheads

In its final decision on Greater Sydney, IPART stated the following.[85]

> *Aither recommended that the allocation of corporate overheads between the two businesses should be based on each business's share of the total "within the region" overheads and direct costs. Aither's adjustment resulted in an increased share of corporate overhead costs and savings being allocated to Greater Sydney (55% from 53%). This is reflected in our recommended forecast operating costs*

This reflected a change to the way WaterNSW calculated its overhead split. In particular, WaterNSW's original approach was to allocate overheads based on direct salaries and wages operating expenditure only, thus excluding "within the region" overheads (those costs directly attributable to either the Rural business or the Greater Sydney business, but which are 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. When this was corrected for, this lead to WaterNSW's proposed split changing from 53/47 to 55/45.

For the purposes of developing its rural regulatory submission, WaterNSW has assumed the same 55:45 split, consistent with IPART's final decision for Greater Sydney.

[85] IPART, *Review of prices for WaterNSW From 1 July 2016 to 30 June 2020*, Final Report, June 2016, page 26

To confirm that this split was still reasonable, we sought information from WaterNSW as to the "natural split" (i.e., the split that would result, based on its cost allocation methodology). The following information was provided.

FY17	Actual % Split	Greater Sydney's share of net overhead	**53.35%**
FY17	Actual % Split	Rural Valleys share of net overhead	**46.65%**
FY18	Actual % Split	Greater Sydney's share of net overhead	**52.81%**
FY18	Actual % Split	Rural Valleys share of net overhead	**47.19%**
FY19	Actual % Split	Greater Sydney's share of net overhead	**52.93%**
FY19	Actual % Split	Rural Valleys share of net overhead	**47.07%**
FY20	Actual % Split	Greater Sydney's share of net overhead	**52.95%**
FY20	Actual % Split	Rural Valleys share of net overhead	**47.05%**
FY21	Actual % Split	Greater Sydney's share of net overhead	**51.04%**
FY21	Actual % Split	Rural Valleys share of net overhead	**48.96%**

Source: WaterNSW, email from WaterNSW on 18/10/2016.

Figure 23 Natural Split of Overheads Between Greater Sydney and Rural Valleys

Whilst we have not audited this information, we note that it is reasonably reflective of the allocations set out in IPART's final decision for WaterNSW's Greater Sydney business, and therefore it is reasonably reflective of the underlying rates assumed by WaterNSW for the purposes of its rural submission.

In addition, we note that in the context of the regulatory framework that WaterNSW operates under, changing allocation shares as part of this review process would inevitably lead WaterNSW to either over or under recover its total costs, purely as a result of the different allocation splits used to determine overhead allowances across its two pricing submissions.

Given the above factors, particularly the latter issue, the review team believes that IPART should approve the split of overhead costs proposed by WaterNSW as part of its rural valleys submission.

5.7.2. Treatment of Water Administration Ministerial Corporation functions

WaterNSW informed us during the review process that it had made no allowance for the transference of WAMC functions. In particular, it stated:[86]

> *WaterNSW confirms that its pricing proposal does not cover pricing for the provision of services for WAMC functions that have transferred from DPI Water to WaterNSW as of 1 July 2016.*
>
> *Customers will be billed for these WAMC functions in accordance with IPART's determination. WaterNSW will collect all revenue from customers under the*

[86] Email from WaterNSW, 17/10/2016.

determination and will then remit an amount to DPI Water. In this sense, there will be no double dipping of charges from customers associated with the WAMC functions.

The rural pricing proposal budgeting process commenced in October 2015 and run up until April 2016. Therefore, WaterNSW was not in the position to consider the cost of the WAMC functions as part of rural pricing proposal. The cost of these functions has been allocated to a separate cost centre, which does not have a budget allocated to it.

Over and above the direct cost impacts of undertaking the WAMC functions, adding a new function such as WAMC is also likely to necessitate WaterNSW having to increase the amount of corporate and overhead costs it incurs in managing those functions. Offsetting this would be the fact that this larger pool of corporate overheads could be distributed across a larger pool of customers (i.e., it would be spread across Greater Sydney, rural customers and WAMC customers, instead of just Greater Sydney and rural customers).

Whether this would lead to an overall increase or decrease in the costs attributable to rural valleys is indeterminable based on the information available to us at the time of the review. Moreover, it was clear from discussions with WaterNSW that they were not in a position to provide any reasonable estimate of the impact that the WAMC functions might have on their corporate costs. For example, in response to this line of questioning, WaterNSW stated that[87]:

At this stage, we are unable to determine whether any overhead efficiencies will result for the other WNSW customers given:

-efficiencies were embedded into the WAMC determination by IPART which are yet to be achieved

-further efficiencies have been committed to be passed back to WAMC function customers

-until WNSW has run the functions for a period we do not have certainty around the costs of running those functions given the poor integrity of financial and operational data that we have for the WAMC functions

This is not unexpected, given how recent the transfer of functions was.

Given this, our recommendation is that IPART make no allowance for the potential impact that the WAMC functions might have on WaterNSW's future corporate costs, and moreover, the amount of corporate costs it allocates to its rural business.

5.8. Assessment of WaterNSW's forecast labour costs

WaterNSW effectively multiplies its FTE forecasts under the new organisational structure by a remuneration level to derive their labour cost forecasts. We asked WaterNSW for a description of their approach, which they provided as follows[88]:

At ~1 Jan 16 the organisation chart was approved together with positional rate ranges however there were a volume of external and internal candidates transitioning

87 Email from WaterNSW, 21/10/2016.

88 Email from WaterNSW, 24/10/2016

into and out of roles. While this brought more certainty to the org chart there was remaining uncertainty as individuals weren't yet in the payroll system. So to limit this uncertainty we used a variety of information sources to include, where possible the people information for a position.

Some background here, typically positional rates are modified by person information. For example, person information such as the results of salary negotiations, allowances (e.g. shift), and superannuation (e.g. defined benefit) will modify planned rates. The exercise at ~1 Jan 16 was to update the workforce planner with as much certainty as possible and we used the following sources to do that:

a) People and Culture's workforce planner (planner)

b) Schedules contained in the SCA's Consolidated Award, SWC's Enterprise Agreement (awards) together with Individual Employment Agreements (agreements)

c) Payroll system reports from SCA's Chris21 and SWC's Tech1 (system)

Where possible sources were triangulated to support rates. A brief explanation of the data sources

-People and Culture's workforce planner contains (inter alia) positions attributed to org units, planned position FTEs, planned rates (grades and ranges of salary) and names of possible successful candidates. These names (employee numbers) enabled cross referencing to system reports, agreements and awards to update rates. Hence the source described as 'planner and system'.

-Schedules in the Awards set out the annual amounts for the associated grade and step, for the years covered by the award. Individual employment contracts reflected rates from negotiations for a role.

-Payroll system reports provided people information with respect to allowances, superannuation and current grade and step rates. This data was applied to individuals who were either successful in a new role and being paid for that role; or able to be applied to a role where a candidate was transitioning to.

-Finally, where we had poor people information for a role we applied an estimate that had regard to a comparable position and its rates as updated by the above.

Generally, WaterNSW's approach would, in our opinion, be a reasonable way of deriving a set of labour cost forecasts in the context of a WaterNSW's business (i.e., a business that was in the midst of a significant restructure, and thus not in a "steady state"). Notwithstanding this, to corroborate this, we asked WaterNSW to provide information regarding how its 2016-17 year-to-date actual labour costs compared to its forecast costs. WaterNSW informed the review team that salary and wages were slightly over budget ($0.5m over budget), primarily due to an unbudgeted increase of $0.7 million of overtime and $0.3 million in terminations payments. Whilst this is not definitive, it does provide some indication that the underlying wage estimates adopted by WaterNSW when developing its budgets are not likely to be materially different to its outturn labour costs.

Further to the above, WaterNSW has informed the review team 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 may, if anything, lead to an underestimate of WaterNSW's future labour costs, as generally (but not always):

- 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 (although technological changes and the broader organisational changes affecting WaterNSW may impact on this in the context of their business).

Overall, the review team do not recommend that any adjustments be made to this component of WaterNSW's operational expenditure forecasts on the basis that:

- The basis for deriving starting wage rates for each FTE appears reasonable, and
- The underlying basis for escalating these labour costs may, if anything, lead to an underestimate of WaterNSW's future labour costs.

Notwithstanding the latter point, we are not prepared to recommend an upward adjustment, given the general uncertainty around these factors, and the fact that WaterNSW have been prepared to commit to these forecasts; upon questioning in interviews as part of the review, WaterNSW did not wish to make any revisions to these forecasts.

5.9. Assessment of key components of WaterNSW's non-labour cost forecasts

There are a number of components of WaterNSW's non-labour cost forecasts that we have considered as part of this review process. These are:

- WaterNSW's forecast growth in electricity and chemical costs,
- WaterNSW's forecast growth in consultancies and contractors,
- Whether WaterNSW's forecasts include any related party transactions, and
- Whether WaterNSW's forecasts include an appropriate assumption regarding the impact that growth in throughput has on its forecast costs.

These are discussed in detail below.

5.9.1. Electricity and Chemical Costs

WaterNSW indicated during interviews that over 90% of its energy consumption relates to three particular sites, all of which are in the Fish River valley. These are:

- The Wallerawang pumps, which serve Mt Piper power station,
- Oberon Pump Station, which serves Oberon township by pumping raw water up to Oberon treatment plant, and
- Duck-Molloy Treatment Plant, which is used to provide potable water to Lithgow and surrounding areas.

WaterNSW also indicated in interviews that it based its forecasts for these sites on recent history, and made no specific allowance for changes in the real cost of electricity (i.e., it did not factor any real electricity cost escalators into its operating expenditure forecasts).

It further stated that materials (excluding electricity) mainly reflected the purchase of chlorine for water treatment plants at Oberon Dam and Riddle, both of which are also in the Fish River valley, and these were forecast to remain at similar levels to recent history.

We sought further information to corroborate these statements. WaterNSW provided the following forecast information at the "natural account level".

Table 39 Electricity and Chemical costs for Fish River valley ($2016-17)

	2017-18	2018-19	2019-20	2020-21	2021-22
Electricity and Chemical Costs	404,037	414,184	424,629	426,444	427,743

Source: WaterNSW, email from WaterNSW, 18/10/2016.

Based on this information, the review team are of the view that this component of WaterNSW's operational expenditure forecasts is likely to be prudent and efficient. This is particularly based on our view that:

- in real terms, the forecasts annual increase of 1.44% per annum is, if anything, potentially too low, given factors affecting the electricity market at present (e.g., network pricing decisions),
- the overall magnitude of these costs is not overly material, and
- that this cost category will not be affected by the reduction in FTEs.

Therefore, the review team do not recommend any adjustments be made to WaterNSW's forecasts as a result of this issue.

5.9.2. The forecast growth in consultancies and contractors

The following table highlights the growth in consultancies and contractors over the forecast period.

Table 40 Growth in consultancies and contractors for rural valleys ($2016-17)

	2017-18	2018-19	2019-20	2020-21	2021-22
Consultancies	1,269,325	696,125	696,125	650,000	400,000
Contractors	7,504,120	7,841,061	7,908,879	7,583,083	7,404,094
TOTAL	**8,773,445**	**8,537,186**	**8,605,004**	**8,233,083**	**7,804,094**

Source: OGW, based on analysis of spreadsheet "17 RV submission_opex calculations.xls" provided by WaterNSW.

In total, these forecasts reflect an average annual percentage decline in real terms of 2.88%. The increase in 2018-19 and 2019-20 in contractors relates to activity "Telemetry and surveillance - ops and maintenance". Excluding that increase would lead to much larger annual declines in real terms (3.23%) for consultancies and contractors combined. That issue ('Telemetry and surveillance') is discussed in more detail later in this section.

Outside of the "Telemetry and surveillance - ops and maintenance", WaterNSW's forecast of large declines in real terms in contractor and consultancies provides a further indication that WaterNSW has developed its operating expenditure forecasts in a way that means they could potentially be too low.

5.9.3. 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[89]:

> *Other than the cost related to hydrometric services, WaterNSW can confirm that there are no related party transactions reflected in its OPEX forecast.*
>
> *The cost of hydrometric services (including data provision) was sourced from a former service level agreement between DPI Water and WaterNSW. These documents are attached.*
>
> *The DPI hydrometric stations have been transferred to WaterNSW on 1 July 2016 as part of the DPI Transaction. WaterNSW is currently assessing the state of these assets, which is expected to take about a year. The estimate cost of managing these assets is contained in the spreadsheet entitled 'Cost of hydrometrics stations from DPI' in our response to question 31 however note that these figures are indicative.*

To give further context to this, in its regulatory submission, WaterNSW states that[90]:

> *WaterNSW purchases river gauging and data management services from DPI Water. DPI Water monitors the availability and condition of surface water by measuring water level, stream flow, rainfall and key water quality indicators. We use this information to assist in managing the delivery of water.*

We note that all activities with "hydrometric" in the title are forecast to have no real change in costs over the regulatory period. We also note that this is at slightly lower levels than 2015-16 actual costs.[91]

Further, the counter-party to this is DPI Water – which, whilst technically a related party, is not a counter-party that is intrinsically likely to actively engage in activities that are counter to end

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89 WaterNSW, response to question 19

90 WaterNSW, *Rural Regulatory Pricing Proposal*, page 100

91 WaterNSW, *Pricing Proposal to IPART for Rural Bulk Water Services, Briefing to Aither,* 14 September, 2016, slide 34

customer's interests. In this context, this issue has not affected our determination of the prudency and efficiency of WaterNSW's proposed operating expenditure forecasts.

5.9.4. Escalation in costs due to growth in outputs

For some businesses, there is a relationship between throughput (e.g., the amount of water delivered), and the costs that the business will incur in the future. In response to a question to this effect, WaterNSW stated:[92]

> *State Water had undertaken a high-level analysis on regulated opex by IPART activity across the 2007-08 – 2011-12 period, it was concluded that State Water is a fixed cost business in the short run, with around only one per cent of costs considered variable based on water delivery sales. Refer to attached report for detailed information.*

The report referred to is one titled "Operating cost structure review, Analysis of State Water's fixed and variable operating costs". In its last review, the ACCC also stated:[93]

> *The ACCC examined State Water's historical opex for water delivery and other operations from 2007– 08 to 2012–13 for valleys outside of the Fish River. No systematic relationship between water delivery opex and the volume of water extractions was found*

Overall, this aligns with our understanding of the underlying cost drivers of a rural water business. Therefore, WaterNSW's decision to not link its operating expenditure forecasts to some measure of outputs is reasonable, and consistent with a prudent and efficient service provider.

5.10. Changes in levels of service

In reviewing WaterNSW's operating expenditure forecasts, we sought to understand the extent to which those forecasts might lead to changes in WaterNSW's overall level of service. This might stem from:

- a general increase/decrease in a certain expenditure component, or
- the introduction of a certain discrete projects/program of works.

In relation to the former, we asked WaterNSW directly whether its proposed expenditure forecasts are based on delivering the same level of service to its customers in the future, relative to its revealed, historic levels. To this end, WaterNSW stated that[94]:

> *WaterNSW confirms that it is not proposing to change the level of service it delivers to its customers in the upcoming determination period, relative to those that have been delivered in the current determination period.*
>
> *WaterNSW is confident that overall customer service standards will not be impacted as a result of the merger efficiencies. WaterNSW will continue to maintain full to high*

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92 WaterNSW, response to question 21d.

93 ACCC, *Final decision on State Water pricing application 2014-15 to 2016-17*, *Attachments*, page 49

94 WaterNSW, response to question 25

levels of compliance with the Operating License in the upcoming determination period.

Notwithstanding the above response, WaterNSW's operating expenditure forecasts appear to reflect the impact of a number of discrete activities or programs that are likely to lead to levels of service being different in the future relative to historic levels. These activities include:

- Reduction in OPEX due to meter reading changes – WaterNSW is proposing to implement changes to its meter reading program that would see some customers not have their meter read four times a year.
- Increased OPEX due to development of 20-year infrastructure strategies – WaterNSW is proposing to materially increase its operating expenditure to develop a 20-year asset management strategy that covers the entirety of its assets. This would be underpinned by the development of long-term strategies for each of its valleys.
- Increased OPEX due to "SCADA" strategy – This involves increased expenditure related to SCADA systems improvements (instrumentation and automation).
- Increased OPEX for Fishways – WaterNSW's rural pricing submission did not include any opex or capex for fishways. Subsequent to the submission of the pricing proposal, WaterNSW has finalised its required funding for fishways.
- Increased operating expenditure due to risk transfer product – WaterNSW has sourced a market based risk transfer product for the volatility that it is created by its non cost-reflective tariff structure, the cost of which was included in its submission. IPART has directed us **not** to review the costs associated with this product.

The first four components are discussed in more detail below.

5.10.1. Meter reading charges

WaterNSW states that:[95]

> *WaterNSW has historically provided a uniform meter reading service of four meter reads per annum irrespective of the size of the customer's meter. WaterNSW has reviewed this policy in the light of a risk and cost based approach. We propose to implement changes to our meter reading program as set out in Table 91 below.*

The changes include:

- Less than 100 ML - Minimum 4 (customer self) reads per annum. At least one compliance check annually
- 101 ML to 500 ML - Minimum of 2 meter reads performed by WaterNSW per annum
- 501 ML or greater - Minimum of 4 meter reads performed by WaterNSW per annum

WaterNSW goes on to state that:[96]

> *By reducing the number of meter reads for smaller customers, we are able to save costs and better target compliance towards areas that we perceive pose greater risk*

---

95 WaterNSW, *Rural Regulatory Pricing Proposal*, page 111

96 WaterNSW, *Rural Regulatory Pricing Proposal*, page 112

from a water extraction and river management point of view. We note that DPI Water is also proposing a similar approach to meter reading. We will be working closely with DPI Water to ensure congruence between our proposal and its proposals for groundwater reads.

This restructure in our approach to meter reading will reduce our costs and provide savings to customers over the four year determination period. We will also continue to support customer led investment in telemetry to further reduce costs, increase compliance and customer confidence in overall regulatory settings.

In considering this issue, the first issue sought to identify was whether or not the affected customers had been consulted, and if so, what were their responses (generally)? In response, WaterNSW stated that:[97]

Customers were open minded however, this was underpinned by our assurances that valley surveillance (e.g. compliance, water theft etc…) would continue to be performed and the cost (of surveillance, not meter reading) continue to be socialised.

Taken on face value, this response does not indicate that WaterNSW's proposed change is not consistent with a prudent service operator. In particular, a prudent service provider would provide a level of service that customers are willing to pay for, and in doing so, it would consult and understanding its customers' particular requirements. It appears to have done so in this case.

We then sought information from WaterNSW regarding how they had derived the forecast reduction in operating expenditure stemming from this change. WaterNSW indicated that it has:[98]

embedded into its opex forecast a reduction from 16 FTEs to 10 FTEs, at an average salary cost of 101k per FTE. This is a saving of approximately $600k in direct cost, which has been allocated to groundwater and bulk water functions.

Including overhead, and other adjustments (including redistributing unallocated overhead between business segments core and core+), the savings for bulk water customers' amounts to $1.7 M per annum (with an overhead rate of approximately 100% of direct cost). The $1.7M has been determined as the difference between the rural meter reading cost in the FY 17 SCI and the rural meter reading in the rural submission, which has been built up for 10 FTEs at a salary cost of 101k per FTE.)

54% of these savings are attributed to the bulk water functions, which is based on the proportion of bulk water meter reads. These savings were then allocated to the rural valleys based on the proportion of metering and compliance cost in the valleys, before the adjustments were made for the cost reductions from the meter reading program.

WaterNSW provided the following split (see Table below)

[97] Email from WaterNSW, 26/10/2016

[98] Email from WaterNSW, 26/10/2016

Table 41 Split of meter reading savings to regions

Valley	Percentage split of savings
Border	5%
Fish River	2%
Gwydir	11%
Hunter	8%
Lachlan	14%
Macquarie	8%
Murray	22%
Murrumbidgee	17%
Namoi	7%
North Coast	1%
Peel	4%
South Coast	1%
TOTAL	100%

Source: WaterNSW, email from WaterNSW, 26/10/2016

The Tables below show the rural meter reading cost by valley with and without the savings.

Table 42 Rural meter reading cost by valley by year (with savings) ($2016-17)

Valley	2018	2019	2020	2021
Border	64	59	59	58
Fish River	27	25	25	25
Gwydir	135	125	125	122
Hunter	89	82	82	81
Lachlan	171	157	158	154
Macquarie	99	91	91	89
Murray	256	236	236	231
Murrumbidgee	200	185	185	181
Lowbidgee	0	0	0	0
Namoi	79	73	73	71
North Coast	10	9	9	9
Peel	43	40	40	39
South Coast	9	8	8	8
TOTAL	**1,183**	**1,091**	**1,091**	**1,069**

Source: WaterNSW, email from WaterNSW, 26/10/2016

Table 43 Rural meter reading cost by valley by year (without savings) ($2016-17)

Valley	2018	2019	2020	2021
Border	159	150	150	145
Fish River	66	63	64	62
Gwydir	335	316	316	306
Hunter	222	209	209	202
Lachlan	424	399	399	387
Macquarie	244	230	230	223
Murray	636	599	599	581
Murrumbidgee	497	468	468	454
Lowbidgee	-	-	-	-
Namoi	196	184	184	179
North Coast	25	24	24	23
Peel	107	101	101	98
South Coast	23	21	21	21
TOTAL	**2,934**	**2,763**	**2,764**	**2,681**

Source: WaterNSW, email from WaterNSW, 26/10/2016

Overall, the review team concludes that WaterNSW proposed reduction in operating expenditure is consistent with the outcomes that a prudent and efficient service provider would seek to provide its customers. We base this conclusion on the following observations:

- WaterNSW has indicated that they have consulted customers on this issue, and they have responded to customer concerns / requests that this proposed change should not compromise WaterNSW's responsibilities regarding surveillance of water usage within valleys,
- The methodology used to both derive the forecast, and allocate the forecast, is in our opinion, entirely reasonable and fair. For example, using the proportion of bulk water meter reads to determine the percentage of savings attributable to bulk water is, in our opinion, reasonable. Allocating those savings to rural valleys based on the original proportion of metering and compliance cost in the valleys is also, in our opinion, a reasonable basis for allocating these savings, and
- The underlying assumptions, namely the FTE rate and the material reduction in FTE numbers, appear reasonable based on the description as to how the meter reading program would change, and our understanding of the cost structure of the industry.

5.10.2. 20-year infrastructure strategies

WaterNSW Board and Management Team have developed a Strategic Action Plan to deliver the organisation's nine Strategic Priorities. One of the Strategic Priorities was "Asset health and capability

management", which was described as "to improve the efficiency of our asset management processes and activities and our asset development projects performance".[99]

One of the core features of any prudent business is that it manages its assets not just in light of short-term requirements, but with an eye to its longer term, strategic objectives. Such an approach will almost certainly lead to more efficient outcomes in the long-term, which is to the benefit of customers in terms of lower cost and higher levels of service.

To this end, WaterNSW is proposing to materially increase its expenditure to develop a 20-year asset management strategy that covers the entirety of its assets. This would be underpinned by the development of long-term strategies for each of its valleys. WaterNSW informed us that they do not currently undertake such an assessment in systemic way.

WaterNSW have provided the following information (Figure 24) regarding the "direct" costs that are reflected into its regulatory submission to complete these activities.

[99] WaterNSW, *Rural Regulatory Pricing Proposal*, page 10

Row Labels	Description	FY18	FY19	FY20	FY21	
Border	20 year Infrastructure Strategy Border		60	95	101	106
Border	Administration		5	5	5	5
Border	Contractors					
Border	Salary and wages		5	40	46	51
Border Total			60	95	101	106
Fish River	20 year Infrastructure Strategy Fish River		57	91	98	102
Fish River	Administration		2	2	2	2
Fish River	Contractors					
Fish River	Salary and wages		5	39	46	50
Fish River Total			57	91	98	102
Gwydir	20 year Infrastructure Strategy Gwydir		111	95	101	106
Gwydir	Administration		5	5	5	5
Gwydir	Contractors					
Gwydir	Salary and wages		56	40	46	51
Gwydir Total			111	95	101	106
Hunter	20 year Infrastructure Strategy Hunter		74	53	57	60
Hunter	Administration		2	2	2	2
Hunter	Contractors					
Hunter	Salary and wages		47	26	30	33
Hunter Total			74	53	57	60
Lachlan	20 year Infrastructure Strategy Lachlan		130	95	101	106
Lachlan	Administration		5	5	5	5
Lachlan	Contractors					
Lachlan	Salary and wages		75	40	46	51
Lachlan Total			130	95	101	106
Macquarie	20 year Infrastructure Strategy Macquarie		60	95	101	106
Macquarie	Administration		5	5	5	5
Macquarie	Contractors					
Macquarie	Salary and wages		5	40	46	51
Macquarie Total			60	95	101	106
Murray	20 year Infrastructure Strategy Murray		65	99	106	110
Murray	Administration		10	10	10	10
Murray	Contractors					
Murray	Salary and wages		5	39	46	50
Murray Total			65	99	106	110
Murrumbidgee	20 year Infrastructure Strategy Murrumbidgee		186	158	168	174
Murrumbidgee	Administration		10	10	10	10
Murrumbidgee	Contractors					
Murrumbidgee	Salary and wages		76	48	58	64
Murrumbidgee Total			186	158	168	174
Namoi	20 year Infrastructure Strategy Namoi		111	95	101	106
Namoi	Administration		5	5	5	5
Namoi	Contractors					
Namoi	Salary and wages		56	40	46	51
Namoi Total			111	95	101	106
Peel	20 year Infrastructure Strategy Peel		28	20	21	21
Peel	Salary and wages		28	20	21	21
Peel Total			28	20	21	21
North Coast	20 year Infrastructure Strategy North Coast		5	5	5	5
North Coast	Salary and wages		5	5	5	5
North Coast Total			5	5	5	5
South Coast	20 year Infrastructure Strategy South Coast		5	5	5	5
South Coast	Salary and wages		5	5	5	5
South Coast Total			5	5	5	5
Grand Total			888	907	965	1,005

Source: WaterNSW, email from WaterNSW, 19/10/2016.

Note: Some figures redacted at the request of WaterNSW.

Figure 24 Direct cost of developing 20-year Infrastructure Strategies

In addition to the above, WaterNSW also provide a brief description of the rationale for the relativities between the costs attributable to the different valleys. These are provided in the following table.

Table 44 Rationale for relativity between the costs attributable to the different valleys

Valley	Reason
Border	Med complexity as other than BRC issues BR is a large catchment serviced by 3 small catchment dams valley was considered a much simpler valley than Lachlan
Fish River	Medium complexity Fish River System includes WTP & complex pipeline systems and dams
Gwydir	Medium complexity as key issues are low reliability downstream from Copeton Dam re GS irrigators therefore simpler than Lachlan
Hunter	Low complexity as 3 WaterNSW dams combine with Hunter system (Liddell) hence considered a much simpler valley than Lachlan
Lachlan	Original Stage 1 study extremely High complexity. Lachlan section High/medium Complexity - Least reliable major system - As the initial Stage 1 study was completed in 2014 deepening the analysis in relation to full breadth of Levels of Service will not require the same complexity.
Macquarie	Medium complexity as Windermere Dam limit ability to meet env & customer reqts and Burrendong has large dead space volumes
Murray	Medium Complexity Hume weir, MDBA &SDL constraints and Menindee lakes operating rules
Murrumbidgee	High Complexity - Blowering interconnections with Snowy Hydro, Burrinjuck and large populations including mid Murrumbidgee Reregulation issues re extensive MIA requirements and SDL
Namoi	Namoi Medium complexity - System dam safety risks(Split Rock) complex transmission losses downstream of Keepit dam
Peel	Peel linked with Namoi 50% TRC urban use, v. high water prices, low system supply reliability
North Coast	V. Low complexity as 1 dam (Toonumbar) 100 customers much simpler valley than Lachlan
South Coast	V. Low complexity as 1 dam (Brogo) 100 customers much simpler valley than Lachlan

Source: WaterNSW, email from WaterNSW, 19/10/2016

Conceptually, we agree with the need to develop long-term infrastructure (asset management) strategies for each valley, and that the costs will vary between valleys depending on the level of complexity. Therefore, we accept that a prudent service operator should be doing such work. In fact, it could be strongly argued that WaterNSW should already be doing this work. To this end, during interviews, we asked WaterNSW whether they had already undertaken any such work previously. WaterNSW indicated that this has not been done previously, outside of:

- Some work that has been completed for the Lachlan Valley in 2014 (this work only focused on new dams, and was only for irrigation water security) which WaterNSW has indicated the direct costs were in the order of $560k, and
- The development of what might be called a “version 1” or work-in-progress 20-year infrastructure strategy document covering WaterNSW’s assets.

Overall, while we are convinced that developing such strategies are consistent with a prudent service provider, and that WaterNSW has not currently undertaken this task in a robust manner (and hence still has significant areas for improvement/enhancement), the review team is not convinced that WaterNSW has proposed costs that are efficient. We have based this conclusion on the following observations:

- WaterNSW does not appear to have reflected any synergies in undertaking similar tasks across different valleys over the regulatory period. In saying this, we are referring to the extent to which WaterNSW has reduced its forecast costs *over time* as more valleys are undertaken and the lessons from those valleys are translated into the activities undertaken in other valleys,
- The coarseness (or lack of specificity) regarding how individual components of the forecasts have been derived indicates to us that these estimates may be very preliminary in nature, thus increasing our uncertainty with regard to the robustness of these forecasts, and
- If Peel, North Coast and South Coast, which are the low complexity valleys that skew the overall average cost down, are removed from the analysis, the average cost per valley is significant, at around $400k over the regulatory period. Based on our experience, this would appear to be at the absolute top end of the reasonable range, which in turn means it is unlikely to reflect WaterNSW's "expected" costs.

To reflect these adjustments, it is recommended that these forecasts be reduced by between 20% - 40%. The review team acknowledge the additional information WaterNSW provided between draft and final reports on this matter, and this information was considered by the review team. It did not however change the view of the reviewers. The recommended reduction is based on bringing WaterNSW's proposed costs more in line with the costs we would expect WaterNSW to incur to undertake this type of work. The adjustment is contained in the table below.

Table 45 Reduction in direct operating expenditure to undertake 20-year infrastructure strategies ($2016-17)

	2017-18	2018-19	2019-20	2020-21
Reduction in direct opex	$266,468	$272,186	$289,565	$301,525

5.10.3. SCADA

As part of our review of WaterNSW's capital expenditure forecasts, we noted that operational technology expenditures such as SCADA within the Maintaining category were poorly justified. This included increased expenditure related to SCADA systems improvements (instrumentation and automation), or SCADA holdings. Overall, we are recommending that WaterNSW's capital expenditure allowance be reduced by 25% for this category of expenditure. Given that this reflects the review team's assessment of WaterNSW's scope for capex efficiency improvements in this activity, and given operating expenditure levels on this activity are inextricably linked to the rollout of the infrastructure itself, we believe it is reasonable that WaterNSW's operating expenditure forecasts reflect and efficiency adjustment. For consistency, we propose the same percentage reduction to operating expenditure.

Table 46 Proposed reductions to WaterNSW's SCADA operating expenditure forecasts ($2016-17)

	2017-18	2018-19	2019-20	2020-21
Reductions in SCADA Holdings expenditure	$96,250	$143,750	$85,000	$27,500

Source: Based on applying 25% reduction to information contained in spreadsheet "SCADA holdings opex".xls, provided by WaterNSW in email on 14/10/2016

5.10.4. Fishways

WaterNSW's rural pricing submission did not include any opex or capex for fishways but did indicate that it was discussing a long term strategy with DPI Fisheries and that its pricing proposal may need to be updated based on the outcomes of those discussions.

Subsequent to the submission of the pricing proposal, WaterNSW has finalised its required funding for fishways being:[100]

- funding to undertake the planning, design, optimised costing and business case activities to finalise the Strategic Fish Passage Program proposal (approximately $2.01 million); and
- the Walgett fishway which will straddle this determination period and the next ($3.24 million).

WaterNSW is proposing to amend its pricing proposal to update for this additional $5.25 million ($1.57M opex/$3.68M capex).

In support, WaterNSW provided the following table breaking down the costs of the Fishways strategy.

$'000	17-18	18-19	19-20	20-21	Total	Description
Engineering design studies for typical fishway designs (capex)	219	219	0	0	438	Engineering design studies will be undertaken to ensure the development of economically optimised fishway designs.
Fishway optimised approach (opex)	308	308	308	0	924	An optimised approach to fish passage planning, design and implementation will be developed. This process will ensure that the program proposed to be implemented across the outstanding WaterNSW high priority sites achieves both environmental and financially optimised outcomes.
Business case development (opex)	0	154	0	0	154	Development of business case which properly explains the issues, options and preferred solutions considered. The proposed strategy will ensure the Fish Passage Program achieves optimal environmental and economic cost-benefit
Fishway monitoring program (opex)	166	166	166	0	499	WaterNSW fishways constructed over recent years are required to be monitored to ensure compliance. These funds have been allocated to ensure WaterNSW addresses this within the context of our post-completion benefits realisation process
Total	693	847	474	0	2,014	

Source: WaterNSW, email from WaterNSW on 18/10/2016

Figure 25 Breakdown of costs of Fishways strategy

[100] WaterNSW, *"Fishways position for Rural pricing proposal and adjustments to the capex program",* Response to additional question in relation to Fishways

Furthermore, WaterNSW has provided a letter from DPI confirming that the Walgett Fishway offset program would discharge its obligations under the Fisheries Management (FM) Act in the Namoi valley.[101]

In our opinion, based on the information provided, particularly the supporting letter from DPI, the prudency of spending some money on Fishways is not in question. Regarding the prudency and efficiency of the detailed components of WaterNSW's operating expenditure forecast, we believe a prudent service operator would spend money to undertake appropriate planning and design in support of any such strategy, as well as monitoring the program. The overall magnitude of these expenditure components, is, in our opinion, also reasonable.

Overall, this leads us to the view that WaterNSW's forecasts are likely to be a reasonable reflection of the costs that a prudent and efficient service provider would incur in developing its Fishways strategy.

5.11. Basis for deriving user shares

Rural bulk water services costs are divided between those to be paid for by NSW Government and those to be paid for by WaterNSW's rural customers.

WaterNSW describes the process for allocating costs between users and Government as follows in its regulatory submission:[102]

> *A framework for the allocation of costs between users and Government has been in place since the IPART 2001 Bulk Water Price Determination. IPART introduced a cost allocation methodology to assign water infrastructure costs between Government and customers (excluding the Fish River Scheme and Lowbidgee). IPART's methodology evolved over several price determinations and was applied by the ACCC in the ACCC 2014 Decision.*
>
> *The cost share ratios are based on the application of the 'impactor' pays principle, which seeks to allocate costs to different individuals or groups in proportion to the contribution that each individual or group makes to creating the costs (or the need to incur the costs)……*

It goes on to say that:[103]

> *Under current arrangements the majority of costs are allocated to customers. The key exceptions as shown in the tables are the pre 1997 dam safety legacy costs which are 100 percent borne by Government, and some environmental costs (for instance, fish passages, carbon neutrality, cold water pollution), which are split in equal shares between customers and the Government.*
>
> *We have submitted our operating expenditure program in this pricing submission as per the IPART methodology……*
>
> *In 2012, the NSW Government asked IPART to conduct a review into bulk water charges to identify options for determining the NSW Government's cost share for bulk water charges in NSW. IPART recommended the continuation of the current*

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101 *Letter DPI Fisheries Walgett Fishway Substitution.pdf*

102 WaterNSW, *Rural Regulatory Pricing Proposal*, page 68

103 WaterNSW, *Rural Regulatory Pricing Proposal*, page 70-71

approach to determining government costs shares, using the cost allocation ratios applied in the 2010 Determination until 1 July 2017. IPART recommended a review the cost share ratios every two years after 2017……

A review of cost allocation arrangements will be a substantial undertaking and due to the commitments associated with the 2017-2021 Rural Pricing determination. WaterNSW's view is that such a review is best conducted after the conclusion of this determination process. This would enable sufficient resources be allocated to the process and ensure proper consideration and consultation of the matter, as well as enabling any recommendations such as legislative or policy changes to be effectively implemented.

The reviewed cost share arrangements would then be in place for application in the 2021 pricing determination. We communicated our position to our customers at the outset of our consultation process on this pricing proposal. This was agreed to by the CSC Reference Group.

It is not within the scope of this review to re-determine the cost shares in detail, as the framework for allocation is to be consistent with previous IPART guidance.[104] Notwithstanding this, we would note that there is nothing in the information provided by WaterNSW that, based on a high-level review, leads us to believe that it has not categorised expenditure correctly or allocated costs between Users and Government in accordance with the previously agreed framework. In particular, it is noted that WaterNSW has made a clear statement that it has submitted its "*operating expenditure program in this pricing submission as per the IPART methodology*", and to corroborate this, we assured ourselves that the shares contained in the model provided by WaterNSW (WaterNSW Information request - 2017 Determination) were consistent with the shares:

- Outlined in WaterNSW's regulatory proposal;[105] and
- Prescribed in the ACCC's previous decision regarding State Water.[106]

5.12. Conclusion – Operating Expenditure Forecasts

Overall, the review concludes that the following adjustments should be made to WaterNSW's proposed operating expenditure forecast.

Table 47 Proposed reductions to WaterNSW's operating expenditure forecasts ($2016-17)

($2016/17)	2017-18	2018-19	2019-20	2020-21
20-year asset management strategy	$266,468	$272,186	$289,565	$301,525
SCADA Holdings expenditure	$96,250	$143,750	$85,000	$27,500
TOTAL	**$362,718**	**$415,936**	**$374,565**	**$329,025**

Outside of these changes, it is our opinion that WaterNSW's overall operating expenditure forecast is likely to represent a reasonable forecast of what a prudent and efficient service operator would need

[104] As per guidance provided by IPART to Aither on the 20 September, 2016.

[105] WaterNSW, *Rural Regulatory Pricing Proposal*, page 68 and 69

[106] ACCC, *Final decision on State Water pricing application 2014-15 to 2016-17*, *Attachments,* page 17

to incur in order to operate a similar business. We do not view the level of these cuts as having any material impact on levels of service.

Notwithstanding the fact that we believe the above discrete changes need to be made to WaterNSW's forecasts, the quantitative information provided by WaterNSW in support of its overall forecasts, as well as a number of the qualitative statements it has made (if taken on face value) may indicate that if anything, WaterNSW's forecasts could represent a challenging and ambitious agenda to achieve. We do however acknowledge WaterNSW's efforts to tighten expenditure and reduce costs to customers, and WaterNSW did not suggest during the review that the proposed opex levels were not realistic, including having stated that it will be able to continue to deliver the levels of service its customers have been accustomed to.

6. Performance against output measures

IPART has used output measures to act as a point of reference and as an input to assessing the prudence and efficiency of WaterNSW's capital and operating expenditure. The output measures were set as part of the 2010 Determination and cover the following areas:[107]

- milestone dates for major projects
- the percentage of maintenance jobs reported on the facilities maintenance and management system
- reporting of State Water's existing asset conditions
- environmental output measures to assess fish passage and reduced cold water pollution.

As part of this expenditure review, an assessment of whether WaterNSW has delivered against the 2010 Determination output measures has been conducted. The output measures are outlined in ACCC's *Final Report – Review of Bulk Water Charges for State Water Corporation 2010 - Appendix* D and have been used to cross check and compare the output measures information provided by WaterNSW. Furthermore, the ACCC report notes that the output measures themselves are not definitive targets that must be achieved over the determination period as there may be valid justifications for variance – this has been considered in the assessments made below.

6.1. Operating – Facilities maintenance management system (FMMS)

Across the 2010 Determination period, WaterNSW was required to report on three outputs related to the FMMS to help assess the operational performance of WaterNSW (then State Water). These were:

- Extent of jobs planned on FMMS
- Number of planned jobs completed per annum
- Number of backlog jobs at 30 June each year[108]

These output measures were intended to measure the effectiveness of corrective and routine maintenance. WaterNSW has reported the following output measure results (ACCC target outputs shown in italics) summarised in Table 48.

[107] Note that although the 2010 Determination period was originally set from 2010/11 through 2013/14, the subsequent extension did not require continued recording of output measures.

[108] WaterNSW is required to report on the number of backlog jobs at 30 June each year, excluding surveillance audit jobs. As at 1 January 2010, the backlog was 700 jobs. In the future, the time to resolve the jobs could also be provided. WaterNSW Output Template 2015-16 p. 3.

Table 48 Reported results for FMMS output measures

Output measure	2010-11	2011-12	2012-13	2013-14
Extent of jobs planned on FMMS	58% (*30%*)	62% (*45%*)	64% (*60%*)	65% (*75%*)
Number of planned jobs completed	4891 (*1066*)	6775 (*1226*)	8177 (*1410*)	8554 (*1621*)
Number of backlog jobs at 30 June each year	214 backlog jobs, this is a 69% reduction (*Target: 50% reduction*)	684 backlog jobs (*Target: Additional 25% reduction*)	359 backlog jobs, this is a 48% reduction on previous year (*No change)*	540 backlog jobs (*No change*)

Note * WaterNSW notes that 2011/12 figures were impacted by the disbanding of the planning team – no percentage figure provided.

** WaterNSW notes that 2013/14 figures were impacted by significant organisational restructuring – no percentage figure provided.

Source: Outputs Template – WaterNSW 2015/16; ACCC Final Report – Review of Bulk Water Charges for State Water Corporation 2010.

6.1.1. Assessment

WaterNSW's performance across the FMMS output measures show that efforts were made to bring operating processes into line with the FMMS. Reporting against the number of completed jobs shows a strong increase over the period, far exceeding targets. The backlog data shows that WaterNSW was capable of reducing backlogs (thus improving operation) in stable years, but in years where major organisational shifts occurred the backlog increased heavily. WaterNSW did not meet targets for jobs planned under the FMMS in the last year, but targets were met in the preceding three years.

On balance and as a measure of the effectiveness of corrective and routine maintenance, the results reported by WaterNSW show relatively good performance with some exceptions (such as high backlogs in certain years).

6.2. Maintenance – asset condition profile

WaterNSW was required to measure the condition profile across the Regulatory Asset Base, which was designed to help show the effectiveness of renewal and replacement capital expenditure and to provide a broad measure to ensure that assets are being maintained in the long term.

The targets across the determination period were set at 'no deterioration' for each year. At the time WaterNSW recorded a response of 'no deterioration' for 2010/11 and 2012/13, however in their *Output Template – WaterNSW 2015-2016* document provided for the review, WaterNSW noted that this was not an accurate assessment and provided the following response:

> *…it is believed that gaps in the data during these periods, combined with the lack of experienced personnel to validate the accuracy of the data within the State Water organisation meant that the ratings of "no deterioration" was in hindsight, inaccurate.*
>
> *Whilst it would be accurate to state that the assets were not failing, and continued to be serviceable over this period, deterioration was occurring due to an insufficient capital allowance as determined by ACCC to offset the annual rate of asset consumption.*

With the formation of WaterNSW, an increased capability in Engineering has been created (with Reliability Engineering skills in particular), which is considerably greater than the sum of the historical capability of either of the two legacy organisations. By retaining this capability, WaterNSW has commenced a programme of collecting, updating and verifying asset condition and risk data utilising specialist in-house resources and filling the data gaps noted above.

In summary, a more accurate statement of the asset condition profile ranking for the four years 2010 – 2014 would be to say; "minor deterioration continuing whilst serviceability continues to be maintained". p. 13.

Furthermore, WaterNSW felt that the measure was not equipped to capture the substantial contribution to replacement and renewals made over the period by large government funded capex programs, such as Dam Safety Upgrade projects, which included replacement and renewal works.

6.2.1. Assessment

It appears that WaterNSW has worked towards effective maintenance of assets despite indicating some shortfalls against the output measure. It should be acknowledged that there are some issues regarding both the output measure itself and WaterNSW's capacity (at the time) to report accurately against it. As a result it is not possible to make a confident assessment with regard to the measure itself, nor its bearing on the overall effectiveness with which WaterNSW maintains assets.

6.3. Maintenance – Completion of dam safety schemes

WaterNSW was required to report the progress of different projects under dam safety schemes. Separate milestones were set for each separate project ranging from design through to completion.

WaterNSW has reported the results against output measures shown in Table 49 (output targets are shown in italics).

Table 49 Completion of dam safety schemes output measures

Output measure	2010-11	2011-12	2012-13	2013-14
Blowering dam	Project Complete (*Project complete*)			
Burrendong dam	Raising Dam Wall Complete (*Design complete)*	Project Complete (*Award contract*)	Project Complete (*Project complete*)	Project Complete (*Project complete*)
Chaffey dam	Project Complete (*Award contract*)	Stage 2 and Augmentation - planning ongoing (*Project complete*)	Stage 2 and Augmentation – detailed design complete / funding negotiations ongoing (*Project complete*)	Stage 2 planning & procurement complete 30/5/2014 (execution complete 2016) (*Project complete*)
Copeton dam	Commenced Construction (*Design complete*)	Construction ongoing (*Award contract*)	Project Complete (*Project complete*)	
Keepit dam	Construction underway (*Design complete*)	Works ongoing (*Award contract*)	Project complete – work package 1 (*Project complete*)	Stage 2A - relocation electrical works commenced
Split Rock dam	Commenced Construction (*Design complete*)	Construction ongoing (*Award contract*)	Project Complete (*Project complete*)	
Wyangala dam	Design complete (*Design complete*)	Commenced Construction (*Design complete*)	Stage 1b (downstream spillway chute wall raising) – commenced (*Award contract*)	Stage 1c (dam crest raising) –suspended pending further flood modelling (*Project complete*)

Source: Outputs Template – WaterNSW 2015/16; ACCC Final Report – Review of Bulk Water Charges for State Water Corporation 2010.

6.3.1. Assessment

Based on the information provided, in most cases WaterNSW successfully delivered dam safety works, however this was not always within the specified time target. The single exception to this is the Wyangala dam which has had Stage 1c suspended pending further flood modelling.

6.4. Telemetry

WaterNSW was required to report on the number and percentage of key sites with remote monitoring for observation and control of assets, automation, and surveillance and monitoring works.

WaterNSW has reported the results against output measures shown in Table 50 (output targets are shown in italics). WaterNSW also notes that these output measure targets and the output measure results do not necessarily reflect the total numbers of structures and telemetry assets, as some developments are being relinquished by WaterNSW (e.g. the Bethungra Dam) and new developments are being implemented and equipped with new technology. As a result, comparisons between the targets and reported data are somewhat misleading. WaterNSW has not provided alternative figures to reflect the broader adoption of telemetry across assets.

Table 50 Telemetry output measures

Output measure	2010-11	2011-12	2012-13	2013-14
Number and percentage of key sites with remote monitoring for observation and control of assets	15 dams, 1 Water Treatment Plant, 43 (80%) (*15 Dams (83%)*)	18 dams, 1 Water Treatment Plant (95%) (*3 Dams (100%)*)		
	40 weirs and regulators (81%) (*43 Weirs and Regulators (83%)*)	49 weirs and regulators (94%) (*14 Weirs and Regulators (100%*)		
Automation of key sites – this is the second stage of the iSMART project which will rationalise the existing telemetry infrastructure to ensure that full benefit of the iSMART project is realised.	0 Dams (0%) (*9 Dams (69%)*)	3 Dams (16%) (*1 Dams (77%)*)	5 Dams (38%) (*0 Dams (77%)*)	6 Dams (46%) (*3 Dams (100%)*)
	0 Weirs and Regulators (0%) *(14 weirs and regulators (30%))*	0 Weirs and Regulators (0%) *(22 weirs and regulators (76%))*	20 Weirs and Regulators (38%) *(4 weirs and regulators (85%))*	21 Weirs and Regulators (40%) *(7 weirs and regulators (100%))*
Surveillance monitoring works – This project phase relates to installation of new dam and weir instrumented surveillance systems to ensure that full benefit of the iSMART project is realised.	0 Dams (0%) (*7 Dams (58%)*)	3 Dams completed 1 partially completed (18%) (*5 Dams (100%)*)	0 Dams (0%)	0 Dams (0%)
	0 Weirs and Regulators (0%) (*21 weirs and regulators (40%)*)	0 Weirs and Regulators (0%) (*17 Weirs and Regulators (77%)*)	0 Weirs and Regulators (0%) (*11 Weirs and Regulators (94%)*)	0 Weirs and Regulators (0%) (*3 Weirs and Regulators (100%)*)

Source: Outputs Template – WaterNSW 2015/16; ACCC Final Report – Review of Bulk Water Charges for State Water Corporation 2010.

6.4.1. Assessment

The output measures provide some evidence that WaterNSW continues to implement telemetry technology, however the extent to which this has been done (relative to target levels of implementation) is not clear through the output measures due to the reasons outlined above.

6.5. Environmental fish passes

6.5.1. Fish passes output measures

As an environmental obligation, WaterNSW was required to report on the length of river open to fish – some rivers had specific targets, while others did not. WaterNSW has provided data on a number of rivers across the determination period. This is shown in Table 51.

Table 51 Environmental fish passes output measures

Output measure		2010-11	2011-12	2012-13	2013-14
Total length of river open to fish measured by valley, length and year	Target for selected rivers		Macquarie 380km Lachlan 519km	Murrumbidgee 210km	Gwydir 368km Namoi 340km
	WaterNSW reported data	Macquarie – 193km Lachlan – 284km Murray – 8km Murrumbidgee – 208km Darling – 322km Namoi – 1km Brunswick – 9km Richmond – 2km Macleay – 62km	Macquarie – 288km Lachlan – 284km Murray – 481km Murrumbidgee 348km Darling – 322km Namoi – 1km Brunswick – 9km Richmond – 2km Macleay – 62km Total: 1797km	Macquarie – 288 km Lachlan – 398 km Murrumbidgee – 348 km	Macquarie- 397km Lachlan- 398km Murray- 1545km Murrumbidgee- 620km Darling- 322km Namoi- 22km Brunswick- 9km Richmond- 2km Macleay- 66km Manning- 20km Tuross- 24km Barwon- 441km Total: 3866km

Source: Outputs Template – WaterNSW 2015/16; ACCC Final Report – Review of Bulk Water Charges for State Water Corporation 2010.

6.5.2. Assessment

While there has been a gradual increase in the total length of river open to fish, many of the output targets were not met. Furthermore the length for the Gwydir River was not reported against (see 2013-14 column above). The results do not present any clear approach to meeting the output measures or that specific actions were taken to meet the output measures; it would appear that targets for the Lachlan, Gwydir and Namoi rivers were not met at the conclusion of the reporting period. However, during the review WaterNSW provided further information on this matter, stating that:

WaterNSW has not delivered any fish passage projects in the Gwydir. Therefore, the total length of river open to fish in the Gwydir in 2013/14 is nil. The fish passages output measures were set in 2010 when the fish passage requirements were still being negotiated between State Water Corporation and the regulator. These negotiations are ongoing, as evidenced by WaterNSW's proposed expenditure on the fish way strategy.

6.5.3. Environmental – cold water pollution

WaterNSW was required to report on the performance of Cold Water Pollution works for valleys where Cold Water Pollution works have been undertaken. The output measure was based on a number of figures used to inform whether a satisfactory performance level was being achieved, including the following data requirements:

- achieving a 60% compliance with the 20th to 80th percentile range (would require at least 18 days observations to be within the range for a 31 day month)
- achieving a 90% compliance with the 5th to 95th percentile range (would require at least 27 days observations to be within the range for a 31 day month)
- no observations outside the range of +/-3 standard deviations.

The data recorded by WaterNSW across the determination period showed a failure to comply with the output measure targets (see Outputs Template – WaterNSW 2015/16). This is likely due, in part, to the strictness of the targets and WaterNSW has provided further explanatory material to this affect (Outputs Template – WaterNSW 2015/16 p. 12):

The CWPIAG (Cold Water Pollution Inter Agency Group) guidelines outline the following CWP targets for sampling applicable between September – April:

Achieve 60% compliance with the 20th/80th percentile range

Achieve 90% compliance with the 5th-95th percentile range

Achieve 100% compliance with +/-3 standard deviation

Note, the above guidelines convert to an average temperature range of only:

20th/80th percentile range: 2.9°C

5th/95th percentile range: 4.8°C

It should be recognised that these are targets only and our Work Approvals have the compliance obligation to operate in accordance with the Variable Offtake Management Plan (VOMP) which State Water [now WaterNSW] *has achieved. As can be seen the above figures highlight the tight target temperature range required.*

In response to the non-compliance with these targets, the VOMP has since been updated and approved by the CWP Interagency Group (CWPIAG)…

6.5.4. Assessment

It appears that this was not a practically achievable implementation output measure, and that WaterNSW has sought to address the issue of Cold Water Pollution through an improved framework in consultation with the relevant stakeholder group.

6.6. Water Delivery – Expenditure to enhance the water delivery operations

WaterNSW at the time of the 2010 Determination was developing performance indicators for water delivery for each valley. Complementary to this, output measures were set across the determination period to build on the performance indicators developed by WaterNSW. The output targets and WaterNSW's reported actions are shown in Table 52.

Table 52 Expenditure to enhance water deliver operations output measures

	2010/11	2011/12	2012/13	2013/14
Output measure	Establish water delivery performance indicators and benchmarks in each major valley based on historical performance.	Set performance improvement targets for each valley. Measure and report performance against performance indicators.	Measure performance against performance indicator targets	Measure performance against performance indicator targets
Reported response	"In 2010/11 we reviewed possible Water Delivery efficiency indicators and decided to adopt "Operational Surplus" as the KPI. The indicator will be expressed as a percentage of (regulated sales plus discretionary environmental water), reported monthly on cumulative monthly totals of Ops surplus and (sales plus Environment). The initial target has been set at 5% but is subject to analysis of past records to confirm whether this is achievable."[109]	Surplus target achieved at 5% across all valleys in 2012/13	Performance indicators are surplus flows and shortfalls are reported to Exec on monthly basis. Surplus target achieved at 4% across all valleys in 2012/13. During 2012/13 47 short falls occurred across the State.	Surplus target achieved at 4% across all valleys in 2013/14.

Source: Outputs Template – WaterNSW 2015/16; ACCC Final Report – Review of Bulk Water Charges for State Water Corporation 2010.

6.6.1. Assessment

Based on the information provided, it is not possible to comment on the effectiveness of WaterNSW's actions in meeting the output measure requirements, however strictly speaking their actions have met the output measure requirements through developing and implementing a reporting process for measuring performance for water delivery.

6.7. Proposed future output measures

The review team have developed the following proposed output measures for further consideration by IPART and WaterNSW. These were selected by the review team based on issues identified as part of the review, including projects or programs reviewed, or broader issues identified. The review team recommend that the output measures are further refined by IPART and WaterNSW.

[109] Outputs Template – WaterNSW 2015-16 p. 10

Table 53 Proposed output measures for WaterNSW for next determination period

Project or area	Proposed output measure	Proposed target completion	Rationale and further detail
Asset renewals and condition	Report on failures in service or service orders requiring reactive maintenance, broken down by asset sub types (number of failures for different classes, types of failures).	Report annually	This would provide information to help inform WNSW forecasting, as well as give confidence to reviewers about asset condition and expenditure requirements.
WaterNSW ERP	Reduction of 5 FTEs due to ERP implementation	1 July 2020	Realisation of benefits that the business case in part relied upon.
	Ceased use of legacy information/ERP systems	1 July 2020	Realisation of benefits that the business case in part relied upon.
Regulatory – Health and Safety	WHS risks are eliminated or mitigated to As Low As is Reasonably Practicable (ALARP), providing a safe working environment for staff, reducing risk to the public, and maintaining operability	30 June 2020	Realisation of benefits that the business case in part relied upon. Measure may be difficult to quantify but could be reported against qualitatively.
Keepit Dam	Completion of works meeting the stated needs & requirements, within budget	30 June 2020	Measure of WaterNSW performance with executing major projects – i.e. this relates to the delivery of the project on time and on budget.
Keepit Dam safety project	Life safety risk position from Keepit Dam reduced to below ANCOLD Limit of Tolerability for societal risk (ANCOLD Guidelines on Risk Assessment Figure 7.4)	30 June 2020	This was argued by WaterNSW as a key rationale for undertaking works. The output measure is designed to ensure the required risk reduction outcome is achieved.
Dam security upgrades	Demonstrated compliance of the level of security at all dams with upgrade works proposed in the next regulatory period as required by NSW Dam Safety Committee	30 June 2020	NSW Dam Safety Guidance Note DSC2H “Dam Security” details specific requirements for dam owners including, for example, to complete a risk-based security plan, assess current security threat, and also requires owners to document and to report on security risk status on their dams.

Project or area	Proposed output measure	Proposed target completion	Rationale and further detail
Future Dam Safety capital works strategy	Following expected changes in dam safety regulations, formulate a medium term (5-10 year) plan of capital works required	12 months following confirmation of applicable dam safety regulations in NSW	Develop a coherent long term plan for capital investment for dams.

7. Water services charges

7.1. Overview

Water services charges are service fees levied by WaterNSW for non-routine product offerings, the costs of which are not recovered through bulk water infrastructure charges. These include water take measurement charges as well as other miscellaneous charges such as water trading charges and environmental gauging station charges.

7.2. Water take measurement charges

7.2.1. Overview of charges considered

WaterNSW owns and operates approximately 2,000 groundwater and surface water meters. These meters were funded by the Commonwealth Government through the NSW Metering Project and are installed at licensed customer extraction points along the Murray and Murrumbidgee valleys.

WaterNSW recovers costs for maintaining meters (owned by WaterNSW) as well as reading meters and conducting water use assessments. For maintenance services, WaterNSW levies a Meter Service Charge (MSC) which covers maintenance and administrative costs (including associated overheads). WaterNSW has proposed MSCs over the determination period that remain relatively flat and are in line with previous determinations.

For meter reading and water use assessments, costs are not recovered through a separate service charge and are instead grouped with (and recovered through) bulk water charges. WaterNSW has proposed changes to the meter reading services it provides which will have the effect of reducing the costs of the service.

7.2.2. Rationale for charges

The MSC charge will recover the costs associated with:

- The maintenance of WaterNSW-owned meters (including asset maintenance in relation to telemetry assets); and
- The administration costs incurred by WaterNSW including associated overheads.

The review team consider that the rationale for applying a separate charge to recover these specific costs is appropriate.

In terms of the reading and water-use assessment services, these costs are recovered through bulk water charges and are not subject to a separate charge. We note that WaterNSW is proposing to restructure its meter reading program to achieve cost savings that will flow through to the bulk water charges. These costs have been considered as part of our broader review of expenditure for bulk water charges rather than non-bulk water charges.

The remainder of the analysis is specific to the MSC.

7.2.3. Cost recovery basis

WaterNSW proposed adjustments to the structure of the meter service charge:

- No longer distinguish between telemetered and non-telemetered meters due to no cost differential from service provider; and
- Discontinuing meter maintenance charges for WaterNSW funded meters because WaterNSW has not installed any WaterNSW funded meters at customer sites.

These changes appear reasonable and do not negatively impact on any economic efficiency that may arise through this charge. Based on this, we agree with WaterNSW's proposed changes to the structure of the meter services charge.

7.2.4. Efficiency of costs and alignment with charges

Based on our review of the costs to be recovered from this charge, there were a number of key issues that required further consideration:

- Contract costs for meter replacement and maintenance;
- WaterNSW's internal administrative costs;
- Asset failure allowance within the costs;
- Calculations within the Microsoft Excel Spreadsheet; and
- Escalation of the charge throughout the regulatory period.

The following outlines our findings for each of these issues.

Contract costs

The calculation of the meter service charges is based on metering cost information – both capital and maintenance – that is currently provided to WaterNSW by a third party. WaterNSW was unable to provide the contract with this third party that outlined these costs (due to confidentiality).[110] This would have enabled the review team to verify that the costs were accurate and to understand the breakdown of the estimated costs. We have therefore had to assume that the capital and maintenance costs listed in the calculation of the meter service charge is consistent with those costs in the contract.

WaterNSW did provide information on the procurement process for the contract and we are comfortable that the contract itself was entered into based on an appropriate competitive tender process.[111] Assuming that the estimated costs reflect those in the contract, we consider the costs for meter replacement and maintenance to be appropriate.

Administrative costs

WaterNSW states that a meter maintenance manager would be required, with an estimated salary of $77,000 per annum (equivalent to a Grade 4 employee). Incorporating on-costs and overheads, WaterNSW forecasts that the total cost of managing the service contract will amount to approximately

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[110] The contract with the service provider prohibits the disclosure of the contract to a third party unless required by law.

[111] The contract has been running with the current contractor since 11 May 2015 for a 5 year term, with an option to renew for an additional 5 year term. Three parties bid as part of the tender process (including the current contractor), and WaterNSW confirmed that out of the three proponents, it selected the provider who proposed the lowest annual maintenance fee for the meters.

$160,000 in 2017-18 and declining over the regulatory period based on the proposed reductions in overhead expenditure. Based on our review of operating expenditure, this allocation of overheads is appropriate (see Section 5).

Asset failure allowance

In the previous pricing decision by the ACCC, the calculation of the metering service charge included an allowance to fund meter and telemetry asset failures outside of warranty. This allowance was based on an estimated failure rate of 1 per cent per annum. WaterNSW has proposed to retain this allowance for the upcoming regulatory period.

We agree with the concept of including the allowance for asset failure, however we note that in the ACCC's previous decision it noted that this allowance would be adjusted in future price reviews to reflect actual failure rates.[112] Based on this, we sought further information from WaterNSW regarding the actual failure rate. This indicated an annual failure rate of approximately 0.32 per cent (this is based on the number of failures to date and the number of meters installed). We therefore propose that the allowance for asset failure be revised to reflect the actual asset failures over the current regulatory period (0.32 per cent).

Calculation of the charge

In addition to the recommendations above regarding elements of the meter service charges, we have also reviewed the Microsoft Excel Spreadsheet that calculates the meter service charges. From this, we have identified some changes to the calculations that will have an impact on the charge:

- WaterNSW had incorporated the annualised telemetry cost twice in the calculation of the charge; and
- Adjustments to the calculation of the annuity of meter replacement costs to ensure it was a consistent annuity cost applied over the life of the asset.

The first change resulted in a slight downward adjustment to the charges, however the second adjustment resulted in an increase for the charges in the upcoming regulatory period. Our proposed adjustments to the annuity calculation primarily change the timing of the recovery of the costs, thereby resulting in higher charges in the near-term and lower charges in the future.

Escalation of charge throughout regulatory period

WaterNSW's submission proposed that this charge be escalated by inflation throughout the regulatory period, however in reviewing the underlying information WaterNSW had calculated charges based on costs for each year of the period. We have re-calculated these charges based on the proposed changes to the calculation and the asset failure rate identified above, the results of these changes are presented in Table 54. WaterNSW's proposed charges are contained in Table 55.

[112] Australian Competition and Consumer Commission, *Attachments to ACCC Final Decision on State Water Pricing Application 2014-15 – 2016-17*, p.143.

Table 54 Recommended MSC for regulatory period ($nominal)

Meter Size	2016-17 (Current)	2017-18	2018-19	2019-20	2020-21	Initial Change
50mm	$398.65	$453.12	$463.61	$474.37	$529.23	13.7%
80mm	$398.79	$455.22	$465.76	$476.56	$530.94	14.2%
100mm	$399.55	$455.17	$465.67	$476.43	$534.79	13.9%
150mm	$420.27	$460.47	$471.03	$481.85	$550.38	9.6%
200mm	$442.79	$463.08	$473.67	$484.53	$562.80	4.6%
250mm	$448.46	$465.48	$476.06	$486.91	$567.84	3.8%
300mm	$450.46	$471.72	$482.36	$493.26	$577.97	4.7%
350mm	$463.04	$499.83	$510.78	$522.01	$631.48	7.9%
400mm	$515.41	$516.51	$527.58	$538.93	$664.66	0.2%
450mm	$623.99	$519.69	$530.76	$542.11	$667.89	-16.7%
500mm	$633.40	$533.43	$544.68	$556.20	$674.58	-15.8%
600mm	$667.59	$550.92	$562.29	$573.94	$687.22	-17.5%
700mm	$681.27	$571.77	$583.35	$595.21	$699.86	-16.1%
750mm	$682.95	$601.33	$613.55	$626.08	$770.99	-12.0%
800mm	$720.82	$620.87	$633.09	$645.62	$790.54	-13.9%
900mm	$775.11	$627.05	$639.28	$651.81	$796.72	-19.1%
1,000mm	$780.59	$638.49	$650.72	$663.25	$808.16	-18.2%
Channel	$7,637.95	$5,947.68	$6,091.46	$6,238.84	$6,595.74	-22.1%

Table 55 WaterNSW's proposed MSC for regulatory period ($nominal)

Meter Size	2016-17 (Current)	2017-18	2018-19	2019-20	2020-21	Initial Change
50mm	$398.65	$440.03	$471.93	$505.16	$583.60	10.4%
80mm	$398.79	$441.92	$473.96	$507.32	$585.36	10.8%
100mm	$399.55	$440.73	$473.18	$506.97	$589.50	10.3%
150mm	$420.27	$443.95	$477.28	$512.00	$605.61	5.6%
200mm	$442.79	$445.59	$479.34	$514.50	$618.26	0.6%
250mm	$448.46	$446.11	$480.60	$516.53	$623.77	-0.5%
300mm	$450.46	$449.33	$485.07	$522.31	$634.66	-0.2%
350mm	$463.04	$466.19	$506.70	$548.95	$690.96	0.7%
400mm	$515.41	$474.27	$518.31	$564.26	$726.28	-8.0%
450mm	$623.99	$475.11	$520.08	$567.00	$730.09	-23.9%
500mm	$633.40	$483.99	$531.06	$580.19	$737.99	-23.6%
600mm	$667.59	$492.31	$543.14	$596.20	$752.91	-26.3%
700mm	$681.27	$503.98	$558.66	$615.75	$767.84	-26.0%
750mm	$682.95	$531.00	$587.33	$646.14	$839.60	-22.2%
800mm	$720.82	$536.35	$598.31	$663.03	$862.68	-25.6%
900mm	$775.11	$538.05	$601.78	$668.37	$869.98	-30.6%
1,000mm	$780.59	$541.18	$608.21	$678.25	$883.48	-30.7%
Channel	$7,637.95	$5,816.33	$6,028.41	$6,247.46	$6,679.53	-23.8%

7.2.5. Summary assessment

We agree with the rationale for applying the MSC, however we have adjusted its calculation based on revised information (updated asset failure rates) and changes to the spreadsheet. Overall, this has resulted in an increase to the proposed MSC, however the changes to the calculation of the replacement annuity will ensure that the charge is lower in the future.

7.3. Trade processing charges

7.3.1. Overview of charges considered

WaterNSW levies charges for trade of water allocation, known as the trade processing charge. The charge covers the administrative costs of transferring an allocation assignment (i.e. a volume of current year allocation) from one access licence to another (noting that there are some limitations on trade between different access licence types).

The trade processing charge consists of a two-part tariff, with a fixed charge for each application to trade, and a variable charge based on the volume to be traded.

7.3.2. Rationale for charges

The costs associated with processing trade applications are directly attributable to those customers seeking a trade application. It is therefore entirely appropriate to apply a specific charge to recover these costs from those customers seeking to trade an allocation.

7.3.3. Cost recovery basis

WaterNSW has proposed to retain the current tariff structure for trade processing charges. The current tariff structure consists of a two-part tariff:

- Fixed charge of $39.16 per trade application; and
- Variable charge of $0.52 per ML of allocated trade (up to a maximum of $154.56).

WaterNSW has proposed to maintain the same structure and level of the tariffs as it is consistent with the ACCC's previous decision regarding the charge and is expected to recover the costs that WaterNSW forecast to incur in providing the service.

We have concerns that the structure of the trade processing charge is not reflective of the costs incurred by WaterNSW in processing the trades.

WaterNSW stated that:

- There is a correlation between the costs incurred and the number of trade applications; and
- There is no correlation between the costs incurred and the volume of water attached to each trade application.

This indicates that the current tariff structure, with its variable component, is not cost reflective and does not promote allocative economic efficiency. Given this, a charge per trade application would appear to be more cost reflective and better reflect economic efficiency.

In considering whether there were any alternative benefits to having a two-part tariff, we reviewed the trade application information to determine whether there was any correlation between the number of trades and the volume of water being traded. If there was a correlation (e.g. higher water volume trades when there is a smaller number of trade applications), then this may provide a degree of hedging of revenue risk for WaterNSW. It can be seen from Table 56 that there is no correlation between the revenue per application (a proxy for the volume of water being traded) and the number of applications. This would indicate that there is no natural hedge for WaterNSW in relation to the number and size of trade applications and therefore, no real benefit to applying the variable component of the charge.

Table 56 Historical revenue and cost analysis ($nominal)

Year	Applications	Revenue	Revenue per Application	Cost	Cost per Application
2010-11	1,861	$116,000	$62.33	$202,856	$109.00
2011-12	2,120	$254,604	$120.10	$187,382	$88.39
2012-13	4,312	$516,537	$119.79	$282,703	$65.56
2013-14	4,735	$536,954	$113.40	$282,373	$60.69
2014-15	4,528	$290,581	$64.17	$225,382	$49.78
2015-16	4,335	$551,000	$127.10	$188,000	$43.37

Source: Information provided by WaterNSW; analysis by Oakley Greenwood.

In order to derive the most economically efficient outcome from the tariff structure, we propose that the structure of the trade processing charge be amended to be a single, fixed charge, regardless of the volume of water attached to the trade application. See further below for what we consider is an appropriate price for this charge. The price at which we propose to set this fixed charge is outlined in the following section.

7.3.4. Efficiency of costs and alignment with charges

Based on our review of the costs to be recovered from this charge, there were a number of key issues that required further consideration:

- Forecast number of trade applications;
- Forecast cost per application;
- Actual revenue and cost from the current regulatory period;
- Setting the single, fixed charge; and
- Escalation of the charge throughout the regulatory period.

The following outlines our findings for each of these issues.

Forecast cost per application

Table 57 provides a breakdown of the forecast number of hours and costs associated with processing trade applications. Given the difficulties associated with forecasting things such as trade applications (or the time associated with processing trade applications), having a consistent annual forecast over the period is reasonable.

Table 57 Forecast cost analysis ($2016-17)

Year	Hours	Direct Costs	Overhead Costs	Total Costs
2017-18	2,400	$116,260	$130,694	$246,954
2018-19	2,400	$116,260	$117,069	$233,329
2019-20	2,400	$116,260	$115,943	$232,204
2020-21	2,400	$116,260	$108,556	$224,816

The forecast direct costs of $116,260 is based on the recovery of costs associated with 1.5 FTEs. Given this, WaterNSW is forecasting a direct cost of $48.44 per hour to process trade applications. This is slightly above the 2015-16 costs of $43.09, but less than the average over the previous 6 years of $57.36. The overhead rate applied to the direct costs is decreasing each year. This reflects the reductions in overhead-related expenditure proposed by WaterNSW for the period.

In revising the trade application charge, we have accepted WaterNSW's direct cost per hour and overhead percentages however we consider that further analysis regarding the number of trade applications is beneficial in determining the number of hours required.

Forecast number of trade applications

As discussed above, the costs incurred in providing this service are likely to correlate with the number of applications received by WaterNSW (WaterNSW noted that while there was a correlation, it was unlikely to impact on the headcount required to provide the service). This means that we would expect that in those years that the number of applications are lower than expected, resourcing may be available to assist in undertaking other activities within the business, thereby requiring a shift in the costs of that resource from the trade processing charge to the regulated costs. The likely change in the level of the charge from factoring in this variation in cost is likely to be relatively minor and the administrative costs associated with doing so would most likely outweigh any benefits.

Historical information regarding demand for services (such as trade applications) is not always the best indicator of future demand for services, however we consider that it is the most appropriate starting point for this type of forecasting.

WaterNSW forecasts that 2,400 hours per annum will be required to process the forecast trade applications in the future. This forecast is based on 1.5 FTEs. Based on an average time per trade application of 0.49 hours (this was the average processing time from 2012-13 to 2015-16[113]), 2,400 hours equates to a forecast number of applications of 4,904 per annum. While the use of this number would result in a lower fixed charge, we consider a forecast of 4,904 applications to be optimistic.

As seen in Table 56 there was a clear jump in the number of trade applications from 2012-13 onwards. WaterNSW indicated that the trade application numbers for 2012-13 and 2013-14 were higher than normal however it did not provide information as to why this was the case. Additionally, the subsequent two years of information have continued this trend of higher application numbers. The

[113] We have used this averaging period because all four years were quite consistent – 0.51, 0.54, 0.46 and 0.44. The 2 years prior involved more time per application, however the subsequent years most likely represent improvements in processes and appear to be ongoing improvements given that they have been continually achieved.

calculation of the average number of trade applications over the past 6 years is heavily influenced by this step change:

- 2010-11 to 2015-16 Average (last 6 years) **3,649**
- 2012-13 to 2015-16 Average (last 4 years) **4,478**

It is not clear whether this is a permanent increase or a temporary increase. If it is a permanent increase in applications, it would be expected that approximately 4,500 trade applications per annum would be expected into the future. If it is temporary, we would expect the number of applications to return to the longer-term average of around 3,500 per annum. Given this uncertainty, we have taken the average of these two periods to determine a revised forecast of **4,063** trade applications per year. This is in contrast to the assumed forecast of 4,904 trade applications from WaterNSW.

Using the average time to process trade applications of 0.49 hours (identified above), we estimate that there will be 1,988 hours incurred by WaterNSW in processing trade applications from customers. We have used this number of hours with the forecast labour rates and overhead rates to determine a new forecast cost for processing trade applications (see further below for proposed prices for the charge).

Actual revenue and costs from the current regulatory period

It can be seen from Table 56 above that WaterNSW has collected revenue in excess of costs each year since 2011-12, with revenue nearly tripling the costs in 2015-16. Despite this, WaterNSW is proposing to continue with the current prices for the trade processing charge.

We note that there does not appear to be a direct correlation between the forecasting of costs and the forecasting of revenue by WaterNSW (i.e. they appear to be undertaken independent of each other). We are therefore proposing that in setting the fixed charge for the upcoming regulatory period, it will be based on the forecast annual cost and the forecast number of trade applications.

Setting the single, fixed charge

As outlined above, we are proposing that the structure of the trade application charge be amended to be a single, fixed charge per application. This charge structure has a higher degree of cost-reflectivity than the current structure and will therefore promote economic efficiency.

We also propose that in setting this fixed charge, the forecast revenue be set equal to the forecast costs per annum. Forecasting the number of applications is difficult and it is not possible to set a purely cost-reflective charge, it is therefore highly likely that there will be variations between costs and revenue throughout the regulatory period. However, for the purposes of establishing a forward-looking charge, the forecast revenue from that charge should be equal to the forecast cost.

Given this approach, we propose that a single, fixed charge be set at $50.36 for 2017-18. This is forecast to recover $204,604 over 2017-18 based on 1,988 hours to process 4,063 trade applications.

Escalation of charge throughout regulatory period

WaterNSW proposed that this charge be escalated by inflation throughout the regulatory period. Rather than simply escalating the initial charge by inflation over the period, we are recommending real reductions in the charge based on the reductions in overhead costs over the period. Consistent with the other charges, this real charge would be escalated by inflation to nominal terms during the regulatory period. Table 58 provides our recommended fixed charge (in real terms) over the regulatory period based on the above proposed changes.

Table 58 Recommended trade processing charge ($2016-17)

Year	Applications	Hours	Total Costs	Fixed Charge
2017-18	4,063	1,988	$204,604	$50.36
2018-19	4,063	1,988	$193,316	$47.58
2019-20	4,063	1,988	$192,383	$47.35
2020-21	4,063	1,988	$186,262	$45.84

7.3.5. Summary assessment

We agree with the rationale for applying a charge to process trade applications, however we have concerns that the current tariff structure is not cost reflective. We therefore recommend that the structure of the charge be a single, fixed charge which is applied to each application. This better reflects the costs incurred by WaterNSW as there is a correlation between its costs and the number of applications it receives. We acknowledge the additional information provided by WaterNSW between draft and final reports on this matter, and confirm this was reviewed. It did not however, alter the recommendations of the review team.

In calculating the fixed charge, we have adjusted WaterNSW's forecast number of applications and hours required, this results in a fixed charge for 2017-18 of $50.36. We propose that the charge be reduced in real terms over the regulatory period (as set out in Table 58) to reflect the reduced overhead costs throughout the business. The following table highlights the charges proposed by WaterNSW and our recommended charges for trade processing.

Table 59 WaterNSW proposed, and recommended trade processing charge ($2016-17)

Year	WaterNSW proposed charge		Recommended charge
	Fixed	*Variable*	
2017-18	$39.01	$0.51 per ML	$50.36
2018-19	$39.01	$0.51 per ML	$47.58
2019-20	$39.01	$0.51 per ML	$47.35
2020-21	$39.01	$0.51 per ML	$45.84

7.4. Environmental gauging station charges

7.4.1. Overview of charges considered

Environmental gauging stations measure environment releases for environmental customers. There are currently 21 environmental gauging stations being operated by WaterNSW, most of which were operated under a Service Level Agreement (SLA) with DPI Water until recently being transferred to WaterNSW.

An environmental gauging station charge was put in place (but not charged) in order to cover the incremental costs of upgrading meters (in line with Commonwealth National Measurement Standards developed under the National Water Initiative). Charges were not levied in the previous determination

period as no meters were updated, however the forthcoming period will require upgrades as meters reach the end of their life.[114] As a result WaterNSW has proposed a continuation of environmental gauging station charges, as well as an increase in the charges to reflect the incremental costs of upgrading meters to national standards.

7.4.2. Rationale for charges

Consistent with the previous ACCC decision, we consider that the application of the environmental gauging station charge is appropriate as it:

- Is designed to recover the additional costs of upgrading the gauging stations to meet the new national metering accuracy standards; and
- Will be applied to customers that are billed from these gauging stations.

Based on this, we consider it appropriate to continue to apply an environmental gauging station charge.

7.4.3. Cost recovery basis

We are comfortable that the structure of the proposed environmental gauging station is appropriate and will allow it to be able to recover its costs of providing the service.

7.4.4. Efficiency of costs and alignment with charges

Based on our review of the costs to be recovered from this charge, there were a number of key issues that required further consideration:

- Installation of Transit Time or Acoustic Doppler Current Profiler;
- Expected useful life of instruments;
- Service supplier sites;
- Incremental costs;
- Calculation of the proposed charge; and
- Escalation of the charge throughout the regulatory period.

The following outlines our findings for each of these issues.

Installation of Transit Time or Acoustic Doppler Current Profiler

In order to achieve the level of accuracy under the new National Measurement Standards, WaterNSW is proposing that either an Acoustic Doppler Current Profiler (ADCP) or Transit Time instruments be installed at each site when the site's current equipment reaches the end of its useful life.

WaterNSW indicated that the choice between Transit Time and ADCP is dependent on the specific conditions of the site, however it noted that at present there are significantly more ADCP's in the field

[114] WaterNSW Pricing proposal to IPART 2017- 2021

compared to Transit Time instruments. Further information provided by WaterNSW indicated that the likely proportion of the split between the sites would be: ADCP at 19 sites and Transit Time at 2 sites.

WaterNSW has estimated that the capital costs associated with procuring and installing an ADCP is $30,000 per site. WaterNSW has provided evidence that this estimated cost is based on actual costs. Given this, we consider that the proposed capital cost for an ADCP per site appears reasonable. The cost for the Transit Time is estimated to be $100,000 per site based on information provided by an external supplier. This cost is considerably higher than the ADCP as it reflects a higher quality technology that is used predominantly in difficult circumstances where other instruments fail.

In re-calculating the charge, we have identified a 'blended instrumentation annuity' which is based on the likely proportions of Transit Time and ADCPs being installed in the field. This is discussed further below.

Expected useful life

In estimating the costs to be incurred by WaterNSW in providing this service, it has used an expected useful life of the ADCP of 3 years and the Transit Time of 4 years. These short lifespans have a material impact on the calculation of the charge as the purchasing and installation costs need to be recovered over a shorter period of time.

We note that the previous ACCC decision applied a useful life of 15 years as it treated the equipment equivalent to a standard meter (this was most likely the reason for the much lower charge). While we do not think that a useful life equivalent to a standard meter is appropriate, we do think that 3 years is an extremely short estimated useful life for an instrument that costs as much as the ADCP and Transit Time. In further information provided to us, WaterNSW stated that in general hydrometric station instruments use between 3 and 7 year renewals cycle.

WaterNSW has provided anecdotal experience of these gauging stations requiring replacement after a short period, however it is not clear whether these are outliers or whether this is the standard. No evidence regarding the number of stations in use, their installation dates and subsequent replacements has been provided to justify a useful life of only 3 years.

We propose that an estimated useful life of 6 years be applied to both the ADCP and the Transit Time instruments. This is primarily based on WaterNSW's subsequent information regarding hydrometric station instruments generally having between 3 and 7 year renewals cycles and our view that 3 years is too short and the previous ACCC decision of 15 years is too long.

Service supplier sites

At the time of submitting its pricing proposal, WaterNSW had a Service Level Agreement (SLA) with DPI regarding the operation and maintenance for most of the environmental gauging stations used by WaterNSW (18 of the 21). This was because DPI owned and operated these environmental gauging stations and subsequently provided information (such as reads) to WaterNSW for it to bill its environmental customers. These were DPI-owned assets and were operated for DPI purposes, therefore if WaterNSW required services in excess of what DPI was proposing (and DPI was unwilling to provide the additional service) WaterNSW was required to undertake the service itself.

There were 3 sites that were outside the SLA. The exclusion of these three sites was not due to any physical characteristics, but to the fact that DPI did not want to continue providing services to these sites. WaterNSW was therefore required to undertake its own operations and maintenance of these sites outside the SLA.

Since the pricing submission was finalised, the SLA is no longer in operation and all sites are now being serviced by WaterNSW. WaterNSW is now in the process of undertaking asset condition

assessments in order to understand the status of the assets that it is now responsible for (we understand that this information was not available from DPI). It is expected that the new structure will be effectively 'bedded-down' and fully operational by the start of 2017.

Incremental costs

Incremental costs will be incurred to undertake the additional calibration to ensure that the outlet continues to meet the required accuracy standards. WaterNSW has estimated these incremental operating and maintenance costs based on a trial of 5 outlets undertaken through the (now redundant) SLA. The result of the trial was that the incremental operating and maintenance expenditure was $4,900 per site. WaterNSW was unable to provide a further breakdown of this estimated cost as it was not provided a breakdown of the costs from DPI.

It would be expected that efficiencies will be able to be achieved through bringing the operations and maintenance of these assets in-house through 'piggy-backing' onto other WaterNSW maintenance work at the sites. There will however, be a transition phase in bringing the services in-house that will mean it will take time to achieve those efficiencies.

In the absence of any more detailed information, we consider that the current estimates of $4,900 per site based on the previous SLA appear reasonable. However, we would expect that there will be more actual costs based on the new service delivery model for the next pricing review which should inform future pricing decisions.

WaterNSW proposed an additional $45,000 for installation costs for sites not covered by the SLA. Given that there are no longer any sites covered by the SLA and that all costs are to be incurred by WaterNSW, it is not clear how this will impact on the proposed incremental costs for those sites that were previously not covered by the SLA. It would be expected that some of these additional costs related to the fact that WaterNSW was only servicing 3 sites and therefore there were considerable incremental costs associated with that. Given this uncertainty we have excluded this cost from the calculation of the charge for the upcoming regulatory period.

Calculation of the proposed charge

We have reviewed the Microsoft Excel Spreadsheet that contains the calculations for the charge and propose to re-calculate the charge using our findings above. The key differences between the calculations in the spreadsheet are:

- No incremental installation costs for non-SLA sites;
- Estimated useful lives; as outlined above, we are proposing to adjust the useful lives of the ADCP and Transit Time to be 6 years
- Blended instrument annuity.

Based on the likely proportions of ADCP and Transit Time (19 and 2), we have re-calculated an annuity of the capital costs associated with these instruments.

Our re-calculated charge (in 2016-17 dollars) is broken down into:

- Instrument annuity ($6,835 - $5,060 for the ADCP and $1,775 for the Transit Time); and
- Incremental operations and maintenance ($4,900)

This results in an environmental gauging station charge of **$11,735** for 2017-18 (in 2016-17 dollars).

Table 60 Recommended environmental gauging station charges for regulatory period

	2017-18	2018-19	2019-20	2020-21
2016-17 Dollars	$11,735	$11,735	$11,735	$11,735
Nominal Dollars	$12,028	$12,329	$12,637	$12,953

Table 61 WaterNSW's proposed environmental gauging station charges for regulatory period

	2017-18	2018-19	2019-20	2020-21
2016-17 Dollars	$18,658	$18,658	$18,658	$18,658
Nominal Dollars	$19,125	$19,603	$20,093	$20,595

Escalation of charge throughout regulatory period

WaterNSW proposed that this charge be escalated by inflation throughout the regulatory period. The cost analysis used to calculate this charge was undertaken in real dollars and therefore we consider that escalating the charge by inflation is appropriate.

7.4.5. Summary assessment

We consider that the environmental gauging station charge is appropriate, however we have revised elements of the charge to derive our proposed price for the charge. These differences reflect:

- No incremental costs associated with non-SLA sites;

  Given that there is no longer an SLA and uncertainty over these costs going forward, we have proposed to not include these costs for this regulatory period.

- Estimated useful lives of ADCP and Transit Time instruments;

  We consider that the proposed lives of 3 years and 4 years respectively are too short and have revised these to 6 years for each instrument.

- Calculation of the annuity for the charge.

  We have revised the spreadsheet to reflect the likelihood of an ADCP or Transit Time instrument being installed at sites to determine an instrument-based annuity which is incorporated into the charge.

The review team acknowledge the additional information provided by WaterNSW between draft and final reports on these charges, and confirm this information was reviewed. It did not however, alter the overall recommendations of the review team.

7.5. Refundable meter accuracy deposits

7.5.1. Overview of charges considered

WaterNSW is proposing to levy a refundable deposit for resolving meter disputes. This deposit is forfeited by the customer if the meter is found to be within certain accuracy standards, while it is returned to the customer if the meter fails those accuracy standards. There are two methods that can be used to test meter accuracy that WaterNSW is proposing to charge on:

- Verification and testing in situ; and
- Verification and testing in laboratory.

In their pricing proposal to IPART, WaterNSW noted that the current deposit charge is below the market rate for assessing and testing meters, and has proposed an increase in the deposit amount. This would see the refundable meter accuracy deposit set at approximately half the costs associated with carrying out verification and testing of meters in situ. Through further discussions with WaterNSW it was indicated that the charge for the service itself will be set at cost-reflective levels (i.e., what it costs WaterNSW to undertake the testing) where the test finds that the meter was not faulty. The deposit is designed to prevent frivolous applications by customers to test the accuracy of their meters.

7.5.2. Rationale for charges

Applying a charge for customers to test the accuracy of meters is an appropriate user-pays charging method. WaterNSW proposes to apply a refundable deposit to customers that seek to test the accuracy of these meters. Customers will only incur the deposit charge if they are seeking to test the accuracy of their meters, and will be refunded the deposit if their meter is proven to be inaccurate.

7.5.3. Cost recovery basis

WaterNSW is proposing to recover the full costs of the service from customers where meters are found to be accurate. Where meters are found to be inaccurate, customers will be refunded their deposit and WaterNSW will bear the costs of the testing.

Based on the information provided to us by WaterNSW regarding actual costs incurred, we are comfortable with the process and costs associated with undertaking the two different meter tests.

Information provided by WaterNSW indicates that the costs that customers will incur where their meters are found to be accurate are:

- $6,045 for meter testing in situ (based on contract costs); and
- $8,177 for meter testing in laboratory (estimated cost).

7.5.4. Efficiency of costs and alignment with charges

The purpose of the deposit is to deter frivolous applications by customers to test their meters. Without undertaking an analysis of the likely changes in customer behaviour to different deposit levels, it is difficult to know whether the proposed levels for the two deposits will have the desired impact of acting as a disincentive for frivolous applications. However we would expect that the proposed levels of the deposits would achieve the desired effect of disincentivising frivolous applications.

It is not clear why the two testing services require two different deposit levels, however the customer is charged the actual costs for the test (where the meter is found to be accurate) and therefore the different deposits are unlikely to impact on the overall outcome.

Through discussions with WaterNSW, it confirmed that customers will be well informed of the actual costs that they may incur if their meter passes the accuracy test prior to the decision to undertake the testing. This is an important element of this charging structure as it is important to ensure customers are provided with the correct pricing information and signals to ensure rational decisions by customers.

Given this, we are comfortable with the deposits proposed by WaterNSW and the proposed approach to recover the actual costs from customers where meters are found to be accurate.

Escalation of charge throughout regulatory period

WaterNSW proposed that the refundable deposit be escalated by inflation throughout the regulatory period. As the service will be provided through contracting external parties, the actual charge will be based on the actual costs from the service provider. We consider that escalating the refundable deposit by inflation is an appropriate approach for the deposit.

7.5.5. Summary assessment

We agree with the rationale of the charge and the proposed user-pays approach to recovering the costs incurred for the service. In considering the costs, we note that the services are provided by external service providers in a competitive market and we have no issues with the approach proposed by WaterNSW.

Regarding the setting of the refundable deposit, so long as customers for either testing service are being charged the full costs for the service being provided and the deposit discourages frivolous applications for meter testing, the level at which the deposit amount is set has little impact on the customer's decision – and no impact on economic efficiency. Therefore, so long as customers are made aware of the actual costs that they are faced with when paying the deposit, then we have no reason to propose alternative levels for the refundable deposits.

7.6. Fish River connection and disconnection charges

7.6.1. Overview of charges considered

Over the previous determination period, WaterNSW charged new connection and disconnection charges to customers in the Fish River Scheme. WaterNSW currently receives approximately two to three connection requests per annum.

In their pricing proposal to IPART, WaterNSW proposes a new approach to levying Fish River connection and disconnection charges. Currently, a flat fee is charged to customers for both establishing connections and disconnecting. The new approach suggests retaining the disconnection charge at the same level, while shifting the fixed charge for new connections to a quote for service type approach. This is based on the logic that establishing connections can vary in cost significantly and that the current charge is insufficient to recover costs. Rather than paying a set charge, Fish River customers wanting a new connection would need to seek a quote from WaterNSW which would include materials at cost as well as labour costs.

7.6.2. Rationale for charges

We consider that a connection and disconnection charge for the Fish River Scheme is appropriate given the unique nature of the scheme and the specific costs involved for the services.

7.6.3. Cost recovery basis

WaterNSW is proposing to replace the regulated fee with individual quotes for the connection service. This is because the current regulated charge ($475.29) does not recover the full cost of the connection service. It is proposed that applicants will be provided a quote for each connection service based on the following components:

- Labour rates for WaterNSW staff;
- Material at cost;
- Hiring of equipment (if required); and
- Travel time.

WaterNSW is proposing to retain the disconnection fee at the current rate ($263.06).

These issues are discussed further in the following section.

7.6.4. Efficiency of costs and alignment with charges

In reviewing the costs of the Fish River Scheme connection and disconnection charges, we have considered:

- WaterNSW's proposed approach for connection charges;
- WaterNSW's proposed approach for disconnection charges; and
- Escalation of the charge throughout the regulatory period.

The following outlines our findings for each of these issues.

Proposed approach for connection charges

Based on reviewing information from WaterNSW regarding the costs incurred in connection services for the Fish River Scheme, we agree that the current charge under-recovers the costs. Given the variable nature of the costs involved in these types of connections and the low number of connection applications likely to be received, individual quotes for connection appear a reasonable approach to recover costs.

It is likely however, that the individual quotes for connections will be significantly greater than the current regulated charge. This reflects the current level of under-recovery within the charge and the move towards a more cost-reflective charge. While this represents a transition to a more economically efficient tariff, we note that there are likely to be considerable customer impacts from the change in the charge, which would need to be considered in any decision by IPART.

Proposed approach for disconnection charge

We agree with WaterNSW's assertion that the disconnection service is less complex than connection service and would therefore involve less costs than the connection service.

The proposed charge equates to approximately 3.5 hours of labour to provide the disconnection service. We consider this to be reasonable and therefore consider that the proposed disconnection charge is reasonable.

Escalation of charge throughout regulatory period

WaterNSW proposed that this charge be escalated by inflation throughout the regulatory period. We propose to take a more granular approach to the escalation of the charge given that it involves separate elements.

The labour rates involved in the connection services will be based on the labour rates at the time of the connection request (as discussed above, these may need to be approved by IPART), similarly, the quoted costs for materials and equipment hire would be based on the rates at the time of the request.

For the Disconnection Service, we would expect that there will be a reduction in the charge in real terms, to reflect the reduction in the overhead rate applied to labour. This charge would then be escalated by inflation over the regulatory period.

Table 62 below provides the recommended Fish River disconnection charge.

Table 62 Recommended Fish River disconnection charge ($2016-17)

Year	Overhead percentage	Total cost per hour	Direct cost per hour	Number of hours	Disconnection charge
2017-18	112%	$72.73	$34.24	3.62	$263.06
2018-19	101%	$68.72	$34.24	3.62	$248.55
2019-20	100%	$68.39	$34.24	3.62	$247.35
2020-21	93%	$66.21	$34.24	3.62	$239.48

7.6.5. Summary assessment

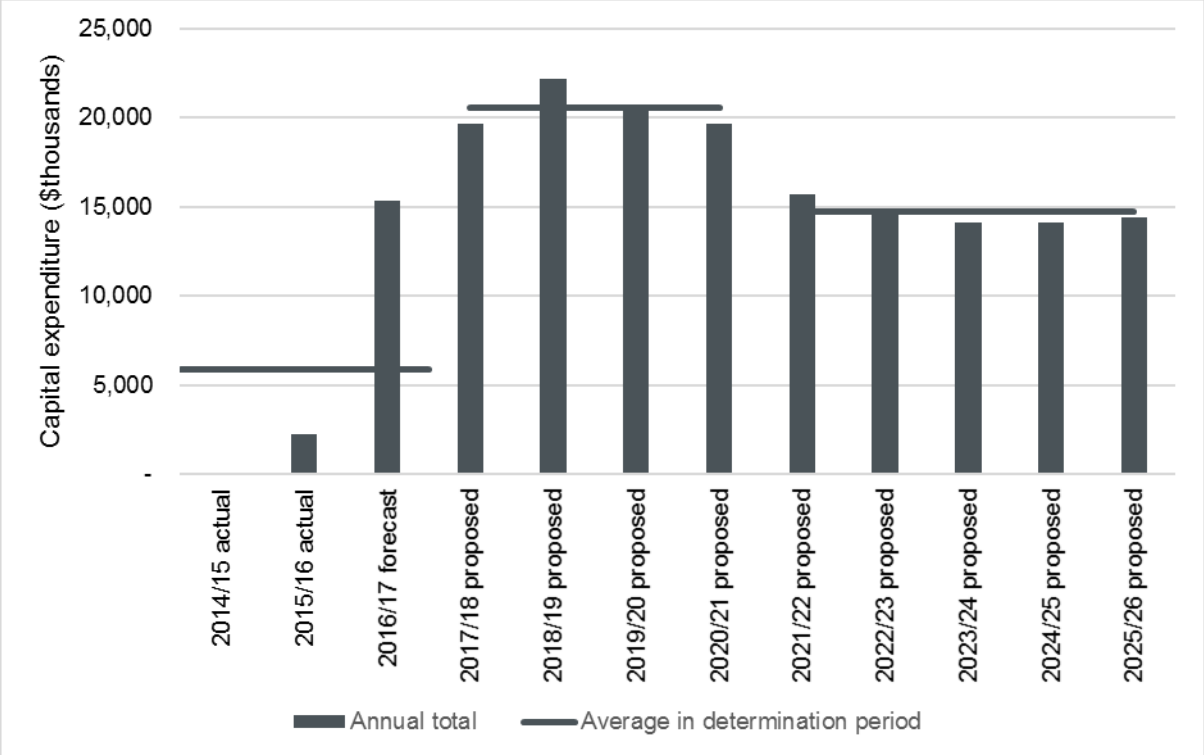
Conceptually we agree with WaterNSW's proposed approach for connection and disconnection charges for the Fish River Scheme, but recommend modifications to calculation of the charge as outlined above.

8. Capital projects review

8.1. Renewals - review of forecasting model

WaterNSW has made a proposed allocation within each valley for asset renewals, a significant subset of the category of 'Maintaining Capability' within its pricing proposal. The assessment and calculations in this section are for the 'per valley' asset renewals expenditure of $82.2 million, with expenditure on the Health and Safety works, ICT, Motor Vehicles, SCADA and Electrical renewals considered elsewhere.

WaterNSW's proposed expenditure on asset renewals on the 'per valley' basis is illustrated in Figure 26, along with historical renewals expenditure; for the current determination period this includes all of WaterNSW's actual/forecast and proposed expenditure on renewals including corporate expenditure as these could not be separately identified. Future expenditure from 2017-18 has been adjusted to only include expenditure on the 'per valley' basis, with other expenditures removed. This shows the average annual expenditure on asset renewals is proposed to rise from approximately $5.9 million[115] in the current determination period to $20.5 million in the next determination period, before reducing to $14.7 million thereafter.



Source: WaterNSW's pricing proposal and spreadsheet 'WaterNSW Information request - 2017 Determination.xlsm' (for actual/forecast expenditure to 2016/17), and WaterNSW's spreadsheet provided September 2016 with filename 'Project list - draft selection.xlsx (proposed expenditure from 2017/18 onwards).

Figure 26 WaterNSW long term proposed capital expenditure; maintaining capability, per valley renewals only

[115] The $5.9 million includes some corporate renewal expenditure but it is considered immaterial to this comparison.

WaterNSW's process for identifying asset renewals to include within the proposed capital expenditure program on this 'per valley' basis is illustrated by the diagram below, with the green chevron indicating where WaterNSW currently is in the process.

Source: WaterNSW response to Aither Initial Information Request Q14 Responses (numbers 1, 2, 4, 7, 10, 11, 15) – Capex Project Sample, provided 5 October 2016.

Figure 27 Simplified representation of the process of developing and delivering the renewals program

The first three steps in the process are to establish a Strategic Asset Management Plan and a Capital Investment Strategy and to gather data in accordance with these. Data is analysed in step four using a spread sheeting model called AssetBank. The final step before locking in the budget expenditures is to validate the AssetBank data.

In step 4, proposed asset renewals are initially identified using a risk based assessment of the asset's condition and criticality. Risks are identified from various sources of information, but particularly asset health data. The detailed asset data associated with each projected individual rural valley renewals project is contained within the AssetBank database. This data includes construction date, useful and remaining life, risk cost prioritisation, criticality, asset condition and other attributes which establish the justification and prioritisation of the proposed expenditure based on established asset management principles.

AssetBank also includes cost information. Cost estimates may vary in terms of confidence or consistency, including whether they are for full replacement or not, and what sources they are derived from (e.g. internal knowledge, recent experience with similar assets, recent quotes etc.).

WaterNSW state that an important process for determining the prudency of capital expenditure is the validation of modelled data in the AssetBank database. This is undertaken in step five, a workshop style review process where each proposed expenditure line item from the list of proposed works generated from Assetbank is subjected to a critical review. It is also at this point that cost estimates may be reviewed, and preliminary options assessment undertaken.

At this stage in the process, the forecast expenditures are included in the pricing submission.

In later steps, the proposed asset renewals are subject to a risk based prioritisation/substitution process and an 'Authority to Spend process'. In these steps, business cases for individual projects (or programs, bundles of smaller projects) are developed, including detailed option analysis, final project scopes and detailed costing, and these are progressed through internal Executive review at the Investment Review Committee, where review, endorsement and approval processes are followed.

The review team undertook an assessment of the forecast expenditures by:

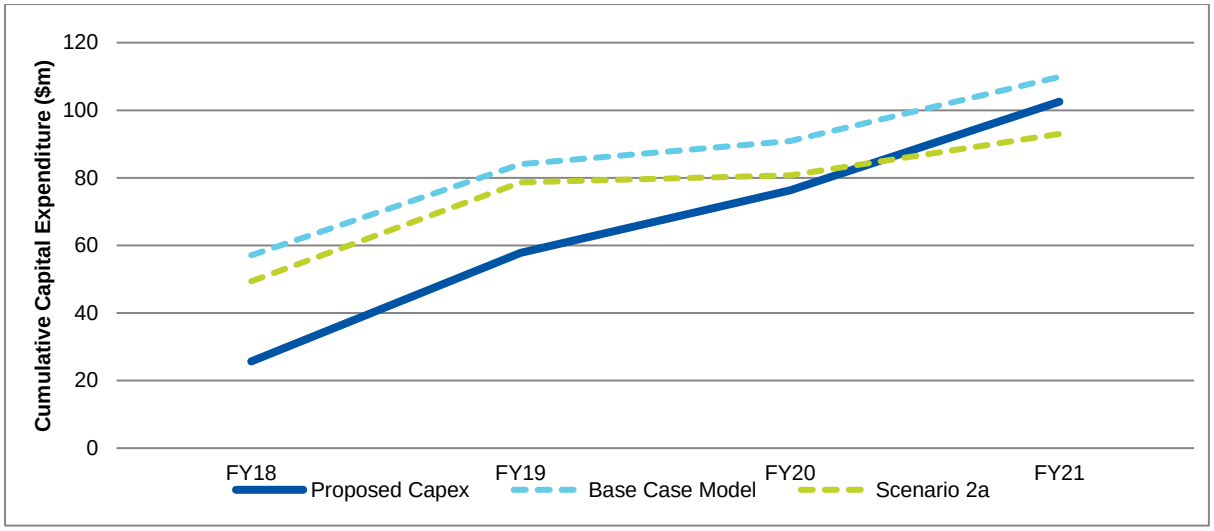
- reviewing the suitability of the process for identifying asset renewals (assessment 1)
- examining the initial list of works developed in the AssetBank Model (assessment 2)
- reviewing the process to validate the proposed expenditures (assessment 3)
- seeking evidence for the level of expenditures proposed (assessment 4).

In assessment 1, the review team found that the process for identifying and delivering asset renewals was sound and should lead to prudent and efficient expenditures being made. It notes that the expenditure forecasts are made before the full process is completed and hence the process may not lead to prudent forecasts of expenditures.

In assessment 2, the review team found that the initial list of works developed from the AssetBank model appears appropriate for further review, noting that the list will contain a greater number of renewal items than required due to the following issues:

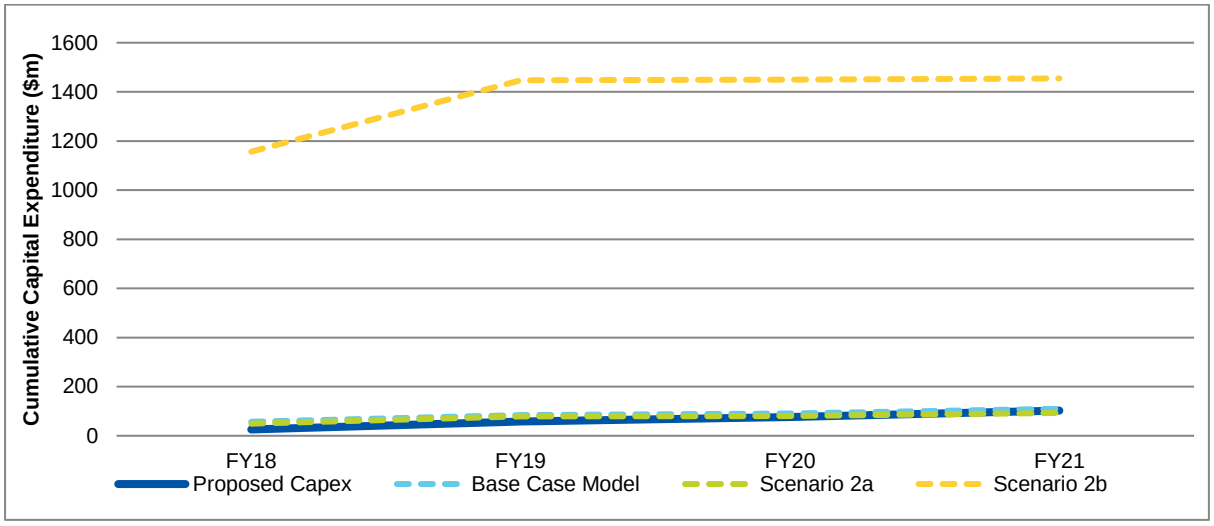
- The condition assessment grading is coarse, consisting of five levels, only two of which indicate poor condition – Poor and Very Poor. The lack of granularity is partly offset by the review process, but it should be noted that about 700 line items are subject to review.
- A condition assessment of Very Poor triggers a need for remediation and covers only the final 1% of an asset's life. This further reduces the granularity of the asset condition assessment.
- The probability of an asset failing in service is determined by the assumed remaining life based on the condition score applied to a Weibull curve. The Weibull curve has a shape factor of 4.5451, which leads to a relatively flat probability distribution function curve. The scale factor is the assumed average life of the asset. If the condition of an asset appears younger than indicated by its age in comparison to the average replacement age, then the model increases the replacement age by an appropriate amount. The review team notes, however, that the coarseness in the condition assessment means that the adjustment for asset condition is also coarse. Further, applying a single scale factor to all asset types (electrical, mechanical, structures etc) will not lead to an optimal outcome as this approach does not take into account the specific failure modes for each asset class. This is considered likely to over-estimate the expenditure required for some assets.
- The criticality score includes reputational risk, which may be seen as an item that customers should not bear the costs of. The review team notes, however, that reputational risk does not impact the criticality scores for any line items included in the forecast expenditures and hence does not drive any of the forecast renewals expenditures.
- Based on a risk score exceeding a pre-set dollar value, the asset condition score is advanced by 1 (>$10,000) or 2 (>$100,000). This arbitrary advancement of the condition score results in advancement of assets in Fair or Poor condition to Very Poor condition, hence triggering remediation before the condition score alone would suggest. This appears appropriate for critical assets; however, the lack of granularity in the condition assessment and criticality results in a risk averse position where risks are brought out though early replacement or remediation rather than consideration of options to manage the risk.

In response to questions about the AssetBank database, WaterNSW provided a set of sensitivity tests they undertook on the current database. One test was to show the sensitivity to changing the apparent age of the asset (based on the condition score) from the middle of the score band (as assumed in the model) to the start and then the end of the band. Figure 28 as reproduced from WaterNSW sensitivity analysis shows the result through adopting the start of the condition score bands and Figure 29 shows the result through adopting the end of the condition score bands. The figures show a small increase in forecast expenditure occurs by moving to the start of the band and a large increase by moving to the end of the band. Given the relatively flat probability distribution function curve adopted, this asymmetry shows the coarse nature of the condition assessment.



Source: Data sourced from WaterNSW, filename 'AssetBank Sensitivity Analysis.docx, provided October 2016'.

Figure 28 Scenario 2a – Analysis assuming assets are at the 'beginning' of their time in the assessed condition



Source: Data sourced from WaterNSW, filename 'AssetBank Sensitivity Analysis.docx, provided October 2016'.

Figure 29 Scenario 2b – Analysis assuming assets are at the 'end' of their time in the assessed condition

In assessment 3, the review team reviewed the process to validate the proposed expenditures. The review team notes the following issues:

- The terms of the review were to obtain: renewal date for asset; approximate cost of asset replacement/rectification works; update condition data where necessary, and specifically for 'Critical' assets[116]:

[116] Renewals AssetBank Guidance Sheet.DOCX

- the review appears to not have considered options to address the needs although WaterNSW said in interviews that options were considered
- approximate costs only were validated (noting that detailed options analysis and scopes are not undertaken until later in the process)
- the validation process relied on the engineering expertise of the workshop participants, hence it is a subjective review

- The validation appears to have addressed some of the issues identified by the review team about AssetBank, specifically the coarseness of the risk assessment process in that the assessed risk was reviewed when determining the asset renewal date.
- The majority of the forecast asset renewal expenditures have not yet been subjected to the rigor of a business case development and approval process. According to WaterNSW's capital planning process, only expenditures that pass this process are considered to be prudent and efficient. Hence, it is not necessarily the case that all of the forecast expenditures will proceed, or be of the same scope. Expenditure may also not occur at the same timeframe currently estimated – works may be delayed to the optimal time of intervention; and WaterNSW may come up with a scope of works to meet the stated need with a cost less than that currently estimated.
- The forecast expenditures were developed as a bottom up build and have not been scaled to form a suitable expenditure for a final program of works. In particular, the review team would expect that some asset renewals works would not be completed within the initially proposed timeframe.

As a result of the step 2 and 3 reviews, the review team is of the view that WaterNSW has adopted an overly conservative risk assessment process. The practice of advancing the condition score when the risk score exceeds a pre-set dollar value means that options to manage the risk are not adequately considered. This can affect the type of remediation undertaken and the timing of that remediation.

An assessment of the amount of forecast expenditure driven by the risk averse nature of the risk assessment process was made by identifying the line items in the renewals program that had the condition score advance to Very Poor. The forecast expenditure was approximately $3 million over four years. This reduces to $2.7 million after deducting the 10% efficiency target allowance that WaterNSW has made before inputting the expenditure into the final capital expenditure program.

In step 3, assessment of the amount of forecast expenditure that might not proceed following the business case development and approval process was made by comparing historic expenditure with the forecast expenditures, adjusting for difference in expenditure classifications between the two periods and other factors.

The outcome on this analysis shown in Table 63 was that WaterNSW's proposed expenditure was a total of $38.5 million higher than adjusted historic renewals expenditure. WaterNSW has demonstrated that there is a need for increased expenditure on renewals compared with historic based on the condition of assets, however not an increase of this magnitude.

Table 63 Renewals expenditure calculations ($000s, $2016-17)

Description	Value ($thousands)	Total ($thousands)
WaterNSW proposed expenditure on Maintaining Capability as per pricing proposal	115,632	
Subtract items not in valley renewals		
Motor vehicles	(6,760)	
ICT Renewals	(6,189)	
Electrical Switchboard and power upgrades	(4,064)	
Automation and Comms Renewals & Upgrades	(3,805)	
Other	(12,659)	
WaterNSW Net proposed renewals expenditure on 'Per Valley' basis (over 4 years)		82,155
Average expenditure per annum		20,539
Historical renewals expenditure (total over 3 years)	17,572	
Add renewals undertaken within larger capital projects with other primary drivers (WaterNSW estimate)	15,200	
Adjusted historical renewals expenditure (total)		32,772
Adjusted average expenditure per annum		10,924
Difference between proposed and historical expenditure on renewals per annum		9,615
Difference over four years		38,459

To assess a prudent level of renewals expenditure, we have used a combination of historic information and information provided by WaterNSW about their current operational approach. Table 64 shows the assessment with key factors being:

- an adjustment of $2.7 million being those expenditures relating to projects where the risk score was advanced to Very Poor based on the forecast expenditure passing a pre-set threshold. As stated above, the review team considers that the advancement of the condition score (representing an advancement in the likelihood of failure) is overly risk adverse and does not provide a forecast that is prudent.
- an adjustment due to change in scope and inaccuracy in estimating taken from current period information.[117] A significant proportion of the current forecast expenditure on asset replacements is derived from the budgeting process indicated in Figure 27 and are expected to be refined and trend downwards. In the past WaterNSW has achieved the outcomes with actual expenditures less than originally forecast, about 10% lower. This results in a $7.9 million reduction (after deducting the 10% efficiency target allowance that WaterNSW has made before inputting the

[117] WaterNSW Rural Regulatory Pricing Proposal, page 127

expenditure into the final capital expenditure program – which is unrelated to the forecasting inaccuracy).[118]

- an adjustment due to deferrals from one determination period to the next, taken from current period information (which was 13.7%)[119], but WaterNSW have shown through improvements already made to its planning processes that this could be reduced to a much lower value and hence a lower figure of 5% has been adopted, resulting in a $3.6 million reduction.
- an adjustment due to carry over at the end of the period based on the current estimate made by WaterNSW of $24 million, about 18% of the current capex program. WaterNSW have shown through improvements to its deliverability processes already made and underway that this could be reduced to a much lower value and hence 10% has been adopted, resulting in a $6.8 million reduction.

Table 64 Assessment of prudent level of renewals expenditures ($2016-17)

Item	How determined	Amount ($million)	Totals ($million)
Renewals proposed			82.155
Less risk adverse	Assetbank brought forward expenditures	2.7	
Less reduction due to change in scope/estimating inaccuracy	10% based on current period performance	7.9	
Less reductions due to deferrals	13.7% in current period, but not expected to be that high next period. Assume 5%	3.6	
Less carry over at end of period	18% in current period but not expected to be that high next period. Assume 10%	6.8	
Total reductions			21.014
Recommended expenditure			61.141

Following the assessment, the review team has concluded that the difference to subtract from WaterNSW's proposed expenditure on a per valley basis is a net $21.0 million; this is a net figure after subtracting a 10% 'efficiency' target which WaterNSW has applied to all renewals related expenditure before including it in the forecast. This represents an approximate 25% difference from expenditure proposed by WaterNSW though greater than the adjusted historical average.

In the past and present WaterNSW has demonstrated its ability to achieve equivalent outcomes, meeting business and customer needs with less capital expenditure than originally forecast for asset renewals. WaterNSW pointed this out frequently during interviews that it does not consider the current

[118] The review team understand that prior to incorporating forecast asset renewals capital expenditure derived from its 'AssetBank' model into its overall capital expenditure program, WaterNSW first deducts 10% from the model outputs.

[119] ibid

pricing determination as an approval mechanism with processes to ensure prudency and efficiency to occur in time:

> *"It is also important to recognise that WaterNSW does not consider a pricing determination as an approval to spend money. The WaterNSW Approval To Spend (ATS) Framework is WaterNSW's investment evaluation and governance framework. The process aims to ensure that WaterNSW makes prudent and efficient decisions that ensure effective delivery of customer and business objectives and which are value-for-money. The process also aims to ensure that appropriate consultation on major investment decision occurs across the business, prior to proceeding."*[120]

Table 65 Renewals expenditure calculations ($000s, $2016-17)

Description	Total ($thousands)
WaterNSW Net proposed renewals expenditure on 'Per Valley' basis	82,155
Recommended expenditure on 'per valley' renewals	61,141
Net deduction (from WaterNSW proposed renewals expenditure on 'Per Valley' basis)	(21,014)

The outcome of this reduction on each valley is presented within Table 66.

[120] WaterNSW submission to Aither, "IPART Rural Pricing Submission - Aither Initial Information Request - Q14 - Responses - Projects 1 2 4 7 10 11 15.docx" 5 October 2016

Table 66 'Per valley' Renewals proposed and recommended capital expenditure ($000s, $2016-17)

Valley	FY18	FY19	FY20	FY21	Total
WaterNSW proposed					
Border	87	98	91	87	362
Fish River	2,779	3,141	2,922	2,785	11,628
Gwydir	728	823	765	730	3,046
Hunter	1,153	1,303	1,212	1,155	4,823
Lachlan	2,643	2,987	2,778	2,648	11,056
Lowbidgee	1,483	1,676	1,559	1,486	6,203
Macquarie	1,768	1,999	1,859	1,772	7,398
Murray	394	445	414	394	1,647
Murrumbidgee	7,203	8,141	7,573	7,218	30,135
Namoi	844	954	888	846	3,533
North Coast	200	226	210	200	836
Peel	173	195	182	173	723
South Coast	183	207	192	183	766
Total	19,638	22,194	20,646	19,677	82,155
Recommended					
Border	64	73	68	65	270
Fish River	2,068	2,338	2,175	2,073	8,653
Gwydir	542	612	570	543	2,267
Hunter	858	970	902	860	3,589
Lachlan	1,967	2,223	2,068	1,971	8,228
Lowbidgee	1,103	1,247	1,160	1,106	4,616
Macquarie	1,316	1,487	1,384	1,319	5,505
Murray	293	331	308	294	1,226
Murrumbidgee	5,361	6,059	5,636	5,371	22,427
Namoi	628	710	661	630	2,629
North Coast	149	168	156	149	622
Peel	129	145	135	129	538
South Coast	136	154	143	136	570
Total	14,615	16,517	15,365	14,644	61,140
Adjustment	5,023	5,677	5,281	5,033	21,014
Adjustment (%)	25.6%	25.6%	25.6%	25.6%	25.6%

Source: All data sourced from 'Sheet 1' of 'Project list - draft selection.xlsx' MS Excel file provided by WaterNSW September 2016.

8.2. Fish River Renewals

8.2.1. Project description

This grouping of expenditure is for renewals across the Fish River valley, across the following facilities, with WaterNSW's proposed capital expenditure in the next determination period indicated:

- Duckmaloi Weir - $*
- Duckmaloi WTP - $*
- Fish River - Other - $*
- Fish River Pipeline - $*
- Oberon Dam - $*
- Rydal Dam - $*
- Wallerawang Plant - $*

(Content redacted at the request of WaterNSW).*

Just under half the proposed expenditure is for progressive replacement of the Fish River Water Supply pipeline (FRWS), a program for which has been underway for several years replacing sections of the pipeline based on criticality and condition.

The other major items of expenditure within the Fish River valley is for the Duckmaloi Water Treatment Plant (WTP) and Oberon Dam, with further expenditure for another four items.

8.2.2. Assessment type and documentation

Assessment type

Expenditure on the two key projects (FRWS Pipeline and Duckmaloi WTP) within the current and next determination period.

Documentation reviewed

During the review, documentation was provided for the FRWS pipeline within the current determination period and on the overall renewal program only. WaterNSW advised that this was the only documentation available for the Fish River Valley. After a draft version of this expenditure review report was produced, WaterNSW provided documentation relating to the Duckmaloi WTP. Unfortunately, this was not able to be assessed in detail as part of the review.

Table 67 Documentation provided for Fish River Renewals

Document title	Reference
D201588365 Board Committee on Infrastructure Planni~Oberon to Duckmaloi Pipeline (T-2 .pdf	D2015/88365
D2016106427 Water Infrastructure Renewal Program - Maintain Capability - Raw Unsmoothed.xlsx	D2016/106427
Board Committee on IPAD - OABC - Fish River Oberon to Duckmaloi - Item 6.1 att.DOCX	
Fish River Water Supply (FRWS) Pipeline Renewal Scheme Explanatory Notes.DOCX	
Fish River Water Supply (FRWS) - Pipeline Renewal Program - NSW Public Works Report 2009.PDF	
Duckmaloi WTP Site Audit Report.PDF (provided after the substantive review and analysis was undertaken)	

8.2.3. Project need

The expenditure driver is categorised by WaterNSW as Maintaining Capability and is for asset renewals.

FRWS Pipeline:

Just under half the proposed expenditure is for progressive replacement of the Fish River Water Supply pipeline (FRWS), a program for which has been underway for several years replacing sections of the pipeline based on criticality and condition. The FRWS comprises approximately 240 km of pipeline in three sections:

- Stage 1, constructed from cast iron, completed in 1948
- Stage 2, prestressed concrete, completed in 1959
- Stage 3, mild steel, completed in 1964.

The prestressed concrete section, stage 2, has been problematic since construction and has been subject of studies by WaterNSW, State Water and other heritage asset owners since the early 1990s. Deterioration in the condition of the pipeline has resulted in breaks and bursts, which in turns results in disruption for customers, costly repairs and potential to damage property. As the condition continues to deteriorate further breaks and predicted by WaterNSW. The proposal is to replace 1.7 km of pipe in 2016/17 and 4.4 km in 2017/18-2022/23.

The operational expenditure required for ad hoc, unplanned repairs to the FRWS pipeline replacement are significant and are predicted to increase as the condition of the pipeline continues to deteriorate. The proposed works are not expected to reduce operational expenditures but will prevent them escalating as the condition of the pipeline deteriorates further.

Duckmaloi WTP:

During the review and upon request from the review team, WaterNSW did not provide any detail regarding this expenditure. Following the draft report, WaterNSW provided an audit type output from a

consultant. This documentation could not be directly reconciled with anything in the AssetBank model, and contained no options assessment, consideration of cost-benefit, or timing.

Other:

The need for other elements of expenditure within the Fish River valley have not been articulated by WaterNSW but is described as replacing or refurbishing existing assets.

8.2.4. Options investigated

WaterNSW has assessed options as follows.

FRWS Pipeline:

- Option 1 - Undertaking repairs as required
- Option 2 - Undertaking in-situ rehabilitation
- Option 3 - Staged replacement (preferred).

The timing of replacement has also been considered in detail by WaterNSW.

Duckmaloi WTP and other works:

- No information on options investigated was provided

8.2.5. Procurement

WaterNSW procures contractors to implement any capital works required, usually by a public tender.

A contract has recently been awarded for the latest stage of the FRWS pipeline replacement, to be carried out mostly in FY17 with some expenditure potentially extending into FY18.

8.2.6. Costs and delivery

WaterNSW has forecast expenditure of $11.628 million in the next determination period. WaterNSW forecasts expenditure of approximately $4.7 million in the current determination period including approximately $4.6 million in the 2016/17 financial year[121].

Delivery of the program is expected to be fairly steady from year to year in the forthcoming determination period. While the expenditure is forecast to be fairly steady over the four years, it may be pulled forward by WaterNSW due to the rising number of breaks on the pipeline.

8.2.7. Assessment of prudence and efficiency

Prudence

FRWS Pipeline:

[121] SIR Capex 2 spreadsheet

Expenditure proposed for the FRWS pipeline is considered prudent:

- WaterNSW has established a clearly defined need for this project, with availability of the FRWS pipeline being essential to fulfilling WaterNSW's Operating Licence.
- WaterNSW's past 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 sections of pipeline demonstrating a history of failures and in unacceptable condition first.
- The investment aligns with corporate policies, strategies and objectives.

Duckmaloi WTP:

As noted above, during the review no information was provided on this expenditure, but an audit report was provided after the draft report, however this could not be reconciled with expenditures contained no options assessment, consideration of cost-benefit, or timing.

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Other:

No documentation is available therefore the review team is unable to make a finding on the prudence of this expenditure.

Efficiency

FRWS Pipeline:

Expenditure proposed for the FRWS pipeline is considered 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.

Duckmaloi WTP:

As noted above, no documentation was provided during the review, and the documentation provided following the draft report was a site audit report which did not have a direct link to the expenditure proposed. Among 34 recommendations made in that report was a recommendation to develop a business case. Therefore the review team was unable to make a definitive finding on the efficiency of this expenditure.

Other:

No documentation is available therefore the review team is unable to make a finding on the efficiency of this expenditure.

8.2.8. Recommended expenditure

For the expenditure that was well documented, which is limited to the FRWS pipeline replacement, it would be recommended all proposed expenditure be accepted if it were a standalone project. It is recommended all expenditure in the current determination period, e.g. from FY15 to FY17, be treated as prudent and efficient.

In line with the overall assessment of the 'per valley' renewal expenditure under the Maintaining category it is recommended a reduction be made to expenditure within the Fish River Valley, indicated in Table 69.

Table 68 Fish River Renewals actual/forecast and recommended capital expenditure ($000s, $2016-17)

	FY15	FY16	FY17	Total
WaterNSW actual/forecast expenditure	0	83	4,617	4,700
Recommended expenditure	0	83	4,617	4,700
Adjustment	0	0	0	0
Adjustment (%)	0	0	0	0

Source: All data sourced from 'SIR Capex 2' of 'WaterNSW Information request - 2017 Determination.xlsx' MS Excel file provided by WaterNSW on 30 September 2016.

Table 69 Fish River Renewals proposed and recommended capital expenditure ($000s, $2016-17)

	FY18	FY19	FY20	FY21	Total
WaterNSW proposed expenditure	2,779	3,141	2,922	2,785	11,628
Recommended expenditure	2,068	2,338	2,175	2,073	8,653
Adjustment	(711)	(804)	(747)	(712)	(2,974)
Adjustment (%)	-26%	-26%	-26%	-26%	-26%

Source: All data sourced from 'Sheet 1' of 'Project list - draft selection.xlsx' MS Excel file provided by WaterNSW September 2016.

8.3. Fish River Renewals - Safety

8.3.1. Project description

WaterNSW has developed a program of safety related renewals using the same methodology as the overall renewals process, separating out a portion of the forecast/proposed expenditure as being for meeting safety needs. This is distinct from 'dam safety' which is a separate category of expenditure. WaterNSW has made allocations for safety renewals in each of the 15 valleys. Audits and assessments to identify compliance with Work Health and Safety (WHS) regulations and risks have been carried out in select valleys. No such audit was carried out for Fish Valley identifying specific

WHS risks in need of intervention therefore the forecast expenditure has been made using an element of engineering judgement.

8.3.2. Assessment type and documentation

Assessment type

Expenditure on the Fish River Renewals Safety program within the next determination period.

Documentation reviewed

No information was provided specifically for this item of expenditure. Information was taken from the spreadsheet provided by WaterNSW applying to all renewals project.

Table 70 Documentation provided for Fish River Renewals - Safety

Document title	Reference
D2016106427 Water Infrastructure Renewal Program - Maintain Capability - Raw Unsmoothed.xlsx	D2016/106427

8.3.3. Project need

The expenditure driver is categorised by WaterNSW as Regulatory health and safety.

WaterNSW is seeking to meet its goal of a reduction in health and safety related risks to its staff, customers and community; and a reduction of risks associated with non-compliance with regulatory requirements. WaterNSW is seeking to achieve an outcome such that risks after treatment are 'As Low As Reasonably Practicable' (ALARP).

Three benefits have been identified by WaterNSW:

- safe place of work for employees and transit for members of the public
- delivery Efficiency (up to 10% cost savings)
- operational continuity.

8.3.4. Options investigated

No information was provided specifically for this item of expenditure indicating any options were investigated.

8.3.5. Procurement

WaterNSW has advised that it is most likely that this expenditure will be rolled up into a larger program and taken to market via public tender(s).

8.3.6. Costs and delivery

Forecast costs have been made by WaterNSW using the Assetbank model approach, which was informed by WHS audits undertaken in the Lachlan, Lowbidgee and Murrumbidgee districts. No plans for delivery have been made at this stage though the works appear to be forecast to be steady over the four year period.

8.3.7. Assessment of prudence and efficiency

Prudence

Expenditure proposed for the Fish River safety renewals is considered prudent:

- WaterNSW has established a reasonable need for this project, with there being a reasonable body of evidence suggesting there are safety risks requiring capital expenditure intervention.
- The investment aligns with corporate policies, strategies and objectives.

Efficiency

Expenditure proposed for the Fish River safety renewals is likely to be efficient:

- The proposed procurement method is considered to be likely to result in unit costs based on competitive market rates.
- WaterNSW has in place an expenditure approval process containing a number of checks and balances.

The proposed expenditure is quite modest for the size of the asset base within Fish River.

8.3.8. Recommended expenditure

No adjustments are recommended to WaterNSW's proposed expenditure.

Table 71 Fish River Renewals - Safety proposed and recommended capital expenditure ($000s, $2016-17)

	FY18	FY19	FY20	FY21	Total
WaterNSW proposed expenditure	146	165	154	147	**612**
Recommended expenditure	146	165	154	147	**612**
Adjustment	0	0	0	0	**0**
Adjustment (%)	0	0	0	0	**0**

Source: All data sourced from 'Sheet 1' of 'Project list - draft selection.xlsx' MS Excel file provided by WaterNSW September 2016.

8.4. *Redacted project*

Content in this section redacted at the request of WaterNSW.

8.5. Hunter Renewals

8.5.1. Project description

This grouping of expenditure is for renewals across the Hunter Valley, across the following facilities, with WaterNSW's proposed capital expenditure in the next determination period indicated:

- Glenbawn - $*
- Glenbawn Dam - $*
- Glennies - $*
- Glennies Creak - $*
- Glennies Creek Dam - $*
- Lockstock - $*
- Lostock Dam - $*
- Other - Valley - $*
- *(* Denotes content redacted at the request of WaterNSW)*.

More than half of the proposed expenditure is for two facilities, the Glenbawn Dam and Glennies Creek Dam. Renewal work proposed includes general civil works, cranes, electrical & instrumentation, equipment, fencing, roads, signs and valves.

WaterNSW cautions that these assets may or may not become part of the final program that will be evaluated continuously and it is subject to change, the objective to obtain a funding envelope.

8.5.2. Assessment type and documentation

Assessment type

Expenditure on the Hunter Renewals program and one key project (Lostock Dam Crane Replacement) within the next determination period.

Documentation reviewed

Documentation was provided for the Lostock Dam crane replacement expenditure within the current determination period and on the overall renewal program only.

Table 72 Documentation provided for WEM001

Document title	Reference
D2016106427 Water Infrastructure Renewal Program - Maintain Capability - Raw Unsmoothed.xlsx	D2016/106427
John Project Charter Lostock Dam Outlet Works Upgrade Overhead Crane 2359P6.PDF	
Crane Replacement Lostock dam.pdf	
ENTERED - 2014 Glennies Creek Dam Comprehensive Surveillance Report.DOC	

8.5.3. Project need

The expenditure driver is categorised by WaterNSW as Maintaining Capability, that is, renewals.

WaterNSW has determined that the existing crane at the Lostock Dam is no longer fit for purpose and requires replacement. The reasons the crane is no longer fit for purpose is primarily to do with safety, with clearances being too great. The existing crane is also unable to travel laterally which is deemed a problem.

The need for other elements of expenditure within the Hunter valley have not been articulated by WaterNSW but is described as replacing or refurbishing existing assets.

8.5.4. Options investigated

WaterNSW has assessed options as follows.

Lostock Dam Crane:

- Option 1 – replace the crane (preferred)
- Option 2 – do nothing, retain current crane without modification
- Option 3 – modify the crane

Other expenditure:

- No information was provided

8.5.5. Procurement

WaterNSW has advised that it is most likely that this expenditure will be rolled up into a larger program and taken to market via public tender(s).

8.5.6. Costs and delivery

Lostock Dam Crane:

The estimate made in 2011 has been retained for the next determination period.

Other:

There was no documentation provided to substantiate any items of expenditure. Cost estimates are drawn from the Assetbank model. Delivery is forecast to be fairly steady over the four years.

8.5.7. Assessment of prudence and efficiency

Prudence

There was not sufficient information to make a determination of prudent expenditure for this valley in its own right.

Efficiency

There was not sufficient information to make a determination of prudent expenditure for this valley in its own right.

8.5.8. Recommended expenditure

There was not sufficient information to make a determination of prudent expenditure for this valley in its own right. In line with the overall assessment of the 'per valley' renewal expenditure under the Maintaining category it is recommended a reduction be made to expenditure within the Hunter Valley, indicated in Table 73.

Table 73 Hunter Renewals proposed and recommended capital expenditure ($000s, $2016/17)

	FY18	FY19	FY20	FY21	Total
WaterNSW proposed expenditure	1,153	1,303	1,212	1,155	4,823
Recommended expenditure	858	970	902	860	3,589
Adjustment	(295)	(333)	(310)	(295)	(1,234)
Adjustment (%)	-26%	-26%	-26%	-26%	-26%

Source: All data sourced from 'Sheet 1' of 'Project list - draft selection.xlsx' MS Excel file provided by WaterNSW September 2016.

8.6. Lachlan - Carcoar 5 year Inspection

The proposed expenditure is to undertake a Comprehensive Dam Safety Inspection on Carcoar Dam which is recommended by ANCOLD and NSW Dams Safety Committee to be completed every 5 years on dams with ANCOLD defined consequence category above "Significant". This inspection is a detailed assessment of the condition, safety status and deficiencies of the dam and is used by the dam owner to determine future works program. A report on the inspection (described as a Surveillance Report by the Dams Safety Committee) must be submitted to the NSW Dams Safety Committee as soon as reasonably practicable after completion.

There are 12 similar 5 yearly inspections proposed to be undertaken on other dams at various times over the expenditure period, plus an ongoing annual program of $16,000 on Rural Valley wide projects described as "SA 5 year inspections".

8.6.1. Assessment type and documentation

Assessment type

Expenditure on the Carcoar 5 year inspection expenditure within the next determination period.

Documentation reviewed

Two documents were provided to the reviewers by WaterNSW, a copy of an internal email providing details of required investigations at Carcoar and a copy of previous report on Glennies Creek Dam (see following Table).

Table 74 Documentation provided for WEM001

Document title	Reference
D2016105472 FW Carcoar 5-Yearly.EML	D2016/105472
ENTERED - 2014 Glennies Creek Dam Comprehensive Surveillance Report.DOC	

8.6.2. Project need

The expenditure driver is categorised by WaterNSW as Maintaining Capability.

Five yearly inspections and Comprehensive Surveillance Inspection Reports are formal and structured reviews of the dam safety performance and status of a dam. They are undertaken by a team of suitably qualified and experienced dam engineers with specialities such as civil, mechanical, electrical, geological and so on, depending on the nature of the dam. The process includes a review of historic dam behaviour (including monitoring results) compared to design expectations, review of any dam safety incidents or events since the last inspection, a review of the hazard category of the dam, documentation, emergency preparedness and staff training records.

These inspections and reports are an integral part of the ongoing formal dam safety surveillance program for a large dam and provide a comprehensive assessment of the dam's safety status and requirements for future surveillance activities, investigations and/or remedial works.

8.6.3. Options investigated

This is a regulatory requirement and standard national industry practice with little discretion for undertaking the activity.

8.6.4. Procurement

The reviewer understands that these inspections and reports are undertaken using a blend of in-house WaterNSW staff and external specialist resources. No information was provided on the proposed team for this inspection or the proposed procurement method for any external resources which may be engaged.

8.6.5. Costs and delivery

No information on how costs were developed was provided by WaterNSW.

WaterNSW proposes to undertake the 5 yearly inspection of Carcoar Dam in FY21 at a cost of $84k and five years later in FY26 for a cost of $51k. There is no historic information on previous costs for these inspections and it is unclear why the expenditure proposed for FY21 is so much larger than that proposed for FY26.

8.6.6. Assessment of prudence and efficiency

Prudence

Expenditure on the Carcoar Dam 5 yearly inspection is considered prudent because it is a regulatory requirement and part of an ongoing and accepted industry standard dam safety surveillance program.

Efficiency

Expenditure proposed on the Carcoar Dam 5 yearly inspection may be efficient with the following issued identified:

- The expenditure amounts proposed in FY21 and FY26 are significantly different, for a similar task;
- There is no justification for the amount of expenditure proposed;
- The procurement and delivery method is undefined.

Mitigating these measures somewhat WaterNSW has in place an expenditure approval process containing a number of checks and balances.

Across the whole 5 yearly program generally with the remaining 12 dams there is similarly no justification of the expenditure amounts proposed, nor an apparent explanation as to why the amounts for similar inspections on the same asset vary over from the current period to future years.

The reviewer has seen no explanation as to the nature of the ongoing Rural Valleys wide program of “SA 5 yearly Inspections” or the basis for the proposed expenditure.

8.6.7. Recommended expenditure

Please refer to Tables provided below.

Table 75 Carcoar 5 year inspection proposed and recommended capital expenditure ($000s, $2016/17)

	FY18	FY19	FY20	FY21	Total
WaterNSW proposed expenditure				84	**84**
Recommended expenditure				84	**84**
Adjustment					**0**
Adjustment (%)					**0**

Source: All data sourced from 'Sheet 1' of 'Project list - draft selection.xlsx' MS Excel file provided by WaterNSW September 2016 .

The reviewer notes the following projects are part of the same program, with WaterNSW's costs indicated below, listed by valley. No adjustments are recommended to any of these projects.

Table 76 5 year inspection proposed and recommended capital expenditure ($000s, $2016/17)

Valley	FY18	FY19	FY20	FY21	Total
WaterNSW Proposed					
Border	82			70	**153**
Fish River					**-**
Gwydir			21	82	**103**
Hunter		147			**147**
Lachlan (this project)				84	**84**
Macquarie	80	80			**161**
Murrumbidgee	162				**162**
Namoi	96		99		**195**
Peel					**-**
Rural Valleys wide projects	16	16	16	16	**64**
South Coast			99		**99**
Total	**437**	**244**	**236**	**252**	**1,168**

Source: All data sourced from 'Sheet 1' of 'Project list - draft selection.xlsx' MS Excel file provided by WaterNSW September 2016.

8.7. Lachlan Valley - Electrical Switchboard and power upgrades

8.7.1. Project description

This capital expenditure project is for a range of electrical replacement works across nine locations within the Lachlan Valley, including:

- new control huts to replace existing control boards & cages
- site motor control centre/ main switchboard including site power and backup batteries
- upgrade battery backup system and install Phase Monitoring relay
- general electrical upgrades.

Much of this expenditure is to support other capital works and is part of a wider program that has been documented in a 'thematic plan' by WaterNSW across seven valleys in total including Lachlan.

8.7.2. Assessment type and documentation

Assessment type

Expenditure on the Lachlan Valley - Electrical Switchboard and power upgrades expenditure within the next determination period.

Documentation reviewed

Documentation was provided for the overall 'thematic plan' for SCADA within the next determination period though this did not specify this project or grouping of expenditure.

Table 77 Documentation provided for WEM001

Document title	Reference
WNSW Operational System & SCADA Thematic Plan 2016.DOCX	
D2015120136 WNSW Operational Support Systems & SCADA Thematic plan work summary - 2016 - 2025.XLSX	D2015/120136
WNSW SCADA and Operational Support Systems Thematic plan work summary - 2016 - 2025 - Submission.xlsx	

8.7.3. Project need

The expenditure driver is categorised by WaterNSW as Maintaining Capability and is for asset renewals within a specific asset class.

WaterNSW stated during discussions that the primary driver or trigger for the works has been other projects such as SCADA and automation in general, which rely on more modern electric switchboards and motor control centres. This is also evident in the documentation provided, the works are renewing older assets however the primary driver is to unlock new capability.

Another need stated during discussions is that due to some older switchboards and motor control centres (MCCs) not meeting current standards they require an electrician to attend site to perform

even simple functions such as resetting minor faults due to the risk of exposure- with the new works an authorised staff member can attend and safely reset. Suitably qualified/trained staff (e.g. electricians) are able to access the switchboards. A lack of spares and suitably experienced contractors or staff to work on older standard works is also becoming an issue for WaterNSW.

8.7.4. Options investigated

No documentation was provided indicating any options investigated to meet the stated need during the review. WaterNSW considers these works are necessary and has not undertaken analysis of any capex/opex trade-offs, but stated it has identified the works are required to support other activities and programmed accordingly.

Subsequent to the draft report being prepared, on 29 November WaterNSW provided the following statement, however did not substantiate this with any evidence (which the review team was seeking during the expenditure review):

> *"WaterNSW asserts that apart from operational efficiencies, addressing the risks identified, including the need to provide segregation of SCADA equipment from mains voltage, is clearly a prudent and appropriate to protect our staff who currently more regularly access these cabinets for SCADA works, rather than for electrical works."*

8.7.5. Procurement

WaterNSW has advised that it is most likely that this expenditure will be rolled up into a larger program and taken to market via public tender(s).

8.7.6. Costs and delivery

Cost estimates have been made by WaterNSW based on past experience with similar works, rolled up into the 'thematic plan'. No indication was made of the delivery method though it is noted WaterNSW is planning to undertake most works during the 2017/18 financial year.

8.7.7. Assessment of prudence and efficiency

Prudence

While there is little in the way of documentation it appears that some work is likely justified across WaterNSW's business; however not enough information has been provided to determine the extent of capital works required or what works within the Lachlan Valley and other Valleys are the priorities. The review team is therefore unable to make a finding that all the expenditure is prudent, but one of partial prudence.

Efficiency

If the works are procured via competitive tenders and undergo more refinement it is likely the capital expenditure will be efficient. As a completely separate issue from procurement/tendering, there is yet

no evidence that the chosen solutions best meet the needs nor that any options were considered, or any cost benefit analysis taking into account the whole of life costs.[122]

The review team does not dispute there is logic behind the project however WaterNSW has not been able to furnish any written documentation quantifying why the expenditure is the most efficient option and whether expenditure in a particular site is driven by an efficiency or safety related need. If it is an efficiency project then the cost savings from not requiring electricians to attend routine operations within electrical cabinets should be examined.

8.7.8. Recommended expenditure

Based on the documentation provided by WaterNSW and following the interview process, the review team considers that expenditure to renew electrical switchboards is likely to be required. However the approach to date, a budgeting process, has been to develop a long list of expenditure without any analysis to determine what is actually required and when. WaterNSW's processes for capital expenditure which are yet to be enacted for any of this expenditure grouping should ensure these activities are carried out and a final, suitable works program is developed for renewal of electrical switchboards and power upgrades. The review team therefore recommends that three quarters (75%) of the proposed expenditure across this grouping of expenditure be included within the assessment of the prudent and efficient expenditure for the next determination period. The 25% reduction has been applied across this program, on the likelihood that elements of some works will be deemed not required during the pricing period.

Table 78 Lachlan Valley – Electrical Switchboard and power upgrades proposed and recommended capital expenditure ($000s, $2016/17)

	FY18	FY19	FY20	FY21	Total
WaterNSW proposed expenditure	807	78	42	311	1,238
Recommended expenditure	605	58	31	233	928
Adjustment	(202)	(19)	(10)	(78)	(309)
Adjustment (%)	-25.0%	-25.0%	-25.0%	-25.0%	-25.0%

Source: All data sourced from 'Sheet 1' of 'Project list – draft selection.xlsx' MS Excel file provided by WaterNSW September 2016.

[122] In response to the draft report WaterNSW stated that: *"The costings have been established in line with those currently being incurred through the iSmart program, which is similar in scale to any program that will be delivered over the forward period."* The review team was not provided with documentation indicating costings have been developed in detail other than a high level budgeting process. There was no evidence of consideration of different options to achieve the outcome required.

Table 79 Electrical Switchboard and power upgrades proposed and recommended capital expenditure ($000s, $2016/17)

Valley	FY18	FY19	FY20	FY21	Total
WaterNSW proposed					
Fish River					31
Gwydir					466
Hunter					104
Lachlan (this project)					1,238
Macquarie					1,331
Murrumbidgee					709
Namoi					186
Total					4,064
Recommended					
Fish River					23
Gwydir					349
Hunter					78
Lachlan (this project)					928
Macquarie					998
Murrumbidgee					532
Namoi					140
Total	**1,893**	**187**	**31**	**937**	**3,048**
Adjustment	(631)	(62)	(10)	(312)	(1,016)
Adjustment (%)	-25.0%	-25.0%	-25.0%	-25.0%	-25.0%

Source: All data sourced from 'Sheet 1' of 'Project list – draft selection.xlsx' MS Excel file provided by WaterNSW September 2016.

Note: Some content redacted at the request of WaterNSW.

8.8. Lowbidgee and Murrumbidgee WHS Compliance Program (high level review only)

8.8.1. Project description

WaterNSW has identified 362 Work Health and Safety non-conformances within the Lowbidgee and Murrumbidgee valleys, which pose hazards such as slips, trips and falls; environment/ physical hazards; static and mobile plant and equipment, manual handling and working at heights. Many of the non-conformances can be addressed with operational actions or controls while others, subject to this assessment, require capital expenditure works.

As noted in the assessment of the Fish River Renewals – Safety, WaterNSW has made allocations for safety renewals in each of the 15 valleys.

8.8.2. Assessment type and documentation

Assessment type

Expenditure within the next determination period for the Lowbidgee and Murrumbidgee WHS Compliance Program, with a 'high level' review only. There was insufficient documentation to review works proposed for Murrumbidgee so the review was then limited to the Lowbidgee valley only.

This capital expenditure item was not in the original sample list; however WaterNSW provided information and the review team has used it to form a conclusion as to the prudency and efficiency of WHS renewal expenditure.

Documentation reviewed

A WaterNSW Board submission paper was provided. Information was taken from the spreadsheet provided by WaterNSW applying to all renewals project.

Table 80 Documentation provided for WEM001

Document title	Reference
Lowbudgee Preliminary Business Case - Board Papers - item 6.2 - 24 Augus....pdf	
D2016106427 Water Infrastructure Renewal Program - Maintain Capability - Raw Unsmoothed.xlsx	D2016/106427
D201671868 3975740 Lowbidgee WHS NPC.XLSX	D2016/71868
Lowbidgee Maintenance Audit (MA) Feb-Mar 2016.DOCX	
Item 6.2 ATT.pdf	
WHS Audit of WaterNSW Rural Assets - Lowbidgee Murrumbidgee and Lachlan Districts.DOCX	

8.8.3. Project need

The expenditure driver is categorised by WaterNSW as Regulatory health and safety.

The review team notes that within the pricing spreadsheet this expenditure has been included under the 'Renewal and Replacement' category.

WaterNSW is seeking to meet its goal of a reduction in health and safety related risks to its staff, customers and community; and a reduction of risks associated with non-compliance with regulatory requirements. WaterNSW is seeking to achieve an outcome such that risks after treatment are 'As Low As Reasonably Practicable' (ALARP).

Three benefits from undertaken the work has been identified by WaterNSW:

- safe place of work for employees and transit for members of the public
- delivery Efficiency (up to 10% cost savings)
- operational continuity.

Specific hazards identify from the WHS audit comprise:

- plant and machine guarding
- confined space signage
- falls from heights
- slip, trip and fall hazards in the work platform areas
- position of actuator valves
- drop bar regulators and falls to water
- bridge geometry and protection
- erosion of earth fill at structures.

8.8.4. Options investigated

WaterNSW considered the following options:

- Option 1 – Implement the Lowbidgee and Murrumbidgee WHS Compliance Programme of Capital Works, as proposed by audit recommendations. This option would see the mitigation of all High and Severe consequences and Medium risks to ALARP.
- Option 2 – Completion of Mandatory Compliance Risks Only This option would see the mitigation of all High and Severe consequence risks to ALARP. Remaining risks would be addressed by implementing operational controls.
- Option 3 – 'Do Nothing'. This would involve continuing to maintain the existing assets in accordance with current maintenance and operational strategies. As such WaterNSW would continue to bear 'High' health and safety risks associated with statutory WHS compliance.

WaterNSW has adopted Option 1, pending completion of planning work, concept design and preparation of a final business case.

8.8.5. Procurement

WaterNSW has advised that it is most likely that this expenditure will be rolled up into a larger program and taken to market via public tender(s).

8.8.6. Costs and delivery

Forecast costs have been made by WaterNSW using the outcome of the audits undertaken. No plans for delivery have been made at this stage though the works appear to be forecast to be steady over the four year period.

8.8.7. Assessment of prudence and efficiency

Prudence

Expenditure proposed for the Lowbidgee safety renewals is considered prudent:

- WaterNSW has established a clear need for this project, with there being a good body of evidence suggesting there are safety risks requiring capital expenditure intervention.

- There are also operational drivers behind ensuring assets are available for service; at the moment WaterNSW is unable to operate many of these assets due to the WHS restrictions.
- The investment aligns with corporate policies, strategies and objectives.

Efficiency

Expenditure proposed for the Lowbidgee & Murrumbidgee WHS renewals is considered efficient:

- A staged approach is being used to refine the works required and develop firm scope before appointing contractors with WaterNSW processes and procedures to be followed before any major expenditure will be approved.
- Following these processes, the scope 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.

8.8.8. Recommended expenditure

No adjustments are recommended to the expenditure proposed by WaterNSW for the Lowbidgee & Murrumbidgee WHS renewals.

Table 81 Lowbidgee Renewals - Safety proposed and recommended capital expenditure ($000s, $2016/17)

	FY18	FY19	FY20	FY21	Total
WaterNSW proposed expenditure					3,802
Recommended expenditure					3,802
Adjustment	-	-	-	-	-
Adjustment (%)	0.0%	0.0%	0.0%	0.0%	0.0%

Source: All data sourced from 'Sheet 1' of 'Project list - draft selection.xlsx' MS Excel file provided by WaterNSW September 2016.

Note: Some content redacted at the request of WaterNSW.

Table 82 Murrumbidgee Renewals - Safety proposed and recommended capital expenditure ($000s, $2016/17)

	FY18	FY19	FY20	FY21	Total
WaterNSW proposed expenditure					3,348
Recommended expenditure					3,348
Adjustment	-	-	-	-	-
Adjustment (%)	0.0%	0.0%	0.0%	0.0%	0.0%

Source: All data sourced from 'Sheet 1' of 'Project list - draft selection.xlsx' MS Excel file provided by WaterNSW September 2016.

Note: Some content redacted at the request of WaterNSW.

The review team notes the following projects are part of the same program, with WaterNSW's costs indicated below, listed by valley. Expenditure in other valleys is more modest than the two valleys examined. No adjustments are recommended from the expenditure proposed by WaterNSW.

Table 83 Safety Renewals proposed and recommended capital expenditure ($000s, $2016/17)

Valley	FY18	FY19	FY20	FY21	Total
WaterNSW proposed					
Border					538
Fish River					254
Gwydir					1,228
Hunter					3,802
Lachlan					822
Lowbidgee (this project)					3,348
Macquarie					393
Murrumbidgee (this project)					598
Namoi					148
Peel					135
North Coast					538
South Coast					254
Total	2,693	3,043	2,831	2,698	11,265

Source: All data sourced from 'Sheet 1' of 'Project list - draft selection.xlsx' MS Excel file provided by WaterNSW September 2016.

Note: Some content redacted at the request of WaterNSW.

8.9. Macquarie - Automation and Communications Renewals & Upgrades

8.9.1. Project description

WaterNSW has prepared a 'thematic plan', or roadmap, to achieve an outcome of adequate remote monitoring and operations of assets. To achieve this the thematic plan identifies instrumentation and automation systems required, and a number of projects to implement the new or upgrade systems within four streams. One such stream is automation enhancements, comprising new automation systems, CCTV cameras for security and operational monitoring, and instrumentation for monitoring of water quality and surveillance monitoring of critical assets. WaterNSW plans to carry out works in 10 rural valleys. The project being examined is the bundle of works proposed for the Macquarie valley, proposing works on the following assets:

- Burrendong Dam
- Windamere Dam
- Marebone Weir & (new) Fishway
- Gunningbah Creek Weir.

8.9.2. Assessment type and documentation

Assessment type

Expenditure within the next determination period.

Documentation reviewed

Documentation relating to the 'thematic plan' was provided, along with documentation for a previous project called iSMART. Most of the documentation provided was for information only and did not have direct relevance to the expenditure proposed for the Macquarie valley or any other valley in the Automation and Communications Renewals & Upgrades program.

Table 84 Documentation provided for WEM001

Document title	Reference
WNSW Operational System & SCADA Thematic Plan 2016.DOCX	
D2015120136 WNSW Operational Support Systems & SCADA Thematic plan work summary - 2016 - 2025.XLSX	D2015/120136
WNSW SCADA and Operational Support Systems Thematic plan work summary - 2016 - 2025 - Submission.xlsx	
iSMART 2013 Business Case.DOC	
iSMART Master Planning Consultancy - ADASA - Value Management estimates NPV.XLS	
iSMART Master Planning Consultancy - ADASA - Benchmarking Analysis Document.DOC	
iSMART Master Planning Consultancy - ADASA - Implementation Plan.DOC	
iSMART Master Planning Consultancy - ADASA - Technological Model.DOC	

8.9.3. Project need

The expenditure driver is categorised by WaterNSW as Maintaining Capability and is for asset renewals within a specific asset class.

According to WaterNSW, the works are required to realise their goal of a centralised control room for river operations, which it states will enable an increase in operating efficiency, improve efficiency of asset management practices, reduce operational losses and realise water savings.

8.9.4. Options investigated

No documentation was provided indicating any options have been investigated or evaluated to best meet the need but has developed a list of works during the budgeting process. The works identified during the budgeting process are as follows:

- Burrendong Dam:
  - 7 spillway gates VFD drives

- Assess existing Spillway FIP for integrity and compliance with relevant standards, integrate to SCADA for monitoring & alarming
- Telemetry, control system and power supply redundancy for spillway
- Intake tower automation upgrade
- Village pumps automation

- Windamere Dam
  - Upgrade and integration of FDC valve to SCADA for monitoring and control
  - New PLC/HMI system for isolation valves, integrate to SCADA
- Marebone Weir & (new) Fishway
  - Replace actuators
  - Automation of fishway and integration to SCADA
- Gunningbah Creek Weir
  - Automation of Nyngan Channel offtake regulator including electrical upgrade.

8.9.5. Procurement

WaterNSW has advised that it is most likely that this expenditure will be rolled up into a larger program and taken to market via public tender(s) though it has no firm plans yet with procurement strategies still being developed.

8.9.6. Costs and delivery

Forecast costs have been made by WaterNSW using engineering judgement and using past projects as a guide. No plans for delivery have been made at this stage though the works appear to be forecast to be steady over the four year period.

8.9.7. Assessment of prudence and efficiency

Prudence

While there is little in the way of documentation it appears that some work is likely justified across WaterNSW's business; however not enough information is available to determine the extent of capital works required or what works within the Macquarie Valley and other Valleys are the priorities. The review team is therefore unable to make a finding that all the expenditure is prudent, but one of partial prudence.

Efficiency

If the works are procured via competitive tenders and undergo more refinement it is likely the capital expenditure will be efficient. However there is yet no evidence that the chosen solutions best meet the needs nor that any options were considered, or any cost-benefit analysis taking into account whole of life costs.

Subsequent to the draft review report, WaterNSW made the following statement:

"This expenditure is predominantly to replace aged SCADA infrastructure, in order to preserve the viability of WaterNSW's current operating model. Expenditure on 'upgrades' to capability being a small proportion of the expenditure, and very much in line with industry practice and WaterNSW's operations strategy. The scope of works was developed in great detail, with very detailed costings at the assembly level calibrated against current works undertaken through large scale procurement through iSmart."

The review team was not provided with documentation indicating scope or costings have been developed in detail other than a high level budgeting process, hence demonstrating that forecast expenditures are efficient.

8.9.8. Recommended expenditure

Based on the documentation provided by WaterNSW and following the interview process it is evident that WaterNSW has developed strategies and plans to achieve a better functioning system to support automation and allow WaterNSW's suite of assets able to be operated remotely. This was better documented in previous pricing periods, e.g. the iSMART program. The work to date to develop this program is more of a budgeting exercise than a robust strategy identifying risks and undertaking proper risk analysis to determine if any unmet needs exist, ways of meting that need, and prioritising expenditure across the asset base.

WaterNSW's processes for capital expenditure which are yet to be enacted for any of this expenditure grouping should ensure these activities are carried out and a final, suitable works program is developed. The review team is therefore unable to recommend all of the proposed expenditure for the Macquarie valley or any other valley be included within the prudent and efficient expenditure for the next determination period. The review team recommends that of the proposed expenditure across this grouping of expenditure be based on that proposed by WaterNSW, minus an amount of $570,000 in FY21. This is based on the likelihood that some works may be found to not be required, re-scoped, or delayed to later determination period.

Table 85 Macquarie - Automation and Communications Renewals & Upgrades proposed and recommended capital expenditure ($000s, $2016/17)

	FY18	FY19	FY20	FY21	Total
WaterNSW proposed expenditure	155	177	52	570	954
Recommended expenditure	155	177	52	-	384
Adjustment	-	-	-	(570)	(570)
Adjustment (%)	0.0%	0.0%	0.0%	-100.0%	-59.7%

Source: All data sourced from 'Sheet 1' of 'Project list - draft selection.xlsx' MS Excel file provided by WaterNSW September 2016.

Table 86 Automation and Communications Renewals & Upgrades proposed and recommended capital expenditure ($000s, $2016/17)

Valley	FY18	FY19	FY20	FY21	Total
WaterNSW proposed					
Border					73
Fish River					281
Gwydir					418
Hunter					198
Lachlan					1,259
Macquarie (this project)					954
Murrumbidgee					342
Namoi					416
North Coast					145
South Coast					157
Total					4,243
Recommended					
Border					73
Fish River					281
Gwydir					418
Hunter					198
Lachlan					1,259
Macquarie (this project)					384
Murrumbidgee					342
Namoi					416
North Coast					145
South Coast					157
Total	**594**	**1,719**	**1,332**	**27**	**3,673**
Adjustment	-	-	-	(570)	(570)
Adjustment (%)	0.0%	0.0%	0.0%	-95.5%	-13.4%

Source: All data sourced from 'Sheet 1' of 'Project list - draft selection.xlsx' MS Excel file provided by WaterNSW September 2016.

Note: Some content redacted at the request of WaterNSW.

8.10. Macquarie - Dam Surveillance Instrumentation Upgrades

8.10.1. Project description

Dam Surveillance instrumentation is a key part of monitoring dam performance and the safety status of a dam, with ANCOLD and the NSW Dams Safety Committee recommending various monitoring requirements and reading frequencies.

The precise details of this project are unclear however the review team understands that this project is part of a larger program proposed by WaterNSW to install telemetry and to allow remote monitoring of some of the instruments at a number of its dam sites.

8.10.2. Assessment type and documentation

Assessment type

Expenditure on the Macquarie Dam Surveillance Instrumentation Upgrades expenditure within next determination period.

Documentation reviewed

Documentation relating to the 'thematic plan' was provided, along with documentation for a previous project called iSMART. Most of the documentation provided was for information only and did not have direct relevance to the expenditure proposed for the Macquarie valley or any other valley in the Dam Surveillance Instrumentation program. The thematic plan made only cursory references to this grouping of expenditure. See Table below.

Table 87 Documentation provided for WEM001

Document title	Reference
WNSW Operational System & SCADA Thematic Plan 2016.DOCX	
D2015120136 WNSW Operational Support Systems & SCADA Thematic plan work summary - 2016 - 2025.XLSX	D2015/120136
WNSW SCADA and Operational Support Systems Thematic plan work summary - 2016 - 2025 - Submission.xlsx	
iSMART 2013 Business Case.DOC	
iSMART Master Planning Consultancy - ADASA - Value Management estimates NPV.XLS	
iSMART Master Planning Consultancy - ADASA - Benchmarking Analysis Document.DOC	
iSMART Master Planning Consultancy - ADASA - Implementation Plan.DOC	
iSMART Master Planning Consultancy - ADASA - Technological Model.DOC	

8.10.3. Project need

The expenditure driver is categorised by WaterNSW as Augmenting.

Dam safety surveillance is a regulatory requirement under ANCOLD and NSW DSC guidelines. Table 5.3 of ANCOLD 2003 Guidelines on Dam Safety Management (Figure 30) sets out recommended surveillance regimes for dams of particular consequence (hazard) categories as below.

TABLE 5.3 GUIDE FOR "IN SERVICE" DAM MONITORING FREQUENCIES[1]

Monitoring	Hazard Category				
	Very Low	Low	Significant	High	Extreme
Rainfall	Monthly[5]	Monthly	Twice Weekly to Weekly (TC)[2]	Daily to Tri Weekly (TR)[2]	Daily (TR)[2]
Storage Level	Monthly[5]	Monthly	Twice Weekly to Weekly (TC)[2]	Daily to Tri Weekly (TR)[2]	Daily (TR)[2]
Seepage	Monthly[5]	Monthly	Twice Weekly to Weekly (TC)[2]	Daily to Tri Weekly (TC)[2]	Daily (TR)[2]
Chemical analysis of seepage[6]			Consider	Consider	Consider
Pore pressure[7]		Consider	3-Monthly to 6-Monthly	Monthly to 6-Monthly	Monthly to 3-Monthly
Surface movement, control[4]				5-Yearly to 10-Yearly	5-Yearly
Surface Movement, normal		Consider	Consider	2-Yearly	Yearly
Internal movement/ stresses[3]			Consider	2-Yearly	Yearly
Seismological[3]				Consider (TR)[2]	Consider (TR)[2]
Post-tensioning[7]			10-Yearly	5-Yearly to 10-Yearly	5-Yearly

Figure 30 Table 5.3 of ANCOLD 2003 Guidelines on Dam Safety

It is prudent that WaterNSW follow this dam safety surveillance regime and we understand that this is the case.

It is reasonable to accept that various dam monitoring instruments will deteriorate over time and require replacement and that as technical understanding of particular dams and associated critical features and loading conditions improves, there will be a case for additional or new monitoring to be installed (for example increasing a seismic monitoring network or monitoring an identified deficiency in a dam, such as a crack in a concrete structure).

Technology advances also now mean that remote monitoring of some dam surveillance instruments is possible using SCADA, and this has potential safety advantages in allowing more frequent monitoring or alarming of critical instrument and potentially reduced ongoing operational effort with reduced need for on-site measurements to be taken. If the latter were the case, then it would be reasonable to see a commensurate reduction in future operating costs for these dams.

The expenditure appears to be driven by a desire to remotely monitor critical assets such as dams although the justification provided in interviews was that it was required for other reasons, and that approval of the NSW Dam Safety Committee would be required before any Opex savings could be made. This is presumably because a change to the number or frequency of dam surveillance monitoring may change as a result of the remote monitoring and therefore may change the nature of dam safety regulatory compliance.

The Macquarie Dam Surveillance Project(s) have (*content redacted at the request of WaterNSW)* for a total of $555k. Supporting documentation provided (D2015120136 Thematic Plan) identifies (*content redacted at the request of WaterNSW)* total $466k for the same projects. It is unclear whether the proposed work in FY17 has or will be completed and therefore whether the amount in the pricing proposal is in addition to the work identified not the Thematic Plan or an increase in previous scope and cost.

It is not clear from the information available to the review team precisely what the drivers for this program of works are. Subsequent to the draft report, WaterNSW provided the following comments:

> *"The Aither review of this project did not consider a major intangible benefit of this instrumentation. The primary driver to WaterNSW upgrading its surveillance instrumentation is to incorporate telemetry of key monitoring points such as seepage weirs. This gives dam engineers the ability to receive timely warning of an impending safety issue and act quickly for evacuation of residences located downstream within the dam break zone.*
>
> *In recent years, WaterNSW has embarked on a risk reduction program by undertaking staged upgrades of several of its high risk dams. Dams such as Wyangala, Copeton, Keepit, Blowering, Split Rock, Burrendong and Chaffey now sit within the DSC f-n ALARP zone, post upgrade works. WaterNSW is required to demonstrate to the regulator that ALARP has been achieved for the dams noted above. ALARP may be demonstrated in some circumstances by having a robust telemetry system in place on key monitoring points that provide early warning thereby directly leading to a reduction in loss of life (i.e. the dam will plot further to the left on the DSC f-n plot and thereby may avoid future upgrades).*
>
> *Consequently WaterNSW considers this expenditure to be part of a prudent, proactive approach to risk management in line with a long term strategy with respect to Dam Safety."*

This was not made clear to the review team during the review process – the main argument put forward at that time was an unquantified reduction in opex due to remote monitoring capability.

While the review team acknowledge that remote monitoring and telemetry of some instruments at some dams may assist early warning and reduce life safety risk, the details and quantum of this in the overall proposed program of $3.801m remains unclear to the review team – the statements made following the draft report were not substantiated. It is the review team's view that it is unlikely the full amount could be justified for this purpose, and insufficient information and justification was provided upon which to recommend an appropriate level of expenditure.

The review team notes that regulatory requirements for dam safety surveillance monitoring is clear and it is acknowledged that periodic replacement of existing instruments and installation of additional monitoring instruments is a prudent investment and that remote monitoring of certain instruments may have dam safety and/or operational cost benefits. However, WaterNSW has stated that it currently meets the requirements of ANCOLD 2003 Guidelines on Dam Safety Management and so given this, it is not clear whether the project is being driven by business efficiency (e.g. with reductions in opex due to less site visits required), meeting current dam safety or security requirements, or meeting additional needs not currently being met.

8.10.4. Options investigated

No documentation was provided indicating any options have been investigated or evaluated to best meet the need.

8.10.5. Procurement

WaterNSW has advised that it is most likely that this expenditure will be rolled up into a larger program, taken to market via public tender(s), however there are no firm plans yet with procurement strategies still being developed.

8.10.6. Costs and delivery

Forecast costs have been made by WaterNSW using engineering judgement and using past projects as a guide. No plans for delivery have been made at this stage though the works appear to be forecast to be steady over the four year period.

8.10.7. Assessment of prudence and efficiency

Prudence

WaterNSW has advised that the capex will result in an operational efficiency by way of reducing the frequency of visits to dam sites and hence lower opex. It will also improve the ability to monitor the site. It has not however, assessed the ratio of costs and benefits and whether the benefits outweigh costs. This will not be known until a detailed analysis is undertaken. Given the uncertainty in benefits, the reviewer cannot find the forecast expenditure prudent in these circumstances.

Efficiency

The reviewer does not have sufficient information to make a conclusion on the efficiency of the proposed expenditure however with the expenditure also unable to be found prudent this is not a driving issue.

8.10.8. Recommended expenditure

No expenditure is recommended to be included for the Macquarie valley or any other valley. Recommended adjustments are indicated in the Tables below.

Table 88 Macquarie - Dam Surveillance Instrumentation Upgrades proposed and recommended capital expenditure ($000s, $2016/17)

	FY18	FY19	FY20	FY21	Total
WaterNSW proposed expenditure		244			**244**
Recommended expenditure	-	-	-	-	**-**
Adjustment	-	(244)	-	-	**(244)**
Adjustment (%)	-	-100.0%	-	-	**-100.0%**

Source: All data sourced from 'Sheet 1' of 'Project list - draft selection.xlsx' MS Excel file provided by WaterNSW September 2016.

Table 89 Dam Surveillance Instrumentation Upgrades proposed and recommended capital expenditure ($000s, $2016/17)

Valley	FY18	FY19	FY20	FY21	Total
WaterNSW proposed					
Border			224		**224**
Fish River		31			**31**
Gwydir		156			**156**
Hunter	52		700		**751**
Lachlan			423		**423**
Macquarie		244			**244**
Murrumbidgee	11	10	526	636	**1,183**
Namoi			788		**788**
Total	63	441	2,661	636	**3,801**
Recommended					
Border	-	-	-	-	**-**
Fish River	-	-	-	-	**-**
Gwydir	-	-	-	-	**-**
Hunter	-	-	-	-	**-**
Lachlan	-	-	-	-	**-**
Macquarie	-	-	-	-	**-**
Murrumbidgee	-	-	-	-	**-**
Namoi	-	-	-	-	**-**
Total	-	-	-	-	**-**
Adjustment	(63)	(441)	(2,661)	(636)	**(3,801)**
Adjustment (%)	-100.0%	-100.0%	-100.0%	-100.0%	**-100.0%**

Source: All data sourced from 'Sheet 1' of 'Project list - draft selection.xlsx' MS Excel file provided by WaterNSW September 2016.

8.11. Murrumbidgee Renewals

8.11.1. Project description

This grouping of expenditure is for renewals across the Murrumbidgee Valley, across 34 facilities, with WaterNSW's proposed capital expenditure in the next determination period for major items indicated:

- Maude Weir coating - $*
- Redbank Weir coating - $*

(Denotes content redacted at the request of WaterNSW).*

WaterNSW cautions that these assets may or may not become part of the final program that will be evaluated continuously and it is subject to change, the objective being to obtain a funding envelope.

8.11.2. Assessment type and documentation

Assessment type

Expenditure on the two key projects (Maude Weir and Redback Weir coatings) within the current and next determination period.

Documentation reviewed

Documentation was provided for two significant elements of expenditure proposed, Redbank Weir and Maude Weir coating.

Table 90 Documentation provided for WEM001

Document title	Reference
Maude Weir - Estimate Basis & Overview.PDF	
Redbank Weir - Estimate Basis & Overview.PDF	
Guide to Protective Coating Assessment & Repair Feasibility.DOC	
2958R11561.pdf	

8.11.3. Project need

The expenditure driver is categorised by WaterNSW as Maintaining Capability and is for asset renewals.

Across its business WaterNSW has determined that the coatings on steel structures act to prolong the life of the structures and defer major replacement costs. In cases such as within the Murrumbidgee valley the coatings are wearing away requiring application of a patch repair or recoating the entire structure.

8.11.4. Options investigated

Maude Weir and Redback Weir coatings:

The same options were considered for the coatings of both weirs:

- do nothing and simply monitor rate of coating deterioration
- locally remove flaking paint to eliminate environmental risks and check out the extent of metal loss associated with crevice corrosion on the access platforms
- completely remove existing coating by abrasive blast cleaning and repaint with a modern coating system.

Some of WaterNSW's steel structures have been coated with lead-based paint, including structures at Maude Weir and Redback Weir. Due to this it is uneconomic to simply undertake 'patch painting' which is usually much cheaper than repainting of an entire structure. In order to undertake any form of

recoating on a structure with existing lead-based paint first requires the entire structure to be encapsulated, which costs more than the painting itself. For this reason there is only a relatively small incremental cost to completely recoat the entire structure, which is what WaterNSW has elected to do.

Other projects:

No evidence that options have been considered for the remainder of the proposed expenditures.

8.11.5. Procurement

WaterNSW has advised that it is most likely that this expenditure will be rolled up into a larger program and taken to market via public tender(s). WaterNSW is proposing to carry out the Redbank and Maude Weir works in a single package to deliver the works efficiently.

8.11.6. Costs and delivery

Redbank and Maude Weir coatings:

WaterNSW has had cost estimates prepared for the two weir coatings for the different options.

Other:

There was no documentation provided to substantiate any items of expenditure. Cost estimates are drawn from the Assetbank model. Delivery is forecast to be fairly steady over the four years with significant capital expenditure proposed, in some cases more than WaterNSW has spent in an entire year recently.

8.11.7. Assessment of prudence and efficiency

Prudence

Redbank and Maude Weir coatings:

Expenditure proposed for the Redbank and Maude Weir coatings is considered prudent:

- WaterNSW has established a clearly defined need for this project, with the timing for coating of both structures being demonstrated as required in order to avoid more costly renewals in future.
- WaterNSW's 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 sections of pipeline demonstrating a history of failures and in unacceptable condition first.
- The investment aligns with corporate policies, strategies and objectives.

Other:

No documentation is available therefore the review team is unable to make a finding on the prudence of this expenditure.

Efficiency

Redbank and Maude Weir coatings:

Expenditure proposed for the Redbank and Maude Weir coatings is considered efficient:

- The option chosen has the lowest whole of life costs of the available options.
- 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.

Other:

No documentation is available therefore the review team is unable to make a finding on the efficiency of this expenditure.

8.11.8. Recommended expenditure

For the expenditure that was well documented, which is limited to the Redbank and Maude Weir coatings, it would be recommended all proposed expenditure be accepted if they were standalone projects. In line with the overall assessment of the 'per valley' renewal expenditure under the Maintaining category it is recommended a reduction be made to expenditure within the Murrumbidgee Valley, indicated in Table 91. This still allows sufficient funding for the identified coating works plus the other, unspecified works.

Table 91 Murrumbidgee Renewals proposed and recommended capital expenditure ($000s, $2016/17)

	FY18	FY19	FY20	FY21	Total
WaterNSW proposed expenditure	7,514	8,141	7,573	7,218	30,445
Recommended expenditure	5,361	6,059	5,636	5,371	22,427
Adjustment	(1,843)	(2,082)	(1,937)	(1,846)	(7,708)
Adjustment (%)	-25.6%	-25.6%	-25.6%	-25.6%	-25.6%

Source: All data sourced from 'Sheet 1' of 'Project list - draft selection.xlsx' MS Excel file provided by WaterNSW September 2016.

8.12. Namoi - Keepit Dam Upgrade

8.12.1. Project description

Keepit Dam was designed in the 1930s and completed in 1960 and does not meet the statutory requirements of the NSW Dams Safety Committee and ANCOLD guidelines for large or extreme floods and earthquake events.

WaterNSW proposes to install post-tensioned ground anchors in the concrete dam wall and adjacent spillway for earthquake protection. This project has three components – relocation of electrical works to allow installation of post-tensioned anchors (completed 2015), installation of post-tensioned anchors, and raising of the dam crest and other minor works. The anchor installation phase of the

project is in two parts – initiation and planning (complete August 2016) and project execution, which is the subject of the expenditure proposal.

8.12.2. Assessment type and documentation

Assessment type

Expenditure within the current and next determination period.

Documentation reviewed

Four documents were provided by WaterNSW to the reviewers for this project as shown in the Table below.

Table 92 Documentation provided for WEM001

Document title	Reference
Keepit Dam Post Tensioning Final Business Case	D2016/95564
WaterNSW 29 June 2016 Board Paper Agenda Item 12.1b "Dam Safety Risk Compliance"	2016/61859
Keepit Dam Upgrade Addendum Report to 2009 Business Case, February 2015	Hincks & Associates Pty Ltd
Keepit Dam Post Tensioning Works – Worksheet on Costed Risk Allowances	D2016/93624
Response to Aither information request of 11 October 2016, Item 2, Keepit Dam Costs spreadsheet	Email from WaterNSW to Aither 11 October 2016 5:54 PM
Keepit Dam Upgrade	Attachment to email from WaterNSW 26 October 2016 5:49 pm

8.12.3. Project need

The expenditure driver is categorised by WaterNSW as Regulatory dam safety.

8.12.4. Options investigated

The proposed works are part of a larger program of required dam safety remediation works at Keepit Dam which were identified prior to 1997 and which have since progressively been undertaken.

Several options for securing the dam against extreme flood and strengthening the dam wall against earthquake have been investigated and the proposed project was identified as the most cost effective and efficient option following an options review (including "do nothing"), Treasury Gateway review and a business case prepared by Hincks & Associates in 2015.

8.12.5. Procurement

The current post-tension works have been subject to a public tender process with three phases – Expressions of Interest to shortlist four companies for inclusion in an Early Tenderer Involvement

(ETI) process; Requests for Tender were provided to the four companies following the ETI process, and an evaluation of tenders including risk review of offers received.

8.12.6. Costs and delivery

At the time of the pricing submission (June 2016) WaterNSW estimated a total project execution cost for these works of $32.425m, of which *(content redacted at the request of WaterNSW)*, $3.421m are internal costs and $2.895m are risk-based contingency costs and that contract works will commence in FY17 and be completed in FY19. This is different from the expenditure forecast for 2016/17 and 2017/18 onwards.

During the review WaterNSW provided an up to date forecast of expenditure for the Keepit Dam post tensioning construction. *(Content redacted at the request of WaterNSW).* This resulted in a net reduction of $$9.7 million in the current determination period and $9.2 million in the next determination period.

8.12.7. Assessment of prudence and efficiency

Prudence

Expenditure for the Keepit Dam Upgrade Phase is considered prudent:

- Dam safety risks have been identified in the past and this project is the next in a series of discrete works packages to progressively reduce these risks to an acceptable level.
- The final stage of the project, dam wall raising and other minor works is currently scheduled for the next determination period, pending the outcome of the current review of NSW Dams Safety regulations.

Efficiency

The following was identified that influence the assessment of the efficient expenditure required:

- Major contract costs have been market tested;
- Contingency amounts have been assessed using risk based techniques on identified issues.

8.12.8. Recommended expenditure

It is recommended WaterNSW's latest forecast be adopted, which is presented in the tables below. This results in a reduction in expenditure for the current and next determination periods. This amount of expenditure is considered efficient to deliver the works required to meet the need.

Table 93 Keepit Dam Upgrade actual/forecast and recommended capital expenditure ($000s, $2016-17)

	FY15	FY16	FY17	Total
WaterNSW original actual/forecast expenditure				
WaterNSW revised expenditure 11/10/2016				
Recommended expenditure				
Adjustment	-	-	-	-
Adjustment (%)	0%	0%	0%	0%

Source: All data sourced from 'SIR Capex 2' of 'WaterNSW Information request - 2017 Determination.xlsx' MS Excel file provided by WaterNSW on 30 September 2016, and reforecast confirmed 11 October 2016.

Note: Some content redacted at the request of WaterNSW.

Table 94 Keepit Dam Upgrade proposed and recommended capital expenditure ($000s, $2016-17)

	FY18	FY19	FY20	FY21	Total
WaterNSW proposed expenditure					
WaterNSW revised expenditure 11/10/2016					
Recommended expenditure					
Adjustment	-	-	-	-	-
Adjustment (%)	0%	0%	0%	0%	0%

Source: All data sourced from 'Sheet 1' of 'Project list - draft selection.xlsx' MS Excel file provided by WaterNSW September 2016, and reforecast confirmed 11 October 2016.

Note: Some content redacted at the request of WaterNSW.

8.13. Corporate wide project - Communications Strategy & Implementation

8.13.1. Project description

WaterNSW has identified a need to implement appropriate telecommunications infrastructure to support business activities. This was identified by the former State Water with a replacement program planned, with the former Sydney Catchment Authority having similar plans. Post merger, these plans were put on hold in order to review the needs of the merged organisation prior to undertaking significant expenditure. There are currently multiple telecommunications networks in place including for voice, corporate activities, SCADA, hydrometric data and metering.

8.13.2. Assessment type and documentation

Assessment type

Expenditure within the current and next determination period.

Documentation reviewed

A range of documentation was provided directly relating to this expenditure item, and for related expenditure. At the highest level is the WaterNSW Enterprise Architecture final report. Next in order of relevancy is the Preliminary Business Case for the - Consolidation of Information Systems (CIMS).

Table 95 Documentation provided for WEM001

Document title	Reference
WaterNSW Board Meeting - 29 June 2016 - ICT Better Business Systems Prog....docx	
WaterNSW Board Meeting - 29 June 2016 - ICT Better Business Systems Prog....pdf	
D201667340 WaterNSW Board Meeting - 29 June 2016 - Information Management Systems C....docx	D2016/67340
Board Committee on Infrastructure and Operations - 18 July 2016 - Better....pptx	
Preliminary Business Case - Consolidation of Information Systems (CIMS) ....docx	
Preliminary Business Case - Attachment - CIMS Project Financial Model.xlsx	
Email sent by WaterNSW, subject 'Fwd Aither information request arising from 10 October capex meeting.msg'	
WaterNSW_Telephony_Strategy_Rev1_4.pdf	
OCTOBER 2016 - Telecommunications Strategy Program - Status Report.xlsx	
Telecoms Strategy - Tender Document As Issued.pdf	

8.13.3. Project need

The expenditure driver is categorised by WaterNSW as Augmenting.

The need for this project has most recently been identified as part of the 'Target Technology Architecture' under the 'Healthy IT Assets' program. Reliable communications are required in order to fully realise the benefits of the ERP project, the consolidation of other information systems, and for WHS reasons.

WaterNSW has further stated the project will be an enabler for productivity gains through greater use of the ERP (CIMS) project by removing duplication, automating some processes, removing manual workarounds and enabling more mobility. It also states that benefits of the WaterNSW Strategic Action Plan for FY17 cannot be fully realised without appropriate telecommunications infrastructure.

8.13.4. Options investigated

WaterNSW is in the process of finalising a State-wide strategy to ensure that communications systems for WaterNSW sites are fit-for-purpose and comply with WaterNSW corporate standards. WaterNSW is yet to undertake detailed options assessment for the communications strategy and implementation; however it did undertake a detailed analysis for future telephony needs in 2015, which form part of the telecommunications strategy but focuses more on voice communications. This strategy considered a suitable range of options to provide fit for purpose telephony solutions with an agnostic basis towards communications mediums. Options considered were:

- retain current systems
- replicate WaterNSW's metro environment for WaterNSW's rural business
- fully replace existing system with a 'hosted' service
- rollout Alcatel solution to all rural sites.

Pros and cons of each option were identified on a qualitative basis, in addition to a quantitative analysis taking into account capital and operational costs of each option. Option 4 was selected which was more expensive than retaining the status quo but delivered the stated need which Option 1 did not.

8.13.5. Procurement

WaterNSW has gone to a public tender for development of the telecommunications strategy and is expected to award a contract shortly. This piece of work will inform the path that WaterNSW takes in procurement; however it is expected it will involve a competitive tender process.

8.13.6. Costs and delivery

WaterNSW has based its forecasts on work prepared by a consultant (Enterprise Architects), referred to by WaterNSW as the 'Enterprise Architecture Roadmap', *(content redacted at the request of WaterNSW)* , referred to by WaterNSW as a 'initial high level estimated cost'.

8.13.7. Assessment of prudence and efficiency

Prudence

WaterNSW has demonstrated the expenditure as being prudent by:

- establishing a clearly defined need for the expenditure with linkages to other key strategic actions to unlock benefits of the merger including operational expenditure savings
- pausing the originally planned separate programs for State Water and SCA to develop a combined strategy
- providing safer working environments for employees.

Efficiency

While difficult to establishg whether the costs are efficient due to the early stage of the project work to date, the review team considers the forecast to be efficient given the planning being put in, the staged

process and the rigour the WaterNSW management and Board are scrutinising proposed expenditure.

8.13.8. Recommended expenditure

No adjustments are recommended for this capital expenditure.

It is however recommended that IPART monitor expenditure on this project and the overall Enterprise Architecture umbrella program for over expenditure or otherwise unnecessary or avoidable expenditure over the next 4-5 years as it is implemented.

Table 96 Corporate wide project - Communications Strategy & Implementation actual/forecast and recommended capital expenditure ($000s, $2016-17)

	FY15	FY16	FY17	Total
WaterNSW actual/forecast expenditure	-	122	66	188
Recommended expenditure	-	122	66	188
Adjustment	-	-	-	-
Adjustment (%)	-	0%	0%	0%

Source: All data sourced from 'SIR Capex 2' of 'WaterNSW Information request - 2017 Determination.xlsx' MS Excel file provided by WaterNSW on 30 September 2016.

Table 97 Corporate wide project - Communications Strategy & Implementation proposed and recommended capital expenditure ($000s, $2016-17)

	FY18	FY19	FY20	FY21	Total
WaterNSW proposed expenditure					5,471
Recommended expenditure					5,471
Adjustment	0	0	0	0	0
Adjustment (%)	0	0	0	0	0

Source: All data sourced from 'Sheet 1' of 'Project list - draft selection.xlsx' MS Excel file provided by WaterNSW September 2016.

Note: Some content redacted at the request of WaterNSW.

8.14. Corporate wide project - ICT Renewals & Replacement

8.14.1. Project description

WaterNSW has had a program in place for renewal of ICT assets, prior to the current determination period beginning. The program generally replaces assets once they reach their depreciation age, which for desktop PCs/laptops is four years, routers/switches five years, and for servers and network equipment (excluding storage) it is five years with storage being two years. Other assets included are mobile phones (two year cycle), other telephony (five years) and video conferencing equipment (six years). A WaterNSW wide policy is yet to be implemented, the proposed expenditure is using the previous State Water approach.

8.14.2. Assessment type and documentation

Assessment type

Expenditure within the current and next determination period.

Documentation reviewed

No documentation provided during the review directly applied to the ICT renewals. A list of all existing assets was provided but this did not indicate what was proposed to be replaced/renewed.

Subsequent to the draft review report, WaterNSW provided a response explaining the basis for and drivers behind the forward estimates and for past expenditure.

Table 98 Documentation provided for WEM001

Document title	Reference
Computer equipment list 12 Oct 2016.xlsx	
Email sent by WaterNSW, subject 'Fwd Aither information request arising from 10 October capex meeting.msg'	
WaterNSW comments on the Aither Draft Report (section 3.30)	

8.14.3. Project need

The expenditure driver is categorised by WaterNSW as Maintaining Capability and is for asset renewals within a specific asset class.

WaterNSW relies on being able to communicate with a staff base spread across several locations, which is a key driver to ensuring availability and reliability of the ICT assets. Provision of core equipment for staff such as computers, phones, servers and printers is a basic requirement for WaterNSW as a business.

8.14.4. Options investigated

During the review, there was no documentation provided to substantiate any items of expenditure. WaterNSW advised it plans in the future to benchmark the replacement program on a whole of life

cost basis to ensure the replacement schedules are appropriate but has been focusing on other priorities since the merger.

In its response to the draft report, WaterNSW advised that expenditure over the past three years has been much lower than historic due to the merger, stating as follows:

> *"Expenditure over period FY2014 and 2015 was less than expected due to a change in renewal approach in response to the merger with Sydney Catchment Authority. Ref D2014/76221 - Business Case for WaterNSW ICT Merger Initiatives.*
>
> *A fundamental merger principle was to align technologies and renewal cycles. To achieve this, the renewal approach was revised from pre phased replacement to break fix replacement. This reduced overall expenditure and permitted an aligned renewal cycle for WaterNSW to be achieved."*

The document cited was not provided.

WaterNSW also made the following statement explaining the uplift:

> *"With respect to uplift the forward anticipated level of spend, this is related to the move to a break/fix approach as described above. This approach is to only replace equipment when it fails, not as part of a pre-planned lifecycle renewal program. As such expenditure during the merger period was significantly lower than the pre-planned lifecycle renewal program as reflected in the forward plan."*

8.14.5. Procurement

Procurement plans were not communicated during the review, however subsequent to the draft report WaterNSW advised its policy requires a competitive tendering process, stating stated this will be either an open tender or a selective tender.

8.14.6. Costs and delivery

WaterNSW advised during and post interviews that forecast costs have been made using defined replacement cycles. No plans for delivery have been made at this stage. Works have some peaks and troughs over the four year period. Expenditure proposed is quite a step from the last two financial years with an annual average of $627,000, while between $1.2–2 million is proposed per annum in the forthcoming determination period.

WaterNSW subsequently provided further information from another document that was not provided to the review team, indicating the basis for the expenditure estimate.

8.14.7. Assessment of prudence and efficiency

Prudence

From the replacement cycles WaterNSW is using it appears that replacement/renewal of ICT assets over time is warranted with the cycles comparing well with industry practice. The information provided after the draft report was useful to support the need for WaterNSW's proposed recurrent expenditure for equipment such as laptop and desktop computers, printers, video conference facilities and

switches, but lacking sufficient detail to support the logic behind larger infrequent expenditure such as SCADA network refresh and server expansions. A finding of partial prudency is therefore made.

Efficiency

Subsequent to the draft report WaterNSW provided statements explaining the reasoning behind the uplift in expenditure though this was not substantiated by demonstrating what the trend prior to the merger was (and this was not sufficient to change the review team's recommendation). Assumed hardware replacement cycles for laptop and desktop computers, printers, video conference facilities and switches used to prepare the forecast appear reasonable by industry standards though the assumption for phone replacements (a two year replacement cycle) appears too frequent. Other items in the forecast are more lumpy with significant expenditure once during the four year program such as a SCADA network refresh and Backup infrastructure. A finding of partial efficiency is therefore made.

8.14.8. Recommended expenditure

While there was little documentation provided to substantiate the need for the expenditure based on past expenditure and knowledge of WaterNSW's processes there is a case for some expenditure being recommended to be included. A concern of the review team is that the expenditure is forecast to increase significantly without any clear linkage to a driver for increased volumes or costs. WaterNSW stated that the average over the last three years was depressed below long term trends due to a pause on procurement following the merger which taken at face value is reasonable. However a demonstration of a long term average expenditure was not provided.

The need for renewal of ICT assets is evident, therefore the review team recommends an amount be included within the overall assessment of the prudent and efficient expenditure based on the forecast actual expenditure for 2016-17.

Table 99 Corporate wide project - ICT Renewals & Replacement actual/forecast and recommended capital expenditure ($000s, $2016-17)

	FY15	FY16	FY17	Total	FY16-FY17 average
WaterNSW actual/forecast expenditure	-	-	847	1,254	632
Recommended expenditure	-	417	847	1,264	632
Adjustment	-	-	-	-	
Adjustment (%)	0%	0%	0%	0%	

Source: All data sourced from 'SIR Capex 2' of 'WaterNSW Information request - 2017 Determination.xlsx' MS Excel file provided by WaterNSW on 30 September 2016.

Table 100 Corporate wide project - ICT Renewals & Replacement proposed and recommended capital expenditure ($000s, $2016/17)

	FY18	FY19	FY20	FY21	Total
WaterNSW proposed expenditure					6,189
Recommended expenditure					3,387
Adjustment	(349)	(886)	(424)	(1,141)	(2,802)
Adjustment (%)	-29%	-51%	-33%	-57%	-45%

Source: All data sourced from 'Sheet 1' of 'Project list - draft selection.xlsx' MS Excel file provided by WaterNSW September 2016.

Note: Some content redacted at the request of WaterNSW.

8.15. Corporate wide project - Water NSW ERP E6

8.15.1. Project description

Post-merger WaterNSW embarked on a project to develop a new Enterprise Architecture for information & communications technology (ICT) and operational technology (OT) systems. This resulted in a project to consolidate various enterprise information systems into a single Enterprise Resource Planning (ERP) system- the project is formally known as Consolidation of Information Systems (CIMS).

8.15.2. Assessment type and documentation

Assessment type

Expenditure within the current and next determination period.

Documentation reviewed

A range of documentation was provided directly relating to this expenditure item, and for related expenditure. At the highest level is the WaterNSW Enterprise Architecture final report. Next in order of relevancy is the Preliminary Business Case for the - Consolidation of Information Systems (CIMS)- which is directly applicable to this project.

Table 101 Documentation provided for WEM001

Document title	Reference
WaterNSW Board Meeting - 29 June 2016 - ICT Better Business Systems Prog....docx	
WaterNSW Board Meeting - 29 June 2016 - ICT Better Business Systems Prog....pdf	
D201667340 WaterNSW Board Meeting - 29 June 2016 - Information Management Systems C....docx	D2016/67340
Board Committee on Infrastructure and Operations - 18 July 2016 - Better....pptx	
Preliminary Business Case - Consolidation of Information Systems (CIMS) ....docx	
Preliminary Business Case - Attachment - CIMS Project Financial Model.xlsx	
Email sent by WaterNSW, subject 'Fwd Aither information request arising from 10 October capex meeting.msg'	
WaterNSW_Telephony_Strategy_Rev1_4.pdf	
OCTOBER 2016 - Telecommunications Strategy Program - Status Report.xlsx	
Telecoms Strategy - Tender Document As Issued.pdf	

8.15.3. Project need

The expenditure driver is categorised by WaterNSW as Augmenting.

WaterNSW's Enterprise Architecture project identified a number of 'pain points' throughout and impact on the business and developed a priority list of needs to address through the new target architecture. One set of pain points followed out of WaterNSW having duplicate systems for obtaining and using data from numerous ICT and OT systems, in particular from OT systems.

In addition to providing new capability this expenditure also unlocks a range of operational expenditure savings across the business that can be removed/consolidated as a result of the project, a saving of $2 million per annum. This appears to be under-estimating the savings, which would be more in the order of $3 million per annum at a salary including on-costs of $200,000.

8.15.4. Options investigated

WaterNSW identified two viable options to achieve the need:

- 'Tweak What We have': utilise an existing vendor solution and fill gaps
- implement a new system.

For the new system option a number of different systems were identified and evaluated, with WaterNSW settling on a particular solution based on whole of life cost and risk. This was demonstrated with NPV analysis. This solution was then chosen over the 'tweak what we have'

option, which was found to have a lower overall cost than other consolidation options including 'tweak what we have' and a 'do nothing' option (the latter not listed above). The chosen system is to be implemented with a few customisations required, fulfilling a range of functions with a single system that under the 'tweak what we have' option would require a number of different software packages from different vendors.

8.15.5. Procurement

A competitive open tender process has been undertaken to select a preferred vendor. Following appointment of a dedicated external project director and completion of further planning and scoping activities, WaterNSW intends to finalise contractual arrangements with this vendor who will undertake final design activities prior to implementation.

8.15.6. Costs and delivery

WaterNSW has an agreed capped implementation fee of *(content redacted at the request of WaterNSW)* with the chosen vendor; note this is WaterNSW wide, the amounts allocated to the Rural operating licence are apportioned as per WaterNSW's cost allocation method.

8.15.7. Assessment of prudence and efficiency

Prudence

WaterNSW has demonstrated the expenditure as being prudent by:

- clearly identifying the need for consolidation of business systems
- undertaking a process to capture whole of business dependencies and requirements
- considering timing.

Efficiency

WaterNSW has demonstrated the expenditure as being prudent by:

- considering a full range of options to achieve the desired need of a consolidation of systems
- demonstrating the operational expenditure savings to be realised following the capital investment
- running an open tender process to select a preferred vendor.

8.15.8. Recommended expenditure

No adjustments are recommended to the expenditure proposed by WaterNSW. Recommended expenditure is outlined in Table 102 and Table 103.

Table 102 Corporate wide project - Water NSW ERP - P6 actual/forecast and recommended capital expenditure ($000s, $2016-17)

	FY15	FY16	FY17	Total
WaterNSW actual/forecast expenditure	-	-	855	855
Recommended expenditure	-	-	855	855
Adjustment	-	-	-	-
Adjustment (%)	0%	0%	0%	0%

Source: All data sourced from 'SIR Capex 2' of 'WaterNSW Information request - 2017 Determination.xlsx' MS Excel file provided by WaterNSW on 30 September 2016.

Table 103 Corporate wide project - Water NSW ERP - P6 proposed and recommended capital expenditure ($000s, $2016-17)

	FY18	FY19	FY20	FY21	Total
WaterNSW proposed expenditure					3,576
Recommended expenditure					3,576
Adjustment	0	0	0	0	0
Adjustment (%)	0	0	0	0	0

Source: All data sourced from 'Sheet 1' of 'Project list - draft selection.xlsx' MS Excel file provided by WaterNSW September 2016.

8.16. Rural Valleys wide project - Operational Systems Programme

8.16.1. Project description

Post-merger WaterNSW embarked on a project to develop a new Enterprise Architecture for information & communications technology (ICT) and operational technology (OT) systems. The EA project identified a number of 'pain points' throughout and impact on the business and developed a priority list of needs to address through the new target architecture. One set of pain points followed out of WaterNSW having duplicate systems for obtaining and using data from numerous ICT and OT systems, in particular from OT systems.

8.16.2. Assessment type and documentation

Assessment type

Expenditure within the next determination period.

Documentation reviewed

An explanatory email was provided by WaterNSW along with a spreadsheet indicating how the costs are made up for each project.

Table 104 Documentation provided for WEM001

Document title	Reference
Cost Model - Operational Systems Program.xlsx	
Email subject 'FW: information request arising from 10 October capex meeting' send by WaterNSW Monday, 17 October 2016 1:50 PM	

8.16.3. Project need

The expenditure driver is categorised by WaterNSW as Augmenting.

WaterNSW has outlined the need for the project as follows:

- The aim of this bundle of expenditure is primarily to deliver an efficient cost effective solution for the hydrometric data collected by the operational technology systems and ensure the data quality and availability from the meter collection to the presentation to and billing of customers.
- Post-merger WaterNSW is the single point of contact for customers who rely on us for the water delivered and information WaterNSW collects and makes available to them. Feedback received directly from the customers through customer service committees and other channels indicated the importance of information provision.
- This program will reduce the inefficiencies, double handling and checking required to improve the WaterNSW employees efficiencies and reduce the licencing impacts of duplicate systems. The full impact and cost savings will be identified in the business case.
- Recent issues with the data being unable to be available for the emergency services and customers during the recent flood events in NSW have further highlighted the need to resolve the issues with the current operational systems environment.

This resulted in a series of projects collectively described as the Operational Systems Program with significant investment proposed:

- WP007 - CAIRO and Hunter Water Salinity Trading Scheme Replacement
- WP011 - New Water Quality/Quantity Management System
- WP012 - New WaterNSW Dam Safety Monitoring System
- WP033 - Implement Metering Operations Roadmap
- WP050 - New WaterNSW Hydstra
- WP054 - Metering Ops Strategy
- WP056 - Migrate onto Single Instance WaterNSW Mike Customised
- WP074 - Water Operations/Hydrometric Strategy
- WP078 - Water Systems Program Architecture and Planning

8.16.4. Options investigated

At this stage no options have been investigated with a high level budgeting process only having taken place to date.

8.16.5. Procurement

No firm plans have been made for delivery of this expenditure yet.

8.16.6. Costs and delivery

No options have been investigated with a high level budgeting process only having taken place to date, though significant expenditure is forecast for FY17. Delivery differs from year to year, with a smaller level of expenditure in FY18 before major construction or implementation work would occur.

WaterNSW has split the program into different phases following their project lifecycle, which is now in the discovery and strategy phase with full needs analysis and preliminary business case to follow.

8.16.7. Assessment of prudence and efficiency

Prudence

While there is little in the way of documentation it appears that some work is likely justified across WaterNSW's business; however not enough information to determine the extent of capital works required or the priorities. The review team is therefore unable to make a definitive finding on the prudency of this expenditure.

Efficiency

If the works are procured via competitive tenders and undergo more refinement it is likely the capital expenditure will be efficient. However there is yet no evidence that the chosen solutions best meet the needs nor that any options were considered, or any cost-benefit analysis taking into account whole of life costs. A positive is that WaterNSW has planned for a ramp-up phase in FY18 prior to undertaking a higher level of expenditure, presumably construction/implementation in FY19.

8.16.8. Recommended expenditure

It is evident that WaterNSW has developed strategies and plans to achieve a better functioning system to support automation, remote operation, etc. This was reasonably well documented in documents relating to the Enterprise Architecture work and documented in previous pricing periods, e.g. the iSMART program. The work to date to develop this program is more of a budgeting exercise than a robust strategy identifying risks and undertaking proper risk analysis to determine if any unmet needs exist, ways of meting that need, and prioritising expenditure based on need and cost benefit analysis to ensure value for money.

WaterNSW's processes for capital expenditure which are yet to be enacted for any of this expenditure grouping should ensure these activities are carried out and a final, suitable works program is developed. The review team is unable to recommend all the proposed expenditure be included within the prudent and efficient expenditure for the next determination period. The review team recommends that three quarters (75%) of the proposed expenditure across this grouping of expenditure be included within the assessment.

Table 105 Rural Valleys wide project - Operational Systems Programme actual/forecast and recommended capital expenditure ($000s, $2016-17)

	FY15	FY16	FY17	Total
WaterNSW actual/forecast expenditure	-	-	1,245	1,245
Recommended expenditure	-	-	1,245	1,245
Adjustment	-	-	-	-
Adjustment (%)	0%	0%	0%	0%

Source: All data sourced from 'SIR Capex 2' of 'WaterNSW Information request - 2017 Determination.xlsx' MS Excel file provided by WaterNSW on 30 September 2016.

Table 106 Rural Valleys wide project - Operational Systems Programme proposed and recommended capital expenditure ($000s, $2016-17)

	FY18	FY19	FY20	FY21	Total
WaterNSW proposed expenditure	1,048	4,798	167	166	6,179
Recommended expenditure	786	3,599	125	124	4,634
Adjustment	(262)	(1,200)	(42)	(41)	(1,545)
Adjustment (%)	-25%	-25%	-25%	-25%	-25%

Source: All data sourced from 'Sheet 1' of 'Project list - draft selection.xlsx' MS Excel file provided by WaterNSW September 2016.

Table 107 Other Operational Technology/SCADA proposed and recommended capital expenditure ($000s, $2016/17)

	FY18	FY19	FY20	FY21	Total
WaterNSW Proposed					
Hunter- Glenbawn Dam - Water Treatment System SCADA Integration					155
Namoi- Water Supply SCADA Integration (Keepit, Split Rock)					104
Operational Support Systems Functionality review					62
Operational Systems Programme	1,048	4,798	167	166	6,179
SCADA Holding	579	826	167	-	1,573
TOTAL	1,689	5,624	439	321	8,073
Recommended					
Hunter- Glenbawn Dam - Water Treatment System SCADA Integration					117
Namoi- Water Supply SCADA Integration (Keepit, Split Rock)					78
Operational Support Systems Functionality review					47
Operational Systems Programme (this project)	786	3,599	125	124	4,634
SCADA Holding	434	620	125	-	1,179
TOTAL	**1,267**	**4,218**	**329**	**241**	**6,055**
Adjustment	(422)	(1,406)	(110)	(80)	(2,018)
Adjustment (%)	-25.0%	-25.0%	-25.0%	-25.0%	-25.0%

Source: All data sourced from 'Sheet 1' of 'Project list - draft selection.xlsx' MS Excel file provided by WaterNSW September 2016.

Note: Some content redacted at the request of WaterNSW.

8.17. Rural Valleys wide project - Renewal & Replacement Asset Engineering

8.17.1. Project description

WaterNSW has made an allowance for Strategic Engineering staff time and some software costs to be allocated to capital expenditure, in order to be an 'informed client'. The new structure of WaterNSW has resulted in project managers having a narrower, specialised function than previously, and are no longer expected to undertake engineering functions themselves but utilise this internal resource when required.

8.17.2. Assessment type and documentation

Assessment type

Expenditure within the next determination period.

Documentation reviewed

During the interviews it was explained what the expenditure was intended for and generally how it was calculated though no documentation was provided.

Table 108 Documentation provided for WEM001

Document title	Reference
Nil	

8.17.3. Project need

The expenditure driver is categorised by WaterNSW as Augmenting.

Once a project has been defined past a certain point by the Strategic Engineering group it passes to the Asset Development group, who will engage internal or external resources to undertake and further design or documentation then resources to construct or implement the works. Strategic Engineering will typically remain involved as a key internal stakeholder. The expenditure under this capex item is to provide technical support to project managers when required, with any time expended to be charged to the relevant project budget.

8.17.4. Options investigated

When developing the current structure WaterNSW determined having a small in-house engineering capability was necessary, along with external engineering resources being engaged on a case by case basis.

8.17.5. Procurement

Not applicable for this item, which is for internal expenditure allocated to capital expenditure.

8.17.6. Costs and delivery

WaterNSW developed the cost estimates based on an assumed number of staff at certain cost rates and known costs of software. The forecast expenditure is steady from year to year.

8.17.7. Assessment of prudence and efficiency

Prudence

The prudency of this expenditure relies directly on the other items of proposed expenditure proposed by WaterNSW, mainly in the renewals area under the 'maintaining capability' category.

Efficiency

While WaterNSW has advised there is no 'double-counting' with this expenditure and other expenditure items no evidence was provided. It also advised that on a project/program accounting basis any time expended will be allocated directly to the relevant project/program. The review team considers that the forecast expenditures must include these costs, otherwise they would not be efficient. We conclude that the inclusion of a separate cost in the capital program for Renewal & Replacement Asset Engineering is not efficient.

8.17.8. Recommended expenditure

No expenditure is recommended for this item in the absence of evidence there is not double counting over what is already included within other 'Maintaining Capability' items.

Table 109 Rural Valleys wide project - Renewal & Replacement Asset Engineering proposed and recommended capital expenditure ($000s, $2016-17)

	FY18	FY19	FY20	FY21	Total
WaterNSW proposed expenditure	443	445	447	444	**1,780**
Recommended expenditure	-	-	-	-	-
Adjustment	(443)	(445)	(447)	(444)	(1,780)
Adjustment (%)	-100%	-100%	-100%	-100%	-100%

Source: All data sourced from 'Sheet 1' of 'Project list - draft selection.xlsx' MS Excel file provided by WaterNSW September 2016.

8.18. Rural Valleys wide project – Motor vehicle replacement

8.18.1. Project description

WaterNSW has made an allowance with the capital expenditure program for replacement of motor vehicles as part of a regular fleet turnover. WaterNSW maintains a motor vehicle fleet for the Rural operating licence 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 determination period to replace vehicles once they are a certain age, travel a certain distance or for one-off reasons. Vehicles are changed over on a like for like basis with the older vehicle used as a trade-in.

8.18.2. Assessment type and documentation

Assessment type

A high level review of expenditure within the next determination period.

Documentation reviewed

No documentation was sought for this high level review.

Table 110 Documentation provided for WEM001

Document title	Reference
Nil	

8.18.3. Project need

The expenditure driver is categorised by WaterNSW as Maintaining.

Like any business WaterNSW requires motor vehicles to carry out its functions and has policies on replacement of motor vehicles. With a significant operational footprint WaterNSW has a requirement for a fleet of motor vehicles for use by front-line operational staff and office-based staff.

8.18.4. 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. This appears appropriate but was not investigated in detail with this being a high-level review only.

8.18.5. Procurement

This was not investigated in detail with this being a high-level review only.

8.18.6. Costs and delivery

WaterNSW has proposed average expenditure of $1.69 million per annum in the next determination period, which is an increase compared to the average expenditure of approximately $1.1 million in the current determination period.

8.18.7. 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 evident; provision of fit for purpose motor vehicles is necessary for WaterNSW operations including field based operations staff.

Efficiency

The expenditure undertaken in the past is considered to be efficient. Future expenditure would likely also be efficient if carried out in accordance with WaterNSW's motor vehicle replacement policy. A concern of the review team was that the expenditure is forecast to increase beyond historical levels. The increase is however considered immaterial in the scheme of the overall program and no changes are recommended.

8.18.8. Recommended expenditure

No changes are recommended.

Table 111 Corporate wide project – Motor vehicles actual/forecast and recommended capital expenditure ($000s, $2016-17)

	FY13	FY14	FY15	FY16	FY17	Total	FY13-FY17 average
WaterNSW actual/forecast expenditure	1,169	866	1,114	1,266	1,331	5,746	1,149
Recommended expenditure	1,169	866	1,114	1,266	1,331	5,746	
Adjustment	-	-	-	-	-	-	
Adjustment (%)	0%	0%	0%	0%	0%	0%	

Source: All data sourced from 'SIR Capex 2' of 'WaterNSW Information request - 2017 Determination.xlsx' MS Excel file provided by WaterNSW on 30 September 2016.

Table 112 Corporate wide project – Motor vehicles proposed and recommended capital expenditure ($000s, $2016-17)

	FY18	FY19	FY20	FY21	Total
WaterNSW proposed expenditure	1,758	1,583	1,808	1,610	6,760
Recommended expenditure	1,758	1,583	1,808	1,610	6,760
Adjustment	-	-	-	-	-
Adjustment (%)	0%	0%	0%	0%	0%

Source: All data sourced from 'Sheet 1' of 'Project list - draft selection.xlsx' MS Excel file provided by WaterNSW September 2016.

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