Detailed paper E – Services and expenditures by activity

Submission to IPART for prices from 1 July 2021 for water management services provided by the Department of Planning, Industry and Environment-Water and the Natural Resources Access Regulator on behalf of the Water Administration Ministerial Corporation

June 2020

Published by NSW Department of Planning, Industry and Environment

dpie.nsw.gov.au

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First published: June 2020

Department reference number: PUB20/523

More information

Department of Planning, Industry and Environment—Water, and the Natural Resources Access Regulator

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Detailed Paper E – Services and expenditures by activity

This Detailed Paper provides the detail of our proposed expenditures for the 2021 regulatory period by water management activity, set out by WAMC activity code.

These expenditures, summed and added to MDBA and BRC expenditures, are our proposed Notional Revenue Requirement (NRR.)

We cost, forecast, record and report on our services to 16 water management activities[1] across 7 activity groups. As most of these activities are performed on a state-wide basis, costs are initially forecast for the whole state and then allocated to pricing water sources (a combination of water type and location) using a primary cost driver for each water management activity.

WaterNSW undertakes a number of water management activities and will make its own separate submission regarding WAMC prices.

A full list of WAMC activity codes, with the responsible delivery agency, is set out in the following table.

Table 1. Water management activities by WAMC activity code and responsible agencies

Activity groups	Activities by code	Activity description	Undertaken by
W01 Surface Water Monitoring	W01-01 Surface water quantity monitoring	The provision of a surface water quantity monitoring system; including design, station calibration, data collection, processing, encoding, quality assurance and archiving from the netwoResolvedrks of water monitoring stations; the delivery of near real time height and/or flow data from all telemetered sites to the corporate database; and the maintenance and operation of surface water monitoring stations.	WaterNSW
	W01-02 Surface water data management and reporting	The data management and reporting of surface water quantity, quality and biological information; including compilation, secure storage, management and publishing of data to customers, stakeholders and the general public	WaterNSW
	W01-03 Surface water quality monitoring	The provision of a surface water quality monitoring program; including design, sample collection, laboratory testing and analysis, test result quality assurance to accepted standards, and test result encoding to make it available for data management and reporting.	WaterNSW

[1] Each of DPIE Water, NRAR and WaterNSW carry out water management activities under Chapter 3 of the *Water Management Act 2000* and in relation to the services listed under the *Independent Pricing and Regulatory Tribunal (Water Services) Order 2004*. We call these water management activities throughout this submission.

Activity groups	Activities by code	Activity description	Undertaken by
	W01-04 Surface water algal monitoring	The provision of a surface water algal monitoring program; including design, sample collection, laboratory analysis, algal identification and enumeration to accepted standards, and result encoding for provision to regional coordinating committees.	WaterNSW
	W01-05 Surface water ecological condition monitoring	The provision of a surface water ecological condition monitoring system to assess the health of water sources; including design and application based on the River Condition Index for rivers, flood plains and wetlands.	DPIE Water
W02 Groundwater Monitoring	W02-01 Groundwater quantity monitoring	The provision of a groundwater level, pressure and flow monitoring system; including design, site calibration, data collection, entry, audit, quality assurance, archiving, and information provision; and the maintenance and operation of groundwater monitoring bores.	WaterNSW
	W02-02 Groundwater quality monitoring	The provision of validated groundwater quality monitoring program including design, sample collection, laboratory testing and analysis, test result quality assurance to accepted standards, and test result encoding to make it available for data management and reporting.	WaterNSW
	W02-03 Groundwater data management and reporting	The data management and reporting of groundwater quantity and quality information; including compilation, secure storage, management and publishing of data to customers, stakeholders and the general public.	WaterNSW
W03 Water take monitoring	W03-01 Water take data collection	The electronic and manual collection, transmission and initial recording of water take data from licence holders for unregulated and groundwater sources; and the operation and maintenance of government owned meter and telemetry facilities.	WaterNSW
	W03-02 Water take data management and reporting	The data management and reporting of water take for unregulated and groundwater sources including compilation, secure storage, management and publishing of data to authorised parties.	WaterNSW
W04 Water modelling impact assessment	W04-01 Surface water modelling	The development, upgrade and application of surface water resource management models, for use in water planning and to assess performance in terms of statutory requirements, interstate agreements, regional water supply optimisation and third party impacts on NSW stakeholders.	DPIE Water

Activity groups	Activities by code	Activity description	Undertaken by
	W04-02 Groundwater modelling	The development and upgrade and use of groundwater resource water sharing and management applications, and for resource impact and balance assessments.	DPIE Water
	W04-03 Water resource accounting	The development and update of water resource accounts and information on NSW water sources, for use by external stakeholders, and for internal water planning, management and evaluation processes.	DPIE Water
W05 Water management implementation	W05-01 Systems operation and water availability management (reform implementation)	The preparation and implementation of the procedures and systems required to deliver the provisions of water management plans; and operational oversight to ensure plan compliance, the available water determinations and the assessment of compliance with long term extraction limits.	DPIE Water
	W05-02 Blue-green algae management	The provision of an algal risk management system; including oversight, coordination and training, the issue of algal alerts and the development of algal risk management plans.	WaterNSW
	W05-03 Environmental water management	The development and collaborative governance of environmental flow strategies and assessments; and the use of environmental water to achieve environmental outcomes.	DPIE Water
	W05-04 Water plan performance assessment and evaluation	The assessment, audit and evaluation of the water management plans' appropriateness, efficiency and effectiveness in achieving economic, social and environmental objectives.	DPIE Water
W06 Water management planning	W06-01 Water plan development (coastal)	The development, review, amendment, and extension or replacement of water management plans, and the consultation activities associated with developing these plans for the coastal water sources.	DPIE Water
	W06-02 Water plan development (inland)	The development, review, amendment, and extension or replacement of water management plans; the development of additional planning instruments to comply with the Commonwealth Water Act; and the consultation activities associated with developing these plans for the inland water sources	DPIE Water
	W06-03 Floodplain management plan development	The development, review, amendment and extension or replacement of Floodplain Management Plans in collaboration with OEH, now DPIE Environment Energy and Science	DPIE Water

Activity groups	Activities by code	Activity description	Undertaken by
	W06-04 Drainage plan development	The development, review, amendment, and extension or replacement of Drainage Management Plans, to address water quality problems associated with drainage systems.	DPIE Water
	W06-05 Regional planning and management strategies (RWS)	The development, evaluation and review of regional water strategies, metropolitan water plans and other planning instruments, including the associated stakeholder engagement.	DPIE Water
	W06-06 Development of water planning and regulatory framework	The development of the operational and regulatory requirements and rules for water access.	DPIE Water
	W06-07 Cross border and national commitments	The development of interstate water sharing arrangements and the implementation of operational programs to meet national and interstate commitments.	DPIE Water
W07 Water management works	W07-01 Water management works	The undertaking of water management works to reduce the impacts arising from water use or remediate water courses	DPIE Water
W08 Water regulation management	W08-01 Regulation systems management	The management, operation, development and maintenance of the register for access licences, approvals, trading and environmental water.	WaterNSW
	W08-02 Consents management and licence conversion	The transcribing of water sharing provisions into licence conditions and the conversion of licences to the Water Management Act.	WaterNSW
	W08-03 Compliance management	The on-ground and remote monitoring activities (including investigations and taking statutory actions) to ensure compliance with legislation, including licence and approval conditions.	NRAR
	W08-99 Compliance management	The administrative overhead costs associated with water consent transactions, which are passed on to customers in the water management tariff.	Mostly WaterNSW some by NRAR and DPIE^

Activity groups	Activities by code	Activity description	Undertaken by
W09 Water consents transactions	W09-01 Water consents transactions	Transactions undertaken on a fee for service basis; including dealings, assessments, changes to conditions and new applications for water licences and approvals.	Mostly WaterNSW, some by NRAR^
W10 Business and customer services	W10-01 Customer management	All customer liaison activities; including responding to calls to licensing and compliance information lines; and producing communication and education materials such as website content and participation in customer forums.	Mostly WaterNSW, some by NRAR^
	W10-02 Business governance and support	The business systems and processes that support organisation-wide activities; including asset management, annual reporting and pricing submissions to IPART.	All
	W10-03 Billing management	The management of billing requirements and subcontracted billing, revenue collection and debtor management service delivery, and responding to queries on billing activities.	WaterNSW

^Further information about which of the three entities – DPIE Water, WaterNSW and NRAR - is responsible for each water management activity is set out in Detailed Paper C that forms part of this submission.

W01 Surface Water Monitoring

For surface and groundwater quantity and quality monitoring and reporting WaterNSW undertakes water management activities in accordance with requirements set by DPIE Water. [2] Throughout the 2016 regulatory period these requirements have been set out in the 2016 Deed of Business Transfer and associated Service Provision Deeds.[3] We have prepared draft protocols and service schedules to specify the location and frequency of monitoring activities to ensure a prudent level of monitoring and reporting is undertaken. The current water reform program has highlighted the urgency for formalising these arrangements and we have designed a roadmap to ensure timely resolution of the service level agreements. In the interim we have extended the Deed of Business Transfer for one year.

The location and frequency of monitoring and reporting of surface water activities is designed to ensure that all three agencies – WaterNSW, NRAR and DPIE Water - have the data available to fulfil our statutory obligations and meet cross border agreements, such as the Border Rivers Commission Agreement[4] and the Murray Darling Basin Agreement[5].

[2] Water management activities undertaken under WAMC activity codes W01-01, W01-02 and W01-03 transferred to WaterNSW as part of the 2016 water transformation project. Further information on these activities is set out in Detailed Paper K and further information on the water transformation project is set out in Detailed Paper C; both Detailed Papers form part of this submission.
[3] Deed of Business Transfer 2016 between the (then) Department of Industry, Skills and Regional Development and WaterNSW.
[4] New South Wales – Queensland Border Rivers Intergovernmental Agreement 2008
[5] Intergovernmental Agreement on Implementing Water Reform in the Murray-Darling Basin June 2013

The service schedules contain routine monitoring and reporting requirements and the procedures in place to request additional non-routine monitoring and reporting in prescribed situations.

In addition, we require the monitoring to comply with appropriate Australian and New Zealand Guidelines and Standards and for the reporting to be subject to strict Quality Assurance processes to ensure the accuracy of the data used for modelling and decision making purposes.

To reflect the requirements of these schedules and standards, WaterNSW's submission includes its calculation of the efficient level of expenditure (capital and operating) to meet these requirements. The resulting Notional Revenue Requirement for monitoring services is included in the tables throughout this document.

W01-05 Surface water ecological condition monitoring

This activity is undertaken by DPIE Water and comprises provision of a surface water ecological condition monitoring system to assess the health of water sources, including design and application based on the river condition index (RCI) for rivers, floodplains and wetlands.

This activity is a critical part of our ability to make evidence-based decisions. Our proposal provides sufficient resources to further develop, populate and publicly share a group of essential reporting tools.

Through our customer engagement over the 2016 regulatory period we have heard that customers want monitoring they can trust, and that improved accountability for and transparency around water management decisions was a priority. The water quality and quantity monitoring we do in W01-05 provides robust data that we use to make well-informed decisions. We make the information and methodology we use publicly available. We propose some changes to improve what we do, to better meet these customer priorities.

We propose to maintain expenditures broadly in line with actuals across the past four years, spending a total of $1.2 million[6] in the 2021 regulatory period on this activity, as set out in Table 4.

In this activity, we produce, populate, refine and publish four vital pieces of information that:

- provide long-term reporting on river condition (the River Condition Index, or RCI)
- measure water quality of rivers (the Water Quality Index, or WaQI),
- store classifications of rivers based on geomorphic qualities (the River Styles database) and
- classify relative ecological values of river reaches (the High Ecological Value Aquatic Ecosystem, or HEVAE database.)

The primary input cost of delivery is the staff time to develop and deliver this information. The proposed expenditure includes an initial small increase to achieve specific expansions in service. The expansions are incorporation of water quality data into the RCI and preparing new information to be included in the coastal HEVAE work, and specific consideration of how surface water ecological condition monitoring data could be used in the review of the Barwon-Darling WSP.

Statutory basis for service

Under the *Water Management Act 2000:*

- section 7 requires the classification of water sources. The work undertaken in W01-05 is the primary information source to inform such classification. In particular, it requires water sources to be classified:

[6] All expenditures are expressed in $2020-21 and are described in the Administrative Information paper accompanying this paper.

    - as to the extent to which they are at risk (that is, the extent to which harm to the water source or its dependent ecosystems is likely to occur),
    - as to the extent to which they are subject to stress (that is, the extent to which harm to the water source or its dependent ecosystems has occurred or is occurring),
    - as to the extent of their conservation value (that is, the extent to which their intrinsic value merits protection from risk and stress),
- section 10 requires a five-yearly review to determine whether work undertaken pursuant to the Act has contributed to the principles set out in section 5 of the Act. The RCI provides a long-term overview of river condition, and how the resource is tracking in terms of meeting those principles,
- the water management principles in section 5 require protection or restoration of a range of aquatic ecosystems,
- section 35 requires management plans to set performance measures for assessing the extent to which a plan has met its objectives and consistency with its vison. Whilst this work is primarily undertaken in activity W05-04, the work undertaken in W01-05:
    - provides significant contextual information on other drivers of river health, where these may override any signal from improvements to changes in hydrology,
    - allows prioritisation of plan performance monitoring and review and plan strategy evaluation by informed risk assessment work that includes analysis of ecological value, through using high ecological value aquatic ecosystem (HEVAE) classifications and
    - allows transferability of plan performance monitoring by using stream classification and
- monitoring of river condition is established and maintained to satisfy section 372(1)(b), particularly to conduct research, collect information and develop technology in relation to water management. Without information on river condition it is difficult to undertake impact assessment.

Stakeholder views

We reviewed stakeholder feedback over the 2016 regulatory period and found that two of the four key themes identified were that customers want:

- monitoring they can trust, and that a 'robust, accurate and reliable water monitoring system is supported and expected by customers'[7] and
- improved accountability for water management systems, which it says means "having strong evidence for its decisions and ensuring that evidence is available to and able to be understood by its customers."[8].

We identified that future work to improve the trust customers place in monitoring depends on 'using best-available and most up-to-date technology to measure and monitor' and 'ensuring that monitoring data and systems are transparent'[9]. To achieve this improvement requires additional work in surface water ecological condition monitoring to enable this enhancement of accountability.[10]

Water quality and quantity monitoring tasks undertaken in W01-05, including making findings publicly available in an accessible format, are key elements in meeting these customer priorities.

[7] KJA, DPIE IPART Price Submission - Stakeholder Engagement, Plain English Summary and final report, 27 February 2020, page 9
[8] KJA, DPIE IPART Price Submission - Stakeholder Engagement, Plain English Summary and final report, 27 February 2020, p11
[9] KJA, DPIE IPART Price Submission - Stakeholder Engagement, Plain English Summary and final report, 27 February 2020, p4
[10] KJA, DPIE IPART Price Submission - Stakeholder Engagement, Plain English Summary and final report, 27 February 2020, p11

Our response to what stakeholders have told us is to propose improvements to how we measure and record water data and to the information we make available on our website.

Historic service 2016-17 to 2019-20 (4 years)

Service description and benefits

DPIE Water is responsible for assessing the rivers of New South Wales for risk, stress and conservation value, and identifying ongoing threats to riverine condition (s7 of the Water Management Act 2000). DPIE Water co-developed the River Styles product[11] to analyse rivers for risk, threat and value across New South Wales. One primary use of the geomorphic information produced by River Styles is in the River Condition Index. Another is the physical state of rivers for High Ecological Value Aquatic Ecosystems (HEVAE) assessment, used to decide high risk rivers for special rules in water sharing plans and reporting to the Commonwealth under the Australian National Aquatic Ecosystem (ANAE) framework.

River Styles is critical to decision making for large developments (State Significant Development and State Significant Infrastructure) and frames approvals and approval conditions to minimise environmental harm arising from large development projects. This includes interruption of geomorphic processes that are important for ecological processes, water quality and hydrological connection.

River condition index

Our river condition reporting tool, the RCI, follows the standard set by the National Framework for the Assessment of River and Wetland Health. The six components measured by the RCI are hydrology, geomorphology, riparian, biota, disturbance and water quality (though water quality is yet to be incorporated into the overall index).[12]

The RCI is used to provide long-term reporting on river condition, along with linking alteration to flow management to other natural resource management measures.

In many river systems, flow alteration is not the main influence on river health. The RCI allows the root causes of river condition decline to be identified and monitored. Without such data, there may be erroneous conclusions drawn that flow protection needs to be made more conservative when ecological improvements are not seen. Water users may be unnecessarily impacted by flow rules where issues such as geomorphic change, for example, may be the primary cause of river condition decline.

The RCI was set up so that reporting on river condition would be as efficient as possible, and largely relies on data collected from other sources. The only active data collection undertaken under W01-05 directly by PIE Water for the RCI is the collection and updating of the NSW River Styles database, which provides the geomorphic component of the RCI.

The RCI is updated during the term of each water sharing plan so that the data can be used as contextual information for monitoring, evaluation and reporting carried out under activity code W05-04. It is also used in risk assessments for water resource plans made under the Basin Plan.

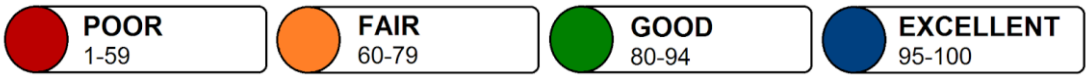
Water quality index

Our water quality index (WaQI) provides a measure of the water quality of rivers relative to appropriate water quality targets. It is a tool to communicate complex and technical water quality data in a simple and consistent way. It is created from water quality data collected by WaterNSW (under activity W01-03) under the water quality assessment and monitoring program.

The WaQI is a single score between 1 and100 as set out in the following figure.

[11] More information available at https://riverstyles.com/
[12] Further information available at https://www.industry.nsw.gov.au/water/science/surface-water/monitoring/river-health

Figure 1. NSW Water quality index scoring categories



A score can be calculated both for individual water quality parameters (salinity for irrigation, temperature and harmful algal blooms in recreational waters) and for an overall integrated score for water-dependent ecosystems (dissolved oxygen, turbidity, pH, total nitrogen and phosphorus).

The WaQI:

- is being considered for incorporation into future iterations of the RCI,
- is used for the water quality aspects of risk assessments prepared for Basin valleys and
- guides the development of water quality management plans in each Basin valley.

River Styles database

The NSW River Styles database was developed to store classifications of NSW rivers, as assessed using the River Styles framework. The framework classifies rivers based on geomorphic qualities that include river type, fragility, sensitivity to disturbance, condition, rarity and recovery potential.[13]

We update geomorphic condition and river recovery potential on a 10-year basis. It is updated in different parts of the state at different times, so the work is ongoing. This process includes satellite imagery interpretation, and field-validation.

In addition to providing the "geomorphic condition" layer of the RCI, River Styles information:

- forms a fundamental base layer used to develop the HEVAE classifications for rivers,
- is used as one of the primary base layers to develop models for fish community status, and threatened species distributions in NSW and
- is used in Controlled Activity Approval (CAA) assessments undertaken under the *Water Management Act 2000* and assist with compliance activity managed by NRAR.

High Ecological Value Aquatic Ecosystem classification

The national HEVAE framework is a "best practice" approach to identifying environmental assets. We have developed a classification system for the relative ecological value of river reaches based on this framework. It uses information collated for four of the five recommended HEVAE criteria that align well with the Basin Plan key environmental asset criteria. It is because of this strong alignment that the HEVAE framework replaced the previous instream value assessment.

The HEVAE classification is used as the ongoing tool to meet NSW requirements under section 7 (classification of water sources) of the *Water Management Act NSW (2000).* It forms a key part of the risk assessments that are used in the development and review of WSPs and WRPs.

The HEVAE framework is also used to identify high value groundwater dependent ecosystems (GDEs), which are used in groundwater WSPs.[14]

Service levels

The following table reports on the output measures and performance indicators specified in IPART's 2016 final report.

[13] Further information at https://www.industry.nsw.gov.au/water/science/surface-water/monitoring/river-health/river-styles
[14] Further information on HEVAE as it applies to surface water is at: https://www.industry.nsw.gov.au/water/science/surface-water/monitoring/river-health/ecological-value and information on HEVAE as it applies to GDEs is at: https://www.industry.nsw.gov.au/water/science/groundwater/ecosystems

Over the reporting period, there was a focus on developing and finalising HEVAE products and the WaQI as these have been extensively used in water planning. The output measure of an annual report on status of the RCI was not achieved, however we have updated the RCI itself.

Table 2. Output measures and performance indicators for the 2016 regulatory period W01-05

Progress	Output measures	Performance indicator
	RCI updated: *An updated report completed each year, outlining the attributes updated and the proportion of the state/water sources covered.*	*Percentage of the state for which RCI is completed in current year:* *• 10% completed each year.* *• 100% of all RCI completed for the state by the end of 10 years.*
2016-17	No report completed River Styles updated for the Lower North Coast, Lachlan and Namoi valleys	River Styles updated for the Lower North Coast, Lachlan and Namoi valleys
2017-18	HEVAE technical report completed and peer-reviewed An analysis of hydrology condition completed for all Murray Darling Basin valleys.	The following updates were undertaken to cover 10% of the RCI: River Styles revisions were completed for part of the Gwydir Basin, and part of the Barwon River Styles geomorphic classifications across the entire State were updated to conform to the River Styles international naming convention so it could be published HEVAE mapping completed for all inland surface water valleys HEVAE completed for all inland groundwater WSP areas A WaQI was developed for sites in all Murray Darling Basin Valleys.
2018-19	Technical reports on water quality completed for inland WSP valleys, including new WaQI	Data from the water quality technical reports was used to develop inland (Basin) water quality management plans. The following updates were undertaken to cover 10% of the RCI: work commenced on updating River Styles for the Hawkesbury-Nepean valley work commenced on updating River Styles for the Sydney Metro region the NSW River Styles database was published
2019-20	Completed RCI incorporating the updated input layers from the previous five years completed and published on DPIE website. River Styles mapping products published on DPIE website, including River Style, geomorphic condition, recovery potential, and stream fragility	The following updates were undertaken to cover 10% of the RCI: revision and update of coastal HEVAE commenced and updated hydrology, and catchment disturbance index layers for NSW

River Condition Index

The RCI has now been applied to a total of 212,832 km of rivers across the state with 10% updated during 2019-20.[15]

[15] More information about the RCI is available at https://www.industry.nsw.gov.au/water/science/surface-water/monitoring/river-health/river-condition-index

River Water Quality Index

The WaQI was developed during the 2016 regulatory period and has now been calculated for all inland monitoring sites. Future work will involve incorporating this index into the RCI.

Water quality technical reports were prepared for each Basin valley.[16] Additionally, an assessment of the water quality targets in Schedule 11 of the Basin Plan was undertaken to ensure that the targets were meaningful and achievable for NSW. Some targets were found to be too conservative and did not appropriately reflect water quality conditions, as influenced by the underlying geology (for example). We published this assessment in 2015.[17]

River Styles database

Information on River Styles can be found on our website.[18] This location includes access to the NSW River Styles database, which was made available during the 2016 regulatory period. The entire NSW River Styles database has been revised to be consistent with the international naming convention for River Styles so it can be published.

River Styles was updated for the Namoi, Lachlan, Central Coast, Hunter, and lower North coast areas during the reporting period. Revisions to the Gwydir included removing duplicates and adding small section to Gil Gil Creek catchment. Barwon was not updated but separated to allow rarity and threat to be assessed for the relevant WRPs.

River Styles was used as one of the primary base layers to develop models for fish community status, and threatened species distributions in NSW.[19] This data was also used to assist in decision-making of water access and trading rules (as part of HEVAE), in conjunction with fish record data.

High Ecological Value Aquatic Ecosystem classification

HEVAE products were completed for 100% of inland surface and groundwater WSP areas. Additionally, 100% of coastal WSP areas were covered by a preliminary HEVAE map to support coastal water planning.

Current coastal HEVAE updates were undertaken according to the timeline for coastal WSP remakes. Bellinger-Coffs Harbour, Hunter and Central Coast, Sydney Metro area (including Hawkesbury-Nepean) and the Lower North Coast catchments were all completed by the end of April 2020.

The HEVAE classifications were incorporated in risk assessments used in Basin WSP development. Information on risk assessments form part of each WRP package.[20]

HEVAE classifications were also used to review water dealing rules in the Namoi valley. Recommendations were made to free up trade from high ecological value to lower ecological value areas, including an assessment of hydrological impacts on existing users.

Preliminary HEVAE outcomes for the coast were applied in the review of:

- water dealing rules in the Hunter unregulated WSP, with trade allowed from high ecological value to low ecological value areas,
- water trade rules in the Coffs Creek WSP,
- cease-to-pump rules in the Isis/Pages River water source in the Hunter unregulated WSP and
- cease-to-pump rules in the lower North Coast WSP.

[16] Available at https://www.industry.nsw.gov.au/water/science/surface-water/quality
[17] Available at: https://www.industry.nsw.gov.au/__data/assets/pdf_file/0019/151174/Murray-Darling-Basin-Water-Quality-Targets-2007-12.pdf
[18] Available at https://www.industry.nsw.gov.au/water/science/surface-water/monitoring/river-health/river-styles.
[19] See Department of Primary Industries Fisheries, 2016, Fish communities and threatened species distributions of NSW
[20] Available at https://www.industry.nsw.gov.au/water/science/surface-water/monitoring/water-planning

High-value GDEs identified using HEVAE classifications were incorporated into inland groundwater WSPs as a schedule in the plan, where rules providing a buffer between licensed water extraction and the GDEs are specified.

Forecast service 2020-21 to 2024-25 (5 years)

This covers the last year under the 2016 regulatory period and the four years of the 2021 regulatory period.

Service levels

Work to update the existing River Styles assessments and the RCI will continue for the period 2020-21 to 2024-25. This includes:

- annual work to update River Styles and the RCI throughout NSW valleys, on a rolling 10-year timeframe to inform evaluation and review of water plans and
- incorporating the WaQI into the RCI.

These efforts will be documented in technical reports and published on our website so they can be accessed by all. The primary goal will be to ensure that results from the annual updates of the RCI are included in WSP evaluation reports. This is because continuous updates of the RCI are used to track river health, which in turn is used to inform decision-making for WSP evaluation.

New work includes development, refinement and application of new HEVAE index products for surface water and for groundwater-dependent ecosystems on the coast.

Completion of this work will represent a significant achievement, whereby all valleys (both inland and coastal) and all water sources (both surface water and groundwater) will have been identified, mapped and incorporated into our overarching program for classifying ecological value.

Similar to the River Styles and RCI products, the method for developing the coastal HEVAE products and their proposed uses will be documented in technical reports and then published on our website.

The HEVAE work is an integral component to coastal water sharing planning because it drives the risk assessments for each valley. The results of the HEVAE are spatially explicit, depicting the ecological value of river reaches. This information is intersected with an assessment of hydrologic pressure in a risk assessment matrix which is then used to identify locations that are of high ecological value that are hydrologically stressed.

The resulting risk identification is a powerful tool that is critical to water sharing planning because it allows stakeholders and water planners to see where and how extraction patterns (and the WSP rules that drive them) are affecting the condition of surface water ecosystems.

Future work on the HEVAE index will include responding to the peer review suggestions for improvement and may include adding a measure of hydrologic stress (as part of activity W06-02).

The various year-to-year activities are scheduled to maximize their contribution to a number of our surface water planning and management programs such as WSP evaluation. That is, updates and work on refining and interpreting the various indices and spatial layers are timed with the due dates for Surface Water Plan evaluation and review.

The following table is a summary of the proposed future activities for surface water ecological condition monitoring.

Table 3. Output measures and performance indicators for the 2021 regulatory period W01-05

Output measures	Performance indicators
River Styles, WaQI and the RCI updated Target: • areas covering 50% of surface water WSPs over five years. • WaQI extended to coastal WSP areas. • WaQI incorporated into the RCI. River and groundwater HEVAE extended to cover coastal WSP areas.	River Styles, WaQI and RCI spatially updated in time for WSP evaluations. • Target: 100% completed on time River Styles, WaQI, RCI and HEVAE available on DPIE website. Technical reports for HEVAE and WaQI updates peer reviewed and published on DPIE website. • Target: 100% available on website

Operating expenditure

The primary input cost of delivery from 2016-17 to 2019-20 was staff time to develop and deliver the major components of W01-05, which were:

- aquatic ecologists to develop the approach for HEVAE, complete a HEVAE technical report, compile data, and work with spatial analysts to produce the geographical information systems (GIS) map layers,
- spatial analysts (GIS) to produce the required mapping products,
- fluvial geomorphologist to update the River Styles mapping,
- water quality experts to analyse water quality data, produce technical reports, and develop the WaQI and
- project management and oversight of the above activities.

We incurred some additional expenditure during 2016-17 to 2019-20 on a number of subject-matter experts commissioned to peer review the surface water HEVAE technical report and GDE report. Remaining operating expenditure was incurred on computers, software licences, field equipment and travel.

We spent slightly less in 2017-18 and 2018-19 than IPART used when determining WAMC prices in 2016, due to staff time staff associated with W01-05 being reallocated to Basin Plan activities. In those years we also did not deliver annual progress reports, and we did not deliver yearly analysis of the RCI in 2016-17, 2017-18, and 2018-19.

The prudent and efficient expenditures used by IPART in setting WAMC prices in 2016 provided for the ongoing base load work of maintaining, updating and reporting on the RCI, River Styles, HEVAE classifications and the WaQI. They provided for most data being obtained from either desktop analysis or from information collected by other programs, making it very cost effective.

The proposed expenditure for the 2021 regulatory period includes a small increase for the first three years to achieve specific expansions in service, for:

- incorporating water quality data into the RCI. This requires specialist water quality advice in re-working the RCI and testing to ensure the changes are robust and appropriate. This work then needs to be documented and published. It will also need to be incorporated into several indices for monitoring surface water condition that we currently use and
- preparing a new GDE layer to be included in the coastal HEVAE work, and specific consideration of how surface water ecological condition monitoring data could be used in the review of the Barwon-Darling WSP.

The GDE work is a new application of a tested method that was developed as part of recent inland surface water planning. Its use on the coast will contribute to significant improvements in the capacity to implement and evaluate WSPs in these valleys. Once established the data generated can be reviewed and up-dated in a similar manner to the River Styles work.

The work has also been designed to contribute to a number of other NSW routine reporting requirements (for example, NRAR compliance activities and State significant development approvals assessments).

All the work in the forecast service levels will support a more robust approach to WSP evaluation (in implementation).

We propose to spend a total of $1.2 million[21] in the 2021 regulatory period on this activity. Average annual actual expenditure in the current regulatory period is $0.3 million with forecast expenditure slightly higher as set out in the following table.

Table 4. Expenditure on surface water ecological condition monitoring W01-05 ($2020-21 $000)

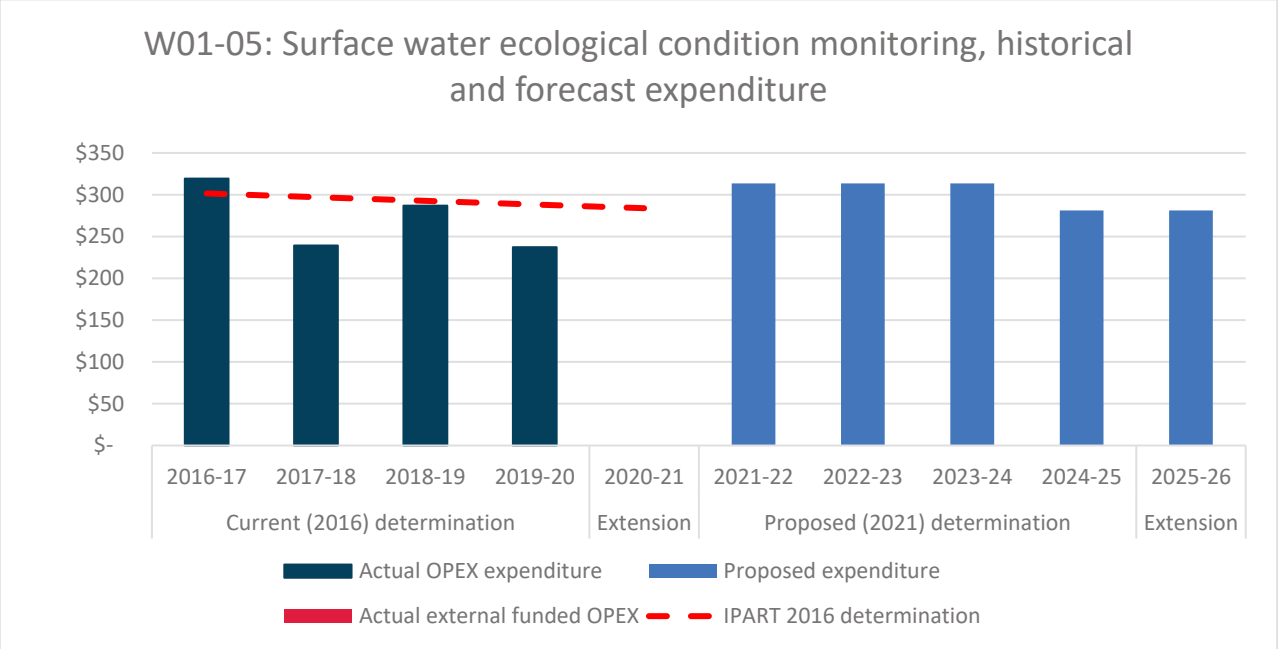
Cost	2016 regulatory period				Extension	2021 regulatory period				
	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
IPART'S 2016 final report	302	297	293	288	284					
Actual DPIE Water operating expenditure	319	239	287	237						
Actual externally funded operating expenditure	0	0	0	0						
Actual externally funded capital expenditure	0	0	0	0						
Proposed DPIE Water operating expenditure						314	314	314	281	281

Notes: IPART's 2020–21 figure has been provided by IPART; actual operating expenditure is net of externally funded operating expenditure; DPIE Water's 2019–20 actual costs are 12/10 x actual costs for the 10 months to April 2020 and NRAR's 2019-20 actual costs are 12/11 x actual costs to May 2020; 2020–21 actual costs are unknown; 2025–26 costs are provided as required by IPART; please also refer to the Administrative Information document that is part of this submission.

This information is also set out in the following graph.

[21] All expenditures are expressed in $2020-21 and are described in the Administrative Information paper accompanying this paper.

Figure 2. Expenditure on surface water ecological condition monitoring W01-05 ($2020-21 $000)



W02 Groundwater monitoring

For surface and groundwater quantity and quality monitoring and reporting, WaterNSW undertakes water management activities in accordance with requirements set by DPIE Water. [22] Throughout the 2016 regulatory period these requirements have been set out in the 2016 Deed of Business Transfer and associated Service Provision Deeds.[23] We have prepared draft protocols and service schedules to specify the location and frequency of monitoring activities to ensure a prudent level of monitoring and reporting is undertaken. The current water reform program has highlighted the urgency for formalising these arrangements and we have designed a roadmap to ensure timely resolution of the service level agreements. In the interim we have extended the Deed of Business Transfer for one year.All costs proposed in this group in the 2021 regulatory period are for activities undertaken by WaterNSW, and are covered in their separate submission to IPART for WAMC prices.

W03 Water take monitoring

All activities in this group have been undertaken by WaterNSW in the 2021 regulatory period and are covered in their separate submission to IPART for WAMC prices. They were transferred to WaterNSW as part of the 2016 water transformation project.[24]

[22] Water management activities undertaken under WAMC activity codes W01-01, W01-02 and W01-03 transferred to WaterNSW as part of the 2016 water transformation project. Further information on these activities is set out in Detailed Paper K and further information on the water transformation project is set out in Detailed Paper C; both Detailed Papers form part of this submission.

[23] Deed of Business Transfer 2016 between the (then) Department of Industry, Skills and Regional Development and WaterNSW.

[24] This applies to water management activities undertaken under WAMC activity codes W03-01 and W03-02. All costs for WAMC activity code W03-01 in the 2016 regulatory period were recorded by WaterNSW and information on service standards and costs will be set out in its separate submission for WAMC prices. Further information on activity code W03-02 is set out in Detailed Paper K and further information on the water transformation project is set out in Detailed Paper C; both Detailed Papers form part of this submission.

W04 Water modelling impact assessment

W04-01 Surface water modelling

This activity comprises development, upgrade and application of surface water resource management models for use in water planning and to assess performance in terms of statutory requirements, interstate agreements, regional water supply optimisation and third-party impacts on NSW stakeholders.

In the 2016 regulatory period we have developed and continue to maintain and use our computer-based models to simulate the behaviour of many river systems in NSW. Using our sophisticated models we can simulate river behaviours such as flow routing in tributaries, rivers, effluents, and channels, irrigation demand and water use, urban water supply and other consumptive uses, water quality and groundwater/surface water interaction.

In the 2021 regulatory period we will be increasing our sustainable diversion limit (SDL) compliance modelling, post commencement of the Water Resource Plans, which will include the newly created floodplain harvesting diversions. We will be implementing our floodplain harvesting monitoring strategy, and supplemented with satellite imagery of crop areas and data, models will need to be revised and reviewed where results change materially.

The internal quality assurance, and stringent review and update processes will instil confidence in our models and facilitate a greater level of model sharing to a wider range of authorised users. Our collaborative undertakings allow other users to develop their own insights into river system response to internal and external drivers. This is an important component of our commitment to stakeholders for greater transparency and accountability.

Stakeholders have asked for improved accountability for water management systems and information available to customers. Customers expect more reporting, more information and improved timeliness of information being provided.

We propose to spend a total of $14.2 million[25] in the 2021 regulatory period on this activity, an annual average of $3.6 million. The proposed annual average represents an increase of 37% from the $2.6 million we spent on average annually so far during the 2016 regulatory period and is 58% higher than the amount IPART used in determining WAMC prices in 2016, as set out in Table 7.

In this activity we develop, maintain and use computer-based models to simulate the behaviour of many river systems in NSW. We use these models to audit NSW compliance with the Murray-Darling Ministerial Council Cap and the future SDLs. We can also estimate the baseline salinity condition and salinity impacts of NSW rivers in the Murray-Darling Basin and understand the risk to outcomes from extended climate data sets, including projections of future change, and solutions to managing these risks. We also use the outcomes of our modelling to assess any proposals for new or modified water management infrastructure.

Statutory basis for service

Water Management Act 2000:

Chapter 2: Part 1, Part 3 Divisions 3, 8 for:

- Specification of scenarios modelled
- LTAAEL (Long Term Average Annual Extraction Limit)
- Water balance assessments and performance evaluation
- Stakeholder consultation

[25] All expenditures are expressed in $2020-21 and are described in the Administrative Information paper accompanying this paper.

- Explicit reference to WSP, and Cap model scenarios in statutory WSPs

Chapter 8, Part 2, Section 372(b) Functions of Ministerial Corporation.

Water Act 2007 (Commonwealth):

Murray Darling Basin Plan:

- Chapter 6 Water that can be taken
- Chapter 8 Environmental Watering Plan
- Schedule 1, Schedule B, Basin Salinity Management
- Chapter 9 Basin Plan, Water Quality and Salinity Management Plan.

NSW Floodplain Harvesting (FPH) Policy

- Input to policy development and implementation
- Specification and upgrade of models with detailed survey data from NRAR
- Extensive stakeholder consultation and review
- Determination of statutory limits and enabling entitlements and accounting

Regional Water Strategy Program

- 12 Regional Water Strategies
    - Climate risk data set development and implementation
    - Baseline definition and vulnerability assessment
    - Options formulation and assessment

Stakeholder views

We reviewed stakeholder feedback over the 2016 regulatory period and found that of the four key themes identified were that customers want:

- improved accountability for water management systems, which means "having strong evidence for its decisions and ensuring that evidence is available to and able to be understood by its customers."[26] and
- improved information available to customers. Customers want more information about water management, which is accurate and easy to access.[27]

The feedback received shows that customers expect a higher level of service from activities such as this one, and lists some specific work that could be undertaken to do so, including better connectivity in planning, more public reporting, more information provided and improved timeliness of information being provided. We identified that future work to improve accountability would be to publish our evidence and update water users on the results of programs and policies.

Historic service 2016-17 to 2019-20 (4 years)

Service description and benefits

We have developed and continue to maintain and use computer-based models to simulate the behaviour of many river systems in NSW. The models use either the Integrated Quantity and Quality Model (IQQM) software, or eWater's Source software. They simulate the major hydrological processes in a river system including:

[26] KJA, DPIE IPART Price Submission - Stakeholder Engagement, Plain English Summary and final report, 27 February 2020, page 11
[27] KJA, DPIE IPART Price Submission - Stakeholder Engagement, Plain English Summary and final report, 27 February 2020, page 11

- flow routing in tributaries, rivers, effluents, and channels,
- reservoir and other infrastructure operations,
- resource assessment processes,
- irrigation demand and water use,
- urban water supply and other consumptive uses,
- wetland and environmental flow requirements,
- water use accounting systems,
- water quality and
- groundwater/surface water interaction.

The models are calibrated to match reservoir levels, diversions and flows over historic calibration periods. They aim to simulate the average long-term behaviour of the river system for planning purposes and not specifically to reproduce individual daily flow behaviour in any particular year, or to forecast a particular future year. We routinely update these models using more recent data, and also periodically upgrade them. We are automating components of the modelling to improve efficiency.

The models are the primary approach we use in water planning to assess the impacts of different management strategies and rules on all water users, including the river environment. By running a series of scenarios with different strategies and rules to understand the impacts over short and long periods, we can identify the optimum solutions. We also use them for:

- auditing NSW compliance with the Murray-Darling Ministerial Council Cap, and the future SDLs,
- estimating the baseline salinity condition and salinity impacts of NSW rivers in the Murray-Darling Basin for Basin Salinity Management,
- understanding risk to outcomes from extended climate data sets, including projections of future change, and solutions to managing these risks,
- assessing any proposals for new or modified water management infrastructure and
- strategic and operational hydrologic matters.

The care and rigour we take in developing and applying our models, as well as the statutory basis of these models, means that these are the preferred models of these river systems by users outside of DPIE Water. One of our objectives in our modelling is to improve our decision-making transparency and accountability, by making these more accessible through formal review processes and collaborative model sharing. This cooperative way of working between DPIE Water and WaterNSW produces better quality models and creates financial efficiencies and development opportunities for staff, resulting in improved capabilities. Models can also be shared with external stakeholders, providing broader industry benefits.

Service levels

The following table is a report against the output measures and performance indicators set out in IPART's 2016 final report by year. We met or exceeded our targets in all but one year of the 2016 regulatory period.

Table 5. Output measures and performance indicators for the 2016 regulatory period for W04-01

Progress	Output measures	Performance indicator
	Number of models/analyses annually Target: 26/2,800	The percentage of surface water share component in NSW covered by models subject to annual assessments: Target: 95% (Regulated river: 100%, Unregulated river: 50%)

Progress	Output measures	Performance indicator
2016-17	26/3000+	100% of regulated rivers 50% unregulated river coverage
2017-18	26/2800	95% of regulated rivers 50% unregulated river coverage
2018-19	26/3000+	100% of regulated rivers 50% unregulated river coverage
2019-20	26/3000+	100% of regulated rivers 70% unregulated river coverage

We maintained and improved 26 river system models during the regulatory period - 12 system models in the Murray Darling Basin and 14 on the coast.

We used the models to support water planning under the *Water Management Act 2000*, as well as for NSW compliance assessment under the MDB Cap on diversions. We have continued to undertake diversion limit compliance in the MDB using our accredited models. We use Annual Cap Compliance runs to compare actual and modelled diversions, and to ensure that NSW is complying with the MDBMC Cap on Diversions policy. In addition, there were a number of requirements for the Basin Plan that necessitated our further development and application of these models.

Water Sharing Plan (WSP) development for Basin Plan Water Resource Plan (WRP) work required significant work by us in upgrading models to improve the baseline scenarios, including a better estimate of Baseline Diversion Limits, improved conformance with current operation to WSP rules, and updating development levels to have a more contemporary scenario for basing SDL scenario runs. This work was critical in testing scenarios in a rigorous and transparent way that allowed our stakeholders to understand and debate trade-offs, and to ultimately demonstrate compliance with WRP requirements.

We prepared a number of scenarios for several cycles of Stakeholder Advisory Panel consultation rule testing and development, including reporting, presenting and testing. Notable issues modelled that have been the subject of significant attention including testing Supplementary Access sharing in the Namoi Regulated River, and translucent flows in the Macquarie Regulated River. We also made an extended effort in modelling access arrangements including daily extraction limits in the Barwon Darling.

As well as this ongoing core business, which required significant efforts in model upgrades and water sharing plan options assessment, we undertook major model development and application work in Floodplain Harvesting, Sustainable Diversion Limit Adjustment Mechanism, model rebuild in Source platform, long term environmental watering, Water Renewal Taskforce, and Regional Water Strategies.

We are implementing the licensing of floodplain harvesting water take, partially under a Commonwealth funded project, with significant co-investment from NSW. The NSW component of expenditure is funded through WAMC prices using a 100% government share, reflecting the impactor-pays principle. While this form of water take has been implicitly included in NSW models to date, this project is formalising and codifying floodplain harvesting within the water entitlements framework. This has required a far greater level of detail in representing landholders individually, rather than grouping them together, and an extra level of attention to how landholders access overland flow and rainfall runoff harvesting that was not previously in the entitlement framework. This project required a major investment in data collection and verification, method development, model building, stakeholder consultation, and reporting. This work is essential to implement the NSW Floodplain Harvesting Policy by ensuring that the entitlements we estimate allow protection of downstream flows and users by meeting Cap and Plan Limit requirements, and that the entitlements reflect existing water usage levels.

To meet the needs outlined above, and to improve model detail and meet new functional requirements, we are undertaking a project to establish a contemporary and enduring software platform based on the Source modelling framework. This framework is COAG endorsed and being increasingly used by most Australian jurisdictions and the hydrological modelling community at large as a National Hydrologic Modelling Platform, with national benefits. Our water models are being progressively rebuilt using the Source software.

We are using this transition as an opportunity to build better, more accurate models with enhanced capability, consistent with better practice guidelines being concurrently developed. Source-based models:

- have been completed for the Border Rivers and Belubula River systems
- are at an advanced stage for Namoi River, Peel River, Murrumbidgee River, and Barwon Darling River and
- are partially complete for the remaining inland valleys.

We are also building new models for several coastal catchments, including a proposal to rebuild models for the Upper Hunter River, the Lower Hunter River, and extend and upgrade the model of the Hawkesbury-Nepean River catchment.

The full implementation of the model rebuild in the Source platform will provide more accurate and capable models that will allow us to meet increasing demands for water management information for the next generation, and provide for a larger pool of modellers working on a common software platform, and improve collaboration. A key element of the Source modelling environment is the application of model implementation guidelines to enable efficient, consistent and fit-for-purpose development of models. This will ensure that models are adequate and able to address the issues and questions as required. Given the scope of these models has increased with the Basin Plan and other work programs, improved efficiency in modelling approaches and development of automated workflows is necessary to offset potential cost and resourcing increases.

We have also done significant modelling work to support NSW's Regional Water Strategies. Work undertaken for the Greater Hunter involved a significant upgrade of the Upper Hunter and Lower Hunter models, integrating these models, developing stochastic climate data sets, and configuring and analysing a suite of options separately and in combination, leading to a strategy that when implemented will most cost effectively improve water security for economically important sectors.

Similar work is underway for remaining regions in NSW; at an advanced stage in Macquarie, Gwydir, Lachlan, Border Rivers, Bega and Richmond catchments, and at a planning or early stage for the remaining inland and coastal regions, with a view for completing most of the first phase of this work within the 2020 calendar year. The program has included a substantial effort in developing enhanced climate data sets that allow us to better assess climate risk and resilience of outcomes. This has included an extended stochastic data set enhanced using paleo-climatological information, considered along with results from climate modelling. This approach will form the basis for us to provide informed input to the 2026 Basin Plan review.

Apart from the major program areas described above, a number of ancillary modelling analyses have been undertaken using our models, including developing Long Term Diversion Limit Equivalent factors for MDB catchments used to determine entitlements buybacks needed to meet Basin Plan SDLs; northern basin connectivity analysis for the Water Renewal Taskforce; inflow severity analysis for drought contextual information; pre-development flow runs for determining diversion impacts to current low flows, etc.

Forecast service 2020-21 to 2024-25 (5 years)

This covers the last year under the 2016 regulatory period and the four years of the 2021 regulatory period.

In accordance with our four-year sustainable modelling plan, there will be some changes to our workload. Commencement of WRPs should occur within the 2016 regulatory period so 2021 may be the last year in which we need to model for MDBC Cap. We will also need to model SDL compliance post commencement of the WRP, which will include the newly created floodplain harvesting diversions. The SDL compliance framework will require our closer attention to keeping MDB models' development and management conditions up to date in order to monitor changes in long term diversions. Of particular relevance is the floodplain harvesting estimation which was completed with a paucity of actual floodplain harvesting diversion data. As data becomes available through the floodplain harvesting monitoring strategy and is supplemented with satellite imagery of crop areas and data, models will need to be revised and reviewed where results change materially. As groundwater models are upgraded, the surface - groundwater linkages will also be factored in where material to water management outcomes in surface water systems.

We will need to take the new models we are building the Source framework through a process to gain stakeholder acceptance, including by MDBA as the best available estimate of SDL and for undertaking annual SDL compliance. This process of acceptance will include internal review and documentation, stakeholder engagement, and independent review.

The internal quality assurance, and stringent review and update processes planned for the models are a necessary step to consolidate these models as the point of truth for water availability and demand in NSW river systems. The confidence established through this will facilitate a greater level of model sharing to a wider range of authorised users to develop their own insights into river system response to internal and external drivers. This includes collaborative proposals currently under discussion, particularly with regards to linking MDB models for connectivity and strategic analysis. This is an important component of our commitment to stakeholders for greater transparency and accountability.

Our work under the Regional Water Strategies will continue as options are refined and tested. The work program for this will include further development of the climate risk data sets in response to recommendations by the Chief Scientist's Independent Expert Panel review of the method.

Basin Plan and general WRP and WSP compliance will also extend to unregulated catchments in NSW. Compliance with diversion limits has been simply based on historical information, however, this information needs to be updated with methods employing remote sensing and analysis of data from recently installed metering. Compliance methods will also need to be developed and implemented for other Basin Plan SDL components, farm dams and plantations.

As these models will be replacing the existing IQQMs, the salt transport work undertaken in 2002-04 under program funding needs to be rebuilt in Source using new data and methods. Upgrading these will be using resources funded by Basin Salinity Management 2030 strategy activity.

Service levels

The following table sets out our proposed output measures and performance indicators for the regulatory period commencing in 2021.

Table 6. Output measures and performance indicators for the 2021 regulatory period for W04-01

Output measure	Performance indicator
Number of models maintained annually: Target: 26	All models updated with an additional year of climate and hydrologic data each year An average of five models per year have a performance review and upgrade Target: five performance reviews and upgrade per year

Our modelling capability is sophisticated, and demand for information from models and for continuous improvement has increased over the last six years, and is expected to remain at a high level for the foreseeable future. Regular prioritisation of this work is necessary to meet the increasing demand with the available resources.

The essential nature of the work in developing, maintaining and applying river basin water planning models will not change. The rigour, transparency and defensibility of these models will however need to meet higher standards and community expectations. Models must be capable of scenario creation and analysis, in some cases for a significant number of options. They require iterative analysis and ongoing quality assurance checking, to ensure the information provided is robust and defensible. Additional and expanded models and scenarios are likely to be required for the 2021 regulatory period.

To improve rigour, defensibility and value of the models we plan to:

- periodically update models with changes in management and development using corporate systems and remote sensing
- enhance representation of surface water – groundwater connectivity
- explicitly represent more unregulated water use within models
- conduct a performance review of each model on average every five years, or when triggered by a major model upgrade (performance reviews for models for high risk river systems will be done by an independent expert)
- time performance reviews so that they correspond with impending water sharing plan reviews
- develop and implement methods to better simulate future climate risk scenarios, rather than solely relying on historic climate data and
- continue conversion of models to the Source platform, as resources allow.

Operating expenditure

The cost of surface water modelling involves systems resources and staff time developing, maintaining and enhancing models to address scenarios specified by water planners and other stakeholders. To keep models up to date the normal practice is to update models each year with another year of climatic and hydrologic information, and to periodically review whether the models are adequately simulating current system behaviour. Additionally, models are often required to be extended in scope to address arising issues as described above.

We spent less than the amount used by IPART when determining WAMC prices in 2016 due to staff losses and work being focused towards modelling upgrades needed for Water Resource Plan development, Floodplain Harvesting work and Source development, which was largely Commonwealth funded. This has meant that routine update work on several models that were not so urgently required has been delayed.

To improve efficiency, we have:

- developed improved internal project management to better prioritise and manage the many demands for model outputs and improvements, including employing a dedicated project manager,
- developed guidelines for model development to help staff work efficiently consistent with best practice,
- automated rainfall / runoff model calibration, so that a process that used to take months now takes weeks,
- semi-automated remote sensed crop areas for input to models that can be run frequently and updated in models, supported by a dedicated remote-sensing analyst

- developed automated workflows to be able to efficiently process model development and usage tasks, including employing a dedicated programmer/developer and
- championed a monitoring and Modelling hub to maximise the efficient use of staff, and to share models across NSW government agencies and beyond.

We propose full time equivalent staff member (FTE) enhancements for three years to resource additional requirements of the modelling of the current budget for this activity. We require

- a Modeller and a Spatial Analyst to develop and implement data capture, methods and workflow to enable the additional diversion compliance for MDB SDLs, including the capture, classification and spatial analysis of remote sensed data, along with metering analysis for the additional components of floodplain harvesting, unregulated diversions, and interception activities. The risk of not having these two roles is that the models will not be updated, and that growth in use will not be detected in valleys until a period of time has elapsed, which may require a large correction
- an additional programmer to undertake model development and enable collaboration in automating workflows, developing cloud- based systems and developing plug-ins for our Source software. The risk of not having this role is a loss of efficiency gains and that system development important for collaboration will not occur
- a Knowledge Coordinator to develop and coordinate communication products, including writing and managing guidelines and the communication of model outputs, which are needed to develop all the documentation required for stakeholder engagement. A risk of this not being done is a deficit in transparency of and stakeholder trust in our models
- a Project Coordinator. This position has been funded to date using program funding, and has been important in developing software systems that enable the coordination of staff resources to meet program milestones. The risk of not maintaining a dedicated project management function in the modelling group is that this function will need to be met by technical staff whose time is better spent developing good quality models.

To improve efficiency so that the improved work described above can be done and stakeholder expectations can be met, we plan to:

- continue to prioritise where work is done on new models and model enhancements, using external funding where it is available to supplement this budget
- automate the annual pre-processing and loading of climatic and hydrologic data, so that it can be achieved each year for all models
- automate processes for generating model outputs and reports and
- improve remote sensing techniques to provide contemporary supporting information (on, for example, crop areas and infrastructure.

We propose to spend a total of $14.2 million[28] in the 2021 regulatory period on this activity. Actual average annual expenditure in the 2016 regulatory period is $2.6 million, which is lower than the average annual expenditure of $3.4 million used by IPART when determining WAMC prices in 2016.

During the 2016 regulatory period, we benefited from external funding from the Commonwealth of $2.6 million in operating expenditure (and a further $5.1 million for capital expenditures) that was invested in data collection and modelling to enable accurate entitlement settings for floodplain management, and rebuilding models as part of Basin Plan implementation. This funding will cease from July 2020.

[28] All expenditures are expressed in $2020-21 and are described in the Administrative Information paper accompanying this paper.

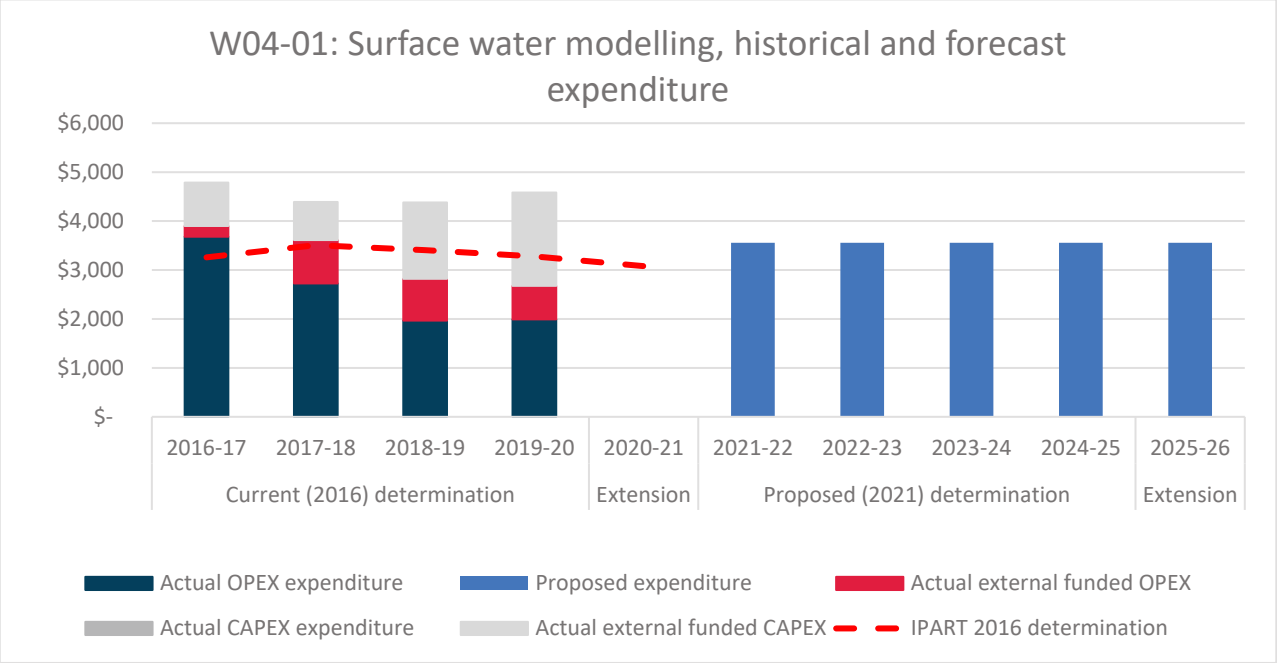
Our proposed expenditure of $3.6 million annually is 6% higher than IPART's 2016 prudent and efficient expenditure, primarily due to extra staff resourcing we require to continue to provide robust modelling to support our water management framework and its increasing workload, and to support transparency in the education and communication of stakeholders in modelling and in making models searchable and accessible outside of the department. This is set out in the following table and graph.

Table 7. Expenditure on surface water modelling W04-01 ($2020-21 $000)

Cost	2016 regulatory period				Extension	2021 regulatory period				
	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
IPART'S 2016 final report	3,259	3,508	3,406	3,279	3,080					
Actual DPIE Water operating expenditure	3,680	2,726	1,967	1,991						
Actual externally funded operating expenditure	219	885	855	685						
Actual externally funded capital expenditure	886	780	1557	1907						
Proposed DPIE Water operating expenditure						3,558	3,558	3,558	3,558	3,558

Notes: IPART's 2020–21 figure has been provided by IPART; actual operating expenditure is net of externally funded operating expenditure; DPIE Water's 2019–20 actual costs are 12/10 x actual costs for the 10 months to April 2020 and NRAR's 2019-20 actual costs are 12/11 x actual costs to May 2020; 2020–21 actual costs are unknown; 2025–26 costs are provided as required by IPART; please also refer to the Administrative Information document that is part of this submission.

Figure 3. Expenditure on surface water modelling W04-01 ($2020-21 $000)



W04-02 Groundwater modelling

This activity comprises development, upgrade, update and use of groundwater resource management models for water sharing and management applications while providing resource impact and balance assessments.

The focus of our work over the 2016 regulatory period was on the Murray-Darling Basin models to support water resource plan development. Other recent work has focussed on updating and maintaining models and creating tools that enabled rapid interrogation of model results. Use of the Pawsey supercomputer in the 2021 regulatory period will allow us to perform future uncertainty analysis on many key inputs to increase certainty about the models, and provide efficiency gains and increased ability to fulfil modelling requests.

The recent drought has highlighted an urgent need for improved information and decision support tools for the State's groundwater resources. With seriously constrained surface water access over the past few years, towns, regional businesses and non-urban landholders have turned to groundwater for emergency supplies and drought relief. With the resultant increased pressure on groundwater systems, it is important that we apply rigorous assessments to ensure that our groundwater resources are not compromised. Groundwater, if depleted, can take years to centuries to recover. There is a risk that the aquifer structure itself can be damaged and the results may be permanent. The new generation modelling improves our confidence around decisions relating to groundwater trades and the distribution of extractions to manage these risks for current users, the environment and future dependencies on these critical resources.

Demand for information from our modelling capability and for continuous improvement has increased over the last six years, and is expected to expand in the foreseeable future, especially as greater awareness about climate change and the impact of devastating drought occurs.

The next review of the Basin Plan will require up to date and robust models to underpin the review of sustainable diversion limits for all our Basin groundwater resources. The model development needs to happen well ahead of the review commencing in 2024.

Groundwater modelling work is essential to meet the increasing demand for evidence-based decision making, and the reasonable demands of stakeholders for robust information about

groundwater management, which is well communicated and easy to access. The experience from historic service has highlighted that at current resourcing levels only the highest priority models are able to be attended to. We propose significantly greater expenditure in the 2021 regulatory period, to allow better integration of groundwater modelling outputs with our policy, planning and resource management activities.

To balance this we have taken steps to develop a modelling strategy and to champion a modelling and monitoring hub to prioritise and attain maximum efficiency within NSW government modelling, and to maximise the benefits of this additional investment.

Stakeholders have asked for more information about water management, which is accurate and easy to access. This has driven model refinements and increased rigour of modelling outputs.

We propose to spend a total of $4.3 million[29] in the 2021 regulatory period, an average annual expenditure of $1.1 million. This represents an increase of 27% over the $841,000 we spent on average annually so far during the 2016 regulatory period and is 31% higher than the amount IPART used when determining WAMC prices in 2016. This is set out in Table 10.

In this activity we use our models to simulate the behaviour of major inland alluviums and selected coastal aquifers where the groundwater system is under stress from high levels of use or at risk in other ways such as from salinisation or contamination.

Statutory basis for service

Water Management Act 2000:

- Chapters 2: Part 1, Part 3 Divisions 3, 8 for
    - scenarios modelled.
    - LTAAEL (Long Term Average Annual Extraction Limit)
    - water balance assessments and performance evaluation

Water Act 2007 (Commonwealth):

- Murray Darling Basin Plan: Part 2, Division 1, Subdivision B.

Stakeholder views

We reviewed stakeholder feedback over the 2016 regulatory period and found that of the four key themes identified were that customers want:

- improved information available to customers. Customers want more information about water management, which is accurate and easy to access.[30]

The feedback received shows that customers expect a higher level of service from activities such as this one, and lists some specific work that could be undertaken to do so, including better connectivity in planning, more public reporting, more information provided and improved timeliness of information being provided.

This is an increasingly important focus for us, given model refinements driven by community expectations around increased rigour of modelling outputs and by recalibrations needed to reflect climate changes. It is also made more urgent by drought and climate change, which has placed an increased importance on understanding the resilience and reliability of groundwater to support towns, agriculture and industry when surface water supplies fail.

[29] All expenditures are expressed in $2020-21 and are described in the Administrative Information paper accompanying this paper.
[30] KJA, DPIE IPART Price Submission - Stakeholder Engagement, Plain English Summary and final report, 27 February 2020, page 11

Historic service 2016-17 to 2019-20 (4 years)

Service description and benefits

We have developed and continue to maintain and use computer-based models to simulate the behaviour of many groundwater flow systems in NSW. They are the most sophisticated tools available for simulating aquifer behaviour and predicting the effects of groundwater use. We currently use variants of the world's most commonly used and accepted modelling software, called MODFLOW, developed by the United States Geological Survey (USGS).

Model development includes model calibration against measured/observed data, a sensitivity analysis to evaluate the influence of parameter uncertainty on model outputs, and a process of peer review.

We have groundwater models for major inland alluviums and selected coastal aquifers where the groundwater system is under stress from high levels of use or at risk in other ways such as from salinisation or contamination. We update many of these models annually with new data to ensure their robustness in evaluating the performance of the groundwater sharing plans, including tracking of drawdown levels and rates against expectations under long-term extraction limits. Occasionally we rebuild models completely and upgrade them onto new software codes as new hydrogeological knowledge becomes available or upgrade to improve an existing model. Making use of the latest or best available data would occur irrespective.

A key output from a calibrated model is the quantification of annual pumping from a groundwater source to enable the maintenance of volumes of water stored in aquifers. No change in the long-term average volume stored implies that the determined level of pumping is sustainable into the future. We also use groundwater models to assess the potential impact of future possible water use scenarios on: the productive base of the aquifer, the hydraulic behaviour of the aquifer, groundwater dependent ecosystems, base flow to rivers, and groundwater quality.

Common applications of our groundwater models include:

- informing water sharing plan evaluation and review,
- informing identification of long-term sustainable extraction limits,
- providing an early warning system for areas of potential over-abstraction (’hotspots’), allowing mitigation measures to be put in place to prevent the irreversible local collapse of an aquifer resulting in diminished groundwater resource,
- annual update of water accounts within the State,
- supporting understanding of groundwater and surface water interactions,
- support of the Murray-Darling Basin’s Basin Salinity Management Advisory Panel with requested outputs,
- supporting assessment of the impact of new irrigation developments on Murray River salinity and
- supporting assessment of operational requirements of Salt Interception Schemes.

Service levels

The following table is a report against the output measures and performance indicators set out in IPART's 2016 final report by year. Within this activity we met our performance indicators and delivered a larger than initially planned workload over this period.

Table 8. Output measures and performance indicators for 2016 regulatory period for W04-02

Progress	Output measures	Performance indicator
	Number of models/analyses annually Target: 22/2,200	Percentage of volume of groundwater share component subject to modelling assessment annually Target: 50%
2016-17	22 models maintained	50% achieved in early 2017
2017-18	22 models maintained	>50%
2018-19	22 models maintained	>50%
2019-20	22 models maintained	>50%

Maintaining and improving models

We maintained and also improved the majority of the 22 models during the 2016 regulatory period. Thirteen models cover the major alluviums of the Murray Darling Basin, and nine for coastal aquifers and targeted salinity management. Setting a target of 2,200 analyses annually was an error, as groundwater models do not operate in the same way as river system models (see W04-01). Generally, only a small number (two or three) of scenario analysis runs are done for water planning on each groundwater model, compared to tens or hundreds done in river system models, and the work required for each scenario analysis run is far greater.

The groundwater modelling reports supporting water resource plans (WRP) also resulted in further improvements to the models and input data. Following a major overhaul, the WRP modelling reports enjoy a consistency of standard to a new common format. The use of modern GIS template standards for presenting the numerous maps of results, as well as extensive edits, resulted in greater clarity, easier reading and improved visual understanding of the reports.

Rebuilding models

Over the period 2016-17 to 2019—2020, several Murray Darling Basin models have undergone complete rebuilds and this was the primary focus along with generating 26 scenario runs with associated reports. During this period all of the key models have been updated with new data to keep the models current. A few models have also been upgraded to the latest version of software code MODFLOW-USGT. The most recent work has been updating key models to 30 June 2019 with the latest available monitored data. This work is ongoing according to a predetermined schedule. The Upper Namoi model is the latest model that has been both upgraded and updated in preparation for further calibration runs on the Pawsey supercomputer.

Further gains were achieved with work focussed on creating tools that enabled rapid interrogation of model results. Several python codes have been developed that have replaced arduous excel spreadsheet workflows. The python codes instantaneously produce model statistics and various charts from model inputs and outputs. Hours of complicated, workflow tasks have been eliminated, resulting in instant assessment of model results. These codes have subsequently been improved to make the charts completely interactive allowing deeper understanding of relationships between aquifers water levels.

Supporting water resource plan development

The focus of work was on the Murray Darling Basin models to support water resource plan development. This has required extensive work in updating and enhancing the models. Only a few remaining scenario reports required for the water sharing plans and water resource plans are still being completed. Outstanding items are final edits, merging for consistency and GIS mapping

issues. The vast majority of reports are complete, have been used for decision taking and are under review by internal stakeholders. One model is currently being prepared for a re-run with verification due to model changes following internal model peer review. At the time of writing only two of the 26 scenarios already run, required for water resource plan modelling are still to be finalised. The scenarios modelled are the Entitlements Scenario and the History of Extraction scenarios. Prioritisation of work on these scenario models meant that normal, business as usual; annual updates to all the other Murray Darling Basin models were not all completed. However, for the 2016 regulatory period the anticipated and planned scenarios will have all been completed. In addition, during this period a number of new construction models were also delivered and calibrated against new data.

Outputs

Over the historic service period, in addition to the 26 scenarios run with reports, the groundwater modelling group utilising additional resources from external funding, managed to update between 7 and 9 models on an annual basis and provide a water balance report for each of these. Over this period the group has also rebuilt/constructed 5 new models with delivery of draft calibration reports. This is versus an initial anticipated 3 models, and managed to finalise calibration on 3 models. Two models have been upgraded to the new MODFLOW-USGT code and this was one more than planned.

Model rebuilds are the main cost driver closely followed by scenario runs.

In the 2016 regulatory period, the majority of the Murray Darling Basin models have been updated with data up to 30 June 2018 and work is in progress to update all models to 30 June 2019. The primary purpose of the updated model runs is to verify that calibration is still current (performance measure) and to monitor new impacts revealed by updated data. A minor and secondary by-product resulting from the culmination of update work provides a water balance for Water Accounting purposes. This model derived data is also provided to the Bureau of Meteorology. The inflexibility on reporting date to Bureau of Meteorology ultimately causes severe disruptions to the advancement of work on priority models.

The Upper Namoi Model (under internal review and audit) has been upgraded and improved and we are now working on improving the Lower Namoi Model. These models will be the first models we have upgraded using internal resourcing, to the latest version of MODFLOW-USGT. The Upper Namoi model has recently been prepared for and subsequently is in the calibration phase on the Pawsey supercomputer. This supercomputing capability, which allows months of calibration time to be achieved in days, will also allow us to perform future uncertainty analysis on many key inputs in a way not previously possible. The net result of this work is to increase the certainty about the models, providing reasonable estimates of predictions. The upgrade in modelling code and use of supercomputing resources to perform calibration using state of the art calibration software (PEST-HP) was delivery of an enormous body of work borne out of necessity. This pioneering work constitutes additional value not initially anticipated or planned for at the beginning of the current historic service period but allows immense efficiency gains.

Forecast service 2020-21 to 2024-25 (5 years)

This covers the last year under the 2016 regulatory period and the 4 years of the 2021 regulatory period.

It is important to emphasise that the backlog for the groundwater modelling group is that on 11 of the Murray Darling Basin models, the code used, being the now discontinued 2005 version of MODFLOW, is out of date and highly problematic in use. The models definitely require to be upgraded to the latest 2020 MODFLOW-USGT version to resolve several issues and avoid becoming obsolete. Other models that we maintain are already verging on obsolete. Our four year sustainable modelling plan aims to transition all of these models to the new platform, and work is already underway to efficiently implement this upgrade.

Under current resource levels, we perform the core function of model updates and maintenance in an ad hoc manner, whenever a gap in time allows, using unpaid overtime and being reliant upon and requesting additional resource support. This submission is an opportunity to right the chronic under-resourcing of groundwater modelling, and to resource the team to respond to the needs of water users in a drying and drought impacted climate.

We recognise that over the forecast service period 2020-21 to 2024-25 (5 years), achieving better integration of the groundwater modelling outputs with our policy, planning and resource management activities is a critical focus area. We have initiated a modelling strategy and the formation of Groundwater Modelling Steering and Advisory Groups to achieve this:

- the executive level Groundwater Modelling Steering Group will provide guidance on our priorities and provide direction on how to resolve resourcing issues or conflicts. This includes prioritising work requests for scenario analyses, when needed and prioritising the care and maintenance of our models. The steering group is also expected to champion the needs of the groundwater modelling work program and guide our approach in managing stakeholder expectations if these cannot be met with available resources and
- the Groundwater Modelling Advisory Group will prepare and coordinate the information to present to the executive level Steering Group, with the group's initial focus being finalising the groundwater modelling work program through to 2026.

As part of the strategy an initial draft of the work program has been prepared and converted into a preliminary detailed work schedule for the groundwater modelling team that aims to align the groundwater modelling outputs with known planning milestones and resource management issues.

Our modelling capability is sophisticated, and demand for information from models (to inform our Water Resource Plans and Regional Water Strategies) and for continuous improvement has increased over the last six years, and is expected to expand in the foreseeable future, especially as greater awareness about climate change and the impact of devastating drought occurs. Regular prioritisation of this work is necessary to meet the increasing demand with the available resources. The experience from historic service has highlighted that at current resourcing levels only the highest priority models are able to be attended to.

We have specific historic service experience of the groundwater modelling resource requirements to support water resource plan development (based on current staffing levels). When this experience is considered together with the draft of the future work program and work schedule, at current resourcing levels of the groundwater modelling team, a clearly identified deficit of resources to perform the work plan is apparent. Under such conditions, any extended, extraordinary leave event by even a single staff member results in delay greatly exceeding and incommensurate with the original leave event. Handovers to untrained temporary staff exacerbate the issue further.

The natural progress in technology requires that each of our models undergoes modernisation onto newer and better software code that resolves serious known issues on the existing code. These issues are no longer tolerated by external reviewers and especially stakeholders (representing water user groups) aware of the benefits of modern codes. A greater demand for additional modelling work requiring more than current resources has been noticed and will be addressed in the forecast service period.

The rigour, transparency and defensibility of these models will need to meet higher standards and community expectations. They require ongoing quality assurance checking, to ensure the information provided is robust and defensible. We will require additional and expanded models and scenarios for the 2021 regulatory period.

Advances in software, computer power and analytical approaches have provided the opportunity to build more robust and effective groundwater models. Future refinement and rebuilding of groundwater models will utilise new modelling technology as well as targeted data collection to improve stakeholder confidence in models. We plan to upgrade the remainder of the groundwater

models to the best practice MODFLOW-USGT software platform over the 2021 regulatory period. This use of this modelling platform together with the calibration and sensitivity and uncertainty analysis using the Pawsey supercomputer will greatly improve the models.

As greater emphasis is placed on model supported decisions the common applications of future groundwater models discussed earlier are envisaged to be supplemented to also include:

- drought scenario modelling,
- recovery from drought scenario modelling,
- evaluating the feasibility and potential impacts of groundwater trading and associated policies,
- enhanced groundwater/surface water interaction information,
- climate change scenario modelling,
- flooding as an aquifer recharge mechanism scenario modelling and
- subsidence of aquifer scenario modelling.

To improve rigour, defensibility and value of the models we plan to:

- update all models each year with an additional year of climate and hydrologic data,
- conduct a performance review of each model after every update or when triggered by model improvements, upgrades or rebuild,
- perform internal review and audit on each model,
- perform both internal and external independent expert reviews and audit for priority models,
- time performance reviews so that they correspond with impending water sharing plan reviews and
- merge several sets of adjoining major aquifer models and rebuild some to include the underlying Great Artesian Basin to provide better simulation of interconnections.

We will merge many of the Murray Darling Basin models beginning in 2020. The main reason for merging is that it would lower the total number of Murray Darling Basin models from 13 models down to eight, in turn lowering the workload burden on existing resources by eliminating duplication of workflow processes. However, at the time of writing, two additional new model builds are being considered. The first models being merged and recalibrated are the Upper and Lower Namoi models into a single catchment wide model.

Generic Outline

An outline of the generic stages of development with completion dates for each of the eight new Murray Darling Basin models are:

- 2020 - model build commences
- December 2021 - model merges and migration to new modelling code
- December 2022 - uncertainty analysis and internal audit and review
- December 2023 - external independent review allowing accredited model scenarios
- December 2024 - LTAAEL / SDL scenarios
- December 2025 - stakeholder discussions
- 2026 - finalised Murray Darling Basin Plan review

An initial draft of the work program has been prepared and converted into a detailed work schedule to determine resourcing requirements to achieve Murray Darling Basin Plan review requirements.

Depending upon the final resourcing levels, two alternative possibilities for the forecast period are achievable, with complete modernisation of our models only possible with the full quantum of additional resources supported. For comparison against the modernisation proposed, a partial

modernisation is achievable with some additional resources. A business as usual level of resources equates to an under-resourcing of the groundwater modelling function

Modernisation

To complete the work requirements (merge/rebuild or upgrade) according to the above outline on eight Murray Darling models, while still performing annual updates to keep the models calibrated and current for any scenario (including annual water balance reporting) would require almost double the current resources.

Partial Modernisation

If resourcing is funded above the current levels modernisation of only three of the highest priority models would be completed on time with a few more, lower priority, models in various states of completion. Only high priority models would be updated annually. Additional scenario requests would be possible, depending on the additional level of resourcing. Reporting Water Balances to Bureau of Meteorology would be a lower priority, however, additional resources would be used to complete annual reporting.

Business as Usual

If resourcing is maintained at current levels the models risk not being merged. Instead, the current models will be updated and reused for scenario runs to inform the 2026 Murray Darling Basin Plan review. Potentially only one or two of the highest priority models would be completed on time according to the above outline. The majority of models would remain on outdated codes and models would be updated on an annual basis with the latest monitored data; however, their performance review would likely indicate deviation from calibration best practice measures. Subsequent internal reviews and audits would recommend rebuild and upgrade to all models. Scenario modelling would be limited and models would not be suitable for supplementary scenario modelling to inform decisions and lower uncertainty as proposed earlier. Ultimately the business as usual approach would result in models becoming obsolete and increased angst from all stakeholders and water users that is likely to be directed to the Minister in charge.

There are current stakeholder expectations on model delivery, that under current resourcing levels are already not being met. These are impacting on our credibility with specific stakeholder groups, specifically the Upper and Lower Namoi and the Lower Murray.

One of the key expectations by stakeholders is for an external independent expert peer review of the model to occur. A review of many of our models running on outdated code would not pass the standard of a reputable reviewer who would likely be critical of work around measures adopted to overcome code issues and especially use of outdated code.

Such a review and audit are estimated to cost in the range of $20,000 to $30,000 depending on the model complexity. To fund an external review of the proposed eight models would require $160,000 to $240,000. We estimate it will cost $120,000 to fund the review of the models covering the groundwater sources of the first six inland plans which have the extraction limit based on an assessment of inputs to the groundwater sources. We expect this cost to be incurred in 2023 but it could be staggered over several years depending on final resourcing. The Peel and Bungendore models which are only proposed at this stage are not included in these estimates.

Annual expenses to the order of approximately $20,000 - $30,000 for computer software licensing subscriptions and contingency expenses are anticipated. Should we lose access to the Pawsey Supercomputer then another paid cloud service provider would entail additional costs that are difficult to estimate without experience on their particular system.

Service levels

The following table sets out our proposed output measures and performance indicators for the regulatory period commencing in 2021.

Table 9. Output measures and performance indicators for 2021 regulatory period for W04-02

Output measure	Performance indicator
Number of models maintained annually: Target: 22 Note: several may be merged but overall modelling coverage the same or larger	All models updated with an additional year of climate and hydrologic data are subjected to a performance review to ensure they remain acceptably calibrated. Target: 25% subject to performance review per year

Operating expenditure

The cost of groundwater modelling involves systems, resources and staff time developing, maintaining and enhancing models to address the requirements of water planners and other stakeholders. To keep models up to date the normal desired practice is to update models each year with another year of climatic and hydrologic information, and also to periodically review whether the models are adequately simulating current system behaviour. Additionally, models are often required to be extended in scope to address arising issues.

As a result of an excessive overload of modelling work requests (for example for groundwater bore assessments) and the need to maintain a large number of models, the under-resourced groundwater modelling team has to prioritise its workloads carefully to ensure the highest priority work is able to be completed. The process implemented is to work in alignment with a weekly work plan derived from a weekly planning meeting where the prior week's progress is discussed and tracked and the following week's progress is planned according to existing and newly introduced demands. Key internal stakeholders are regularly consulted to ensure that the highest priority work is being placed at the forefront.

To improve efficiency, we have:

- developed improved internal project management to better prioritise and manage the many demands for model outputs and improvements,
- arranged access to a supercomputer for model calibration, enabling calibration processing time to be reduced from months to days and enabling a more rigorous calibration process and
- created computer codes to improve interrogation of models and decrease processing time of results.

The cost savings created by these efficiencies were immediately offset by additional modelling work requests and demands from water Users. These were generated by the enhanced abilities of improved and updated models and also by the general expansion in interest in model derived information.

To continue to improve efficiency, we plan to:

- continue to prioritise where work is done on new models and model enhancements,
- automate the annual pre-processing and loading of climatic and hydrologic data, so that it can be achieved each year for all models at a reduced cost and
- automate processes for generating model outputs and reports.

Nevertheless, we propose an increase in expenditure on this activity, as current resources are not sufficient to maintain and improve the current models even with these efficiency measures.

Groundwater modelling expectations for the future cannot be met with the current staff shortfall. This also factors into the establishment of modelling requirements, inputs to models and review outcomes that underpin our statutory water management functions.

Without this additional resourcing, we will not be able to achieve all the expected model improvements and maintain all the models on an ongoing basis.

We propose to spend a total of $4.3 million[31] in the 2021 regulatory period on this activity. Average annual expenditure in the 2016 regulatory period is $841,000, which is 3% higher than the amount IPART used when determining WAMC prices in 2016. Our proposed expenditure is 31% higher (27% higher than average actual expenditures) at $1.1 million annually as set out in the following table.

During the 2016 regulatory period, we benefited from external funding from the Commonwealth of $372,000 in operating expenditure for Basin Plan implementation. This funding will cease from July 2020.

Table 10. Expenditure on groundwater modelling W04-02 ($2020-21 $000)

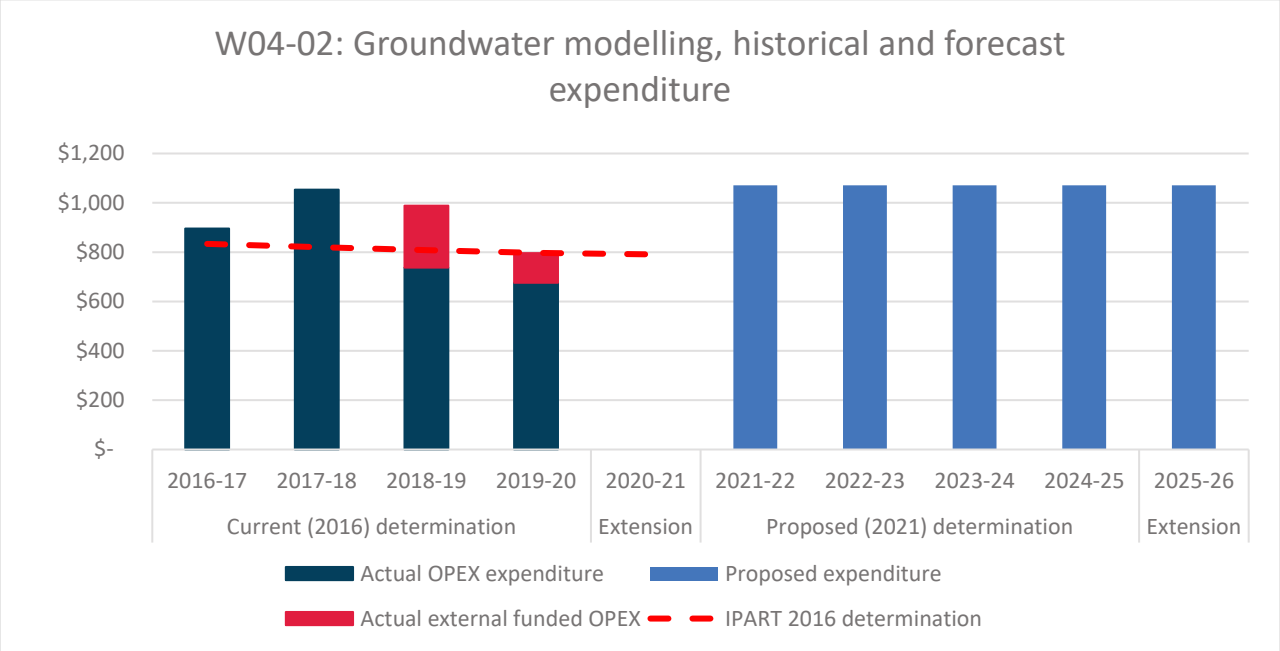
Cost	2016 regulatory period				Extension	2021 regulatory period				
	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
IPART'S 2016 final report	834	820	808	797	791					
Actual DPIE Water operating expenditure	896	1,054	737	676						
Actual externally funded operating expenditure	0	0	251	120						
Actual externally funded capital expenditure	0	0	0	0						
Proposed DPIE Water operating expenditure						1,071	1,071	1,071	1,071	1,071

Notes: IPART's 2020–21 figure has been provided by IPART; actual operating expenditure is net of externally funded operating expenditure; DPIE Water's 2019–20 actual costs are 12/10 x actual costs for the 10 months to April 2020 and NRAR's 2019-20 actual costs are 12/11 x actual costs to May 2020; 2020–21 actual costs are unknown; 2025–26 costs are provided as required by IPART; please also refer to the Administrative Information document that is part of this submission.

This information is also set out in the following graph.

[31] All expenditures are expressed in $2020-21 and are described in the Administrative Information paper accompanying this paper.

Figure 4. Expenditure on groundwater modelling W04-02 ($2020-21 $000)



W04-03 Water resource accounting

This activity comprises data management and reporting of groundwater quantity and quality information; including compilation, secure storage, management and publishing of data to customers, stakeholders and the general public.

We provide transparency and access to detailed annual information of water resource availability, changes to these water resources, and the management of the resources under water sharing plan rules.

In the 2016 regulatory period we have produced nine ‘General Purpose Water Accounting Reports’ each year. These cover the eleven Murray Darling Basin regulated water sources of NSW and including a suite of data analysis products and modelled water balances for eight major groundwater alluvial water sources. We have given the public access to more data and information and developed numerous reports and dashboards that deliver what our stakeholders say they need.

In the 2021 regulatory period we will continue to deliver the high quality reports we have developed, which provides the required data and information at an appropriate service level.

We heard that stakeholders want an accurate and reliable water monitoring system from which to provide transparent and timely access to information and manage resources under water sharing plan rules.

We propose to spend a total of $2.4 million[32] in the 2021 regulatory period on this activity, an annual average of $602,000. The proposed annual average represents a decrease of 17% from the $725,000we spent on average annually so far during the 2016 regulatory period and is 30% higher than the amount IPART used when determining WAMC prices in 2016.

In this activity we consolidate water information from a wide range of sources to provide consistent and validated information to drive the water planning, policy and statutory reporting requirements of the state.

[32] All expenditures are expressed in $2020-21 and are described in the Administrative Information paper accompanying this paper.

The validated information sets form the basis for all our water resource accounting based statutory reporting requirements. Given the complexity and diversity of accounting rules and water information within NSW and the evolving environmental water activities it is imperative that our reporting output is efficient, high quality and consistent.

Statutory basis for service

Water Resource Accounting requirements are required under:

Intergovernmental Agreement on a National Water Initiative, Clauses 80-88

Water Management Act 2000:

- Water Accounting information (AWDs, trading, environmental water accounting, end of system flows) for review and evaluation of Water Sharing Plans.

Water Act 2007 (Commonwealth):

- MDBA Water Audit Monitoring Reports under Murray Darling Basin Agreement transitioning to Sustainable Diversion Limits (SDL) reporting required for the Murray Darling Basin Plan (MDBA),
- Water Accounting requirements for the MDBA and
- Provision of water information to the Bureau of Meteorology as the national custodian of water information under Subdivision F – Reporting Obligations (the reporting obligation of the Basin state is to report the quantity of water available from the water sources of the water resource plan area during that water accounting period).

Stakeholder views

We reviewed stakeholder feedback over the 2016 regulatory period and found that of the four key themes identified were that customers want:

- monitoring they can trust, and that a 'robust, accurate and reliable water monitoring system is supported and expected by customers'[33]

We identified that future work to improve the trust customers place in monitoring depends on 'using best-available and most up-to-date technology to measure and monitor' and 'ensuring that monitoring data and systems are transparent'[34]. To achieve this improvement requires a robust, accurate and reliable water monitoring system from which to provide transparent and timely access to detailed annual information of water resource availability, changes to these water resources, and the management of the resources under water sharing plan rules.

Historic service 2016-17 to 2019-20 (4 years)

Service description and benefits

Water resource accounting is a critical business enabler that devolved from NSW National Water Commitments, recognising the need for consistent, comparable, validated and quality assured information to drive the water planning, policy and statutory reporting requirements of the state. The activity consolidates water information from a wide range of sources including:

- WaterNSW (hydrometric, licence holder accounting and planned environmental water accounts),

[33] KJA, DPIE IPART Price Submission - Stakeholder Engagement, Plain English Summary and final report, 27 February 2020, page 9
[34] KJA, DPIE IPART Price Submission - Stakeholder Engagement, Plain English Summary and final report, 27 February 2020, p4

- Environmental Water Managers (current environmental holdings, usages and trading activity),
- Irrigation Corporations (internal water budgets and system return flows),
- bordering state governments (trade and use),
- the Bureau of Meteorology (climatic),
- local councils (council storage operation and use) and
- the MDBA (Murray River Operations).

This activity provides transparency and access to detailed annual information of water resource availability, changes to these water resources, and the management of the resources under water sharing plan rules. The validated information sets form the basis for all of our water resource accounting based statutory reporting requirements. The activity provides efficient, high quality and consistent reporting output, which is of particular importance given the complexity and diversity of accounting rules and water information within NSW and the evolving environmental water activities.

Specifically, the activity directly feeds information and advice to support

- Bureau of Meteorology water regulations and national reporting,
- annual sustainable diversion limit compliance accounting,
- Matter 9 Basin plan reporting,
- NSW State of the environment reporting,
- administration of the held environmental water register (referenced water resource plans),
- associated audits of held environmental water,
- NSW water sharing plan development, review and Natural Resources Commission (NRC) audits,
- Murray Darling trade working group activities,
- IPART usage forecasting, and
- a broad range of other project support and information requests.

We disseminate indirectly available data internally, through a range of custom developed systems, reducing duplication and increasing efficiency.

For water sources with adequate data coverage, we disseminate information publicly via General Purpose Water Accounting Reports (GPWAR), developed under the Australian Water Accounting Standard 1. These detailed reports, akin to annual financial reporting, provide a rigorous reporting framework, comparable between years and across areas, and importantly provide a transparent public record and point of truth for the information driving planning, policy and compliance. While annually focused the reports also include a range of historical information and analysis providing a useful asset for broad use. For areas that do not readily lend themselves to a detailed GPWAR, the department has developed a range of online dashboard tools on water usage, trading, water allocations and environmental water.

The following figures provide some examples of the reports that are made publicly available as part of the role of this activity.

Figure 5. Example of online General Purpose Water Accounting Report and online environmental water register

Figure 6. Two examples of online dashboards

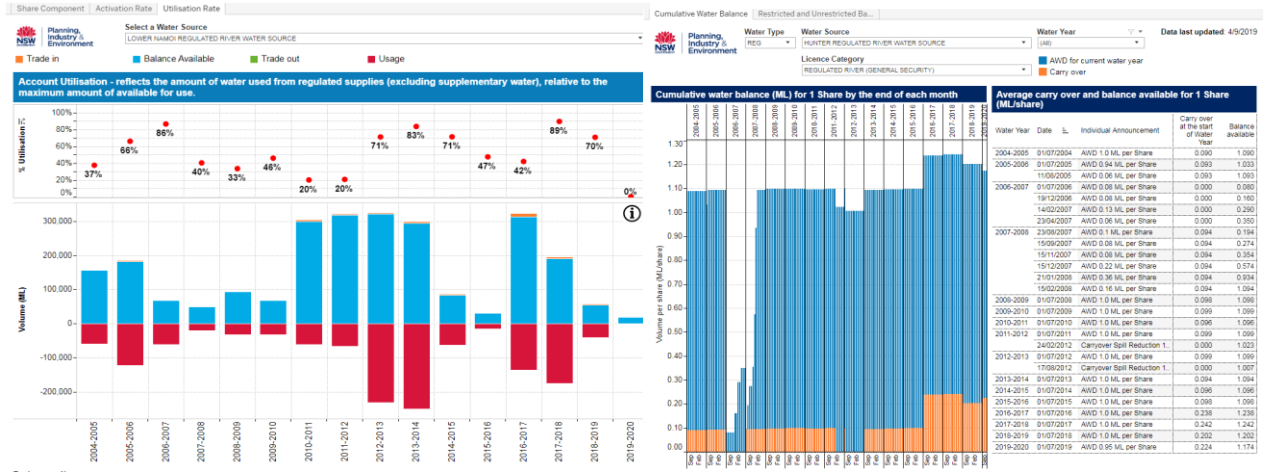


Figure 7. Example of online consolidated and quality assured water account for statutory reporting

Category	Share 30 June 2019	Opening Balance	AWD	Licences		Assignments		Transfer to Snowy for environmental release	Recredit	Account Usage	Net account usage	Uncontrolled Flow Usage	During Year Forfeit	End of Year Balance		End of Year Forfeit	Carry Forward
				New	Cancelled	In	Out							Available Balance	Unavailable Balance		
Coleambally Irrigation (Conveyance)	130,000	4,692	110,809	0	0	20	9,178	3,140	0	103,203	103,203	0	0	0	0	0	0
Domestic and Stock	20,985	(1)	20,993	0	8	0	0	0	0	16,098	16,098	0	0	4,886	0	4,905	(20)
Domestic and Stock [Domestic]	271	(20)	271	0	0	0	0	0	0	102	102	0	0	150	0	166	(16)
Domestic and Stock [Stock]	12,883	0	12,883	0	0	0	0	0	0	11,084	11,084	0	0	1,799	0	1,799	(0)
Local Water Utility	23,816	0	23,816	0	0	146	500	0	0	9,107	9,107	0	0	14,355	0	14,355	0
Murrumbidgee Irrigation (Conveyance)	243,000	7,121	154,111	0	0	0	18,461	14,312	0	128,458	128,458	0	0	1	0	0	1
Regulated River (Conveyance)	2,968	199	208	0	0	0	217	190	0	0	0	0	0	0	0	0	0
General Security	1,891,995	407,074	132,440	0	7	345,446	317,523	14,343	0	0	0	0	0	152,319	0	623	151,696
High Security	363,698	(2)	342,284	0	0	15,696	52,323	1,791	0	302,841	302,841	0	0	1,024	0	1,168	(145)
High Security (Aboriginal Culture)	2,150	0	2,150	0	0	0	0	0	0	500	500	0	0	1,651	0	1,651	0
High Security (Research)	300	0	300	0	0	0	0	0	0	300	300	0	0	0	0	0	0
High Security (Town Water Supply)	19,769	0	19,769	0	0	0	0	0	0	19,769	19,769	0	0	0	0	0	0
Supplementary Water	198,780	0	198,780	0	0	26,806	26,806	0	0	0	0	0	0	198,780	0	198,780	0
Supplementary Water (Lowbidgee)	747,000	0	747,000	0	0	393,117	393,117	0	0	0	0	0	0	747,000	0	747,000	0

Figure 8. Example of online environmental trading summary for SDL adjustment process

NSW Murray		TO									
		Enviro				Non-Enviro					Total
FROM		LOWER DARLING REGULATED RIVER WATER SOURCE	NEW SOUTH WALES MURRAY REGULATED RIVER WATER SOURCE	SOUTH AUSTRALIA WATER SOURCE	VICTORIA WATER SOURCE	LOWER DARLING REGULATED RIVER WATER SOURCE	MURRUMBIDGEE REGULATED RIVER WATER SOURCE	NEW SOUTH WALES MURRAY REGULATED RIVER WATER SOURCE	SOUTH AUSTRALIA WATER SOURCE	VICTORIA WATER SOURCE	
Enviro	LOWER DARLING REGULATED RIVER WATER SOURCE		153.9								153.9
	NEW SOUTH WALES MURRAY REGULATED RIVER WATER SOURCE	122,737.5	378,924.9	30,000.0	5,000.0			1,494.1			538,156.5
	SOUTH AUSTRALIA WATER SOURCE		30,000.0								30,000.0
	VICTORIA WATER SOURCE		17,530.0								17,530.0
Non-Enviro	LOWER DARLING REGULATED RIVER WATER SOURCE							13,800.4			13,800.4
	MURRUMBIDGEE REGULATED RIVER WATER SOURCE							48,414.0			48,414.0
	NEW SOUTH WALES MURRAY REGULATED RIVER WATER SOURCE					49,236.8	1,063.6	236,047.1	31,041.9	99,685.2	417,074.6
	SOUTH AUSTRALIA WATER SOURCE							1,061.0			1,061.0
	VICTORIA WATER SOURCE							18,569.2			18,569.2
Total		122,737.5	426,608.8	30,000.0	5,000.0	49,236.8	1,063.6	319,385.8	31,041.9	99,685.2	1,084,759.6

Service levels

The following table reports against the output measures and performance indicators specified by IPART in its 2016 final report. During the 2016 regulatory period we changed the targets of this activity to reflect an increasing requirement for a much broader range of information provision to support policy, planning, management and reporting obligations. Encompassing this change we still met our indicators relating to the percentage of entitlement by water type covered by the water accounting reports.

Table 11. Output measures and performance indicators for 2016 regulatory period for W04-03

Progress	Output measures	Performance indicator
	Number of outputs for water accounting reports, reporting obligations and required ad hoc. Target: 17 valleys 17 analysis reports 20 miscellaneous studies	Percentage of entitlement by water type covered by the water accounting reports. Target: Regulated river: 100% Unregulated river: 60% Groundwater: 95%
2016-17	10 valleys 9 analysis reports 14 miscellaneous studies	Regulated river: 100% Unregulated river: 15% Groundwater: 90%
2017-18	The requirements of this function changed since the original submission. The following produced in 2017-18: 9 General Purpose Water Accounting Reports covering 11 regulated water sources and water balances for 8 major groundwater alluvial water sources 50 miscellaneous analysis reports 35 water accounting reports for state and federal compliance reporting obligations	Regulated river: 100% Unregulated river: 100% Groundwater: 100%

Progress	Output measures	Performance indicator
2018-19	The requirements of this function changed since the original submission with an increasing requirement for a much broader range of information provision to support policy, planning, management and reporting obligations. The following were produced in 2018-19: 9 General Purpose Water Accounting Reports covering 11 regulated water sources and water balances for 8 major groundwater alluvial water sources 50 miscellaneous analysis reports 35 water accounting reports for state and federal compliance reporting obligations Release of 4 on-line dashboards containing detailed analysis of Trade, Usage, Utilisation and Allocations. Historical available water determination reports for all 14 regulated water sources published and updated monthly	Regulated river: 100% Unregulated river: 100% Groundwater: 100%
2019-20	The requirements of this function changed since the original submission with an increasing requirement for a much broader range of information provision to support policy, planning, management and reporting obligations. The following activities have commenced in 2019-20: Preparation for 9 General Purpose Water Accounting Reports covering 11 regulated water sources and water balances for 8 major groundwater alluvial water sources Update of environmental water register Maintenance of online dashboard 15 miscellaneous analysis reports	Regulated river: 100% Unregulated river: 100% Groundwater: 100%

Performance

With an increase in demand for standardised quality assured and validated data the group has delivered a single source of truth for the growing range of statutory and water resource management data requirements. This has resulted in an expansion of the functionality being delivered under this activity to include the analysis and provision of water accounting data and advice through analysis reports, detailed water accounting reports/information products, and meeting statutory reporting obligations at both state and federal level.

The output associated with this activity includes:

- nine ‘General Purpose Water Accounting Reports’ that we produced annually over the 2016 regulatory period, covering the eleven Murray Darling Basin regulated water sources of NSW and including a suite of data analysis products and modelled water balances for eight major groundwater alluvial water sources,[35]
- expansion of public access to data and information through the internally funded development of on-line dashboards providing transparent information that supports irrigation business planning and operations
    - Usage and Accounting Dashboard,[36]

[35] Available at https://www.industry.nsw.gov.au/water/allocations-availability/water-accounting/gpwar
[36] Available at https://www.industry.nsw.gov.au/water/allocations-availability/water-accounting/usage-dashboard

    - Trade Dashboard,[37]
    - Allocations Dashboard,[38]
    - Utilisation Dashboard [39] and
    - Accounting Rules Summary Dashboard [40]
- making available historical water determination reports for all 14 regulated water sources published and updated monthly,[41]
- environmental water register expanded and continually maintained that introduces transparency around the location and volume of water held for the environment,[42]
- annual average delivery of 50 miscellaneous analysis reports that support water planning and policy development, review and reporting, in areas such as water accounting, trade and environmental water,
- provision of up to 35 reports including water accounting balance summaries, trade movement analysis reports, water allocation summaries to meet state and federal compliance reporting obligations,
- data and advice for State review and the NRC's audit of Water Sharing Plans,
- a customised water resource accounting system that is under development (asset development externally funded) that will improve efficiency with which GPWAR are produced and data is disseminated and accessed and
- improved efficiencies in data ingestion from multiple sources through automation via the utilisation of web services where possible. These have enabled to expansion of the services provided under this activity by replacing previously tedious and time-consuming data collection processes. It has also enabled procedures to be developed under transitional compliance report arrangements to disseminate water resource accounting information to support compliance reporting at both state and federal level.

Forecast service 2020-21 to 2024-25 (5 years)

This covers the last year under the 2016 regulatory period and the four years of the 2021 regulatory period.

Service levels

We will continue to produce and publish GPWARs, and will both expand coverage of GPWAR, and bring the product to a web-based publication, allowing easier navigation and downloadable access to the underlying datasets.

We will continue to provide business-enabling support for a range of other functions (miscellaneous analysis reports). Example reports include:

- review of IPART usage forecasts,
- unmetered groundwater estimation for SDL accounting,
- system availability analysis for critical drought resource management,
- water resource plan data support,

[37] Available at https://www.industry.nsw.gov.au/water/licensing-trade/trade/dashboard
[38] Available at https://www.industry.nsw.gov.au/water/allocations-availability/allocations/dashboard
[39] Available at https://www.industry.nsw.gov.au/water/allocations-availability/water-accounting/utilisation-dashboard
[40] Available at https://www.industry.nsw.gov.au/water/allocations-availability/water-accounting/accounting-rules-summary-dashboard
[41] Available at(https://www.industry.nsw.gov.au/water/allocations-availability/water-accounting/historical-available-water-determination-data

[42] Available at https://ewp.water.dpi.nsw.gov.au/ewr/main/ewrHome

- active management in unregulated rivers data and advice,
- trade limit and availability analysis,
- Murray Darling trade working group data analysis support,
- compliance activity support to NRAR and
- custom data requests for water resource management applications.

We will continue to provide water accounting reports for state and federal compliance reporting obligations including water accounting balance summaries, trade movement analysis reports, and water allocation summaries.

We will continue to maintain the NSW Environmental Water Register.

In order to improve efficiency and service delivery, we will:

- move to a system solution for data ingestion and dissemination of standardised data, including automation of feeds where possible.
- engage with external data custodians to identify further opportunities to automate data access, which will allow expanded coverage of detailed resource accounting products when combined with expected data expansion from the proposed metering rollout program,
- move the Australian water accounting standard 1 (AWAS1) accounting process to a dedicated Water Resource Accounting System,
- move to web based GPWAR reporting utilising a number of data and presentation automation techniques and
- adding additional features to provide data download options and hence improved transparency.

The service level is appropriate because it delivers coverage of priority reporting areas for water resource accounts and provides key information quality assured and validated with established standards to meet the state's reporting and information provision obligations.

The structural arrangements of water resource management in NSW, including the operations of water corporations and the emergence of dedicated environmental water portfolios, results in fragmented accounting information at a water resource scale. To produce a holistic, accurate and quality assured record of historical operation under NSW water sharing plan implementation, data therefore needs to be sourced, validated and consolidated from various custodians, various sources, various systems and various formats.

Data exchange is largely dependent on the capacity of the custodian and can range from fully automated data feeds, to exchange of emails and pdf documents. We continue to develop processes and utilise technology where efficiency gains are likely without compromise of data accuracy and quality. Examples of these are the automated collection of data from multiple data sources via web services, automated process for data ingestion and reporting, and the development systems to provide easy data access and reporting.

Historically significant issues existed around data duplication and quality with datasets being produced across the department to varying degrees of quality and consistency. We have significantly reduced these issues by ensuring that data products are multi-use and produced through a quality assured single point of truth.

The table below shows proposed output measures and performance indicators for the 2021 regulatory period.

Table 12. Output measures and performance indicators for the 2021 regulatory period W04-03

Output measures	Performance indicators
Annually: Nine detailed GPWARs (11 Water Sources) Approximately 50 miscellaneous analysis reports Approximately 35 reports to meet state and federal compliance reporting obligations. Environmental Water Register updated	GPWARs published within 12 months of the end of the water year. Respond to data analysis requests within prioritised timeframes. All accounting inputs into statutory report requirements provided annually. Environmental Water Register available online with a currency of 1 week Target: Regulated river: 100% Unregulated river: 60% Groundwater: 95%

Operating expenditure

The major cost is staff time working on general purpose water accounts and other water accounting reporting that is being progressively developed for each water source. The actual costs of this relatively new activity exceeded the amount used by IPART when determining WAMC prices in 2016.

To improve efficiency during the 2016 regulatory period, we sourced additional resources to develop the Water Resource Accounting System and maintain and enhance the Environmental Water Portal and internal report tools. These provide significant efficiency improvements and benefits to internal and external stakeholders both currently and moving forward.

We propose to spend a total of $2.4 million[43] in the 2021 regulatory period on this activity. Average annual expenditure in the 2016 regulatory period is $725,000 with forecast expenditure 17% lower at $602,000 annually as set out in the following table. Our proposed resourcing is at a level 30% above that used by IPART when determining WAMC prices in 2016.

[43] All expenditures are expressed in $2020-21 and are described in the Administrative Information paper accompanying this paper.

Table 13. Expenditure on water resource accounting W04-03 ($2020-21 $000)

Cost	2016 regulatory period				Extension	2021 regulatory period				
	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
IPART'S 2016 final report	474	469	463	453	450					
Actual DPIE Water operating expenditure	985	549	621	745						
Actual externally funded operating expenditure	0	0	0	0						
Actual externally funded capital expenditure	0	0	0	0						
Proposed DPIE Water operating expenditure						602	602	602	602	602

Notes: IPART's 2020–21 figure has been provided by IPART; actual operating expenditure is net of externally funded operating expenditure; DPIE Water's 2019–20 actual costs are 12/10 x actual costs for the 10 months to April 2020 and NRAR's 2019-20 actual costs are 12/11 x actual costs to May 2020; 2020–21 actual costs are unknown; 2025–26 costs are provided as required by IPART; please also refer to the Administrative Information document that is part of this submission.

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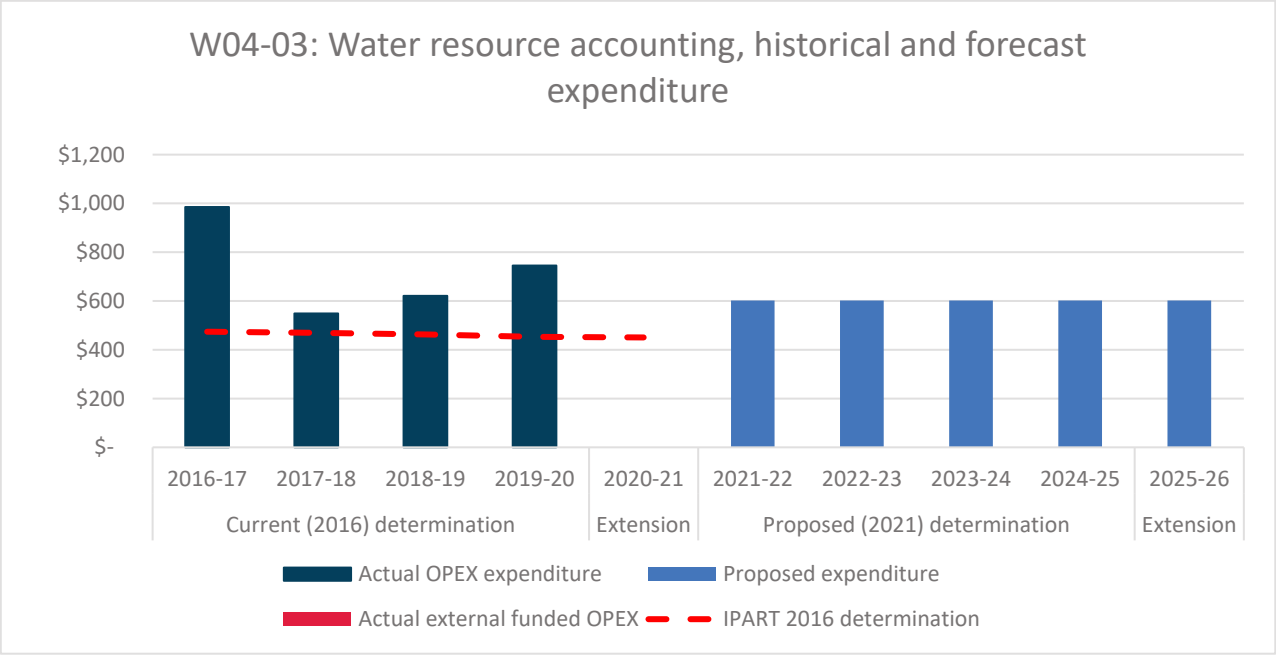
This information is also set out in the following graph.

Figure 9. Expenditure on water resource accounting W04-03 ($2020-21 $000)



W05 Water management implementation

Water management activities in the 2021 regulatory period under WAMC activity code W05-02 will be undertaken by WaterNSW and are covered in its separate submission to IPART for WAMC prices. They have been undertaken primarily by WaterNSW since the 2016 water transformation project. However, some costs have been recorded by DPI Water during the 2016 regulatory period; information on these costs is set out in Detailed Paper K that forms part of this submission. Information on the water transformation project is set out in Detailed Paper C.

W05-01 Systems operation and water availability management

This activity comprises preparation and implementation of the procedures and systems required to deliver the provisions of water management plans; and operational oversight to ensure plan compliance, the available water determinations and the assessment of compliance with long term extraction limits.

We monitor water availability conditions and forecasts and make Available Water Determinations (AWD). We use this information to credit bulk and private water users' accounts in accordance with the AWD.

We are responsible for implementing water management plans and ensuring users comply with those plans.

The drought has required us to increase our work on how remaining supplies are managed. We signal worsening conditions and identify increased drought measures to prioritise water for critical needs, including making and implementing temporary water restriction orders.

In the 2021 regulatory period we plan to introduce greater sophistication in AWD analyses and we will engage with water users to better provide useful information to meet their changing information needs.

We propose to complete development and commence a WSP implementation program under Section 51 of the *Water Management Act 2000*, to provide rigour, transparency and accountability across WSP implementation activities conducted by each of DPIE Water, WaterNSW and NRAR.

Stakeholders asked for monitoring they can trust and improved information available to customers. This has become more important through the drought and we have increased consultation across agencies on drought management and with water users and communities on both actions being undertaken and the need for water users to develop contingency arrangements.

We propose to spend a total of $11.0 million[44] in the 2021 regulatory period on this activity, an annual average of $2.8 million. The proposed annual average represents a decrease of 4% from the $2.9 million we spent on average annually so far during the 2016 regulatory period and is 2% higher than the amount IPART used when determining WAMC prices in 2016, as set out in Table 17.

Statutory basis for service

Implementation and operation of equitable and sustainable water sharing under:

- *Water Management Act 2000*
    - Chapter 2 Water management planning
        - Implementation planning

[44] All expenditures are expressed in $2020-21 and are described in the Administrative Information paper accompanying this paper.

        - Amendment of plans
    - Chapter 3 Water management implementation
        - Available water determinations
        - Metering
        - Dealings (trade)
    - Access Licence Dealings Principles Order
        - Dealings (trade)
    - Water sharing plans, Limits to the availability of water, provide the statutory basis for water allocations, usually Part 7 (regulated river), or Part 9 (groundwater).
    - General resourcing required for input into operational policies and procedures.

- *Water Act 2007 (Commonwealth):*
    - Basin Plan 2012
    - Water trading rules

- *Snowy Hydro Corporatisation Act 1997*
    - Part 5
    - Management of the Snowy Water Licence

Stakeholder views

We reviewed stakeholder feedback over the 2016 regulatory period and found that two of the four key themes identified were that customers want:

- monitoring they can trust, and that a 'robust, accurate and reliable water monitoring system is supported and expected by customers'[45]
- improved information available to customers. Customers want more information about water management, which is accurate and easy to access.[46]

The feedback received shows that customers expect a higher level of service from activities such as this one, and lists some specific work that could be undertaken to do so, including better connectivity in planning, more public reporting, more information provided and improved timeliness of information being provided.

Historic service 2016-17 to 2019-20 (4 years)

Service description and benefits

Available water determinations

We monitor water availability conditions and forecasts, determining volumes for allocation, and arranging for bulk and private water users' accounts to be credited in accordance with the Available Water Determination (AWD) that we make. Once water is in water allocation accounts it can be ordered and used by owners.

We also prepare and disseminate information products, including meeting with water users to explain water availability, forecasts and rules for water sharing.

[45] KJA, DPIE IPART Price Submission - Stakeholder Engagement, Plain English Summary and final report, 27 February 2020, page 9
[46] KJA, DPIE IPART Price Submission - Stakeholder Engagement, Plain English Summary and final report, 27 February 2020, page 11

AWDs are made for all water sources in regulated, unregulated and groundwater systems

Water sharing plan implementation

We are responsible for implementing water management plans and operational oversight to ensure plan compliance.

WaterNSW operations compliance monitoring and reporting

We contribute to the legislative responsibility to monitor WaterNSW's compliance with their work approval conditions. Each year, as a condition of their work approvals, WaterNSW submits Annual Compliance Reports for review to NRAR. These reports detail compliance with the WaterNSW held work approvals across the state. We provide advice to NRAR regarding the compliance reports and whether the conditions of the work approvals are being met. This annual function is critical in the successful implementation of WSPs, to ensure that WSPs are being implemented effectively and as intended.

Assessment of compliance with long term extraction limits

We are responsible for assessing compliance with long term extraction limits set under water sharing plans. These assessments are scheduled to be completed annually in accordance with the method set out in the relevant water sharing plan. In the case of regulated rivers, it requires significant modelling resources (from activities W04-01 and W04-02.)

Groundwater local impact management

Groundwater local impact management involves setting up local impact zones in areas of high localised risk to groundwater quantity, quality or GDEs. Groundwater water sharing plans include specific provisions for local impact management. Where a local impact zone is established special rules can be applied including trading restrictions, and water level/quality triggers for extraction restrictions. We are responsible for the establishment and operation of these local impact management zones.

Drought management

The drought has required us to increase our work on how remaining supplies are managed. The updated Extreme Events Policy of 2018[47] set out our process for declaring Drought Stages to signal worsening conditions and the increased level of drought measures that may need to be applied to prioritise water for critical needs, including making and implementing temporary water restriction orders reducing or suspending some users access to water in their accounts or protecting environmental releases and first flush flows, suspending water sharing plans and cutting off lower section of rivers for regulated supply if needed.

The drought has also required increased levels of consultation across agencies on drought management and with water users and communities on both actions being undertaken but also the need for water users to develop contingency arrangements. We established Critical Water Advisory Panels across the state, a cross agency critical water technical advisory group, chaired a cross agency Water Security Working Group and provided representation to many state and regional drought committees and town water supply working groups. For stakeholders, we provided substantial additional communication material through our dedicated Drought Update website and held several drought roadshows across the state and provided follow up information on all issues raised[48].

[47] DPIE Water, 2018, NSW Extreme Events Policy Policy framework for the management of NSW Murray– Darling Basin water resources during extreme events. https://www.industry.nsw.gov.au/__data/assets/pdf_file/0008/187703/Extreme-Events-policy.pdf

[48] Communication material can be found at www.droughthub.nsw.gov.au

With the time frame for assessing groundwater applications being a significant issue, we play a coordinating role in ensuring that processes are streamlined as much as possible and turnaround times improved.

The drought team has also been facilitating a carting rebate scheme where regulated water supplies could not be delivered as required under the water sharing plans.

Operational consultation with stakeholders during the term of WSPs

We frequently consult with water users and other stakeholders while plans are in operation to discuss implementation issues and provide feedback on monitoring and possible future water availability. This service is requested by the stakeholders.

Service levels

The following table is a report against the output measures and performance indicators specified in the 2016 regulatory period. To date we have met our targets for submitting our Annual Compliance Review. After the first year of the 2016 regulatory period we have consistently delivered close to our target of 100% for timely issue of AWD.

Table 14. Output measures and performance indicators for the 2016 regulatory period for W05-01

	Output measures	Performance indicator
	Annual compliance review on WaterNSW work approval conditions. Available Water Determinations (AWD) issued. Target: • Regulated river: at least monthly AWD for all licence categories for all water sources • Unregulated river and groundwater: annual AWD for each water source	Annual compliance review on WaterNSW submitted within 3 months of receiving input data. Target: 100% timeliness for AWDs
Progress: Annual compliance review on WaterNSW work approval conditions.		
2016-17	Annual compliance review completed	Annual compliance review for 2015-16 submitted within 3 months of receiving input data
2017-18	Annual compliance review completed	Annual compliance review for 2016-17 submitted within 3 months of receiving input data
2018-19	Annual compliance review completed	Annual compliance for 2017-18 review submitted within 3 months of receiving input data.
2019-20	Annual compliance review underway	The 2018-2019 compliance review will be conducted in the first half of 2020. Not all Annual Compliance Reports have been received from WaterNSW.

	Output measures	Performance indicator
Progress: Available water determinations (AWDs)		
2016-17	AWDs issued: • Regulated river: at least monthly AWD for all licence categories for all water sources • Unregulated river - Annual AWD for each water source • Groundwater: Annual AWD for each water source	Timeliness of AWDs: Regulated 98%. Unregulated 65% Groundwater 53%
2017-18	AWDs issued: • to all regulated river, groundwater and unregulated river licence categories on 1 July 2017. • where a full allocation was not possible, conditions were monitored and allocations incremented as soon as water became available during the year. • over 1,400 AWDs were determined in 2017-18.	Timeliness of AWDs: Regulated 100%. Groundwater 100% Unregulated 100%
2018-19	AWDs issued: • to all regulated river, groundwater and unregulated river licence categories on 1 July 2018 • where a full allocation was not possible, conditions were monitored and allocations incremented as soon as water became available during the year. • over 1,600 AWDs were determined in 2018-19	Timeliness of AWDs: 95%
2019-20	AWDs issued: • to all regulated river, groundwater and unregulated river licence categories on 1 July 2019. • where a full allocation was not possible, conditions were monitored and allocations incremented as soon as water became available during the year. • over 1,600 AWDs were determined in 2019-20	Timeliness of AWDs: Regulated 95%. Groundwater 95% Unregulated 95%

Available water determinations

All AWDs were made in accordance with the rules in respective water sharing plans and published. For the opening State-wide allocations on 1 July, involving over 1,000 allocations, a spreadsheet is provided to WaterNSW to allow efficient automated upload to its accounts system.

The process for entering 2016-17 AWDs for unregulated river and groundwater AWDs was a manual time-consuming process with a large number of water sources. Improved processes that reduced data handling and risk of errors, and automated upload to systems were implemented for 2017-18 onwards to achieve 100% of AWDs being implemented within weeks.

In addition, water availability outlooks were provided in the NSW Murray and Murrumbidgee valleys in 2016-17 and in most valleys in 2018-19 to assist water users to plan their seasons.

Our work on AWDs consumes a large proportion of the expenditure for activity W05-01.

Water sharing plan implementation

Around 20% of our expenditure under activity W05-01 is directed towards preparing and implementing procedures and systems required to deliver the provisions of water sharing plans. We have commenced development of a WSP Implementation Program under Section 51 of the *Water Management Act 2000* to provide necessary coordinated oversight and management of implementation activities. Previous approaches based on individual WSPs were under-resourced, and this, combined with limited state-level oversight, meant we did not implement key WSP provisions in an effective and timely way.

The program will consist of several theme-based implementation plans aligned to WSP strategies, with each theme coordinating relevant activities across all WSPs. We will report on progress against anticipated schedules annually. We propose to commence development of the individual theme implementation plans in the regulatory period commencing in 2021. Without additional resourcing for this activity, plan development cannot be completed and the program scope and commencement will be restricted.

Systematic implementation of WSPs must be given ongoing high priority in order to meet our obligations under the *Water Management Act 2000.* Specific areas we must address include provision implementation, metering, assessment of annual and long term take against plan limits, environmental water governance, licence conditioning, compliance activities, performance indicator monitoring, objective based evaluation, and progress reporting. Activity W05-01 contributes to the structured and full implementation of WSPs by providing oversight of implementation governance and annual progress reporting.

WaterNSW operations compliance monitoring and reporting

This is an ongoing annual function that DPIE Water have completed during each year of the 2016 regulatory period. Since 2018, NRAR has been responsible for granting and managing approvals required by state owned corporations, including WaterNSW, however, within activity W05-01, DPIE Water still provides essential technical input and review functions.[49] Under their water supply work approvals, WaterNSW submit Annual Compliance Reports for review to NRAR that detail compliance against the conditions detailed in the work approvals. DPIE Water review these compliance reports, assess whether the conditions of the work approvals were met, and provide advice to this end back to NRAR.

This activity consumes only a small portion of DPIE Water expenditure for activity W05-01.

[49] This submission covers the activities of both DPIE Water and NRAR. DPIE Water undertakes the functions of activity W05-01. The related work undertaken by NRAR is included in activity W08-03 and by WaterNSW in W10-02

Assessment of compliance with long term extraction limits

Assessment of compliance with long term extraction limits in regulated river systems has occurred irregularly, rather than annually as stated in the water sharing plans, largely due to data unavailability. The data required to assess compliance, such as user behaviour, current infrastructure development and cropping practices, is not updated or made available at sufficiently regular intervals.

In unregulated rivers, with the exception of the Barwon-Darling, the lack of comprehensive metering of extractions hinders compliance with long term extraction limits. Implementation of the non-urban metering framework[50] under 2018 changes to the *Water Management Act 2000*, requires improved standards for and coverage of water meters across NSW, with licensed water users required to have accurate, tamper-proof meters. As that metering framework is implemented, our assessment of compliance with long term extraction limits will be more feasible and accurate.

Assessment of compliance with groundwater extraction limits has been completed in accordance with the water sharing plans for all groundwater sources.

Our program management and quality assurance of a new metering Data Acquisition Service will ensure that fit for purpose take information will be captured, managed and available to assess compliance. The design, administration and review of captured information will support the management of surface water and groundwater take.

Groundwater local impact management

We currently have local impact management zones in place at three locations in NSW to manage local extraction concentration risks. Trading of water extraction rights into these zones is limited so as to prevent excessive local drawdown of groundwater.

Drought management

In 2018-19, and particularly during 2019-20, in response to the current unprecedented drought, we implemented numerous Section 324 temporary water restriction orders to restrict water take on rivers to protect water for critical needs. We also imposed a temporary water restriction order within the Upper Namoi Zone 11 Groundwater Source, upstream of Elfin Crossing on Maules Creek. This aquifer is highly connected to Maules Creek, and restricting take from this groundwater source limits draw of water from that river. When placing these orders, we spend time and effort in consultation with partner agencies and communicating the restrictions to stakeholders.

Operational consultation with stakeholders during the term of WSPs

We are invited annually to groundwater user group meetings in various locations around the state to present updates on water level monitoring and likely future available water. In the inland most other consultation was subsumed in the consultation for water resource plan development (where this was Commonwealth funded the costs are not included here).

Forecast service 2020-21 to 2024-25

This covers the last year under the 2016 regulatory period and the 4 years of the 2021 regulatory period.

Service levels

During the 2016 regulatory period, WSPs for the whole state were finally completed and many WSPs are in the second ten-year phase. We intend now to put greater emphasis on more effective implementation of plans and reporting as this has been a recognised area of shortfall. This

[50] Information on the non-urban metering framework can be found at https://www.industry.nsw.gov.au/water-reform/metering-framework

includes making and publishing WSP implementation programs and annual reports, as specified in the *Water Management Act 2000* and improving implementation of some specific WSP provisions.

Available water determinations

AWDs will continue in accordance with WSP requirements. To improve our performance, we plan to introduce:

- greater sophistication in AWD analyses using contemporary research and innovative techniques to improve reliability of assessments and forecasts, reduce conservatism, reduce risk of shortfalls and maximise return from the use of water and
- better provision of useful information through closer engagement with water users to understand their changing information needs and to help them to better understand their water availability situation and outlook so as to inform their business decisions including opportunities to engage in water markets.

WaterNSW operations compliance monitoring and reporting

We will continue to work with NRAR as the licensor to review annual compliance reports from WaterNSW and to better address any areas of non-compliance.

We propose to review and refine reporting templates to ensure consistency in reports across NSW, and ensure they meet minimum reporting standards. This will introduce efficiency and rigour in the annual compliance reporting undertaken by WaterNSW, including review of Works Approval Conditions. Non-compliance will be better addressed with more consistency and rigour in compliance reviews.

Assessment of compliance with long term extraction limits

We will continue to assess compliance with long term extraction limits set under water sharing plans and required under the *Water Management Act 2000.* These assessments are scheduled to be completed annually in accordance with the method set out in the relevant water sharing plan.

In the case of regulated rivers, significant modelling resources are necessary. Where extraction levels exceed the Long Term Average Annual Extraction Limit (LTAAEL), we will adjust the available water determination according to the rules in the relevant water sharing plan. These assessments are also used for reporting on compliance against sustainable diversion limits (SDLs) under the Basin Plan.

With floodplain harvesting take to be included in the licensing framework and assigned a volume, we expect some northern basin valleys to exceed LTAAEL. There is strong community expectation that LTAAEL will be used to ensure that water take is within sustainable limits, and that measures are used to manage it. We are currently scoping a pilot project to complete a LTAAEL for the regulated Gwydir River, and subsequently roll out to other areas. To improve efficiencies, we are developing a risk-management framework to update only current condition models where certain triggers are reached that indicate trends toward LTAAEL being exceeded.

In future we will begin to use water use data from the new metering framework as it becomes available, along with remote sensing information, to obtain a more accurate assessment of compliance against the LTAAEL and SDLs for unregulated rivers. This will represent a significant improvement in reporting against LTAAEL and SDLs in unregulated rivers across NSW.

In unmetered areas, we will assess LTAAEL compliance based on user behaviour, current infrastructure development and cropping practices from data captured in log books, and via remote sensing of active irrigation in unregulated water sources.

Groundwater local impact management

The current local impact zones will continue in operation, and we will establish further zones if necessary.

Drought management

Given forecasts for ongoing dry weather beyond 2019-20, we anticipate that a sustained level of support will be needed for drought management activities in inland and coastal rivers, particularly stakeholder engagement, and the issuing of Section 324 Temporary Water Restriction Orders.

We will:

- compile 'lessons learnt' documents and up-date valley-scale incident response guides and the NSW extreme events policy, which will enable greater clarity in making decisions for the current and future droughts
- continue to facilitate carting rebates, which are still required in the most drought affected area and
- support the groundwater application process, with a focus on securing Town Water Supplies where the risk of lost water access is highest.

Water sharing plan implementation program

We propose to complete development and commence a WSP implementation program under Section 51 of the *Water Management Act 2000,* to provide rigour, transparency and accountability across WSP implementation activities conducted by each of DPIE Water, WaterNSW and NRAR.

The program will consist of an overview document and a series of theme-based implementation plans stating how activities will be implemented on a state-wide basis and for each WSP. We will make a summary of these plans publicly available and aim to identify WSP specific rules to manage local issues. It will include a register of WSP plan amendments and adaptive management clauses and describe the anticipated extent of implementation activities and associated standards.

We will finalise the implementation program development during the regulatory period commencing in 2021. The next 12 months will focus on the development of the overarching implementation program, and appropriate templates for reporting purposes.

Once the program commences, we will review it each year to take account of changes to any WSPs and experience in implementation and publish annual reports for each theme and for the overall program.

Regular comprehensive implementation reporting is a critical gap that limits our ability to demonstrate we are effectively managing the state's water resources. Effective implementation is the foundation for WSP success and a fundamental component in WSP objectives-based evaluation.

Annual implementation reports will inform:

- NRC WSP implementation audits under Section 44 of the *Water Management Act 2000,*
- NRC WSP evaluations under Section 43A of the *Water Management Act 2000 and*
- five-year reviews of the work and activity of DPIE Water under Section 10 of the *Water Management Act 2000*

Operational consultation with stakeholders during the term of WSPs

We plan to improve operational consultation with WSP stakeholders across the state. This consultation will be supported by the published annual implementation program reviews mentioned above and will typically occur annually with key stakeholders in each area, though the frequency will vary depending on the issues and the level of stakeholder concerns. This will support more effective plan implementation and make plan evaluation and review more efficient.

Unregulated river cease to pump operations

This activity involves development and implementation of a communication system to ensure water users on unregulated river systems are aware of whether pumping is prohibited due to very low

flow in gauged unregulated river water sources. Currently, there is no system in place that allows users to easily access this information.

The following table sets out output measures and performance indicators for the 2021 regulatory period.

Table 15. Output measures and performance indicators for the 2021 regulatory period W05-01

Output measure	Performance indicator
Annual review of WaterNSW Annual Compliance Review report against work approval conditions.	Annual compliance review on WaterNSW submitted within three months of receiving input data
Implementation programs prepared and implemented progressively for all WSPs by the end of the 2021 regulatory period.	Completed implementation programs published Annual reports published for all completed implementation programs
Assessment of compliance with long term extraction limits as specified in WSPs.	Compliance with LTAAEL assessed annually in accordance with rules set out in respective WSPs
AWDs issued for all WSPs at the commencement of the water year For regulated rivers at least monthly AWD review assessments for all licence categories for water sources (until full allocation reached).	AWDs published on our website within 1 week of being made Timeliness of AWDs: • Target: 100%

Operating expenditure

The cost of systems operation and water availability management relates to the staff time working on each water type and the operational complexity of the pricing water source for the activity.

For the first two years of the 2016 regulatory period and 2019-20, our actual expenditure exceeded the amount IPART used when determining WAMC prices in 2016. Over the four year period we spent 6% more than the amount IPART had used for this group of activities when setting WAMC prices in 2016. This level of expenditure reflects the larger than forecast workload.

Specifically, this was due to a significant increase in drought-related assessments. In particular, matters related to providing technical assessments on groundwater trades (both permanent and temporary), basic landholder rights applications for groundwater, assessment of new groundwater applications, and bore constructions, along with other matters such as advising on groundwater licences which are part of integrated development assessment processes. Resourcing for these issues has increased since the start of the reporting period, due to the NSW Government making additional contributions, as the drought has worsened. During this period there has also been an average of 15 meetings with water user groups per year. Much of the work involves assessing impacts of bores on groundwater levels and neighbouring bores. The table below shows the number of applications received per category from July 2018 until September 2019:

Table 16. Number of applications received per category

Category	Number received
Basic landholder rights	418
New bores	266
Permanent trade	89
Temporary trade	1,162
TWS bores	79
NRAR enquiries	297

Commencing in 2018-19 and continuing into 2019-20, an increase in activity related to development and scoping of implementation programs for water sharing plans became a growth area of work, and will be a feature of this activity for the 2021 regulatory period.

As the drought worsened across NSW, particularly in 2018-19 and 2019-20, we faced a greater workload due to an increase in the requirement to issue water restrictions under s324 of the *Water Management Act 2000* to restrict water take to provide water for critical needs

We propose expenditures broadly in line with expenditures used by IPART when setting WAMC prices in 2016 to allow us to:

- develop an implementation program, theme-based implementation plans and annual implementation reporting for WSPs to allow transparent reporting on WSP activities, which has been identified as a failure by stakeholders and MDBA, and to meet obligations under section 51 of the *Water Management Act 2000*,
- produce annual implementation reports will allow these to be collated and provided to the NRC for their 5-year audits of WSPs. This work will also feed into Basin Plan schedule 12 reporting requirements.
- provide a greater level of sophistication and better customer service on available water determination announcements and
- set up a communications system for cease to pump announcements in unregulated rivers.

We propose to spend $11.0 million[51] in the 2021 regulatory period on this activity. Average annual expenditure in the 2016 regulatory period of $2.9 million is slightly over the average annual amount of $2.7 million used by IPART when setting WAMC prices in 2016. Our actual operating expenditure of $11.5 million between 2016-17 and 2019-20 has been boosted by external funding of $1.3 million. We propose to spend an average annual amount of $2.8 million in the regulatory period commencing in 2021. This is set out in the following table.

[51] All expenditures are expressed in $2020-21 and are described in the Administrative Information paper accompanying this paper.

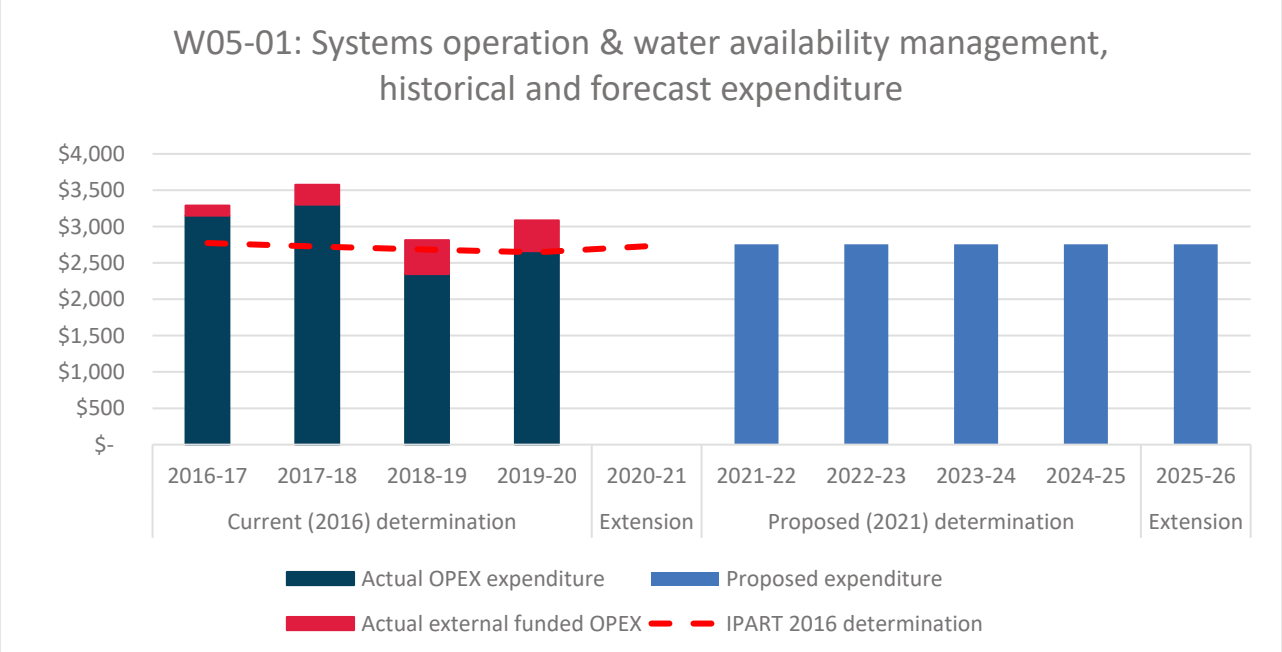
Table 17. Expenditure on systems operations and water availability management W05-01 ($2020-21 $000)

Cost	2016 regulatory period				Extension	2021 regulatory period				
	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
IPART'S 2016 final report	2,774	2,725	2,684	2,646	2,729					
Actual DPIE Water operating expenditure	3,150	3,303	2,346	2,662						
Actual externally funded operating expenditure	139	272	467	424						
Actual externally funded capital expenditure	0	0	0	0						
Proposed DPIE Water operating expenditure						2,755	2,755	2,755	2,755	2,755

Notes: IPART's 2020–21 figure has been provided by IPART; actual operating expenditure is net of externally funded operating expenditure; DPIE Water's 2019–20 actual costs are 12/10 x actual costs for the 10 months to April 2020 and NRAR's 2019-20 actual costs are 12/11 x actual costs to May 2020; 2020–21 actual costs are unknown; 2025–26 costs are provided as required by IPART; please also refer to the Administrative Information document that is part of this submission.

This information is also set out in the following graph.

Figure 10. Expenditure on systems operations and water availability management W05-01 ($2020-21 $000)



W05-03 Environmental water management

This activity comprises development and collaborative governance of environmental flow strategies and assessments; and the use of environmental water to achieve environmental outcomes.

Water for the environment is set aside to support the long-term health of local rivers, creeks and wetlands. Rivers and wetlands are important cultural and spiritual sites for indigenous people.

We ensure that conditions are imposed on work approvals for major dams to implement environmental watering plans and to mitigate cold water pollution impacts on receiving waters.

We are responsible for determining Snowy Hydro environmental flow releases. In determining how to use the environmental water recovered for the Snowy River through the Snowy Water Initiative[52], the NSW, Victorian and Commonwealth Governments agreed that ecological objectives would be achieved by storing and then releasing sufficient volumes to provide annual flushing flows.

Throughout the 2021 regulatory period we will continue to improve the structural governance of environmental water management in NSW, which will deliver a more effective and coordinated effort across government agencies managing water in NSW.

In accordance with the direction by the Murray Darling Basin Authority we will be transitioning to Prerequisite Policy Measures for the operation of environmental water planning over the 2021 regulatory period. Due to the risks and complexity in the new arrangements, an ongoing adaptive management approach is required to allow implementation arrangements to evolve and improve over time.

We will continue to implement the significant environmental water work program that the Department commenced following the Matthews *Independent Investigation into NSW Water Management and Compliance* in 2017, focusing on better management of environmental water in the northern NSW Murray Darling Basin. The critical nature of this work has been reinforced by the *Independent Assessment of the 2018-19 fish deaths in the lower Darling* (March 2019)[53] led by Professor Robert Vertessy and the 2019 Natural Resources Commission review of the *Water Sharing Plan for the Barwon-Darling Unregulated and Alluvial Water Sources 2012*[54]. Both these reviews highlighted the need to protect low flows and improve connectivity in the northern Basin for the environment and downstream water users.

Stakeholders also asked for improved accountability for water management systems and more accurate and accessible information about water management.

In our environmental water management work, we are responding to stakeholder views by operating collaboratively and sharing significant information with the public to improve our accountability for decision-making processes[55].

We propose to spend a total of $4.5 million in the 2021 regulatory period on this activity, an annual average of $1.1 million. The proposed annual average represents an increase of 141% from the $469,000we spent on average annually so far during the 2016 regulatory period and is 8% higher than the amount IPART used when setting WAMC prices in 2016, as set out in Table 20.

[52] More information on the Snowy Water Initiative is available at https://www.industry.nsw.gov.au/water/basins-catchments/snowy-river/initiative
[53] Vertessy et al.Independent assessment of the 2018-19 fish deaths in the lower Darling – Final Report, 2019
[54] Sheldon, Fran for the NSW Natural Resource Commission Technical Review of the Water Sharing Plan for the Barwon-Darling Unregulated and Alluvial Water Sources 2012, 2019
[55] KJA, DPIE IPART Price Submission - Stakeholder Engagement, Plain English Summary and final report, 27 February 2020, page 11

Statutory basis for service

Under the *Water Management Act 2000:*

- section 8 provisions related to environmental water requirements
- changes to individual water sharing plans to improve environmental water management

Water Act 2007 (Commonwealth)

- environmental and supply considerations in section 14
- Schedule F effect of Snowy Scheme of Schedule 1 in the Murray Darling Basin Agreement

Stakeholder views

We reviewed stakeholder feedback over the 2016 regulatory period and found that two of the four key themes identified were that customers want:

- improved accountability for water management systems, which it says means "having strong evidence for its decisions and ensuring that evidence is available to and able to be understood by its customers."[56].
- improved information available to customers. Customers want more information about water management, which is accurate and easy to access.[57]

The feedback received shows that customers expect a higher level of service from activities such as this one, and lists some specific work that could be undertaken to do so, including better connectivity in planning, more public reporting, more information provided and improved timeliness of information being provided.

In our environmental water management work, we are responding to the views stakeholders have shared by building on the mechanisms that have been put in place by the NSW and Commonwealth Governments to protect environmental water, operating collaboratively and sharing significant information[58] with the public to improve our accountability and information that is available, so that stakeholders can see the evidence that is being used along with the decision-making processes.

Historic service 2016-17 to 2019-20 (4 years)

Service description and benefits

Collaborative management of environmental water

The *Water Management Act 2000* defines broad types of environmental water: planned environmental water, adaptive environmental water, licensed environmental water, and licences used for environmental purposes (that is, held environmental water). Water for the environment is set aside to support the long-term health of local rivers, creeks and wetlands. Rivers and wetlands are important cultural and spiritual sites for indigenous people.

We work in collaboration with DPIE Environment Energy and Science (formerly OEH) to manage environmental water that is the responsibility of the NSW government. This activity only covers the work undertaken by us; costs of work by DPIE Environment Energy and Science are not included.

DPIE Environment Energy and Science manages the NSW Government's adaptive, licensed and held environmental water portfolio, and shares responsibility with us for managing the planned

[56] KJA, DPIE IPART Price Submission - Stakeholder Engagement, Plain English Summary and final report, 27 February 2020, page 11
[57] KJA, DPIE IPART Price Submission - Stakeholder Engagement, Plain English Summary and final report, 27 February 2020, page 11
[58] KJA, DPIE IPART Price Submission - Stakeholder Engagement, Plain English Summary and final report, 27 February 2020, page 11

environmental water. We contribute to the development of annual watering plans for five catchments (Gwydir, Lachlan, Macquarie-Castlereagh, Murray and Lower Darling and Murrumbidgee) in which water is actively managed for the environment. These plans are based on advice received from Ministerially appointed Environmental Water Advisory Groups (EWAGs) which include DPIE Water representatives. The plans outline the environmental watering priorities for the coming year depending on climatic factors and water availability.

We ensure that conditions are imposed on work approvals for major dams to implement environmental watering plans and to mitigate cold water pollution impacts on receiving waters.

We also chair the Interagency Group that supervises implementation of the NSW Cold Water Pollution Strategy 2011[59].

Snowy environmental flows

We are responsible for administering the Snowy Water Licence under which Snowy Hydro environmental flow releases are determined.

These releases occur as a result of the Snowy Water Initiative of the NSW, Victorian and Commonwealth Governments. In determining how to use the environmental water recovered for the Snowy River through the Snowy Water Initiative, the combined governments agreed that ecological objectives would be achieved by storing and then releasing sufficient volumes to provide annual flushing flows. We expect that as the river physically responds over time to the higher flows, the focus of the recovery process will transition to meet other ecological objectives.

In 2018 some aspects of this work were transferred to the then OEH (now DPIE Environment Energy and Science.) While we remain responsible for many aspects of the environmental flow releases, including communications, DPIE Environment Energy and Science is now responsible for designing release patterns for the water that will deliver optimum environmental outcomes, monitoring and reporting on environmental watering and administering the Snowy Advisory Committee to advise the government on Snowy environmental outcomes. We also continue to work with DPIE Environment Energy and Science to investigate improvements in delivery of Snowy River increased flows and River Murray increased flows and implement the recommendations of the 10-year Snowy Licence Review[60As above]. We are still responsible for all aspects of licence administration. This includes implementing the recommendations of the recent review, as well as establishing a best practice management framework for licence administration, review of the flow releases, and administrative amendments.

Service levels

The following table reports against the output measures and performance indicators set out in IPART's final report in 2016. In the years for which we were responsible for delivery of Snowy River and Snowy Montane River increased flows we met or exceeded the target in each year, except for 2018-19 where a rusty valve at the dam caused extra days where flows were off-target.

[59] NSW Cold Water Pollution Strategy 2011 available at http://www.water.nsw.gov.au/__data/assets/pdf_file/0010/547714/quality_cold_water_pollution_strategy_report_stage_one.pdf

[60] Ten-year review of the Snowy water licence - Final Report, 2018 is available at https://www.industry.nsw.gov.au/water/basins-catchments/snowy-river/corporate-licence/review

Table 18. Output measures and performance indicators for the 2016 regulatory period W05-03

Progress	Output measures	Performance indicator
	Delivery of Snowy River and Snowy Montane River increased flows. Conditions on major dam work approvals to implement environmental watering plans and to mitigate cold water pollution impacts on receiving waters. Monitor and evaluate water resource plans to determine environmental outcomes.	Percentage of occasions that Snowy River and Snowy Montane River daily flow target achieved. Target: 98% of occasions.
2016-17	Snowy River and Snowy Montane River increased flows were released Conditions are on works approvals to mitigate the impacts of cold water pollution A new framework for setting environmental objectives and evaluating water sharing plans was developed under Activity W05-04.	In 2016-17, the flows achieved a 99.5% compliance rate against the daily flows for the Snowy Increased Flows (only 2 days non-compliant out of 365)
2017-18	Snowy River and Snowy Montane River increased flows were released Conditions are on works approvals to mitigate the impacts of cold water pollution. A monitoring program to assess the effectiveness of the floating curtain at Burrendong (in addressing cold water pollution) is ongoing. Monitoring of cold water pollution impact and control sites commenced in most inland river valleys.	In 2017-18, the flows achieved a 98.5% compliance rate against the daily flows for the Snowy River Increased Flows (only 5 days non-compliant out of 365).
2018-19	Snowy River and Snowy Montane River increased flows were released Conditions are on works approvals to mitigate the impacts of cold water pollution.	In 2018-19, the flows achieved a 96% compliance rate against the daily flows for the Snowy River Increased Flows.
2019-20	Snowy River flow reporting transferred to DPIE Environment Energy and Science (EES)* Conditions are on works approvals to mitigate the impacts of cold water pollution.	Snowy River flow for 2019-20 will be reported by DPIE Environment Energy and Science (EES)*

Note: DPIE EES is the state's environmental water manager, and manages the portfolio of held environmental water and planned discretionary environmental water. In recognition of this important role, and to be consistent with its management throughout the rest of NSW, the role of designing the Ewater releases was transitioned across to DPIE EES in 2019-20. DPIE Water has continued to work closely with DPIE EES to ensure that the releases are compliant with the daily flows for the Snowy River Increased Flows. A Snowy Advisory Panel (consisting of community stakeholders) has also been set up to guide decision making on future releases. DPIE Water is continuing to manage the day to day operational aspects of the licence, as well as implementing the recommendations of the recent licence review.

Collaborative management of environmental water

Our work on collaborative management of planned environmental water included:

- representation on EWAGs,
- review of OEH/EES annual reports: use of water for the environment in NSW,
- collaboration with OEH/EES on long-term water pollution development,
- representative on the Southern Connected Basin Environmental Water Committee,
- development of protocols for active management of held environmental water in the northern basin, particularly in the Barwon-Darling, lower Macquarie, and lower Gwydir valleys and
- developing, gazetting and announcing temporary water restriction orders to protect environmental water moving downstream, in conjunction with NRAR and WaterNSW.

Snowy environmental flows

We continued to administer the Snowy water licence, including:

- technical investigation/review of water release provisions,
- set-up and administration of Technical Working Group,
- review and update regulatory policies and procedures for licence administration,
- set-up and administration of Snowy Water Government Officials Committee and
- auditing of compliance.

We set the targets for release of environmental water in the Snowy River and the Snowy Montane Rivers until this function was in 2018 transferred to OEH (now DPIE Environment Energy and Science), and they were achieved to a very large degree by Snowy Hydro. We are still in the process of compilation and transfer of data and process knowledge to DPIE Environment Energy and Science to enable them to fulfil this function with the guidance of our ecohydrologists. Most of this work is now complete, with the only outstanding issue being the finalisation of an agreed project plan.

We conducted a statutory 10-year review of the Snowy water licence that concluded in December 2018. Details are available on our website.[61] The review recommended initial changes to the licence to address identified administrative improvements, followed by a program of investigations into how to improve environment water releases leading to further licence amendments.

We have also evaluated the environmental benefits of the Snowy River Increased Flows, monitoring thermal pollution, aquatic insect responses and geomorphic channel changes since the large flushing flows began in 2011. This information was used to undertake the review of the Snowy Water Licence.

Improved management of environmental water

The NSW and Commonwealth Governments have invested significant public funds in recovering water for the environment (referred to as held environmental water or 'HEW'). This held environmental water is used to achieve outcomes of the Basin-wide environmental watering strategy[62] and long-term water plans[63].

The community expects that HEW recovered for environmental purposes will reach its intended destination and achieve the expected environmental outcomes. This includes benefits in rivers and floodplains within and between valleys in NSW.

In 2017 a number of reviews were undertaken, including the Murray-Darling Basin Water Compliance Review and Ken Matthews' *Independent Investigation into NSW Water Management and Compliance*.[64] These reviews made recommendations for improving water management and compliance in NSW and highlighted the need to better manage environmental water in the northern Murray-Darling Basin.

In response to these recommendations the NSW government developed the Water Reform Action Plan and created the Water Renewal Taskforce to deliver key outcomes related to transparency, metering and environmental water.

The Water Renewal Taskforce established an Interagency Working Group in February 2018 with New South Wales and Commonwealth agency representation, to develop options on how the NSW

[61] Available at https://www.industry.nsw.gov.au/water/basins-catchments/snowy-river
[62] MDBA, Basin-wide environmental watering strategy available at https://www.mdba.gov.au/publications/mdba-reports/basin-wide-environmental-watering-strategy
[63] Long term water plans available at https://www.environment.nsw.gov.au/topics/water/water-for-the-environment/planning-and-reporting/long-term-water-plans
[64] Matthews, Ken, *Independent Investigation into NSW Water Management and Compliance* available https://www.industry.nsw.gov.au/__data/assets/pdf_file/0016/120193/Matthews-interim-report-nsw-water.pdf

Government can better manage environmental water in accordance with requirements of the *Water Management Act 2000.* It was the impetus for our involvement in the 2018 northern connectivity event in which 31 gigalitres was released from northern storages in a partnership between the Commonwealth Environmental Water Office and OEH. The flow travelled over 2,000 km through Bourke, Wilcannia and Menindee, helping refresh waterholes and provide connectivity to support native fish and other aquatic life.

In June 2018 the NSW Government released the *Better management of environmental water – Interim solutions* package and announced that the Government would progress these recommendations. In February 2019 (updated April 2019), we provided the MDBA with a detailed plan of the work to be completed to progress proposed solutions to better management of environmental water. These reports can be accessed on our website.[65] The work plan includes measures to:

- better understand connectivity in the northern Murray-Darling Basin,
- actively manage held environmental water,
- manage the resumption of flows in the Barwon-Darling River after an extended dry period and
- limit daily water take in the Barwon-Darling River.

Water is one of the State's most precious resources and the Water Reform Action Plan represents the most ambitious and significant change to the management of that resource since commencement of the *Water Management Act 2000*. The rollout of a State-wide metering framework, transparency of water information and the creation of a new independent regulator (the Natural Resources Access Regulator) represent a paradigm shift toward a better future for management of water in NSW.

The delivery of the 'better management of environmental water' program has shifted that paradigm even further. Enduring solutions are in place that will leave more water in the river at the right times, provide licence holders with clarity about when and how much water can be taken and better protect water for the environment. Resource Managers better understand the complexity of the Northern Murray-Darling Basin and can act appropriately based on the current scientific information.

Forecast service 2020-21 to 2024-25 (5 years)

This covers the last year under the 2016 regulatory period and the 4 years of the 2021 regulatory period.

Service levels

Collaborative management of environmental water

The recurrent work funded under the 2016 WAMC price determination will continue, including:

- contributing to the development of annual watering plans and delivery of adaptive and held environmental water, through the EWAGs,
- participating in EWAGs to aid decision making on environmental water management in each valley and
- ongoing management of the Interagency Group that supervises implementation of the NSW Cold Water Pollution Strategy.

[65] *Better management of environmental water – Interim solutions* package available at https://www.industry.nsw.gov.au/water-reform/better-management-of-environmental-water

We will continue to improve the structural governance of environmental water management in NSW, which will deliver a more effective and coordinated effort across government agencies managing water in NSW.

Snowy environmental flows

We will continue to lead the administration of the Snowy licence to implement the Snowy Water Initiative, though part of the function has been transferred to DPIE Environment Energy and Science. In particular, we have ongoing management of the licence, and will implement the recommendations of the 2018 Snowy licence review. This is a large body of work and includes:

- implementing a best management practice framework for the management of the Snowy licence and
- completing flow releases investigations, covering the more contentious issues of the licence review, with outcomes potentially impacting on irrigators in the Murray and Murrumbidgee as well as on Snowy Hydro Limited.

Improved management of environmental water

Although the Water Renewal Taskforce has ended, the reform and positive change has not. A dedicated team in the DPIE has taken on implementing and progressing the enduring solutions from the program as part of a broader NSW Government drive to improve the management of our natural resources. The effectiveness, appropriateness and efficiency of the new water sharing plan rules will also be evaluated as part of the regular review process for these plans. This information will be used to further adapt and improve water resource management efforts by the Government.

During the 2021 regulatory period, we will continue to implement activities of the Water Renewal Taskforce relating to improved management of environmental water. Significant areas of implementation include active management of held environmental water in the Barwon Darling, lower Macquarie, and lower Gwydir valleys in collaboration with other agencies. Other key activities include administering daily take limits, imposing temporary water restriction orders, and managing the resumption of flows in the Barwon-Darling River after an extended dry period.

Additionally, a significant volume of work is required to investigate options for improving connectivity between Northern Basin tributaries and the Barwon-Darling River, including implementing the North West Unregulated Flows Plan, and assessing options for the protection of environmental water from Queensland.

We will also manage the Environmental Water Hub established on our website to ensure it is kept updated and reflects contemporary management of environmental water.[66]

If this work is not undertaken there is a major risk of further deterioration of ecosystems. Significant resources have been used to develop these measures and there is a high community expectation that this work will be continued.

Implementation and adaptive management of prerequisite policy measures

Prerequisite Policy Measures (PPMs) are a mechanism to maximise the efficient use and outcomes of licensed environmental water, whilst maintaining the same reliability of water supply to consumptive users as at the establishment of the Basin Plan. PPMs enable the use of licensed environmental water at multiple sites (environmental flow reuse) and the opportunity to order licensed environmental water from a headwater storage during a natural flow event (piggybacking). This has the effect of greatly increasing the ability of the licensed environmental water to achieve environmental outcomes, thereby reducing the amount of water that would otherwise be sought to

[66] Available at https://www.industry.nsw.gov.au/water-reform/better-management-of-environmental-water

be transferred from consumptive use. Current Basin Plan sustainable diversion limits assume PPMs will be in place in the Murray and Murrumbidgee regulated river systems.

Delivering environmental water as required by the PPMs is a fundamentally new and complex way of managing and operating the State's river systems that came into effect on 1 July 2019.[67] They allow held environmental water to be used more effectively and flexibly, by letting it be used across multiple sites, and allowing water for the environment to be released on top of natural flow events. PPMs are guided by a number of principles to ensure that any potential detrimental impacts on the access rights of licence holders are mitigated or offset, whilst also enabling optimum environmental outcomes. Over the last few years, we led development of PPMs in the NSW southern Basin as a part of Basin Plan implementation, with funding from the Commonwealth. The development work included multi-site environmental watering trials in the Murray Valley and extensive consultation.

After development in the 2016 regulatory period, the MDBA has now determined that PPMs are in effect in NSW and that the requirements under Section 7.15 (2) of the Basin Plan have been met. Due to the risks and complexity in the new arrangements, an ongoing adaptive management approach is required to allow implementation arrangements to evolve and improve over time. This adaptive approach requires a rigorous process of review and evaluation including a reporting process to inform an annual analysis and evaluation of the PPM operations.

While the initial development was Commonwealth funded, ongoing implementation is a our water management responsibility to be funded through WAMC prices. This is particularly as if PPMs are not implemented, there is a risk that additional water would need to be recovered for licensed water holders for the environment. PPMs are applied during the operation of the SDL Adjustment Mechanism in the Basin Plan. Any increase to the sustainable diversion limit resulting from supply measures will be calculated by adding notified supply measures and removing any unimplemented PPMs from the benchmark conditions of development, while maintaining equivalent environmental outcomes and no detrimental impacts on reliability of supply of water to the holders of water access rights that are not offset or negated.

In developing the PPMs, the NSW government is discharging its obligations to implement water reform and deliver on the Basin Plan along with meeting NSW obligations under the *Water Management Act 2000* for to effectively and efficiently deliver environmental water for beneficial outcomes.

The following table sets out proposed output measures and performance indicators for the regulatory period from July 2021.

Table 19. Output measures and performance indicators for the 2021 regulatory period W05-03

Outputs	Output measure/ Performance indicator
Provision of advice to EWAGs to inform annual environmental watering priorities.	Input provided to 5 EWAGs each year.
Snowy license review implemented by 2021.	Report on implementation published on DPIE website.
Annual analysis and evaluation of the PPM operations.	Annual report on PPM implementation published on DPIE website.
Implementation of better environmental water management in the northern Basin	Annual progress report published on the environmental water hub on the DPIE Website.

Operating expenditure

Operating expenditure over the 2016 regulatory period, has been lower than the amounts used by IPART when setting WAMC prices in 2016, particularly in 2018-19. One factor in this is that the

[67] Available at https://www.industry.nsw.gov.au/water/basins-catchments/murray-darling/prerequisite-policy-measures

Interagency Working Group on Cold Water Pollution did not function for three years due to agency restructuring, although work recommenced in 2019-20. It is also because most work on improving management of environmental water has been funded by short term injections from alternative external funding sources, such as the National Partnership Agreement, which allowed development of the policies and processes that needed to be set up that programs for prerequisite policy measures (in the southern Basin) and better management of environmental water (in the northern Basin).

As a result of these injections and work completed to date, funding through WAMC prices is only required to support ongoing implementation and adaptive management requirements for the management of environmental water. So, whilst these programs were set up using other funding, they are now part of our water management activities' business as usual (as they enter their implementation phase) and therefore greater confidence in ongoing expenditure needs and expenditures is forecast.

We propose to spend $4.5 million[68] on this activity in the 2021 regulatory period. Average annual expenditure in the 2016 regulatory period is $469,000, augmented by an additional $4.6 million in funding from the Commonwealth in 2018-19 and 2019-20 (funding that will cease from 30 June 2020.) Our proposed expenditure of $1.1 million annually is 8% higher in real terms than the annual average amount IPART deemed prudent and efficient for this activity when setting WAMC prices in 2016. Expenditures are set out in the following table.

Table 20. Expenditure on environmental water management W05-03 ($2020-21 $000)

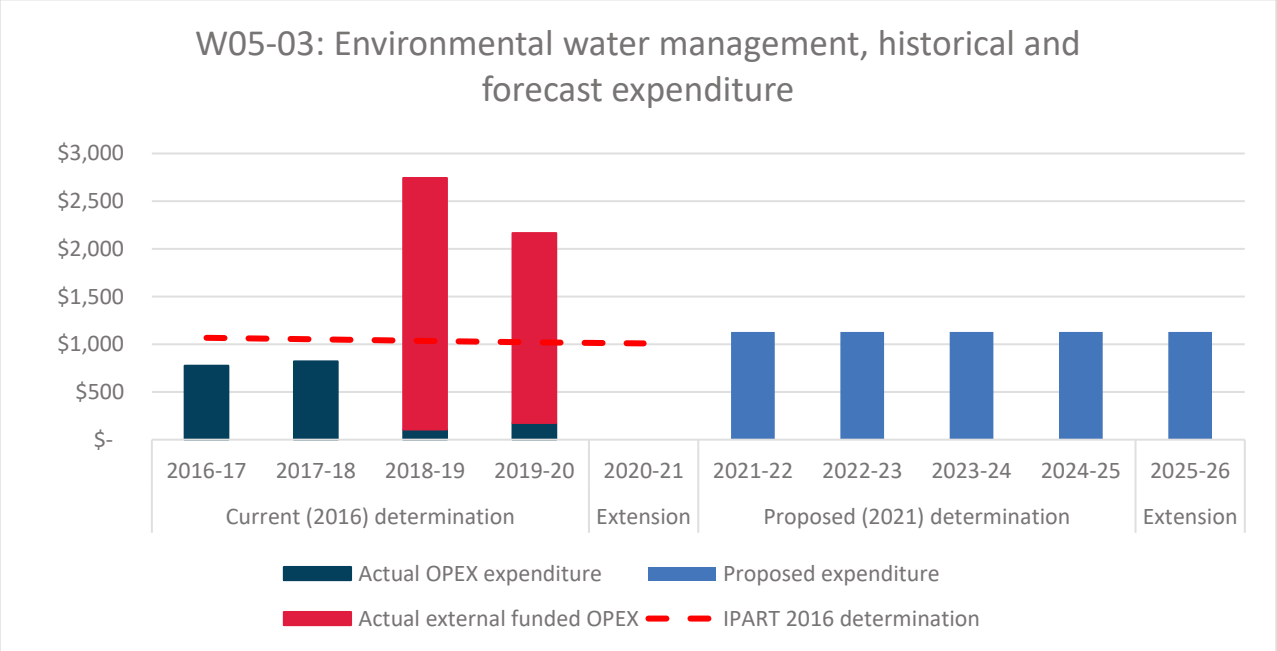
Cost	2016 regulatory period				Extension	2021 regulatory period				
	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
IPART'S 2016 final report	1,068	1,051	1,036	1,020	1,009					
Actual DPIE Water operating expenditure	775	820	107	176						
Actual externally funded operating expenditure	0	0	2,636	1,990						
Actual externally funded capital expenditure	0	0	0	0						
Proposed DPIE Water operating expenditure						1,129	1,129	1,129	1,129	1,129

Notes: IPART's 2020–21 figure has been provided by IPART; actual operating expenditure is net of externally funded operating expenditure; DPIE Water's 2019–20 actual costs are 12/10 x actual costs for the 10 months to April 2020 and NRAR's 2019-20 actual costs are 12/11 x actual costs to May 2020; 2020–21 actual costs are unknown; 2025–26 costs are provided as required by IPART; please also refer to the Administrative Information document that is part of this submission.

This information is also set out in the following graph.

[68] All expenditures are expressed in $2020-21 and are described in the Administrative Information paper accompanying this paper.

Figure 11. Expenditure on environmental water management W05-03 ($2020-21 $000



W05-04 Water plan performance assessment and evaluation

This activity comprises assessment, audit and evaluation of water management plan appropriateness, efficiency and effectiveness in achieving environmental, social and economic objectives.

Knowledge acquisition, knowledge update, environmental condition assessments and changes to environmental conditions (used to inform the update and development of plans or the understanding of plans) underpin this activity.

It is fundamental to our evaluation reporting commitments, providing a robust evidence base particularly in times of water scarcity, and assisting us to identify lessons that can be learned from implementation of water management plans.

We are forecasting a considerable increase in expenditure relative to historical expenditures, because we need to invest in a formalised socio-economic monitoring program, increase the number of evaluation reports produced, and complete risk assessments for coastal water sharing plans.

We propose to spend a total of $14.6 million[69] in the 2021 regulatory period on this activity, an annual average of $3.7 million. The proposed annual average represents an increase of 281% from the $962,000 we spent on average annually so far during the 2016 regulatory period and is 39% higher than the amount IPART used when determining WAMC prices in 2016, as set out in Table 26.

We have spent less in the 2016 regulatory period than the amount used by IPART when setting WAMC prices in 2016, because resources were supplemented with external funding from the Commonwealth to deliver Basin Plan activities, enabling monies to be allocated to other water management priorities. However, this redeployment of staff also meant that some services were

[69] All expenditures are expressed in $2020-21 and are described in the Administrative Information paper accompanying this paper.

not able to be completed as had been forecasted - evaluation reports were delayed and fewer were produced than had been targeted over the current period. We propose that more resources will be required for W05-04 from 2021, because we must increase the number of evaluation reports as well as needing to develop a formal socio-economic monitoring program.

Efficiency and effectiveness gains have been made which will be realised in the 2021 regulatory period because Commonwealth funding for implementing the Basin Plan has been used strategically to put in place systems, structures, processes and agreements that will contribute to more cost-effective monitoring, reporting and evaluation activities for future water sharing plan evaluation. For example, water sharing plan environmental objectives were significantly re-worked using external funding. When combined with the risk assessments completed for the water resource plan development process, the two provide a transparent framework for evaluation activities. This is because the risk assessment directs us to the most hydrologically stressed and environmentally valuable water sources, and the objectives clearly articulate what should be investigated there.

The risk assessments, objective evaluation process and identification process for performance indicators are significant pieces of work that each contribute to providing transparency, certainty, and rigour in future water sharing plan evaluation efforts.

We started using a request managing software, WAMS, in October 2018. Growth in requests for service we have received since then can be seen in the WAMS data, as set out in the following table.

Table 21. Servicing requests received by activity W05-04 between October 2018 and March 2020

	State significant development and state significant infrastructure work requests	Trades and bore approvals	WSP, WRP and others
October 2018 - June 2019	89	1167	354
July 2019 - March 2020	237	1673	467

Statutory basis for service

Performance monitoring and assessment of Water Sharing Plans (WSPs), Water Resource Plans (WRPs) and Regional Water Plans (RWPs) is required by:

- *Water Management Act 2000*
    - Section 43A(3) review to be undertaken by the NRC in considering whether a plan should be extended, based on its contribution to environmental, social and economic outcomes
    - Section 44 audits of WSPs (transferred to the NRC from 1 December 2018 under changes to the *Water Management Act 2000*, however we continue to provide ongoing support in providing data and information to the NRC for these audits) and
    - Division 3, Section 10 requirement for an evaluation every five years of the extent to which our activities have contributed to the Principles of the Act.
- *Water Act 2007 (Commonwealth)*
    - Schedule 12 of the Basin Plan sets monitoring, evaluation and reporting obligations for Basin States under the Basin Plan.

Stakeholder views

One of the key themes we identified in our review of our customer engagement over the 2016 regulatory period was a desire for improved information being made available to customers, including progress reports on the implementation of WSPs and WRPs. This confirms that customers expect a higher level of service in relation to the performance evaluation undertaken in W05-04. We share information that underpins our evaluations of plans and we propose to expedite reviews of plans over the 2021 regulatory period in a timeframe that allows all feedback to be incorporated into the next ten-year plans.

Critically and systematically examining how well our water management plans are meeting each plan's objectives allows us to adapt plans to ensure they are as effective as they can be. This aids in improving our accountability for our water management decisions, another priority for customers identified by our review.

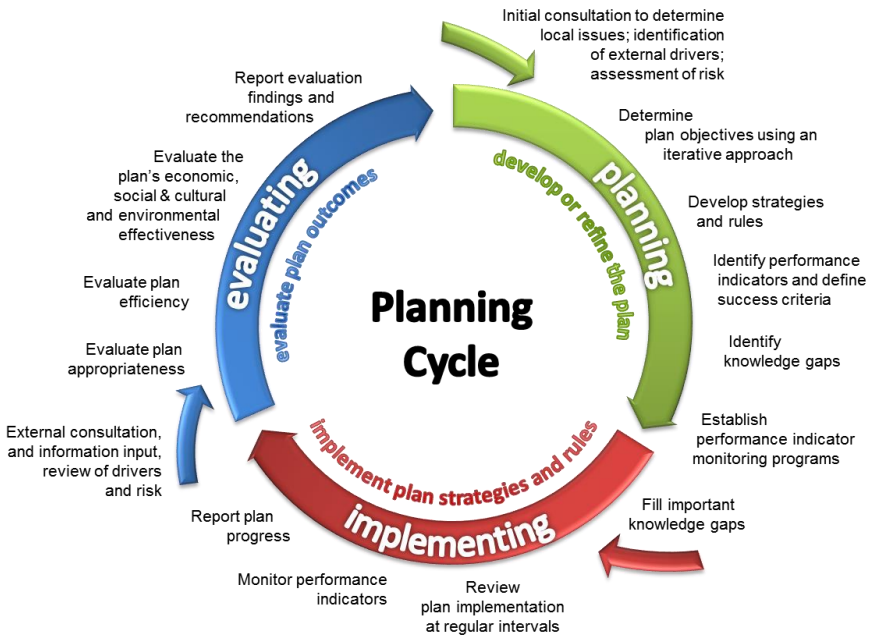
Historic service 2016-17 to 2019-20 (4 years)

Service description and benefits

WSPs contain rules and conditions that are designed to support environmental health, community water requirements and local economic prosperity. Each plan has a unique set of rules that are tailored to the local needs and conditions in a valley or groundwater source.

WSPs are reviewed every ten years to adapt to changes in knowledge and circumstances, and to improve their effectiveness and efficiency in achieving these objectives. These reviews are undertaken by the NRC under Section 43A of the *Water Management Act 2000*. We provide essential input to these NRC reviews through our plan performance, assessment and evaluation strategy, which is set out in the following figure.

Figure 12. Performance monitoring and evaluation steps during the planning cycle



The elements of our plan performance, assessment and evaluation strategy are:

- **ongoing review and improvement of plan objectives and performance indicators** – to improve their relevance and ability to be measured in a cost-effective manner,

- **development and review of monitoring programs to measure performance indicators** – major monitoring programs (e.g. surface water and groundwater quality and quantity monitoring) are reviewed in relation to their usefulness in assessing WSP performance, and other monitoring programs that contribute to assessing WSP performance (such as economic monitoring) are also addressed,
- **research and technical assessments to address knowledge gaps** – including high risk knowledge gaps identified during plan development and implementation, and essential technical assessments using the latest updated information,
- **risk assessments** – we prepare technical reports to identify risks that are likely to affect future plan performance,
- **evaluation reports for each WSP** – these reports pull together performance indicator information, risk assessment and research as well as relevant contextual, information and changes, to provide critical information to inform the NRC's reviews and WSP revisions and
- **WSP audits** - the formal s44 audit of WSP implementation, which was our responsibility until November 2018.

Much of the work done under this activity is focused on WSPs, and we are now entering a phase of evaluating and improving these plans given they are all complete and many are coming up for their ten-year review. WSPs are critical instruments for water resource management because they provide the long-term statutory basis for sharing water between the environment and water users, bringing together in one place agreed rules that provide water for the environment but also allow irrigators and other users to make long term business decisions. WSPs are adaptive documents, so the ten-yearly reviews bring them up to date in terms of what is known about water resources using current technology and modelling capabilities and allow us to make improvements reflecting our experience in developing plans over the past decade. Information generated from activities conducted under W05-04 are integral to our ability to evaluate the various plans' effectiveness, appropriateness and efficiency.

This activity also informs Basin Plan monitoring and reporting and will use monitoring information gathered for the Basin Plan. The implementation of these activities is currently in the developmental phase.

This activity contributes to activity W05-01 'System operation and water availability management' through development of implementation programs, and intersects with water plan performance assessment and evaluation in that the work generated under W05-04 will contribute to how implementation is undertaken. In a similar manner, the work from W01-05 'Surface water ecological condition monitoring' contributes to how WSP evaluation is completed within this activity, W05-04, because it draws on the risk assessment outcomes generated in W05-04.

Service levels

Surface water plan reviews

The following table is a report against the output measures and performance indicators in IPART's 2016 final report. The cumulative figures show that all plans that needed to be audited within the 2016 regulatory period were audited, although some were completed after the five-year interval period specified in the Water Management Act, 2000.

Table 22. Output measures and performance indicators for the 2016 regulatory period W05-04

Progress	Output measures			Performance indicators		
	Number of valleys being assessed under the performance and assessment strategy	*Number of plan audits completed*	*Number of plan evaluations completed*	*Plans incorporated into ecological performance and assessment programs (%)*	*Plans audited within statutory requirement (%)*	*Plans evaluated that have come to term (%)*
Cumulative	*Target: 24*	*Target: 32*	*Target: 17*	*Target:100%*	*Target:100%*	*Target:100%*
2016-17	11	19	2	46%	0%	10%
2017-18	16	25	2	52%	0%	10%
2018-19	23	25	2	64%	12%	-
2019-20	27	50	13	73%	76%	-

In 2016 there were 82 WSPs (incorporating several hundred water sources) in place across NSW. We prioritised these for performance monitoring and assessment according to advice from water users. The number of WSPs has been reduced to 58 by merging many closely linked plans.

The 50 plan audits completed was greater than the target of 32 because:

- 19 audit reports prepared during the previous IPART regulatory period (2012-13 to 2015-16) were finalised in 2016-17 and reported against the target for that year. The predicted six reports for 2016-17 were completed in the following year bringing the cumulative total to 25 for 2017-18, and
- While no audits were completed during 2018-19, when a new WSP Audit Panel was convened in 2018, an external service provider was engaged to complete the remaining 25 audits due in the regulatory period bringing the total number or plans audited between 2016-17 and 2019-20 to 50.

Groundwater plan reviews

The following table provides more detailed information about the groundwater plan reviews planned and achieved between 2016 and 2020.

Table 23. Groundwater plan reviews planned and achieved in the 2016 regulatory period W05-04

Planned for 2015-2020	Achieved 2015-2020
Work associated with the preparation of WRPs	
Preparation of WRPs and associated documentation	Groundwater Risk Assessments Groundwater Resource Description reports for all of the water sources within the Murray Darling Basin. The reports are available online as appendices of each WRP [70] Update to inland WSPs Policies review, update and consultation on those with water users.

[70] Available at https:--www.industry.nsw.gov.au-water-plans-programs-water-resource-plans

Planned for 2015-2020	Achieved 2015-2020
Update to the WSP for the Great Artesian Basin	
No specific program anticipated in 2015[71]	In 2017, an internal review of the risks to groundwater and gaps in the current Great Artesian Basin (GAB) WSP resulted in a new work program being defined by DPIE Water. Part of that program was also relevant to the Cap & Pipe the Bores program under the Great Artesian Bore Sustainability Initiative (GABSI). Some funding for this was made available through the NSW part of the GABSI and matched by the Commonwealth for most of the bore inventory and pressure recovery. Work delivered included: • GAB resource description report • GAB spring survey: ground truthing and initial hydrogeological and ecological characterisation (2017-2019) • GAB bore survey 2018, 2019, 2020 supporting both data input to the update of the GAB WSP and the scoping of direction in the GABSI program, with 658 bores surveyed to date, aiming at 390 additional bores in 2020. Each landholder surveyed received a bore report. • GAB pressure recovery assessment • GAB basic landholder rights take assessment • GAB recharge study • GAB distance conditions review The WSP will commence 1 July 2020. Most technical reports are either already available on the DPIE website or will be made available online.
Coastal WSPs assessments	
Work in coastal areas includes the assessment: - of groundwater conditions as part of the work of assessment of impact proposed development and - to support town water utilities. In 2017 we initiated work on characterisation of coastal groundwater resource to support the understanding of risks to coastal groundwater resources including high risk technical issues, key knowledge acquisition and efficiencies improvements	Maroota hydrogeology study – delivered to define one unique groundwater conceptual model of the area which in turn clarifies management of impacts and licensing of groundwater • groundwater coastal investigations: The Macklay Sands Water Resource Description Report is reaching completion. • policy development: ○ minimum requirements for pumping tests on water bores in New South Wales, 2019,[72] ○ groundwater trades: Assessing groundwater applications fact sheet,[73] ○ Support to the NSW Non-Urban Water Metering Policy and the Water Management (General) Regulation 2018. ○ development of a State-wide groundwater quality sampling strategy and plan ○ support to the Chief Scientist investigation into the water bottling industry (2019)

[71] GAB WSP redevelopment was not a priority in 2015-16 when the current IPART price determination was being put in place, but has become more important over the last four years with more attention being paid nationally to water management in the GAB.

[72] Available at https://www.industry.nsw.gov.au/__data/assets/pdf_file/0011/286049/min-requirements-pump-testing-of-water-bores-.pdf
[73] Available at https://www.industry.nsw.gov.au/__data/assets/pdf_file/0008/175931/Assessing-groundwater-applications-fact-sheet.pdf

Planned for 2015-2020	Achieved 2015-2020
Inland WSPs	

Since 2017 the Water Assessments team is running a series of small projects designed to capture undocumented knowledge or knowledge gap and provide the opportunity for development to staff in line with business priorities.
 	
Noting ongoing assessments of groundwater use and water levels is taking place as part of groundwater trades impact assessments. The gaps identified during these ongoing activities have been addressed by improved processes and the design of new tools which have led to increased efficiencies.
	Policy development:
	• Long Term Annual Average Extraction Limit review
	• Support to the NSW Non-Urban Water Metering Policy and the Water Management (General) Regulation 2018
	• discussion on a number of policies related to inland WSP updates
	  ○ review of groundwater quality monitoring results in pumping hotspots (for delivery June 2020)
	  ○ Namoi subsidence project
	  ○ Billabong Creek Salt Interruption Scheme review and groundwater model
	  ○ Cockburn River and Aquifer Connectivity Study (for completion late 2020)
	  ○ aquifer parameters consolidation and mapping project 2018-2020
	  ○ setting requirements, support to the development, update and scenarios of the inland regional groundwater models
	  ○ support to the MDBA Salt Joint Venture team regarding salt interception schemes and Lake Victoria management, optimisation and reporting

Audits by the Natural Resources Commission

The Natural Resources Commission (NRC) has been performing audits for all plans required to be updated. We used the outcomes of these audits to confirm our work program for the update or redevelopment of WSP.

Socio-economic assessment

In 2017 we planned for a project that would assess cultural values and economic outcomes and opportunities. Limitations in resourcing meant the project was not developed, however we note that it will be multi-disciplinary and require multiple capabilities not currently available to us.

Collaboration with research centres and universities

We are developing a groundwater prospectus, which is aimed at better management of groundwater through better information being provided to groundwater users. We are also preparing for a one-day annual symposium to discuss with research centres and agencies which knowledge gaps or assessments are required to be addressed and how collaborations through a range of agreements can be achieved. This platform will be launched in FY 2020/21.

Development and review of monitoring programs to measure performance indicators

In 2019 we delivered a NSW monitoring, evaluation and reporting framework in collaboration with DPI Fisheries and DPIE Biodiversity & Conservation (part of DPIE Environment, Energy and Science). The framework describes key principles for collecting and sharing data and information, and coordinating, collaborating and reporting monitoring activities.

Valley-specific monitoring, evaluation and reporting plans were then developed, again in collaboration with DPI Fisheries and DPIE Biodiversity & Conservation, for each inland valley. These will provide key evidence for future WSP rule evaluation and adaptive management responses. These plans have been published on our website as part of each inland valley WRP.[74]

[74] Available at https://www.industry.nsw.gov.au/water/plans-programs/water-resource-plans/drafts

We have not yet been able to resource a program to collect economic and social/cultural performance information, but during the 2016 regulatory period had the benefit of work funded by the Commonwealth for the Basin Plan. A consultant was engaged to develop socio-economic objectives and performance indicators, which were then used to inform water sharing plan objective development. This work will directly influence the socio-economic monitoring proposed to be undertaken during the regulatory period commencing in 2021.

Experience in evaluating the first round of WSPs showed that their objectives and performance indicators were deficient as a basis for assessing performance. We made significant progress during the 2016 regulatory period in refining WSP environmental objectives to improve their relevance and identifying more practical and specific performance indicators for future research. We completely revised social and economic objectives and performance indicators for inland WSPs.

To improve the efficiency of monitoring, we tabulated the relationship between WSP, Basin Plan and Long-term Water Plan environmental objectives. These depict a direct 'line-of-sight' between various influential NSW water planning documents that allows common monitoring and assessment activities to be identified and shared.

Research and technical assessments to address knowledge gaps

We have a program for assessing and confirming the links between environmental water rules and environmental outcomes. This involves monitoring selected biological indicators at particular locations to evaluate whether the expected ecological responses are occurring. We currently have 46 investigation projects identified, of which 14 have commenced.

Our hydrogeologists provided essential technical input on aquifer characterisation, recharge and local impact issues to support review of groundwater WSPs (in Resource Description reports.[75]) This was additional to information provided by groundwater models (see W04-02, which is the activity for groundwater modelling that supports WRPs and WSPs.)

Risk assessments

Risk assessments have recently been completed for all surface and ground WSP areas in the NSW Murray-Darling Basin as part of WRP development. The risk assessments examined the potential for the environment, water availability, quality, and water users to be impacted by a range of stressors including water extraction, climate change and catchment development activities. These assessments build on previous NSW programs such as the macro WSP risk identification approach and the Resource Condition Index.

The twenty reports are published on our website as components of each WRP.[76] Risk was assessed at a river reach, management zone or water source scale based on data availability. Potential for impacts on connected water resources was also examined. The risk assessments were based on key pieces of work that characterised individual river reaches and groundwater-dependent ecosystems and identified potential risks throughout the NSW portion of the Basin, namely:

- GDE mapping,
- HEVAE, spatially explicit aquatic ecosystem value indices designed to determine the relative environmental value of river reaches and groundwater-dependent vegetation patches,
- assessment of hydrologic stress for river reaches and
- assessment of groundwater levels and extraction demand.

[75] Water Resource Descriptions are an appendix in the relevant groundwater or surface water WRP. They are a generic description of the resource/catchment, condition, issues, historic water use etc. WRPs are available at. https://www.industry.nsw.gov.au/water/plans-programs/water-resource-plans/drafts

[76] Available at https://www.industry.nsw.gov.au/water/plans-programs/water-resource-plans/drafts

By assessing risk to the environment and water users these reports provide a firm foundation for future water management decisions. Risk assessments underpin ongoing WSP adaptive management and new plan development. They guide implementation effort, monitoring, evaluation and reporting activities, and identify key issues and focus locations for further investigations.

WSP audits

In July 2018 the Minister appointed a new Audit Panel responsible for delivering the twenty-five outstanding s44 audits; formal audits were executed by accredited third party auditors under the direction of the Audit Panel and were completed by the end of 2019. While the responsibility for future audits was transferred to the NRC from 1 December 2018 we retain the role of compiling the evidence base and providing the information in sufficient detail to enable the NRC to produce the audit report. In future, our annual s51 reports (prepared as part of activity W05-01) will be designed to inform the NRC process.

WSP evaluations

We completed and published evaluations for 13 WSPs[77]. These reports were the first of their kind. They informed the review of those WSPs, and helped to identify inconsistencies in plan objectives, performance indicators and overall logic. The results were presented to Stakeholder Advisory Panels for the inland valleys and used to inform water plan development in activity W06-02.

Forecast service 2020-21 to 2024-25 (5 years)

This covers the last year under the 2016 regulatory period and the four years of the 2021 regulatory period.

Service levels

Development and review of monitoring programs to measure performance

A major component of WSP performance monitoring relies on the collection of water level, flow and quality information under long standing state-wide programs. These are described and funded under activities W01, W02 and W03, mostly administered by WaterNSW. We will review these data collection networks on a regular basis to ensure they continue to effectively and efficiently address the performance monitoring needs of WSPs and WRPs.

In the past, we have been unable to undertake assessments of socio-economic objectives and construct a formalised socio-economic monitoring program because of insufficient dedicated staff. We propose to address this in the regulatory period commencing in 2021.

Review and improvement of plan objectives and performance indicators

In the 2021 regulatory period, we will continue to review and improve objectives and performance indicators in WSPs as they are remade. A particular focus will be on the development of more relevant and cost-effective performance indicators for social and economic objectives.

Research and technical assessments to address knowledge gaps

We will continue targeted monitoring and assessment of selected biological indicators and locations to evaluate whether the expected ecological outcomes are occurring in response to WSP strategies our hydrogeologists will continue to provide essential technical input on aquifer characterisation, recharge and local impact issues to support review of groundwater WSPs.

[77] The status of all Water Sharing Plans can be viewed at https://www.industry.nsw.gov.au/water/plans-programs/water-sharing-plans/status

Risk assessments

Risk assessments will be prepared or updated for each WSP as a component of the plan evaluation. The level of resources for each assessment will vary depending on the overall stress and risk of the water sources. Surface water risk assessments will be extended to incorporate River Styles information and groundwater risk assessments will be done in coastal areas as coastal GDE identification is completed.

This is new work because the risk assessment method for the coasts has been customised to meet the specific needs in coastal valleys. The risk assessments rely on new hydrological and ecological products and are the rationale and framework for new environmental objectives in WSPs and monitoring programs on the coast. The work goes well beyond simply a continuation of the inland risk assessment method.

WSP evaluations

Building on the lessons learned from preparing earlier evaluation reports and extensive work to improve plan objectives and performance indicators, evaluation reports will be prepared to inform each WSP review. Completion of a triple-bottom line evaluation for WSPs when they come to term will allow true adaptive management of WSPs and plans to be adjusted based on the need to ensure they effectively meet their objectives.

On average there will be around six WSPs requiring an evaluation each year. The level of detail in any WSP evaluation will be commensurate with the level of risk and the level of management.

We intend to complete relevant reports by year 8 of the term of each plan, to allow for consideration by the NRC, and then incorporation of any changes into the next iteration of the WSP. A detailed evaluation report and an evaluation summary will be published.

As a minimum, each evaluation report will include:

- contextual information on other contributors to river health (for example, climate data, River Condition Index),
- information on social, economic, and ecological outcomes (commensurate with risk and level of management),
- the extent to which the strategies and rules in the WSP have contributed to meeting the objectives of the plan and
- any recommendations for change.

Basin reporting

Schedule 12 of the Murray Darling Basin Plan outlines reporting and evaluation requirements, including annual and five yearly reporting. For the five-yearly reporting, reports are required for:

- ecological outcomes at the asset scale,
- progress to water quality targets and
- efficiency and effectiveness of WRPs.

The work undertaken to evaluate WSPs as discussed in the previous section will be used to inform Basin Plan reporting to ensure we use resources efficiently and effectively to cover both needs.

The following table sets out proposed output measures and performance indicators for the regulatory period from July 2021.

Table 24. Output measures and performance indicators for the 2021 regulatory period W05-04

Proposed output measure	Performance indicator
WSP evaluation reports prepared. Target: reports for 29 WSPs over 5 years (approximately 50% of the total WSPs)	Evaluations prepared prior to formal WSP reviews by NRC. • Target: 100% Assessments and evaluations published on DPIE website. • Target: 100%

Groundwater-specific service level

In the next five years there will be a strong focus on coastal WSP areas, State-wide groundwater quality, water level management (inland mostly), groundwater recharge and groundwater connectivity processes and quantification of impact from climate change on water availability and water quality.

The technical assessments will support the development of policies. The later WSPs have contingency for additional management clauses in relation to matters that are uninformed at this stage, such as climate change or population densification and recharge protection.

Table 25. Technical assessments planned for 2020-2025

Planned technical assessments
Great Artesian Basin: • pressure recovery & water availability • aquifer characterisation • GAB Springs – aquifer source and case study • policy on large stock and domestic intake
Coastal WSP assessments • increased sea levels on groundwater salinity and availability assessments • targeted climate change vulnerability monitoring • Hunter connectivity study • coastal groundwater systems groundwater resource description reports • groundwater recharge in the Sydney metro area WSP
Inland WSPs • informing groundwater connectivity and allowances in plans, for example, the Bellabulla Alluvium • Murrumbidgee subsidence • inter-aquifer salinisation risks and management • groundwater recharge

Planned technical assessments
Policy support • reasonable take policy, • Managed Aquifer Recharge policy, • return to flow policy, • excavation dewatering and • optimisation of groundwater resources
Both inland and coastal • water quality baseline and ongoing rationalised program, • coal basin and coal seam gas water quality and water level, • capture industry data (and make it publicly available), • groundwater vulnerability and availability, • key GDE field characterisation • map socio-economic values of groundwater

Our obligation to develop a formalised socio-economic program, increase the number of evaluation reports completed and develop new risk assessments for the coastal valleys plus update those inland, are a significant increase in demand on current resources. To date, limited resources have been moved between tasks and have additional tasks allocated to them to achieve efficiencies and meet deadlines. However, when resources are too stretched this results in necessary work not being completed on time or not started. For example, during 2019 the scientists who were working on inland risk assessments were re-tasked onto coastal risk assessment development but are also responsible for conducting monitoring projects to support WSP evaluation throughout NSW, as well as delivering the inland risk assessment updates. These same scientists could not also design a socio-economic program to support performance assessment and evaluation. This work is additional to the work they already undertake and is also specialised.

Operating expenditure

During the 2016 regulatory period, we benefited from externally funding from the Commonwealth of approximately $14.8 million. A considerable part of the work undertaken in the 2016 regulatory period and described above, including the risk assessments and development of improved objectives and performance indicators, was developed using this funding. These products and activities that have been paid for through Commonwealth funding relate directly to WSP performance assessment and evaluation and have provided a foundation for current coastal WSP evaluation work. The products are also being used to guide and inform planning for monitoring activities in inland valleys.

However, this focus on the development of foundational tools and activities did mean that delivery of some evaluation reports was delayed or were less than projected. A number of planned monitoring, evaluation and reporting projects were also not commenced or completed as planned.

We did not receive any Commonwealth funding to support the development of WRPs. Three technical projects that are partly funded by the MDBA's Monitoring Evaluation Reporting program are currently in progress, however that Commonwealth funding will come to an end in June 2020.

During the development of documents to support the WRP, the update of WSP and the numerous stakeholder meetings in early 2017, the water assessments team's resourcing comprised around ten full time equivalent staff members (FTE), which has subsequently dropped to around 5 FTEs with the ending of Commonwealth funding. Expenses associated with this task comprise technical studies procured externally due to either lack of time or specific expertise to perform them.

In the 2021 regulatory period, we propose that in each of the four years, we will increase resources above the level used by IPART when setting WAMC prices in 2016. The increased budget for this activity is proposed to support the expanded service level expectations described above, and summarised as:

- implementing social and economic performance monitoring and reporting for WSPs, addressing a weakness in performance monitoring that has drawn considerable criticism from stakeholders,
- completing and publishing risk assessments for coastal WSPs as they come up for review, and updating risk assessments in inland WSPs as they come up for review, using the best available information and
- developing and publishing evaluation reports for all WSPs as they come up for review so that stakeholders, the NRC and our water planners will have a strong scientific basis to inform critical decision making on rules in WSPs.

We propose to spend a total of $14.6 million[78] in the 2021 regulatory period on this activity, an annual average of $3.7 million. Our average annual expenditure in the 2016 regulatory period so far is $1.0 million, which has been supported by an additional $14.8 million in external Commonwealth funding, used between 2016-17 and 2019-20. Commonwealth funding will cease on 30 June 2020. Forecast expenditure of $3.7 million annually is 39% higher than the $2.6 million annual average IPART used in 2016 to determine prices, reflecting the greater workload expected by stakeholders. These amounts are set out in the following table.

Table 26. Expenditure on water plan management W05-04 ($2020-21 $000)

Cost	2016 regulatory period				Extension	2021 regulatory period				
	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
IPART'S 2016 final report	2,719	2,662	2,604	2,546	2,646					
Actual DPIE Water operating expenditure	1,630	733	675	810						
Actual externally funded operating expenditure	4,296	5,848	2,888	1,751						
Actual externally funded capital expenditure	0	0	0	0						
Proposed DPIE Water operating expenditure						3,661	3,661	3,661	3,661	3,661

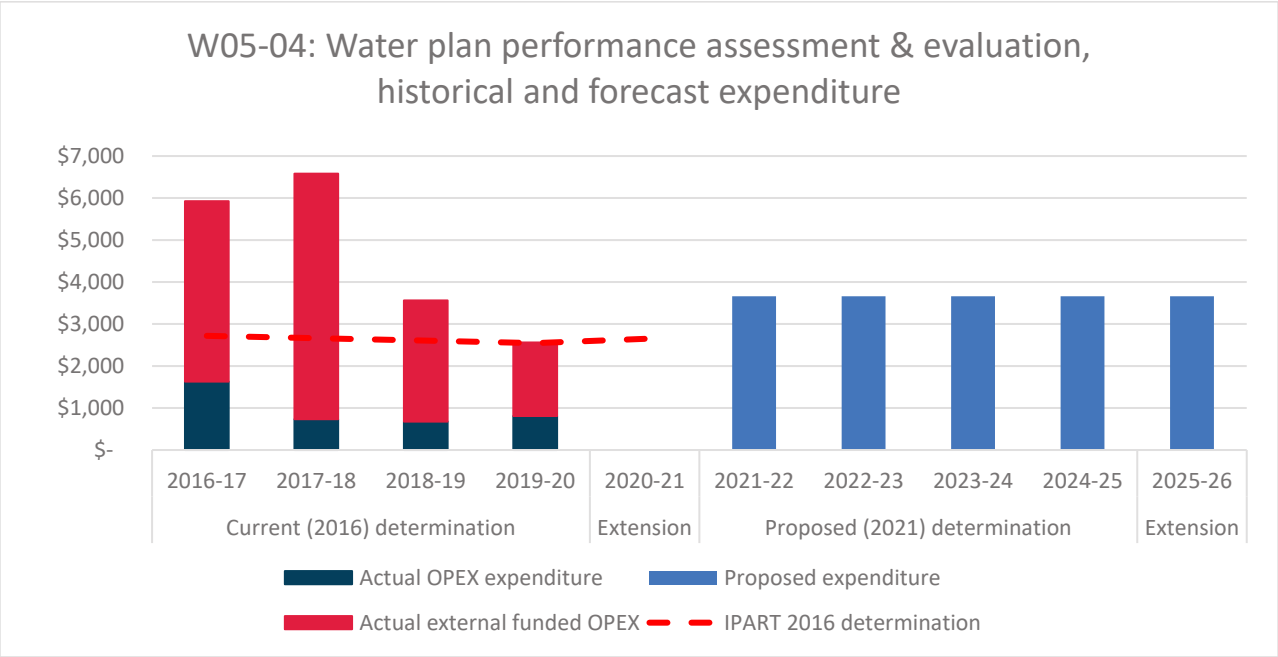
Notes: IPART's 2020–21 figure has been provided by IPART; actual operating expenditure is net of externally funded operating expenditure; DPIE Water's 2019–20 actual costs are 12/10 x actual costs for the 10 months to April 2020 and NRAR's 2019-20 actual costs are 12/11 x actual costs to May 2020; 2020–21 actual costs are unknown; 2025–26 costs

[78] All expenditures are expressed in $2020-21 and are described in the Administrative Information paper accompanying this paper

are provided as required by IPART; please also refer to the Administrative Information document that is part of this submission.

This information is also set out in the following graph, where our proposed expenditures are slightly above that used by IPART to set WAMC prices in 2016, and considerably higher than actual expenditure during the current period because of the Commonwealth funding received that will cease on 30 June 2020.

Figure 13. Expenditure on water plan management W05-04 ($2020-21 $000)



W06 Water management planning

W06-01 Water plan development (coastal)

This activity comprises development, amendment, and extension or replacement of water management plans, and the consultation activities associated with developing these plans for coastal water sources.

Water plan development activities are needed to deliver statutory water sharing plans (WSPs) and provide a statutory framework for sharing water access in NSW. We have now established WSPs over all surface water and groundwater sources in NSW.

Our WSPs are reviewed by the NRC and, we may include NRC, community or government recommendations in our extension or remake of plans.

In the 2021 regulatory period our efforts will focus on the review and remaking of WSPs. We have resourced the program to ensure we can deliver the plans to schedule. We have also developed process improvements that use a more scientific approach to risk analysis, deliver better mid-term reporting, consult more widely with our coastal stakeholders and resolve outstanding issues as they arise.

Stakeholders said they would like a Stakeholder Advisory Panel set up on the coast to have a central panel where water policy and planning reforms can be shared and stakeholders can provide advice back to government.

They would like more frequent engagement, not just once in ten years when plans are reviewed and remade.

We propose to spend a total of $7.0 million[79] in the 2021 regulatory period on this activity, an annual average of $1.8 million. The proposed annual average represents an increase of 39% from the $1.3 million we spent on average annually so far during the 2016 regulatory period and is 6% higher than the amount IPART used when determining WAMC prices in 2016, as set out in Table 31.

Statutory basis for service

Water Management Act 2000:

- water planning as required under Chapter 2, Part 3 Management Plans, Division 1, Division 2 Water sharing, Division 3 Water use and Part 4 Minister's plans for the making of management plans for water sharing

Intergovernmental agreement on a National Water Initiative:

- as a signatory, NSW is required to prepare water plans consistent with the Initiative.

Stakeholder views

In our review of our engagement with our stakeholders over the 2016 regulatory period, we identified that two of the key expectations of us, expressed during consultation for water resource plan (WRP) and water sharing plan (WSP) development, are

- clear enforcement of the rules in WRPs and WSPs, based on accurate and transparent information and

[79] All expenditures are expressed in $2020-21 and are described in the Administrative Information paper accompanying this paper.

- monitoring that customers can trust.[80]

This identifies a need for an increased level of service in line with customer expectations in relation to water plan development, along with the need for specific monitoring rules to be included in WRPs and WSPs.

Neither enforcement nor monitoring are a function of activity W06-01, however the plans that are developed, reviewed and amended within this activity must exist, be up-to-date, require useful information to be made available and contain rules that are detailed and robust enough to be enforced if necessary.

Plans must contain sufficiently detailed but comprehensible information to enable them to be used and understood in all respects by:

- water users, who require appropriate data in order to operate within their licence conditions,
- water users, who are required to abide by rules in the plans - to boost compliance and lessen the need for enforcement,
- other stakeholders, who will hold users to account over compliance and
- NRAR, as it determines whether enforcement is justified and to what extent.

To achieve this level of information within WSPs and WRPs, the expenditure proposed for this activity includes resourcing that will allow for thorough reviews including assistance to the NRC for its audits, scientific and other technical input and comprehensive consultation with all stakeholders that can be assessed and incorporated into plans as required.

Historic service 2016-17 to 2019-20 (4 years)

Service description and benefits

Water plan development activities are needed to deliver statutory water sharing plans and provide a statutory framework for sharing water access in NSW. WSPs provide clarity and security for water users by specifying the sharing arrangements between the environment and water users, and also between the different types of water users. Requirements for WSPs are specified in the *Water Management Act 200*.

WSPs now cover all the water sources in NSW - surface water and groundwater. Complete coverage was achieved during the 2016 regulatory period, with the exception of some discrete areas of coastal alluvial water that is being progressively incorporated as plans are replaced over the next ten year planning cycle, There are currently 58 WSPs across the state, of which 26 are on the coast. WSPs must be reviewed then either revised or extended after ten years, so all WSPs are reviewed during a ten-year period.

The process for review of WSPs involves a formal review by the NRC which makes recommendations to the Minister. If the Minister accepts their recommendations, the WSP is either extended unchanged for another ten years, or remade with changes, depending on what the NRC recommends and the Minister's decision.

When a WSP is remade, we develop changes to the plan to implement the NRC's recommendations and any other relevant matters that we have identified. This usually requires consideration and assessment of a range of options to change rules and other provisions in the WSP. Assessment of options typically includes input from technical experts, system modelling and consultation with interested parties. Plans are also redrafted to reflect improved document templates and processes. Once a draft plan is prepared it is placed on

[80] KJA, DPIE IPART Price Submission – Stakeholder Engagement Plain English Summary and Final report, 27 February 2020, pages 7, 8 and 9

exhibition and submissions are received and considered before a final plan is submitted to the Minister.

The amount of our staff time involved in this process varies depending on the complexity (number of water sources, existence of major infrastructure, level of demand placed on the water sources), risks and benefits to the health of the water sources and the social and economic impact on licence holders and the community, and the nature of the recommended changes. The *Water Management Act 2000* allows the Minister to grant an interim extension of the current plan for up to 2 years beyond its expiry date, which we use in some cases to adequately address difficult issues or for the purposes of managing the workload and approvals process.

WSPs are audited mid-term by the NRC, which is supported by our input. There is also consultation with stakeholders during the term of a WSP to report on progress, identify stakeholder concerns and deal with new information, changes in circumstances or policy that could affect the plan and other matters.

WSPs are sometimes amended mid-term. Most such amendments are provided for in the WSP itself where a particular matter is slated for review mid-term leading to possible amendment. Where such amendments are done, they involve a similar process to remaking the plan, with assessment, consultation and public exhibition, albeit usually on a reduced and targeted scale. When a plan includes a possible mid-term amendment, we make an assessment and decide whether the available information and benefits warrant proceeding with it then, as opposed to delaying it to be included in the normal plan review at the end of term.

Planning documents are available on our website.[81]

Service levels

The following table reports against the output measures and performance indicators specified by IPART in its 2016 final report. We have exceeded the output measure of five WSPs to be reviewed and replaced/extended during the period, with three plans replaced, four plans extended and six plans under review. Longer term, we are on track for all WSPs to be reviewed and replaced over the ten-year period.

Table 27. Output measures and performance levels in the 2016 regulatory period W06-01

Progress	Output measures	Performance indicator
	5 WSPs will be reviewed and replaced/extended. *7 WSPs will be reviewed.* *1 WSP will be reviewed and merged into an existing WSP.*	*Cumulative percentage of forecast WSPs reviewed, replaced/extended or merged:* *Target: 100%*
2016-17	1 WSP commenced (Nambucca)	17% of cumulative target
2017-18	1 WSP commenced (cumulative)	17% of cumulative target
2018-19	2 WSP commenced (cumulative) (Hastings) 1 WSP replaced (Paterson)	50% of cumulative target

[81] https://www.industry.nsw.gov.au/water/plans-programs/water-sharing-plans.

Progress	Output measures	Performance indicator
2019-20	2 WSP commenced (cumulative) 2 WSP replaced (cumulative) (Bellinger) (4 WSPs extended 2 years to allow further time to address issues - Coffs, Central Coast, Hunter Unregulated, Lower North Coast)) Review underway for 3 plans (Greater Metro Groundwater, Greater Metro Surface Water, Central Coast).	80% of cumulative target

With the commencement of the Hastings WSP in 2019, all water sources on the coast are covered by WSPs, with the exception of a few discrete small areas.

Forecast service 2020-21 to 2024-25 (5 years)

This covers the last year under the 2016 regulatory period and the four years of the 2021 regulatory period.

Service levels

Review and remaking of WSPs will continue from July 2021 as an ongoing activity. The *Water Management Act 2000* mandates regular scrutiny so that WSPs are kept up to date with changes in knowledge, risks and circumstances, and continually improved to reflect experience in implementation.

The coastal water sharing plan review schedule will be able to remain on target in the period commencing in 2021 if the full resourcing that is proposed is available.

The number of plans to be reviewed, replaced and implemented over the next four-year regulatory period is more than double the number in the 2016 regulatory period. Plans with mid-term amendments that were postponed in the 2016 regulatory period due to our focus on inland water resource planning will be evaluated and addressed either independently or as part of the plan remake process in the 2021 regulatory period.

In the 2021 regulatory period, the following plans are proposed to be commenced, reviewed, extended or amended.

Table 28. Plans to be commenced, reviewed, extended or amended

Plan Name	Amendment	Review Complete	Replacement/Extension	Review commenced
Central Coast		Y	Y	
Lower North Coast		Y	Y	
Coffs Harbour		Y	Y	
Hunter unregulated	Y	Y	Y	
Tweed		Y	Y	
Bega Brogo		Y	Y	

Plan Name	Amendment	Review Complete	Replacement/Extension	Review commenced
Murrah Wallaga		Y	Y	
Towamba		Y	Y	
Richmond	Y	Y	Y	
Hastings	Y			
Greater Metropolitan Unregulated		Y	Y	
Greater Metropolitan Groundwater		Y	Y	
Brunswick				Y
Clarence				Y
Clyde				Y
Deua				Y
Hunter Regulated				Y
Macleay				Y
North Coast Coastal	Y			Y
North Coast fractured and Porous rock				Y
Snowy Genoa unregulated and alluvial				Y
South Coast groundwater				Y
Tuross River unregulated and alluvial				Y
TOTAL	4	11	11	11

Service delivery will be improved and more efficient in the upcoming regulatory period by:

- utilising a more robust scientific approach to analysis of the risks and values of water sources within a plan area. This will allow more targeted development of plan rules and is likely to lead to beneficial outcomes for the environment, water users and for communities,

- streamlining the review and replacement process as experience is gained resulting in faster reviews and replacements,
- a higher level of mid-term reporting and more frequent ongoing communication and consultation with stakeholders and
- resolving outstanding licence conditions that have been identified during plan remake.

The table below shows proposed output measures and performance indicators for the 2021 regulatory period.

Table 29. Output measures and performance indicators for the 2021 regulatory period W06-01

Proposed output measure	Performance indicator
WSPs reviewed and remade or extended for ten years as they expire in accordance with s 43A of the *Water Management Act 2000.* Target: • 11 WSP reviews completed by NRC and the department to inform replacement • Public exhibition and community consultation on 11 replaced plans • 11 WSPs replaced over five years (42% of the total coastal WSPs) • Four outstanding amendments are assessed and either resolved or scheduled to be addressed in the plan remake process • Commencement of review for 11 WSPs due to expire in 2026	Requests made to the NRC to conduct a review of plans due for expiration by year seven of the plan. • Target: 100% Draft plans are available on DPIE website for public consultation for a minimum of 40 days • Target: 100% Factsheets outlining proposed changes to plans and issues raised in submissions are available during consultation • Target: 100% Final plans are available on the NSW legislation website. • Target: 100%

Table 30. Output measures and performance indicators for the 2021 regulatory period W06-01 – reviewed WSPs

No.	Water Sharing Plan	Commenced on	Ceases on*	Current audit date (within the first 5 years) Currently year 5 date shown	Current review date (within years 5-10 of the plan being made) Currently year 10 date shown)
1	Bellinger unregulated and alluvial	1 Jul 2008	30 Jun 2020	Completed by DPIE Water	30 Jun 2020
2	Central Coast unregulated	1 Aug 2009	30 Jun 2020	Completed by DPIE Water	30 Jun 2020
3	Coffs Harbour unregulated and alluvial	1 Aug 2009	30 Jun 2020	Completed by DPIE Water	30 Jun 2020
4	Hunter unregulated and alluvial	1 Aug 2009	30 Jun 2020	Completed by DPIE Water	30 Jun 2020
5	Lower North Coast unregulated and alluvial	1 Aug 2009	30 Jun 2020	Completed by DPIE Water	30 Jun 2020
6	Bega Brogo regulated, unregulated and alluvial	1 Apr 2011	30 Jun 2021	Completed by Alluvium Consulting	30 Jun 2021
7	Greater Metropolitan Region groundwater	1 Jul 2011	30 Jun 2021	Completed by Alluvium Consulting	30 Jun 2021
8	Greater Metropolitan Region unregulated	1 Jul 2011	30 Jun 2021	Completed by Alluvium Consulting	30 Jun 2021
9	Murrah-Wallaga Area unregulated and alluvial	17 Dec 2010	30 Jun 2021	Completed by Alluvium Consulting	30 Jun 2021
10	Richmond River Area unregulated, regulated and alluvial	17 Dec 2010	30 Jun 2021	Completed by Alluvium Consulting	30 Jun 2021
11	Towamba River unregulated and alluvial	17 Dec 2010	30 Jun 2021	Completed by Alluvium Consulting	30 Jun 2021

No.	Water Sharing Plan	Commenced on	Ceases on*	Current audit date (within the first 5 years) Currently year 5 date shown	Current review date (within years 5-10 of the plan being made) Currently year 10 date shown)
12	Tweed River Area unregulated and alluvial	17 Dec 2010	30 Jun 2021	Completed by Alluvium Consulting	30 Jun 2021
13	Brunswick unregulated and alluvial	1 Jul 2016	30 Jun 2026	2021	30 Jun 2026
14	Clarence unregulated and alluvial	1 Jul 2016	30 Jun 2026	2021	30 Jun 2026
15	Clyde unregulated and alluvial	1 Jul 2016	30 Jun 2026	2021	30 Jun 2026
16	Deua unregulated and alluvial	1 Jul 2016	30 Jun 2026	2021	30 Jun 2026
17	Hunter regulated	1 Jul 2016	30 Jun 2026	2021	30 Jun 2026
18	Macleay unregulated and alluvial	1 Jul 2016	30 Jun 2026	2021	30 Jun 2026
19	North Coast Coastal Sands	1 Jul 2016	30 Jun 2026	2021	30 Jun 2026
20	North Coast Fractured and Porous Rock	1 Jul 2016	30 Jun 2026	2021	30 Jun 2026
21	Snowy Genoa unregulated and alluvial	1 Jul 2016	30 Jun 2026	2021	30 Jun 2026
22	South Coast groundwater	1 Jul 2016	30 Jun 2026	2021	30 Jun 2026
23	Tuross River unregulated and alluvial	1 Jul 2016	30 Jun 2026	2021	30 Jun 2026
24	Nambucca unregulated an d alluvial	30 Sep 2016	30 Jun 2027	2022	30 Jun 2027

No.	Water Sharing Plan	Commenced on	Ceases on*	Current audit date (within the first 5 years) Currently year 5 date shown	Current review date (within years 5-10 of the plan being made) Currently year 10 date shown)
25	Hastings unregulated and alluvial	1 Jul 2019	30 Jun 2029	2024	30 Jun 2029
26	Paterson regulated	1 Jul 2019	30 Jun 2029	2024	30 Jun 2029

Operating expenditure

The cost of water planning is largely staff time required to develop, consult, extend, amend or replace each water management plan. The time and resulting cost for each WSP varies depending on the complexity of the plan and the issues to be addressed.

The completion of plans to cover the whole state meant that we have been able to implement several measures to reduce costs and improve efficiency during this regulatory period and moving forward. This is because the work of preparing a plan for the first time is much more than that required for review and replacement. Particular measures include:

- amalgamating the Murrah-Wallaga and Bega-Brogo plans so that the number of reviews is reduced long term
- progressively revising and standardising WSP provisions to make review more effective and efficient
- removing the practice of a full public review being undertaken in parallel with the NRC's review
- rationalising and systematising internal processes.

Over the 2016 regulatory period, W06-01 expenditure was considerably less than the amount used by IPART when setting WAMC prices in 2016, as a result of staff being redeployed to externally funded high priority planning, mostly in the Basin. While the majority of the output measures for 2016-20 were met, we note that the performance indicators fail to capture the full scope of the work. As such, there has been limited work achieved in other areas associated with the WSP process, specifically:

- the data analysis and consultation processes associated with addressing plan amendments identified to be resolved during the life of a number of the plans were not achieved,
- a number of issues (for example, conditions not applied across entire WSP areas, licencing conditions not implementable, licences allocated to incorrect water sources, and some water resources not allocated to any water source) relating to licencing across the coastal WSPs that were identified in the 2016 regulatory period will be resolved in the 2021 regulatory period. This involves amending water sharing plan rules to enable implementation of mandatory licence conditions, and the issuing of

licences in some water sources. These issues are likely to be resolved through plan amendments during the 2021 regulatory period and

- the preliminary work typically undertaken as part of reviewing a plan (review of amendment clauses, review of audit document and organisation of working groups) that should have been undertaken for plans nearing their expiration date (Coffs Harbour, Central Coast, Lower North Coast and Hunter unregulated) is behind schedule. This work has now commenced.

The proposed expenditure for W06-01 in the 2021 regulatory period reflects the number of plans and planned amendments to be addressed per year on average and the additional improvements to service delivery outlined above, most notably the considerable input from the science group of DPIE Water. It also incorporates efficiencies achieved in terms of the administration activities associated with plan review, options analysis and plan drafting that are associated with the more mature nature of WSPs.

The proposed expenditures ensure that coastal plans will be equivalent to non-coastal plans with respect to the use of underlying science, their objectives and their approach to monitoring, evaluation and reporting. We will continue to refine planning approaches and documentation to operate in a least cost way to deliver planning outcomes.

The forward schedule of expiring WSPs is not evenly spread from year to year, so the expenditure and delivery of outputs will vary from year to year. We will work with the NRC to spread the work of WSP reviews more evenly over time by advancing some WSP reviews and applying interim extensions to others.

We propose to spend a total of $7.0 million[82] in the 2021 regulatory period on this activity. Average annual expenditure in the 2016 regulatory period is $1.3 million with forecast expenditure 39% higher at $1.8 million annually as set out in the following table.

Table 31. Expenditure on coastal water plan development W06-01 ($2020-21 $000)

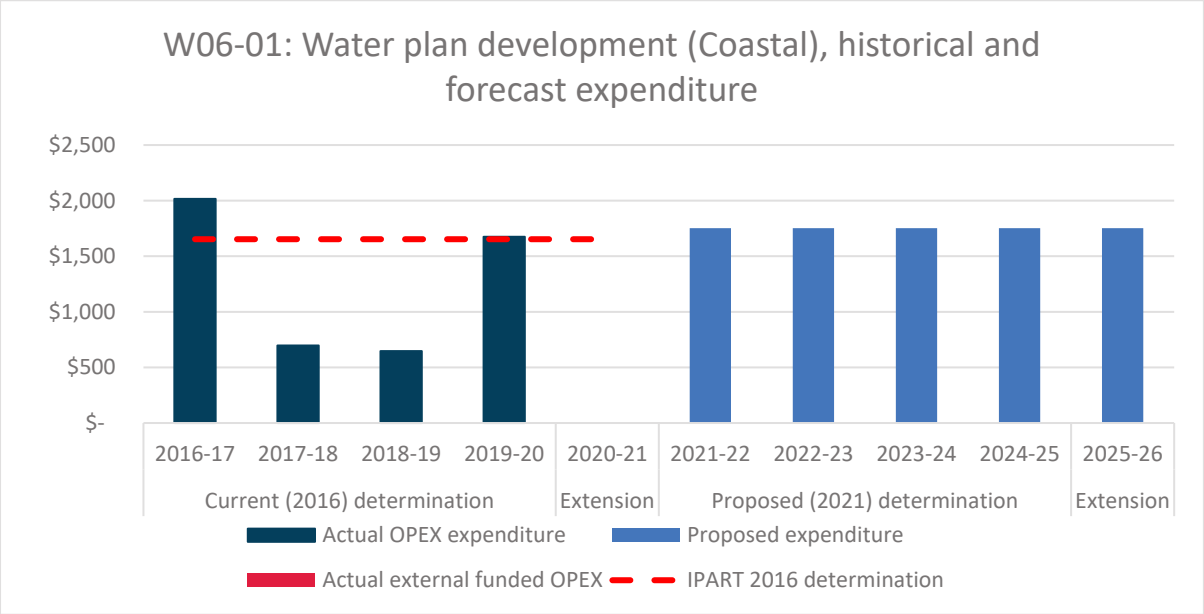
Cost	2016 regulatory period				Extension	2021 regulatory period				
	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
IPART'S 2016 final report	1,653	1,653	1,653	1,653	1,653					
Actual DPIE Water operating expenditure	2,015	698	647	1,675						
Actual externally funded operating expenditure	0	0	0	0						
Actual externally funded capital expenditure	0	0	0	0						
Proposed DPIE Water operating expenditure						1,752	1,752	1,752	1,752	1,752

[82] All expenditures are expressed in $2020-21 and are described in the Administrative Information paper accompanying this paper.

Notes: IPART's 2020–21 figure has been provided by IPART; actual operating expenditure is net of externally funded operating expenditure; DPIE Water's 2019–20 actual costs are 12/10 x actual costs for the 10 months to April 2020 and NRAR's 2019-20 actual costs are 12/11 x actual costs to May 2020; 2020–21 actual costs are unknown; 2025–26 costs are provided as required by IPART; please also refer to the Administrative Information document that is part of this submission.

This information is also set out in the following graph, which shows that our proposed resourcing is at a level only marginally above that used by IPART when setting WAMC prices in 2016, but higher than actual expenditure during the 2016 regulatory period because the focus was initially on inland rather than coastal water plans, which can be seen by the fluctuations between years in the expenditures we recorded to this activity.

Figure 14. Expenditure on coastal water plan development W06-01 ($2020-21 $000)



W06-02 Water plan development (inland)

This activity consists of amendment, and extension or replacement of water management plans, amendment of additional planning instruments to comply with the Commonwealth *Water Act 2007* and the consultation activities associated with these processes for inland water sources.

Water sharing plan (WSP) remake and replacement and associated activities are needed to ensure that statutory WSPs are in place and provide a legislative framework for sharing water access in NSW.

Our WSPs are reviewed by the NRC and, at the request of the Minister, we include any recommendation in our extension or remake of the plan.

In the 2021 regulatory period our efforts will focus on the review and remaking of WSPs. We have resourced the program to ensure we can deliver the plans to schedule. We have also developed process improvements that deliver better mid-term reporting and resolve outstanding issues as they arise.

Stakeholders asked for clear enforcement of the rules in Water Resource Plan (WRP) and Water Sharing Plan (WSP), based on accurate and transparent information and they wanted monitoring they can trust[83].

To facilitate monitoring and enforcement we ensure plans make available useful information and contain rules that are detailed and robust enough to be clearly understood and enforced if necessary.

We propose to spend a total of $11.9 million[84] in the 2021 regulatory period on this activity, an annual average of $3.0 million. The proposed annual average represents a decrease of 17% from the $3.6 million we spent on average annually so far during the 2016 regulatory period and is 2% higher than the amount IPART used when determining WAMC prices in 2016, as set out in Table 38.

Statutory basis for service

Water planning as required under:

Water Management Act 2000:

- Chapter 2, Part 3 Management Plans, Division 1, Division 2 Water sharing, Division 3 Water use and Part 4 Minister's plans for the making of management plans for water sharing

Water Act 2007 (Commonwealth):

- Part 2 – Management of Basin water resources
- Murray Darling Basin Plan, Chapter 10 water resource plan requirements
- As a signatory to the Murray Darling Basin Plan, NSW has committed to preparing Water Resource Plans and Environmental Watering Plans by 2019-20.

Intergovernmental agreement on a National Water Initiative:

- As a signatory, NSW is required to prepare water plans consistent with the Initiative.

Stakeholder views

In our review of our engagement with our stakeholders over the 2016 regulatory period we identified that two of the key expectations of us, expressed during consultation for Water Resource Plan (WRP) and Water Sharing Plan (WSP) development, are

- clear enforcement of the rules in WRPs and WSPs, based on accurate and transparent information and
- monitoring that customers can trust.[85]

This identifies the need for an increased level of service in line with customer expectations in relation to water plan development, along with the need for specific monitoring rules to be included in WRPs and WSPs.

Neither enforcement nor monitoring are a function of activity W06-02, however the plans that are developed, reviewed and amended within this activity must exist, be up-to-date, require

[83] KJA, DPIE IPART Price Submission – Stakeholder Engagement Plain English Summary and Final report, 27 February 2020, pages 7,

[84] All expenditures are expressed in $2020-21 and are described in the Administrative Information paper accompanying this paper.

[85] KJA, DPIE IPART Price Submission – Stakeholder Engagement Plain English Summary and Final report, 27 February 2020, pages 7, 8 and 9

useful information to be made available and contain rules that are detailed and robust enough to be clearly understood and enforced if necessary.

Plans must contain sufficiently detailed but comprehensible information to enable them to be used and understood in all respects by:

- water users, who require appropriate data in order to operate within their licence conditions,
- water users, who are required to abide by rules in the plans - to boost compliance and lessen the need for enforcement,
- other stakeholders, who will hold users to account over compliance and
- NRAR, as it determines whether enforcement is justified and to what extent.

To achieve this level of information within WSPs and WRPs, the expenditure we propose for this activity includes resourcing that will allow for thorough reviews including assistance to the NRC for its audits, scientific and other technical input and comprehensive consultation with all stakeholders that can be assessed and incorporated into plans as required.

Historic service 2016-17 to 2019-20 (4 years)

Service description and benefits

Water sharing plan remake and replacement and associated activities are needed to ensure that statutory WSPs are in place and provide a legislative framework for sharing water access in NSW. WSPs provide clarity and security for water users by specifying the sharing arrangements between the environment and water users, and also between the different types of water users. Requirements for WSPs are specified in the *Water Management Act 2000*.

WSPs now cover all inland surface and groundwater sources in NSW. There are currently 58 WSPs across the state, with 32 classed as inland (west of the divide). This number may change over time as some WSPs may be merged or split to improve alignment with contemporary policy positions. WSPs must be reviewed then either revised and replaced or extended after ten years, so all WSPs are either replaced or extended during a ten-year period.

The process for review of WSPs involves a formal review by the NRC which makes recommendations to the Minister to either extend or replace the WSP. If the Minister accepts the recommendations, the WSP is either extended unchanged for another ten years, or remade with changes, depending on what the NRC recommends and the Minister's decision. To date no plans have been extended; the NRC has recommended to amend and replace all WSPs that they have reviewed. We expect that this will be the case for the next ten-year WSP cycle and the proposed budget reflects the replacement of WSPs rather than the extension. We contribute significant resources in providing information, data and staff time (expressed as full time equivalent staff members (FTE)) to the NRC to enable thorough reviews.

When a WSP is remade, we develop changes to the plan to implement the NRC's recommendations and any other relevant matters that we have identified through internal reviews and documents such as the 13 WSP evaluations reports (W05-04). This usually requires consideration and assessment of a range of options using best available information to change/modify rules and other provisions including objectives and performance indictors in the WSP. Assessment of options typically includes input from technical experts, system modelling, mapping and consultation with affected and interested parties. Plans are also redrafted to reflect improved document templates, processes and current policy positions. Once a draft plan is prepared it is placed on public exhibition for 40

days and submissions are received and considered prior to a final plan being submitted to the Minister for gazettal.

The amount of staff time involved in this process varies depending on the complexity, risks and benefits and the nature of the recommended changes. The level of complexity is dependent on the plan area. Complexities include the number of water sources in a plan area and the diversity of water users and industries. The infrastructure in place and their operation, future projects underway as part of the *Water Supply* (*Critical Needs) Act 2019* (Wyangala, Dungowan and Mole River Dams) and work being undertaken by the Regional Water Strategies program will increase the amount of work required to make plan amendments. The number and type of legislative frameworks and policies applicable to a plan area such as the Basin Plan and programs such as Sustainable Division Limits Adjustment Mechanisms and floodplain harvesting. The environmental assets in a plan area can add to the complexity of the plan. Managing risks and benefits to environmental assets and the overall health of a riverine system as well as maintaining the social and economic security for communities and water users is the key component of the water sharing plan remakes.

The *Water Management Act 2000* allows the Minister to grant an interim extension of the current plan for up to 2 years beyond its expiry date, which we use in some cases to adequately resolve difficult issues or for the purposes of managing the workload and approval process.

Commonwealth requirements 2016-17 to 2019-20

We have allocated considerable staff resourcing to developing 20 Basin Plan compliant water resource plans (WRPs) using Commonwealth funding. The 20 WRPs were completed for submission to the Murray - Darling Basin Authority (MDBA) in December 2019[86]. A decision was made to not submit the WRPs to the MDBA at that time. This due to the drought and to allow for more consultation on the draft water sharing plans.

Further consultation on the WSP changes with the respective valley stakeholder advisory panels has been completed. The feedback will be considered as part of finalising the water sharing plans and water resource plans. The groundwater resource plans have been submitted to MDBA. The surface water resource plans were submitted to MDBA on 29 June 2020.

Service levels

The following table is a report against the output measures and performance indicators specified in the last regulatory period by year. The number of WSPs replaced or merged greatly exceeds the original forecast because of the approach adopted under the Basin Plan water resource planning process.

[86] The full list of completed Water Resource Plans can be found at https://www.industry.nsw.gov.au/water/plans-programs/water-resource-plans

Table 32. Output measures and performance indicators for the 2016 regulatory period W06-02

Progress	Output measures	Performance indicator
	8 WSPs will be reviewed and replaced/extended. 2 WSPs will be reviewed. 3 WSPs will be reviewed and merged into an existing WSP. 22 WRPs will be completed. (Note number was reduced to 20 when four NSW areas merged into two areas [87])	Cumulative percentage of forecast WSPs reviewed, replaced/extended or merged: Target: 100% Cumulative percentage of forecast WRPs completed: Target: 100%
2016-17	7 WSPs replaced 8 WSPs reviewed and merged into existing WSPs 0 WRPs completed	Cumulative percentage of forecast WSPs reviewed, replaced/extended or merged: 136% Cumulative percentage of forecast WRPs completed: 0%
2017-18	8 WSPs replaced (cumulative) 8 WSPs reviewed and merged into an existing WSP (cumulative) 0 WRP's are completed. As a result of the Basin Plan amendments in June the number of WRPs to be delivered reduced to 20. The coverage stayed the same.	Cumulative percentage of forecast WSPs reviewed, replaced/extended or merged: 145% Cumulative percentage of forecast WRPs completed: 0%
2018-19	13 WSPs replaced (cumulative) 8 WSPs reviewed and merged into an existing WSP (cumulative) 0 WRPs completed.	Cumulative percentage of forecast WSPs replaced/extended or merged: 190% Cumulative percentage of forecast WRPs completed: 0%

[87] Amalgamation of four WRP areas into two WRP areas to align the Basin Plan areas more closely to the NSW water sharing plan boundaries: Western Porous Rock WRP area (GW6) and Eastern Porous Rock WRP area (GW16) into NSW Murray Darling Basin Porous Rock WRP area; and Lachlan and South Western Fractured Rock WRP area (GW11) and New England Fractured Rock and Northern Basalts WRP area (GW17) into NSW Murray Darling Basin Fractured Rock WRP area. As part of the proposed NSW WRP area amalgamation the Oaklands Basin SDL resource unit (GS38) is included in the NSW Murray–Darling Basin Porous Rock WRP area. This request was agreed by the MDBA in 2018

Progress	Output measures	Performance indicator
2019-20	16 WSPs replaced (cumulative) 8 WSPs reviewed and merged into an existing WSP (cumulative) 20 WRPs submitted for accreditation	Cumulative percentage of forecast WSPs replaced/extended or merged: 218% Cumulative percentage of forecast WRPs completed: 100%

The Basin Plan water resource planning process grouped like groundwater source plans into a single plan, for example all Darling Alluvium plans previously spread across a number of WSPs were combined into one alluvial plan for the Darling. The water resource development provided an opportunity to improve rules in the water sharing plans that stakeholders identified as not working appropriately or could be improved. It also provided the opportunity to better align the water sharing plans with Basin Plan requirements and improve consistency across plans. The groundwater and the majority of the surface water regulated plans were subsequently replaced to reflect the NRC 2014 reviews, the most up to date legislative format and to implement the Basin Plan. The specific Basin Plan implementation requirements are the sustainable diversion limit compliance mechanism (all WSPs) and the pre-requisite policy measures in the Murrumbidgee and Murray – Lower Darling water sharing plans.

Forecast service 2020-21 to 2024-25 (5 years)

This covers the last year under the 2016 regulatory period and the four years of the 2021 regulatory period.

Service levels

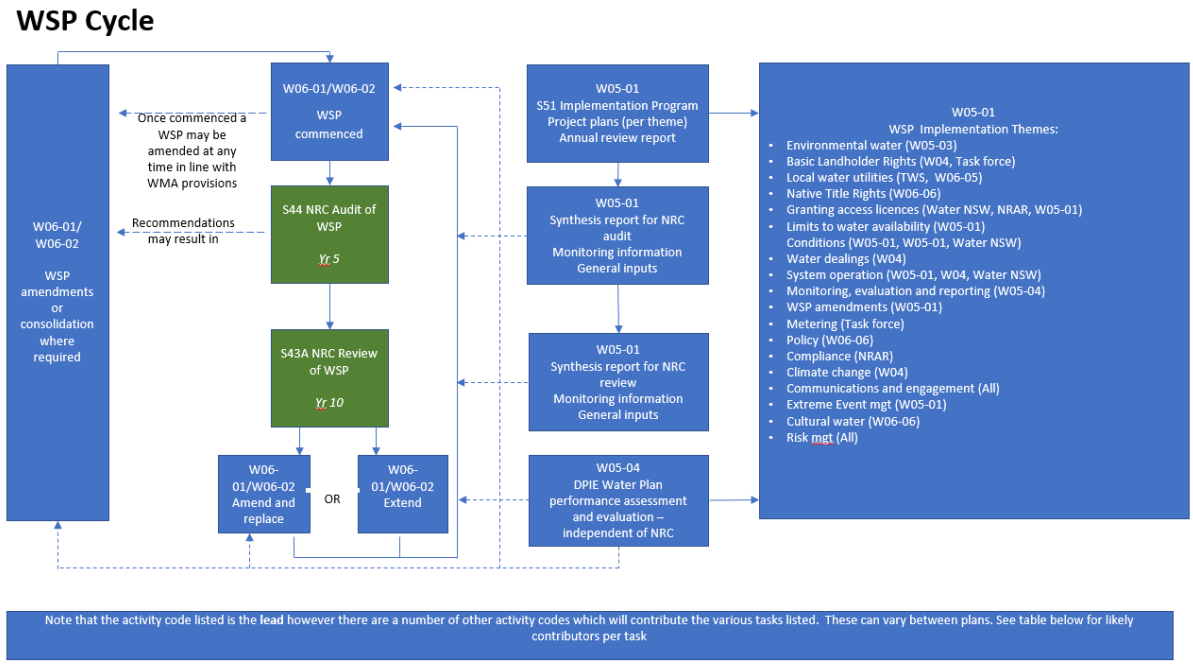
Review and remaking of WSPs will continue during the 2021 regulatory period as an ongoing activity. It is an integral part of the planning cycle and is directly related to the other WSP activities of implementation, system operation (W05-01) and water plan performance and assessment (W05-04). The planning cycle is a continuous improvement cycle that ensures more effective outcomes for the environment and water users in line with the objects and water management principles of the Act.

After the NRC undertakes its review and the findings of our plan performance and assessment are made, we amend and remake the WSPs, after which any changes are implemented into our water management operations.

The *Water Management Act 2000* mandates this process so that the WSPs can be kept up to date with changes in knowledge, risks and circumstances, and continually improved to reflect experience in implementation. Additional work amending WSP and Basin Plan WRPs may also occur if required.

The following diagram outlines the water sharing cycle and demonstrates where the various Activities are located within the cycle.

Figure 15. Water sharing plan cycle



Service delivery will be improved in the upcoming regulatory period by:

- a higher level of mid-term auditing and reporting and more frequent ongoing communication and consultation with stakeholders and
- resolving outstanding licence conditions that have been identified during plan remake.

The table below shows proposed output measures and performance indicators for the 2021 regulatory period.

Table 33. Output measures and performance indicators for the 2021 regulatory period W06-02

Proposed output measure	Performance indicator
WSPs reviewed and remade or extended for ten years as they expire in accordance with s 43A of the Act. Target: 18 WSPs over 5 years (56% of the total inland WSPs) Outstanding mid-year amendments are assessed and either resolved or scheduled to be addressed in the plan remake process. Five WSPs will be audited in accordance with s 44 of the Act	Requests made to the NRC to conduct a review of plans due for expiration by year 7 of the plan. • Target: 100% Draft changes to plans are available on DPIE website for public consultation for a minimum of 40 days • Target: 100% Undertake targeted and public consultation for each WSP that is being amended or remade after the NRC review • Target: 100% Factsheets outlining proposed changes to plans and issues raised in submissions are available during consultation • Target: 100% Final plans are available on the NSW legislation website. • Target: 100%

Within the 2021 regulatory period, a total of 13 inland WSPs will be reviewed by the NRC. We anticipate that an additional four groundwater WSPs that are expected to be remade in 2020 will be reviewed internally and with other NSW agencies[88]. These reviews will be undertaken between 2021 and 2022 and involve reviews, consideration of the review and potential amendments and remakes for gazettal in 2023 and 2024.

The WSPs vary in complexity, however we expect that all will need to be changed to reflect more up to date information and changes in management in other inland and coastal systems. However, each plan will require a water planner to coordinate the various inputs from internal cost codes, other NSW agencies, Commonwealth agencies and external stakeholders. Each plan must go through this process with some expected to be relatively simple, for example NSW Great Artesian Basin Shallow groundwater as there relatively low levels of licences and water use. Other plans are expected to be difficult due to the level of interest in the plan (Barwon Darling), the geographic extent of the WSP (Murray Darling Fractured Rock, where over two-thirds of the state is covered under one the WSP) or unresolved issues with high expectations of change from stakeholders.

The *Water Management Act 2000* allows the Minister to grant an interim extension of the current plan for up to two years beyond its expiry date. We use this extension in most cases as NRC recommendations are usually received late in year ten, and approximately 18 months per plan is required to adequately address recommendations to manage the workload and approvals process.

[88] More information on the status of Water Sharing Plans can be found at https://www.industry.nsw.gov.au/water/plans-programs/water-sharing-plans

Under section 44 of the *Water Management Act 2000*, WSPs are audited mid-term (five-year point) by the NRC, which is supported by our input. There is also consultation with stakeholders during the term of a WSP to report on progress, identify stakeholder concerns and deal with new information, changes in circumstances or policy that could affect the plan and other matters. The outcomes of the audits may require amendments to the WSPs.

WSPs are sometimes amended midterm. Most amendments are provided for in the WSP itself where a particular matter is slated for review mid-term leading to possible amendment. Where such amendments are done, they involve a similar process to remaking the plan, with assessment, consultation and public exhibition, albeit usually on a reduced and targeted scale. When a plan includes a possible mid-term amendment, we do an assessment and decide whether the available information and benefits warrant proceeding with it then, as opposed to delaying it to be included in the normal plan review at the end of term.

Based on significant stakeholder feedback obtained during the 2016 regulatory period, we will undertake extensive targeted and public stakeholder consultation as part of the amendment or remake of the 18 WSPs over the four years of the 2021 regulatory period. This will be a significant additional resource cost, that is more than has occurred in the previous regulatory period. Early planning for this activity indicates significant travel and resource costs to meet stakeholder expectations. This includes consultation with Aboriginal organisations which has been consistently recognised as an area for improvement for WSPs.

The following table provides a list of WSP reviews scheduled to occur in the future.

Table 34. Forward schedule of WSP reviews and amendments (reviewed WSPs)

Water Sharing Plan	Commenced on	Ceases on*	Current audit date[89]	Current review date[90]	Anticipated activities
NSW Border Rivers regulated	1 Jul 2009	30 Jun 2021			Implementation of any relevant Regional Water Strategies recommendations
Castlereagh unregulated and alluvial	1 Oct 2011	30 Jun 2022		2022	Review and remake of unregulated component Alluvial merged with Macquarie Castlereagh Alluvial WSP, anticipating remake in 2020
Intersecting streams unregulated and alluvial	14 Nov 2011	30 Jun 2022		2022	Review and remake of unregulated component Development of mechanism to protect held environmental water from Queensland in NSW Potential new rule set for Toorale National Park Alluvial merged with Darling Alluvial WSP, anticipating remake in 2020
Lower Lachlan Alluvium	1 July 2008	30 June 2020	1 July 2018	2018	Anticipate remake for 1 July 2020

[89] Year 10 date shown
[90] Year 10 date shown

Water Sharing Plan	Commenced on	Ceases on*	Current audit date[89]	Current review date[90]	Anticipated activities
Lower Murray Shallow groundwater	1 Apr 2012	30 Jun 2022		2022	Merged with Murray Alluvium. Anticipate remake 2020 Anticipating review by 2022
Lower Murray-Darling unregulated and alluvial	30 Jan 2012	30 Jun 2022		2022	Review and remake of unregulated component Alluvial merged with Darling Alluvial WSP, anticipating remake in 2020
Murray unregulated and alluvial	30 Jan 2012	30 Jun 2022		2022	Review and remake of unregulated component Alluvial merged with Murray Alluvial WSP, anticipating remake in 2020
North Western unregulated and Fractured Rock	1 Oct 2011	30 Jun 2022		2022	
NSW Border Rivers unregulated and alluvial	1 Jun 2012	30 Jun 2022		2022	Review and remake of unregulated component Mole River Dam rule development Alluvial merged with Border Rivers Alluvial WSP, anticipating remake in 2020
NSW Great Artesian Basin Shallow groundwater	14 Nov 2011	30 Jun 2022		2022	Anticipate remake 2020 Anticipating departmental review by 2022
NSW Murray Darling Basin Fractured Rock	16 Jan 2012	30 Jun 2022		2022	Anticipate remake 2020 Anticipating departmental review by 2022
NSW Murray Darling Basin Porous Rock	16 Jan 2012	30 Jun 2022		2022	Anticipate remake 2020 Anticipating departmental review by 2022
Barwon-Darling unregulated and Alluvial	4 Oct 2012	30 Jun 2023		2023	Review and remake of unregulated component Includes development and implementation of new rule set to meet NSW Government stage 3 commitment in response to NRC and independent reports into water management in the Barwon Darling Alluvial merged with Darling Alluvial WSP, anticipating remake in 2020
Belubula regulated	4 Oct 2012	30 Jun 2023		2023	Review and remake of plan

Water Sharing Plan	Commenced on	Ceases on*	Current audit date[89]	Current review date[90]	Anticipated activities
Gwydir unregulated and alluvial	3 Aug 2012	30 Jun 2023		2023	Review and remake of unregulated component Alluvial merged with Gwydir Alluvial WSP, anticipating remake in 2020
Lachlan unregulated and alluvial	14 Sep 2012	30 Jun 2023		2023	Review and remake of unregulated component Alluvial merged with Lachlan Alluvial WSP, anticipating remake in 2020
Macquarie Bogan unregulated and alluvial	4 Oct 2012	30 Jun 2023		2023	Review and remake of unregulated component Alluvial merged with Macquarie Castlereagh Alluvial WSP, anticipating remake in 2020
Murrumbidgee unregulated and alluvial	4 Oct 2012	30 Jun 2023		2023	Review and remake of unregulated component Alluvial merged with Murrumbidgee Alluvial WSP, anticipating remake in 2020
Namoi unregulated and alluvial	4 Oct 2012	30 Jun 2023		2023	Review and remake of unregulated component Inclusion of Dungowan Dam Alluvial merged with Namoi Alluvial WSP, anticipating remake in 2020

Table 35. Forward schedule of WSP reviews and amendments (audited WSPs)

Water Sharing Plan	Commenced on	Ceases on*	Current audit date[91]	Current review date[92]	Anticipated activities
Lower Gwydir groundwater	1 Jul 2019	30 Jun 2029	2024	2029	Anticipate remake 2020 Implementation of any relevant Regional Water Strategies recommendations
Lower Macquarie groundwater	1 Jul 2019	30 Jun 2029	2024	2029	Anticipate remake 2020 Implementation of any relevant Regional Water Strategies recommendations

[91] within the first 5 years, currently year 5 date shown
[92] within the first 5 years, currently year 5 date shown

Water Sharing Plan	Commenced on	Ceases on*	Current audit date[91]	Current review date[92]	Anticipated activities
Lower Murray groundwater	1 Jul 2019	30 Jun 2029	2024	2029	Anticipate remake 2020 Implementation of any relevant Regional Water Strategies recommendations
Lower Murrumbidgee groundwater	1 Jul 2019	30 Jun 2029	2024	2029	Anticipate remake 2020 Implementation of any relevant Regional Water Strategies recommendations
Upper and Lower Namoi Groundwater	1 Jul 2019	30 Jun 2029	2024	2029	Anticipate remake 2020 Implementation of any relevant Regional Water Strategies recommendations

Table 36. Forward schedule of WSP reviews and amendments (Participated WSP amendments)

Water Sharing Plan	Commenced on	Ceases on*	Current audit date[93]	Current review date[94]	Anticipated activities
Murray and Lower Darling regulated	1 Jul 2016	30 Jun 2026	2019 (review conducted by Alluvium Consulting)	2026	Anticipate remake 2020 Review and potential of amendment to portion of water sharing rules Implementation of any relevant Regional Water Strategies recommendations
Murrumbidgee regulated	1 Jul 2016	30 Jun 2026		2026	Anticipate remake 2020 Review and potential of amendment to portion of water sharing rules Implementation of any relevant Regional Water Strategies recommendations
Peel regulated	1 July 2010	1 July 2020		2026	Anticipate remake 2020 Review and potential of amendment to portion of water sharing rules based in NRC audit Dungowan Dam and pipeline operation Implementation of any relevant Regional Water Strategies recommendations

[93] Within the first 5 years, currently year 5 date shown
[94] Within the first 5 years, currently year 5 date shown

Water Sharing Plan	Commenced on	Ceases on*	Current audit date[93]	Current review date[94]	Anticipated activities
Border Rivers regulated	1 Jul 2009	30 Jun 2021		2021	Anticipate remake 2020 Development of amended rules in response to Mole River Dam Review and potential of amendment to portion of water sharing rules Implementation of any relevant Regional Water Strategies recommendations
Namoi regulated	1 Jul 2016	30 Jun 2026		2026	Anticipate remake 2020 Review and potential of amendment to portion of water sharing rules Implementation of any relevant Regional Water Strategies recommendations
Gwydir regulated	1 Jul 2016	30 Jun 2026		2026	Anticipate remake 2020 Review and potential of amendment to portion of water sharing rules Implementation of any relevant Regional Water Strategies recommendations
Lachlan regulated	1 Jul 2016	30 Jun 2026		2026	Anticipate remake 2020 Development of amended rules in response to Wyangala Dam extension Review and potential of amendment to portion of water sharing rules

Table 37. Forward schedule of water resource plans amendments

No. of plan	Water Resource Plan	Commenced on
1	Darling Alluvium	Pending
2	Gwydir Alluvium	Pending
3	Lachlan Alluvium	Pending
4	Macquarie-Castlereagh Alluvium	Pending
5	Murray Alluvium	Pending
6	Murrumbidgee Alluvium	Pending

No. of plan	Water Resource Plan	Commenced on
7	NSW Border Rivers Alluvium	Pending
8	NSW MDB Fractured Rock	Pending
9	NSW GAB Shallow	Pending
10	NSW MDB Porous Rock	Pending
11	NSW Namoi Alluvium	Pending
12	Barwon Darling Watercourse	Pending
13	Gwydir Surface Water	Pending
14	Intersecting Streams Surface Water	Pending
15	Lachlan Surface Water	Pending
16	Macquarie-Castlereagh Surface Water	Pending
17	NSW Murray and Lower Darling Surface Water	Pending
18	Murrumbidgee Surface Water	Pending
19	NSW Border Rivers Surface Water	Pending
20	Namoi Surface Water	Pending

Additional Commonwealth requirements

In addition to its State obligations in relation to water planning, in February 2014 the NSW Government signed the *Intergovernmental Agreement on Implementing Water Reform in the Murray Darling Basin*. To satisfy this agreement we have developed 20 WRPs for accreditation under the requirements stated in the Basin Plan during the 2016 regulatory period. We expect that the 20 NSW WRPs will be submitted to the MDBA before 30 June 2020. If in assessing the WRPs the MDBA determines that they do not meet the criteria established under the Basin Plan, we will be required to undertake further changes to the WRPs. This may also involve amendments to the 31 NSW WSPs that form the basis of the WRPs.

The WRPs are statutory instruments under the Commonwealth *Water Act 2007*. While the Commonwealth has previously provided funding to develop them, it will not be providing continuing funding for ongoing review and amendments of the 20 NSW WRPs. This is a new business requirement that will commence being undertaken within the 2021 regulatory period.

The WRPs set out Murray-Darling Basin consistent arrangements for sharing water for consumptive use, establish rules to meet environmental and water quality objectives and take into account potential and emerging risks to water resources. They have a fundamental role in ensuring that sustainable diversion limits for the water resources set by the Basin Plan are implemented from 2019 onwards.

As part of the water resource planning process, where appropriate WSPs are being merged to achieve cost savings in the ongoing plan review process. Community consultation is undertaken as part of the development of WRPs and review of WSPs to ensure the delivery of quality products that meet customer needs.

When NSW amends a WSP and that amendment has a material effect on the relevant water resource plan, the WRP must be amended. The WRP amendment will be assessed by the MDBA for consistency with the Basin Plan, before it is accredited by the Commonwealth Water Minister. This is a new business requirement that will be undertaken within the 2021 regulatory period.

The Commonwealth funded the development of the NSW WRPs up to 30 June 2020. As part of the *Agreement on Murray-Darling Basin Reform 2008* and the *Intergovernmental Agreement on Implementing Water Reform in the Murray Darling Basin 2013.* Past 30 June 2020, NSW agreed to undertake any further tasks to implement and if required amend the NSW WRPs without Commonwealth funding.

The Basin Plan will be reviewed and amended in 2025-26. If an amendment to the Basin Plan results in the need to change the water resource plans, NSW will be required to amend the water resource plans within three years of the Basin Plan amendment. Changes to the water resource plans as part of a Basin Plan is likely to be in the 2021 regulatory period.

Forward planning beyond 2025

A total of eight regulated surface WSPs were remade as part of the water resource plan development in 2018- 2019. The full review cycle and remake and replacement actions have moved to 2030. An additional task in the next period will be amending the 20 NSW WRPs after the Basin Plan amendments in 2025/26.

Operating expenditure

The cost of water planning is largely staff time and consultation required to extend, amend or replace each water management plan. The costs for each WSP vary depending on the complexity of the plan and the issues to be addressed.

The completion of plans to cover the whole state means that we have been able to implement several measures to reduce costs and improve efficiency during this regulatory period and moving forward. This is because the work of preparing a plan for the first time is much more than that required for review and replacement. Particular measures include:

- amalgamating some small WSPs into larger WSPs, where this is appropriate, so that the number of reviews is reduced long term
- progressively revising and standardising WSP provisions to make review more effective and efficient
- removing our previous practice of doing a full public review in parallel with the NRC's review
- rationalising and systematising internal processes.

The proposed expenditure from 2021 for the next five years includes efficiencies achieved during recent years and the more mature WSPs. We will continue to refine planning approaches and documentation to operate in a least cost way to deliver planning outcomes. The proposed FTEs also reflects the level of consultation requested by stakeholders and the additional requirements of having to amend two plans (NSW WSP and Basin Plan WRPs) under the Basin Plan arrangements.

The forward schedule of expiring WSPs is not evenly spread from year to year, so the expenditure and delivery of outputs will vary from year to year. We will be working with the

NRC to spread the work of WSP review more evenly over time by advancing some WSP reviews and applying interim extensions to others.

If this funding is not provided there is a risk that inland WSPs will expire and not be replaced which would mean there is no WSP in place, so no rules for protecting the environment or sharing water between users. This means we would not be able to deliver on the objectives of the *Water Management Act 2000*. If a WSP expires it also raises complex legal issues between the state water sharing arrangements and those recognised under the WRPs.

During the 2016 regulatory period, our actual and estimated expenditure is an average annual amount of $3.6 million[95], which exceeds the amount IPART deemed prudent and efficient when setting WAMC prices in 2016, which was $2.9 million annually. This is because of the much greater number of WSPs reviewed than was originally forecast, as a result of Basin Plan requirements.

We propose to spend a total of $11.9 million[96] in the 2021 regulatory period on this activity, with forecast expenditure 17% lower than actuals in the current period and is 2% higher than the prudent and efficient amount used by IPART when setting WAMC prices in 2016. This is set out in the following table

Table 38. Expenditure on inland water plan development W06-02 ($2020-21 $000)

Cost	2016 regulatory period				Extension	2021 regulatory period				
	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
IPART'S 2016 final report	2,925	2,925	2,925	2,925	2,925					
Actual DPIE Water operating expenditure	3,486	4,380	3,539	2,912						
Actual externally funded operating expenditure	7,936	4,667	7,323	7,942						
Actual externally funded capital expenditure	0	0	0	0						
Proposed DPIE Water operating expenditure						2,976	2,976	2,976	2,976	2,976

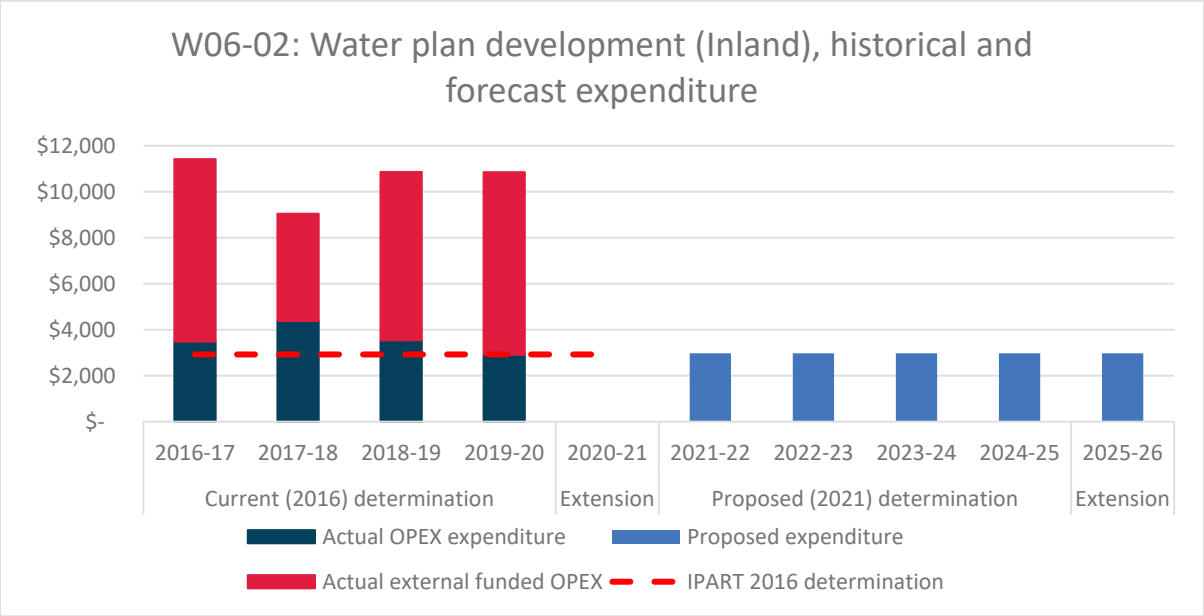
Notes: IPART's 2020–21 figure has been provided by IPART; actual operating expenditure is net of externally funded operating expenditure; DPIE Water's 2019–20 actual costs are 12/10 x actual costs for the 10 months to April 2020 and NRAR's 2019-20 actual costs are 12/11 x actual costs to May 2020; 2020–21 actual costs are unknown; 2025–26 costs are provided as required by IPART; please also refer to the Administrative Information document that is part of this submission.

This information is also set out in the following graph. The graph also shows the amount of Commonwealth funding for activity W06-02, with externally funded operating expenditure of $27.9 million between 2016-17 and 2019-20 for Basin Plan implementation (on top of our

[95] All expenditures are expressed in $2020-21 and are described in the Administrative Information paper accompanying this paper.

own expenditure of $14.3 million in that period). Commonwealth funding will cease on 30 June 2020.

Figure 16. Expenditure on inland water plan development W06-02 ($2020-21 $000)



W06-03 Floodplain management plan development

This activity comprises development, review, amendment and replacement of Floodplain Management Plans. We have undertaken this work in collaboration with the former Office of Environment and Heritage (OEH), now known as the Environment, Energy and Science group within the Department of Planning, Industry and Environment. Over the next price path, we will need to deliver the required flood modelling work to support floodplain management plan development, with this input required as of 1 July 2020.

Floodplain Management Plans (FMPs) establish a framework for the coordinating of floodworks within designated floodplains, whether such works be for flood management or other purposes, such as water storage, that impact on the flow of water across the floodplain. They are part of the transition of water management from the provisions of the *Water Act 1912* to the provisions of the *Water Management Act 2000.* Critically, the FPMs and associated designation of a floodplain underpin the ability of the state to implement floodplain harvesting entitlements, which are the mechanism for managing water take and growth in water take from floodplains.

Previous approaches to floodplain management have been piecemeal. Incomplete information has prevented us from effectively linking floodplain management to improved river and healthy floodplains outcomes. Implementation of valley-wide, *Water Management Act 2000*-compliant FMPs addresses this issue. Differences between the new and old FMPs reflect better and more integrated information about floodplain characteristics, flood flows and structures within the floodplain, the more specific requirements of the *Water Management Act 2000,* and the impact of structures within the floodplain on safety, property, environmental and cultural outcomes.

In setting WAMC prices in 2016, IPART allowed $0.2 million for this activity across the four years from 2016 to 2020. To accelerate our program, we spent $0.9 million above the IPART determined forecast across those 4 years, and an additional $10.7 million in external funding on developing floodplain management plans. This was essential to underpin work currently

underway to determine entitlements for floodplain harvesting licences within the Northern Basin by June 2021.

We propose to spend a total of $7.4 million[97] in the 2021 regulatory period on this activity, an annual average of $1.8 million. The proposed annual average represents a substantial increase from the $68,000 we spent on average annually so far during the 2016 regulatory period and is also substantially higher than the amount IPART used when determining WAMC prices in 2016 ($46,000 average annual), as set out in Table 41.

Statutory basis for service

Water planning as required under:

Water Management Act 2000:

- Chapter 2, Part 3 Management Plans, Division 1, Division 5 Floodplain Management, Division 7 Environmental Protection and Part 4 Minister's plans for the making of management plans.

Water Act 2007 (Commonwealth):

- Part 2 – Management of Basin water resources.
- Murray Darling Basin Plan, Chapter 10 water resource plan requirements.
- As a signatory to the Murray Darling Basin Plan, NSW has committed to preparing Water Resource Plans and Environmental Watering Plans by 2019-20.

Stakeholder views

In our review of our engagement with our stakeholders over the 2016 regulatory period, we identified that three of the key expectations of us, expressed during consultation for Water Resource Plan (WRP) and Water Sharing Plan (WSP) development, are

- clear and transparent enforcement of the water management framework,
- monitoring that customers can trust and
- improved accountability for water management decisions.[98]

Neither enforcement nor monitoring are a function of activity W06-03, however the plans that are developed, reviewed and amended within this activity must exist, be up-to-date, require useful information to be made available and contain rules that are detailed and robust enough to be enforced if necessary. Plans must contain sufficiently detailed but comprehensible information to enable them to be used and understood in all respects by users, other stakeholders and NRAR.

To achieve this level of information in FMPs, the expenditure proposed for this activity includes resourcing that will allow for thorough reviews including scientific and other technical input and comprehensive consultation with all stakeholders that can be assessed and incorporated into plans as required.

[97] All expenditures are expressed in $2020-21 and are described in the Administrative Information paper accompanying this paper.
[98] KJA, DPIE IPART Price Submission – Stakeholder Engagement Plain English Summary and Final report, 27 February 2020, pages 7, 8 and 9

Historic service 2016-17 to 2019-20 (4 years)

Service description and benefits

In 2015, Part 8 (Floodplain Management) of the *Water Act 1912* was repealed. The existing 22 floodplain management plans (FMPs) were given transitional status as Minister's Plan under the *Water Management Act 2000*.

New FMPs for six floodplain valleys have been developed or are being developed for six rural floodplains as part of the transition of water management from the provisions of the *Water Act 1912* to the provisions of the *Water Management Act 2000*. FMPs provide the framework for coordinating the development of flood works on a whole-of-valley basis.

The first six FMPs to be prepared under the *Water Management Act 2000* are for the five valleys of the Murray-Darling Basin in northern New South Wales: the Gwydir, Namoi (Upper and Lower), Barwon-Darling, Macquarie and Border Rivers. These replace 12 existing *Water Act 1912* FMPs with *Water Management Act 2000* compliant plans that cover a larger area within each valley.

The six FMPs have been completed or are being completed as part of the implementation of the NSW Healthy Floodplains Project, which commenced in 2013 to reform the management of water on floodplains through the preparation of FMPs and the work to licence the take of floodplain harvesting water. All funding for this activity was from the Commonwealth.

The purpose of a FMP is to manage the risk to life and property from the effects of flooding and to protect and maintain ecological and cultural features of the floodplain that are dependent on floodwaters. FMPs build on current practice and use improvements in knowledge and technology to deliver a streamlined approvals process for new and amended flood works.

Service levels

IPART found that a very small amount in expenditures was prudent and efficient for this activity when determining WAMC prices in 2016. Almost all of the funding for this activity to date has been from the Commonwealth as part of the implementation of the Murray-Darling Basin Plan.

We agree with IPART's decision[99] that the user share for this activity should be zero. This activity deals with legacy issues and resolving them will have significant benefits for both the NSW Government and coastal regional economies.

The following table reports against the output measures and performance indicators under the Healthy Floodplain Project for the development of FMPs. Six new FMPs for five northern inland valleys have been developed and will have commenced within the 2016 regulatory period. These FMPs result in the designation of six rural floodplains in the northern Murray Darling Basin , with FMPS for Gwydir, Barwon Darling and upper Namoi commenced, and FMPs for the Lower Namoi, Border Rivers and Macquarie catchments nearing completion.

[99] IPART, Rural Water Cost Shares - Final Report, 2019, p47

Table 39. Output measures and performance indicators for the 2016 regulatory period W06-03

Progress	Output measures	Performance indicator
	Development of five* floodplain management plans Progress in implementing floodplain harvesting licensing	Complete technical investigations of floodway network, flood behaviour and environmental, cultural, socio-economic and other existing floodplain assets Development of draft management plan Public exhibition of draft Floodplain Management Plans Commencement of Floodplain Management Plans Cumulative percentage of forecast FMPs completed: Target: 100%
2016-17	Gwydir Valley FMP commenced Barwon Darling Valley FMP commenced Public exhibition of Lower Namoi Valley FMP	34% of Floodplain Management Plans commenced
2017-18	Nil Plans commenced. Public exhibition of Border Rivers Valley FMP	
2018-19	Upper Namoi Valley FMP commenced Public exhibition of Macquarie Valley FMP	50% (cumulative) of Floodplain Management Plans commenced
2019-20	Border Rivers and Lower Namoi Valley FMPs to commence	

* Six FMPs to be prepared for five valleys.

Note: Macquarie Valley Floodplain Management Plan to commence in first half of 2020-21

Forecast service 2020-21 to 2024-25 (5 years)

The development of new and review of the existing FMPs will continue during the 2021 regulatory period as an ongoing activity. The *Water Management Act 2000* mandates reviews and audits so that FMPs are kept up to date with changes in knowledge, risks and circumstances, and continually improved to reflect experience in implementation.

Service delivery will be improved in the 2021 regulatory period by:

- development of further *Water Management Act 2000* compliant FMPs to replace the existing ten FMPs under the *Water Act 1912* and
- a higher level of mid-term reporting for the existing FMPs under the *Water Management Act 2000* and more frequent ongoing communication and consultation with stakeholders.

The ten *Water Act 1912* FMPs are currently located in southern inland NSW:

- three in the Lachlan Valley
- two in the Murrumbidgee Valley and
- five in the Murray Valley.

There are also two designated floodplains without FMPs (Belubula and one in the Murrumbidgee.) There are no FMPs under the *Water Act 1912* or designated floodplains in the Lower Darling valley.

Previous approaches to floodplain management have been piecemeal. Incomplete information limits the NSW Government from effectively linking floodplain management to improved river and floodplain healthy outcomes. Implementation of valley-wide, *Water Management Act 2000* compliant FMPs addresses this issue. Differences between the new and old FMPs reflect better available information and the more specific requirements of the

Water Management Act 2000. New FMPs contain maps of clearly delineated management zones and transparent rules and assessment criteria to coordinate flood work development. They also cover the extent of major flooding in a valley, filling in any gaps between existing FMPs which focused on smaller problem areas. *Water Management Act 2000* FMPs provide greater clarity and consistency for landholders applying to build or amend flood works.

The NSW Healthy Floodplains Project has established a clear process for the development of *Water Management Act 2000* compliant FMPs, including technical methodologies, governance frameworks and processes for stakeholder and community engagement. We have published a Technical Manual for rural FMPs developed under the *Water Management Act 2000*.[100] Our lessons learned through the project so far will assist us in streamlining the process for developing new FMPs in the southern inland areas of NSW.

The NRC will undertake audits of the ten *Water Act 1912* FMPs and the Gwydir Valley FMP before 30 June 2021.We expect that the NRC will recommend replacement of the ten *Water Act 1912* FMPs with Water Management Act 2000 compliant FMPs.

Service levels

The table below shows proposed output measures and performance indicators for the 2021 regulatory period.

Table 40. Output measures and performance indicators for the 2021 regulatory period W06-03

Proposed output measure	Performance indicator
Prioritisation of replacement of existing *Water Act 1912* FMPs	Publishing prioritisation of *Water Act 1912* FPHs for replacement by *Water Management Act 2000* compliant plans
Develop three priority *Water Management Act 2000* compliant FMPs	Complete technical investigations of floodway network, flood behaviour and environmental, cultural, socio-economic and existing floodplain assets for three floodplains Development of draft FMPs Public exhibition of draft FMPs Target: Three

Operating expenditure

The cost of developing FMPs reflects the intensive technical investigations of floodway network, flood behaviour and environmental, cultural, socio-economic and other existing floodplain assets. This is a critical part of the development of FMPs and relies on specialised experts and the collection and interpretation of new data sets, including for example the collection or purchase of airborne LiDAR (Light Detection and Ranging), satellite imagery and field investigations.

Costs across the 2021 regulation period (2021-22 to 2024-25) are annual costs for the development of the floodplain management plans from project commencement. Tasks were carried across DPIE Water and DPIE Environment Energy and Science (previously Office of Environment and Heritage). DPIE Environment Energy and Science undertook the majority of the technical development of the Floodplain Management Plans.

[100] Rural floodplain management plans Technical manual for plans developed under the Water Management Act 2000 Version 2.0 https://www.industry.nsw.gov.au/__data/assets/pdf_file/0016/143152/rural-fmp-draft-technical-manual.pdf

Additional expenditure in 2021-22 and 2022-23 reflects consultation requirements under the *Water Management Act 2000*. The actual cost of data acquisition is included under expenses. This includes the purchase of LiDAR information, satellite data and field surveys.

Lessons learnt during the development of the six *Water Management Act 2000* consistent FMPs will be applied during the development of future FMPs. This will ensure that the development of future FMPs is effective, efficient and timely.

The development of FMPs in southern inland NSW will assist in future licensing of floodplain harvesting water by providing technical information about floodplain boundaries, flooding regimes, flood behaviour, existing flood structures and ecological and cultural assets.

If we are inadequately funded for this activity, there is a risk that FMPs will not be developed or reviewed and the state will not be able to deliver on the objectives of the *Water Management Act 2000*. FPMs underpin the ability of the state to implement floodplain harvesting entitlements which are the mechanism for managing water take and growth in water take from floodplains. There are also legal and reputational risks to NSW if stakeholder expectations are not met.

Commonwealth funding in the 2016 regulatory period has been $10.3 million[101]. That funding will cease as at 30 June 2020. Proposed expenditure for 2021 regulatory period is lower than this, at $7.4 million, or $1.8 million on average annually, as set out in the following table.

Table 41. Expenditure on floodplain management plan development W06-03 ($2020-21 $000)

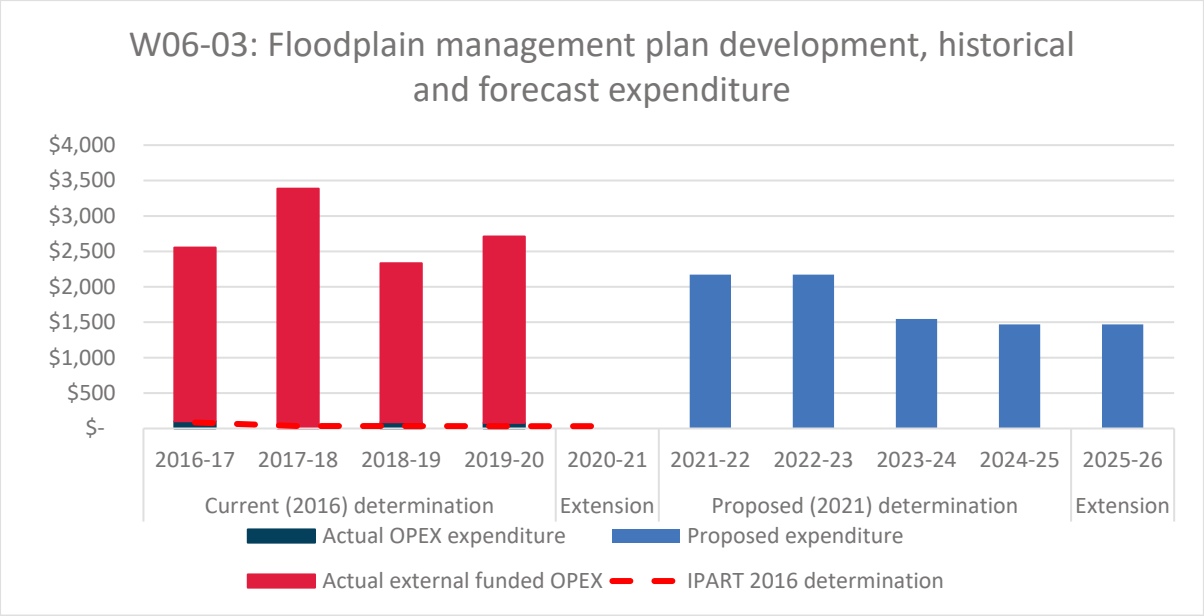
Cost	2016 regulatory period				Extension	2021 regulatory period				
	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
IPART'S 2016 final report	85	34	34	33	33					
Actual DPIE Water operating expenditure	102	0	90	79						
Actual externally funded operating expenditure	2,452	3,385	2,243	2,631						
Actual externally funded capital expenditure	0	0	0	0						
Proposed DPIE Water operating expenditure						2,172	2,172	1,547	1,469	1,469

Notes: IPART's 2020–21 figure has been provided by IPART; actual operating expenditure is net of externally funded operating expenditure; DPIE Water's 2019–20 actual costs are 12/10 x actual costs for the 10 months to April 2020 and NRAR's 2019-20 actual costs are 12/11 x actual costs to May 2020; 2020–21 actual costs are unknown; 2025–26 costs are provided as required by IPART; please also refer to the Administrative Information document that is part of this submission.

[101] All expenditures are expressed in $2020-21 and are described in the Administrative Information paper accompanying this paper.

This information is also set out in the following graph.

Figure 17. Expenditure on floodplain management plan development W06-03 ($2020-21 $000



W06-04 Water management works

This activity comprises the development of drainage management plans, to address water quality problems associated with drainage systems.

During the 2016 regulatory period, we have commenced developing a drainage management framework that will meet our defined objectives. The framework is being developed in conjunction with other key DPIE divisions and DPI Fisheries and will cover each of the seven catchments identified as priority catchments for action under the Department of Primary Industries' (DPI) Marine Estate Management Strategy 2018-28 (MEMS.)

In the 2021 regulatory period we will finalise the drainage management framework and the Government will decide whether to proceed to develop drainage management plans, or whether we can meet the objectives by amending the existing approvals regime and compliance activities.

We propose to spend a total of $2.2 million[102] in the 2021 regulatory period on this activity, an annual average of $542,000. The proposed annual average represents a substantial increase from the $576 we spent on average annually so far. There are minimal expenditures recorded in the 2016 regulatory period because $0.2 million of external funding was received under Stage 1 of the MEMS. That funding will cease on 30 June 2020. The proposed annual average cost represents a 140% increase on the combined DPIE Water actual spend and external funding, and is substantially higher than the very small amount IPART used when determining WAMC prices in 2016 ($33,000), as set out in Table 43.

In this activity we are preparing a drainage management framework to cut red tape and deliver improvements in estuarine health. Without improvements to drainage management,

[102] All expenditures are expressed in $2020-21 and are described in the Administrative Information paper accompanying this paper.

water quality in estuaries will continue to decline and the productivity of land will decrease, which will have economic, social and cultural impacts on regional and rural communities.

Statutory basis for service

Under the *Water Management Act 2000*:

- Chapter 2, Part 3 Management Plans, Division 1, Division 4 Drainage Management and
- Regulation-making powers in s. 400(2)

Stakeholder views

Key stakeholders - including local government and agricultural landholders – have made representations asking for the current approvals requirements under NSW legislation to be made simpler and to cost less in time and fees, especially for drain maintenance activities (as opposed to new developments) on coastal floodplains.

Historic service 2016-17 to 2019-20 (4 years)

Service description and benefits

Our two aims in preparing the management framework - and possibly plans under the Water Management Act 2000 - are to identify how to cut red tape associated with the current approval regime for coastal floodplain agricultural drainage infrastructure and to deliver improvements in estuarine health by improving the water quality emanating from this infrastructure. Better management of the downstream impacts of coastal floodplain agricultural drains and floodgates will protect the environment, businesses and communities affected by water quality issues associated with drainage systems. Without improvements to drainage management, water quality in estuaries will continue to decline and the productivity of land will decrease, which will have economic, social and cultural impacts on regional and rural communities.

An interagency working group (with representatives from DPIE Water and other DPIE divisions – Planning and Assessment, Environment Energy and Science, Crown Lands and NRAR and from DPI Fisheries) is in the process of identifying and analysing policy options to simplify and cut costs to landholders and government associated with the current approvals framework. This working group is led/chaired by DPIE Water. The options identified include switching off existing approval requirements under a suite of legislation and replacing them with drainage work approvals under the Water Management Act 2000. This is best achieved by first developing drainage management plans for seven coastal catchments identified as priority catchments under the Marine Estate Management Strategy. These are the Tweed, Richmond, Ballina, Clarence Valley, Mid Coast and Shoalhaven. The working group is also in the process of identifying options for ensuring that there is a clear compliance framework and responsibilities for achieving compliance.

The improved drainage management policy framework will meet environmental, economic and social and cultural objectives:

- environmental
    - improve water quality, particularly acidity, downstream of agricultural drainage infrastructure on coastal floodplains and
    - reduce blackwater events at local and catchment scale,
- economic
    - maintain upstream production values in accordance with land capability,

    - create opportunities to minimise economic impact by authorised mitigation works,
    - reduce the regulatory burden of multiple approval processes, especially for ongoing maintenance of agricultural drains and
    - maintain water quality that supports healthy estuaries, which in turn support coastal tourism and fishing industries and
- social and cultural
    - improve coastal floodplain water quality, which supports social and cultural values of estuaries and
    - provide a simpler, clearer and less costly approval framework for drainage works and activities for key agricultural stakeholders/industries.

Once a policy framework for managing coastal agricultural drainage into the future is agreed, we will implement it, which will involve putting in place:

1. a regulatory regime that is clear and fit for purpose – i.e. approvals and compliance that is appropriate given the likely water quality and other environmental impacts of an activity,
2. a risk-based approach to inform the future approvals regime, based on mapping that is currently under development (due for completion in 2020-21),
3. if appropriate, drainage management plans under the *Water Management Act 2000* to set the rules for drainage works and activities.

The decision as to whether it is appropriate to develop drainage management plans or not will be based on myriad considerations, including key stakeholder plan-making and consultation fatigue, the cost of plan development and implementation and the benefits of this approach over using other tools, such as making changes to the existing regulatory framework – both approvals and the way they are implemented, including compliance. Developing another plan under the WMA may be particularly sensitive in the Richmond, which is a key catchment for achieving improvements in estuarine water quality, given the years of policy-making and plan development that has already occurred.

Service levels

During the 2016 regulatory period, we have commenced developing a drainage management framework that will meet the objectives outlined above. This work has largely been funded through Stage 1 of DPI's Marine Estate Management Strategy (MEMS).

From 2020-21 to 2024-25 we propose to finalise that framework and possibly deliver up to seven plans for priority areas that will improve the management of coastal floodplain drainage impacts. Seven plans will be developed if catchment-level planning is necessary and drainage management plans under the WMA considered the best tool to deliver those improvements; if not, one plan with rules that apply across all seven catchments – and possibly other coastal catchments – will be developed, or another more appropriate tool or set of tools used to achieve the outcomes.

The framework is being developed in conjunction with the other key DPIE divisions listed above and DPI Fisheries. State agencies and will cover each of the seven catchments identified as priority catchments for action under the MEMS.

Forecast service 2020-21 to 2024-25 (5 years)

This covers the last year under the 2016 regulatory period and the 4 years of the 2021 regulatory period.

Service levels

The 2021 regulatory period will see the finalisation of the drainage management framework and a decision by Government by 30 June 2021 on whether to proceed to develop drainage management plans, or whether the objectives can be met by simplifying the existing approvals regime and clarifying roles and responsibilities and resourcing for compliance activities.

This will require ongoing consultation with other State divisions/agencies and key stakeholders including local councils, industry representatives and agricultural landholders.

We agree with IPART's decision[103] that the user share for this activity should be zero. This activity deals with legacy issues and resolving them will have significant benefits for both the NSW Government and regional economies.

The table below shows proposed output measures and performance indicators for the 2021 regulatory period.

Table 42. Output measures and performance indicators for the 2021 regulatory period W06-04

Proposed output measures	Performance indicator
Completion of the drainage management framework (2020-21) Development and commencement of up to seven drainage management plans	Approved drainage management framework communicated across Government and to key stakeholders Meetings held between other Government divisions/agencies and with key stakeholders, including local government, industry groups and agricultural landholders Reduced regulatory burden - by 'switching off' approvals required under other legislation once an agreed framework – which may include a drainage management plan or plans - is made Up to seven drainage management plans published on the legislation NSW website.

Operating expenditure

Little expenditure is shown in the 2016 regulatory period as the project has received $225,000of external funding under Stage 1 of DPI's MEMS. That funding will cease on 30 June 2020.

The cost of drainage management development is largely staff time required to develop the policy framework, consult with other agencies and key stakeholders, including local government, industry representatives and the community, and make drainage management plans, regulations and supporting documentation. The costs for developing the first drainage management plan based (at least in part) on the model in Chapter 2 of the *Water Management Act 2000* will be more than future plans as lessons are learnt and processes improved.

The proposed resourcing requirements are based on the resourcing of water sharing plan and floodplain management plan development and includes the cost of policy support for the

[103] IPART, Rural Water Cost Shares, February 2019, available at https://www.ipart.nsw.gov.au/Home/Industries/Water/Reviews/Rural-Water/Rural-Water-Cost-Shares/05-Feb-2019-Final-Report/Final-Report-Rural-Water-Cost-Shares-February-2019

drainage management framework development (for year 2020-21 only), spatial services support for maps for statutory plans, water quality and other scientific and technical support, and water planning resources to develop and commence drainage management plans for each year of the regulatory period.

We propose to spend a total of $2.2 million[104] in the 2021 regulatory period on this activity, as set out in the following table.

Table 43. Expenditure on drainage plan development W06-04 ($2020-21 $000)

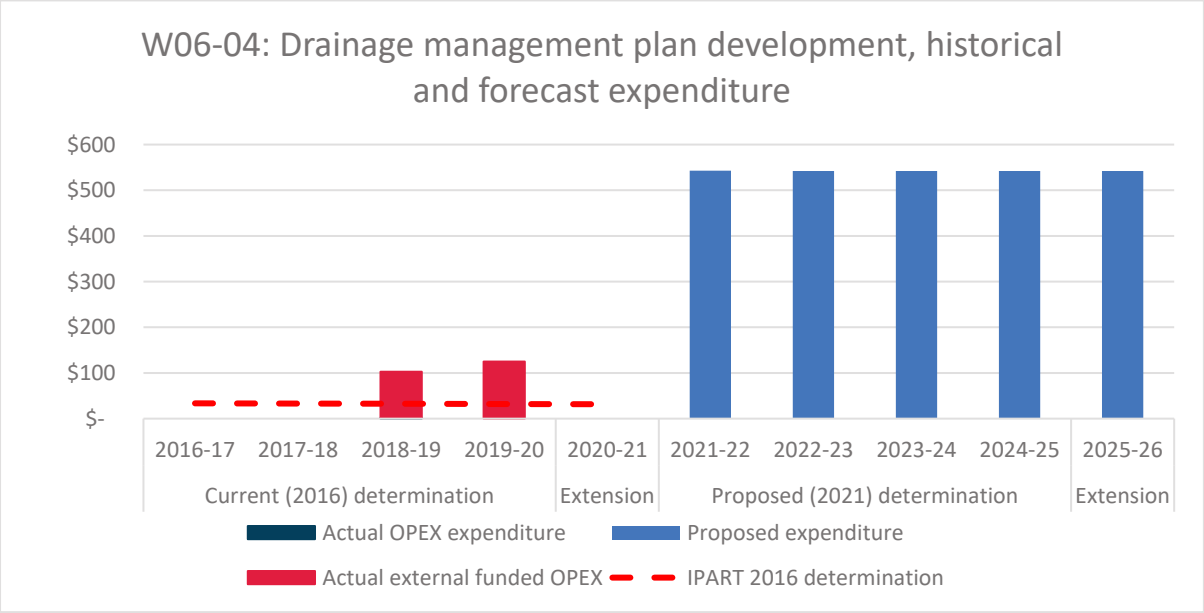
Cost	2016 regulatory period				Extension	2021 regulatory period				
	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
IPART'S 2016 final report	34	33	33	32	32					
Actual DPIE Water operating expenditure	0	0	2	0						
Actual externally funded operating expenditure	0	0	100	125						
Actual externally funded capital expenditure	0	0	0	0						
Proposed DPIE Water operating expenditure						543	542	542	542	542

Notes: IPART's 2020–21 figure has been provided by IPART; actual operating expenditure is net of externally funded operating expenditure; DPIE Water's 2019–20 actual costs are 12/10 x actual costs for the 10 months to April 2020 and NRAR's 2019-20 actual costs are 12/11 x actual costs to May 2020; 2020–21 actual costs are unknown; 2025–26 costs are provided as required by IPART; please also refer to the Administrative Information document that is part of this submission.

This information is also set out in the following graph.

[104] All expenditures are expressed in $2020-21 and are described in the Administrative Information paper accompanying this paper.

Figure 18. Expenditure on drainage plan development W06-04 ($2020-21 $000)



W06-05 Regional planning and management strategies

The regional planning and management strategies activity code has, to date, covered the development, evaluation and review of regional water strategies, metropolitan water plans and other planning instruments, including associated stakeholder engagement.

Moving forward, a more accurate description would be the development, coordination, implementation, evaluation and review of state, regional and metropolitan strategies, providing full coverage across the state, and the associated stakeholder engagement. Throughout this section we have titled this more visionary and encompassing work the Water Strategy Program.

The Water Strategy Program is a framework that will set the strategic direction for water resource management and the water sector in NSW. The framework includes a new State Water Strategy, regional water strategies, the metropolitan Greater Sydney Water Strategy, and the Lower Hunter Water Security Plan.

The Premier[105], ICAC[106], NSW Productivity Commission[107] and the NSW Auditor General[108] have all indicated that they require DPIE Water to have in place a strategic planning framework for water resource management in NSW.

The Water Strategy Program meets these requirements. The State Water Strategy is being developed to set out a vision that reflects the objects of the *Water Management Act 2000* and the over-arching strategic outcomes, priorities and targets for the management of the State's water sources, and associated organisations that have a role in water management.

[105] DPIE Portfolio priorities.
[106] Draft Corruption Prevention Submissions, ICAC, Operation Avon. Recommendation 1: *The NSW Government sets out its water strategy, objectives and priorities for the use and management of NSW's water resources in a manner consistent with the priorities of the Water Management Act 2000*,
107 Kickstarting the productivity conversation, NSW Productivity Commission, October 2019
108 Auditor General Regional Town Water Audit. Criteria 3(a) There are defined *objectives for strategic planning, with aligned priorities at a local, regional and state-wide level. 3(b) There are clear plans to engage local stakeholders on town water infrastructure issues when developing state and regional water strategies*.

Twelve regional water strategies, the Greater Sydney Water Strategy and the Lower Hunter Water Plan will underpin the State Water Strategy.

Access to water is essential for the prosperity of the NSW economy which is forecast to grow in value from just over half a trillion dollars in 2020 ($600 billion) to about $2 trillion by 2040.[109] The NSW 2040 Economic Blueprint targets *productive and vibrant regions,* including an agricultural industry supplying the growing middle class in Asia, aspiring to be *'Asia's delicatessen'* – a trusted source of high-quality, high-value products.

The suite of strategies in the Water Strategy Program will support these goals by guiding how NSW water agencies meet their water management obligations and priorities, and ensuring they are delivered in the most coordinated, effective and efficient ways over a 20-40 year horizon.

The strategies provide a platform for water agencies to work together to avoid crisis management, reactive responses, and a siloed, project by project approach. They will enable us to clearly articulate for our customers and stakeholders what we are doing and why across the spectrum of plans, regulatory reforms, projects and other initiatives across the Water Sector in NSW, in order to meet long term outcomes and address emerging challenges. The strategies will also provide the strategic framework for managing future droughts, and a monitoring and evaluation framework to track performance of water utilities and government in delivering these strategies.

When IPART last determined WAMC prices, the regional water strategies program was in its infancy. In 2018, the NSW Government expanded the objectives of the strategies, which resulted in a more complex development process and more comprehensive engagement. This has led to higher costs of delivering the strategies. As a result, funding through WAMC prices in the 2016 regulatory period was sufficient to complete only one strategy every two years, with minimal capacity for stakeholder engagement or whole of government coordination.

Our expenditure on regional water strategies in the 2016 regulatory period from user charge revenue was a total of $8.8 million, or $2.2 million on average over the four years (6% higher than the amount IPART decided was prudent and efficient in 2016). To reflect the expanded scope and recognise the Water Strategy Program as a Government priority, this was supplemented by significant external funding from a range of sources. We have recorded expenditure of $5.7 million in additional NSW funding used to complete the Greater Hunter Regional Water Strategy, significantly progress an additional five strategies[110] and undertake the planning, initial research and agency engagement for the remaining[111] strategies in the 2016 regulatory period. We propose to spend a total of $23.8 million in the 2021 regulatory period on this activity, an annual average of $6.0 million.

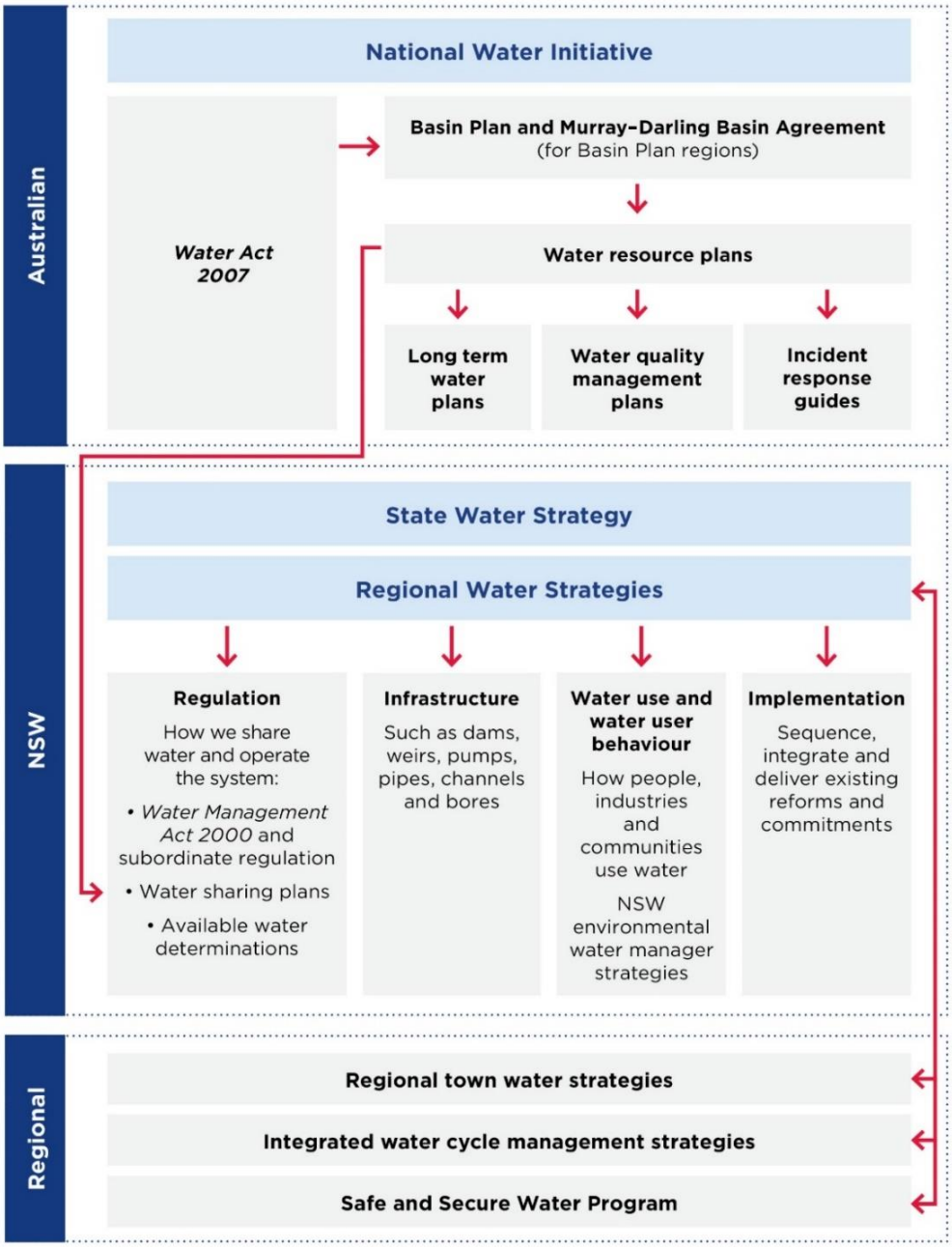
In the 2021 regulatory period we will have final strategies and implementation plans in place for all NSW regions. The need for good strategic planning is strongly supported by the external stakeholders the department has engaged with.

To achieve this new and challenging program, the proposed annual average expenditure over the 2021 regulatory period represents a 172% increase from the $2.2 million we have spent on average each year during the 2016 regulatory period so far. This is 190% higher than the amount IPART used when determining WAMC prices in 2016, shown in Table 49.

Figure 19 sets out key components of our Water Strategy Program, how they fit together and how they support our legislated obligations.

[109] NSW Treasury 2040 Economic Blueprint
[110] Gwydir, Macquarie, Lachlan, Far North Coast and South Coast.
[111] Border Rivers, Namoi, Western, Murray, Murrumbidgee and North Coast.

Figure 19. NSW water policy and planning context



Statutory and policy basis for service

While the strategies in the Water Strategy Program are not statutory plans, they contribute to water management outcomes aligned with the objects of the *Water Management Act 2000*. The strategies also contribute to key priorities and commitments by the NSW Government.

Statutory obligations

The regional water strategies are not specifically required by legislation but will guide how NSW water sector agencies meet their obligations under water management legislation, including the *Water Management Act 2000 (Water Management Act 2000)*, *Water Act 2007* (Cth), *Local Government Act 1993*, *WaterNSW Act 2014*. The strategies will ensure water agencies are better coordinated, and more effective and efficient at meeting obligations under the *Water Management Act, f*or example, by using the same models and planning

assumptions, and ensuring that water programs and infrastructure projects are aligned and scheduled to collectively meet intended outcomes. This will provide service improvements for customers during the 2021 regulatory period through more efficient use of our shared resources and more streamlined engagement and decision making. The strategies will also better inform landuse planning and investment decisions across government and industries by identifying the opportunities, risks and constraints of water resources across the state.

Government priorities and strategic policy objectives

The Premier provided key policy priorities for the Planning, Industry and Environment cluster in July 2019, including a direction to develop an integrated water strategy for the entire State to ensure efficient use of resources and future water security for both regional and metropolitan NSW. The Water Strategy Program is fundamental to achieving this priority, and will also inform better planning and investment decisions by Government by being clearer about the risks, opportunities and limitations posed by water resources across the state.

The State Water Strategy is due for completion in late 2020 for consultation in early 2021. It will set overarching direction for how we will manage the State's water resources to ensure future water security and resilience, and address long-term challenges including climate change and population changes. It will provide important context and direction for the 12 regional water strategies, the Greater Sydney Water Strategy and the Lower Hunter Water Plan.

Ensuring reliable water supplies for water users is a priority for the NSW Government and a core focus of the $4.2 billion Snowy Hydro Legacy Fund. The Government made an election commitment in 2019 to fast track the delivery of regional water strategies and has committed $9 million from that fund for development of those strategies in 2019-20 and 2020-21.

The Restart NSW Fund was established to support the delivery of high-priority infrastructure projects that improve the state's economic growth and productivity. This fund has also committed $7.5m to program costs and water security studies in the Gwydir, Macquarie and Lachlan, and research and analysis to inform the Gwydir, Macquarie, Lachlan, Far North Coast and South Coast regional water strategies.

The Greater Sydney Water Strategy will replace the current Metropolitan Water Plan and will set out the NSW Government's strategic policy objectives and desired outcomes for managing Sydney's urban water. The strategy will enable the delivery of a 40-year vision for integrated water management across the Greater Sydney region, and lay out the critical role of water in making Greater Sydney and the Illawarra more productive, liveable and sustainable cities for future generations.

Population growth and climate change increase the risk to a sustainable water supply. By 2040 Greater Sydney's population is forecast to grow by 1.9 million to 7.1 million people. In fact, the Strategy needs to accommodate a global city of 8.3 million by 2056, with an estimated increase in annual water demand of 50% to 65% (~280GL to 360GL per year).

As a global city, confidence in Greater Sydney's water security is essential for support economic growth, jobs, houses and community wellbeing.

How will this water be sourced? Rain dependent water in Sydney catchments is already fully allocated and periodically subject to severe drought. Secure, reliable water supply in the future will need to include rainfall independent sources of water, either desalinated and or recycled purified wastewater and or stormwater.

One of the key challenges is to identify the best mix of supply and demand options, including leveraging the significant reinvestment in wastewater systems, to ensure that the most

economic and affordable investment decisions are made going forward which involves many billions in infrastructure spending.

The Greater Sydney Water Strategy adopts an integrated water cycle management approach (consistent with the NWI paragraph 92) and water sensitive urban design to deliver place-based outcomes as envisaged in the Greater Sydney Region Plan (Greater Sydney Commission). It is based on total-system thinking with integrated engineering and economic options analysis, and climate adjusted hydrological modelling of the Greater Sydney catchment.

Recommendations of the State Infrastructure Strategy 2018-2038

The State Infrastructure Strategy (2018-2038) [112] that was finalised in 2018 identified the need for critical water infrastructure projects to be delivered in priority areas of NSW within a strategic framework, informed by state and regional water strategies. Its strategic objective is to 'support the growth, productivity and liveability of metropolitan and regional communities by ensuring that water security, quality and wastewater services protect public health and the environment.'

It notes that:

- in the next 20 years and beyond, the most important environmental change is likely to be a reduction in the availability of water for extraction. Contributing factors to this reduction include rising temperature, changing rainfall patterns and increases in the allocation of water for environmental uses,
- the water sector in NSW is heavily regulated and asset intensive. Improved operational performance, more efficient asset utilisation and better management and conservation practices will be critical to addressing current and future water challenges,
- we need to take a long-term view about the management of water resources and how best to ensure water security and quality,
- long-term planning of water infrastructure for Sydney should be predicated on the need to serve a city of over eight million people by 2056 and
- NSW must also ensure it has the robust climate science capability required to manage water resources appropriately and make informed investment decisions.

Recommendations in the State Infrastructure Strategy include:

- developing a 20-year strategic capital plan for Sydney's water and wastewater systems for consideration by the NSW Government and inclusion in Sydney Water's Pricing Submission to the Independent Pricing and Regulatory Tribunal
- developing options for the augmentation of Sydney's water supply and providing advice to the NSW Government.

On 1 July 2020, IPART's final determination of Sydney Water's prices will take effect. Sydney Water's price proposal to IPART includes a 'stocktake' of potential options for the capital plan. The Greater Sydney Water Strategy will set the strategic objectives and inform what is needed from the capital plan within the broader suite of water management and security options for the region. Sydney Water will then finalise the capital plan and options for implementation to deliver on these Government objectives.

The State Infrastructure Strategy 2018-2038 also recognises that "existing natural disaster risks (in some cases exacerbated by climate change), a growing population and increasing

[112] Available at http://www.infrastructure.nsw.gov.au/expert-advice/state-infrastructure-strategy/

interdependencies between infrastructure systems highlight the need to improve the resilience of infrastructure across NSW, particularly infrastructure that supports the essential needs of communities".[113]

The strategic objective to "ensure that existing and future infrastructure is resilient to natural hazards and human-related threats" is highly relevant to water infrastructure planning and decision making. Water infrastructure and water management must consider and provide resilience to climate extremes – this includes flooding, as well as drought.

The State Infrastructure Strategy, State Water Strategy and regional water strategies, also provide strategic context for our development and implementation of Floodplain Management Plans (FMPs) that currently apply to five major catchments in the northern Murray-Darling basin. These FMPs set out the restrictions and approval requirements for development within designated floodplains in the northern Murray-Darling Basin.

New Urban Water Policy Framework for Sydney

The NSW Cabinet approved an Urban Water Policy Framework in August 2018, which comprised six key elements relating to water planning for the Sydney region:

- development of a Greater Sydney Water Strategy to replace the 2017 Metropolitan Water Plan,
- a performance monitoring framework to be developed as part of the strategy,
- an integrated 20-year Long-term Capital and Operational Plan for Sydney Water and WaterNSW,
- an Emergency Drought Response Plan, a standing plan for future droughts that will be revised every five years,
- amendments to Sydney Water Corporation's and WaterNSW's Operating Licences to implement the framework; new Sydney Water Corporation licence clauses commenced 1 November 2019 and WaterNSW amendments are currently proposed to commence in 2020, and
- new governance arrangements.

The operating licences for WaterNSW, Sydney Water and Hunter Water Corporation require each of these agencies to use their best endeavours to establish and maintain a memorandum of understanding with us to form the basis for a cooperative relationship regarding roles and responsibilities for the review and implementation of the water plans for their areas and comply with the memoranda of understanding. Under the agreements, we coordinate implementation and review of the plans in cooperation with WaterNSW, Sydney Water and Hunter Water

Stakeholder views

Our water management stakeholder engagement over the last five years has identified that customers and stakeholders want government to be accountable for its decisions. This means being transparent in decision-making, having strong evidence for decisions, and ensuring that evidence is available to and able to be understood by customers and stakeholders more broadly.[114]

[113] Available at https://www.nsw.gov.au/projects/nsw-infrastructure-strategy-2018-2038
[114] KJA *DPIE IPART Price Submission – Stakeholder Engagement,* February 2020

Recent workshops held with local councils, joint organisations, Aboriginal groups and peak stakeholder groups on the development of the draft Lachlan, Gwydir and Macquarie regional water strategies have strongly reinforced this view.[115]

Briefings with peak stakeholder groups, including NSW Irrigators Council, NSW Farmers, NSW Minerals Council, Conservation Groups, the NSW Water Directorate and Primary Industries Regional Development Corporations, on regional water strategies took place throughout March and May 2020 in preparation for the release of the Gwydir, Macquarie and Lachlan draft strategies. We heard:

- there is significant confusion amongst customers about water resource management, water planning and water reforms. Customers want us to communicate much more clearly how the *Water Management Act* works and reforms fit together: the regional water strategies Guide [116] that will be published in July 2020 along with a clear decision-making framework, responds to this concern,
- customers are seeking clearer information about future water security and water availability to inform business decisions (and our response to this is that each of the strategies in the Water Strategy Program will include this information[117]),
- customers want us to take a strategic approach to regional planning and
- customers want to be involved in the development of the regional water strategies.[118]

Transparent evidence-based decision-making involving stakeholders is a core element of the regional water strategies program, which the State Water Strategy will build on.

Stakeholder approach under expanded regional water strategy program

With guidance from the Land and Water Commissioner, Regional Town Water Supply Coordinator and peak Aboriginal organisations, we have taken a new approach to stakeholder engagement for this program.

Councils, joint organisations, local Aboriginal communities and peak Aboriginal groups are being closely involved in the development of the strategies.

An extensive engagement program supports the regional water strategies, with five phases for the development of each strategy:

- firstly, initial engagement with Aboriginal peak groups as well as councils, local water utilities, joint organisations and Aboriginal communities in each region, then
- public exhibition of the draft regional water strategy, then
- further targeted engagement with Aboriginal peak bodies, councils, local water utilities and joint organisations and Aboriginal communities in each region, then
- public release of the final regional water strategy, and finally
- stakeholder consultation on implementation of the strategy.

In our consultation on the development of regional water strategies, stakeholders have indicated strong support for long term strategic planning for water.

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[115] See Attachment 1: Target Stakeholder Engagement, *Draft Lachlan Regional Water Strategy* pp109 – 119; Attachment 1: Target Stakeholder Engagement, *Draft Gwydir Regional Water Strategy* pp97-107 and Attachment 1: Target Stakeholder Engagement, *Draft Macquarie Regional Water Strategy* pp116-129 which are all available at https://www.industry.nsw.gov.au/water/plans-programs/regional-water-strategies when the strategies are published

[116] See https://www.industry.nsw.gov.au/water/plans-programs/regional-water-strategies

[117] See for example pp31 - 42 of the draft Gwydir Regional Water Strategy yet to be published and market sensitive until It is

[118] See *What we heard report* [yet to be published].

State Water Strategy

The State Water Strategy, to be finalised in 2020 for consultation in 2021, will be the apex document in the state water planning framework and will include a vision for water in NSW that reflects the objects of the *Water Management Act 2000* and sets the over-arching policy context, targets and strategic outcomes, for the management of the State's water sources.

The 20-year State Water Strategy for NSW will ensure sustainable, secure and healthy water resources and services to support growth of the NSW economy, community well-being, and be resilient to drought, flood and climate change. The State Water Strategy will:

- set the vision for water in NSW that reflects the objects of the Water Management Act 2000,
- set the over-arching policy context, targets and strategic outcomes for the management of the State's water resources,
- protect the integrity and sustainability of environmental and cultural assets,
- support the critical needs of NSW communities and industries to enhance opportunities for a diverse economy,
- facilitate a water supply market that is efficient and responsive to changing demands and
- promote the use of best available information, transparency and water literacy.

The 12 regional water strategies, the Greater Sydney Water Strategy and the Lower Hunter Water Plan will underpin and deliver on the State Water Strategy.

Regional water strategies

This section describes the regional water strategies program, its benefits and performance over the 2016 regulatory period. It then sets out our proposed forward program for the 2021 regulatory period and why these activities are needed.

Service description and benefits

We are preparing 12 regional water strategies in partnership with water service providers, local councils, communities, Aboriginal people and other stakeholders across NSW.

The regional water strategies will improve the resilience of our water resources, and of our water users and their communities, by identifying options to meet the following objectives:

- delivering and managing water for local communities
- enabling economic prosperity
- recognising Aboriginal people's water rights, interests and access to water
- protecting and enhancing the environment
- ensuring affordable policy and infrastructure options.

The strategies will provide the context and direction for water management over the next 20 years and beyond. They will identify priorities for potential investment in infrastructure and non-infrastructure solutions to address changing water needs and climate variability.

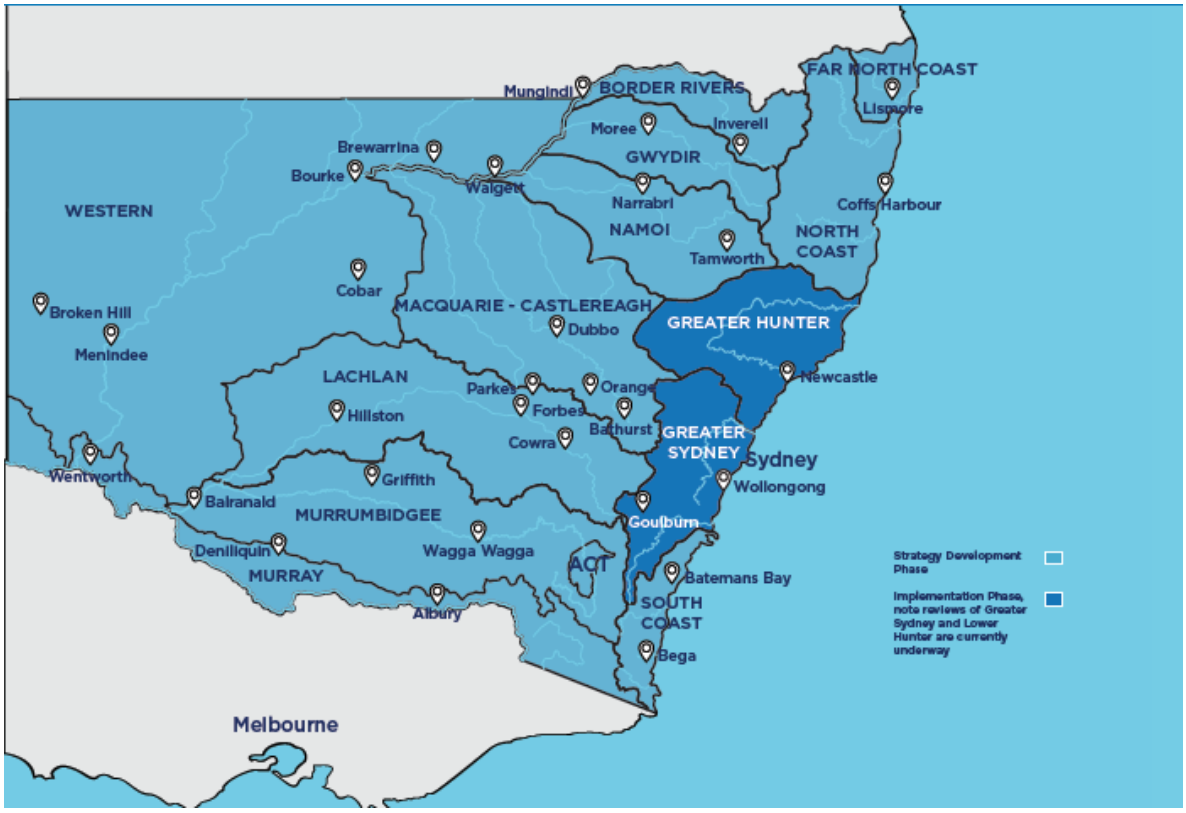
Significantly, all strategies in the Water Strategy Program will be based on new and more comprehensive climate data and modelling that we have developed during the 2016 regulatory period. This will better inform evidence-based water planning, allow us to more accurately project reliability of water access, and anticipate the potential impact of climate extremes, including changes in frequency, intensity and duration of both drought and flooding rains.

By considering what is needed at a regional scale, the strategies will provide a better understanding of current and future water needs and water resource management risks, drawing on more sophisticated climate data, community feedback and recent water reform and security studies.

Regional water strategy implementation will be set out in a clear and coordinated work program, providing a 5 year focus within a 20 year direction. Implementation will cover all elements of water resource management in the region, and address stakeholder feedback which has sought clarity in processes, priorities and decision making.

Figure 20 shows the areas that will be covered by the 12 regional water strategies across NSW.

Figure 20. Map of NSW regional water strategy regions



Benefits of regional water strategies work to date

A robust and transparent framework for developing and implementing the strategies

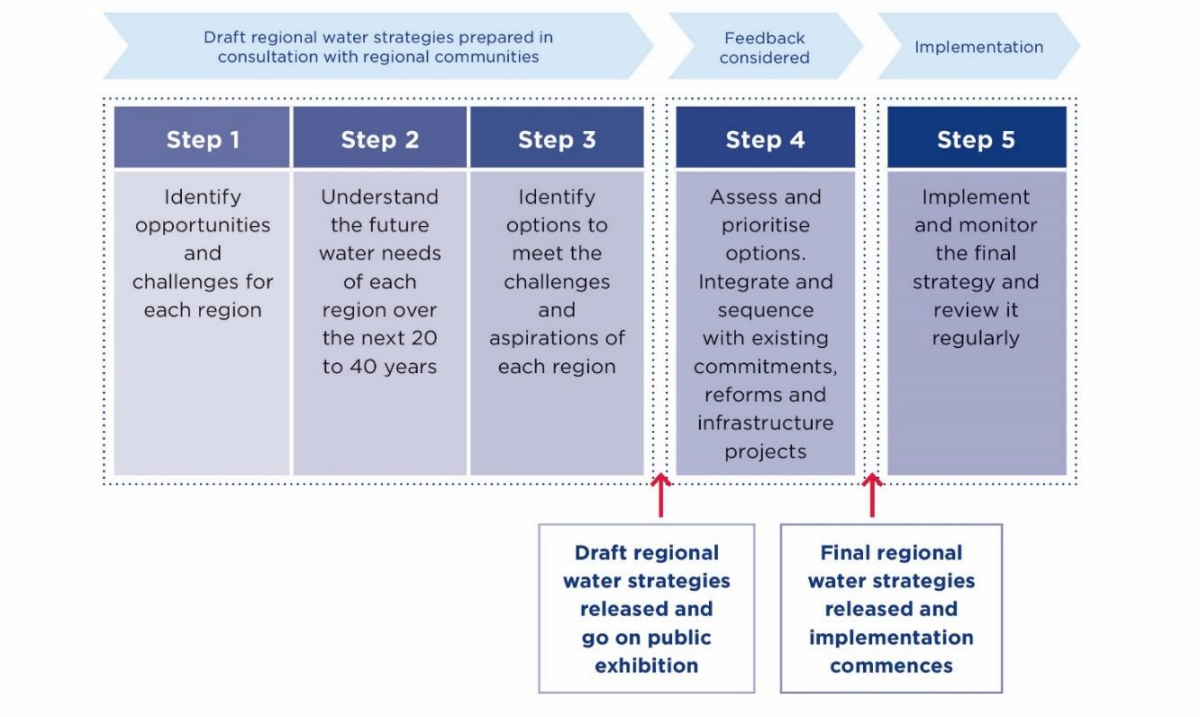
Historically, water management in regional NSW has not been undertaken through a rigorous, strategic framework. As a result, water management decisions, why actions were undertaken, and the timing of changes has not always been transparent to water users and the community. Criticisms have included concerns that decisions were not based on sufficient evidence, or perceptions that decisions were made to benefit some part of the community to the detriment of others.

We are responding by putting in place strategy documents that water users, stakeholders and the wider community can use to understand what we are doing and why we are doing it; that reflect what users, stakeholders and the community want; and that are based on robust, up-to-date evidence.

Regional water strategies reflect an evolution in our approach to planning. We are now using the latest climate modelling and an economic decision-making framework, overseen by an expert panel including NSW Treasury.[119]

The strategies integrate hydrologic, economic and environmental risk assessment to manage water resources at a regional scale. They provide the overarching strategic direction and integration for statutory plans (including water sharing plans), and provide the context for our water infrastructure planning. Stakeholder engagement is integral to the planning process to ensure the plans meet each region's needs. The process for developing and implementing regional water strategies is illustrated in Figure 21.

Figure 21. Regional water strategies: five-step development and implementation process



Draft strategy kits are being developed in consultation with government agencies, local councils, joint organisations and Aboriginal communities. They are made up of three parts:

- Part 1: information about regional water strategies,
- Part 2 - detailed analysis of each region including key water, demographic and economic risks, challenges and opportunities and
- Part 3 - a long-list of options for the region which could contribute to the objectives of the program outlined above.

Each draft strategy kit will be released for public consultation to seek feedback on the challenges, risks and opportunities for the region and the potential options for addressing them.

Following public consultation the long list of options will be assessed using an economic decision-making framework that has been developed in consultation with NSW Treasury, other NSW government agencies and WaterNSW, and peer reviewed by an expert panel.

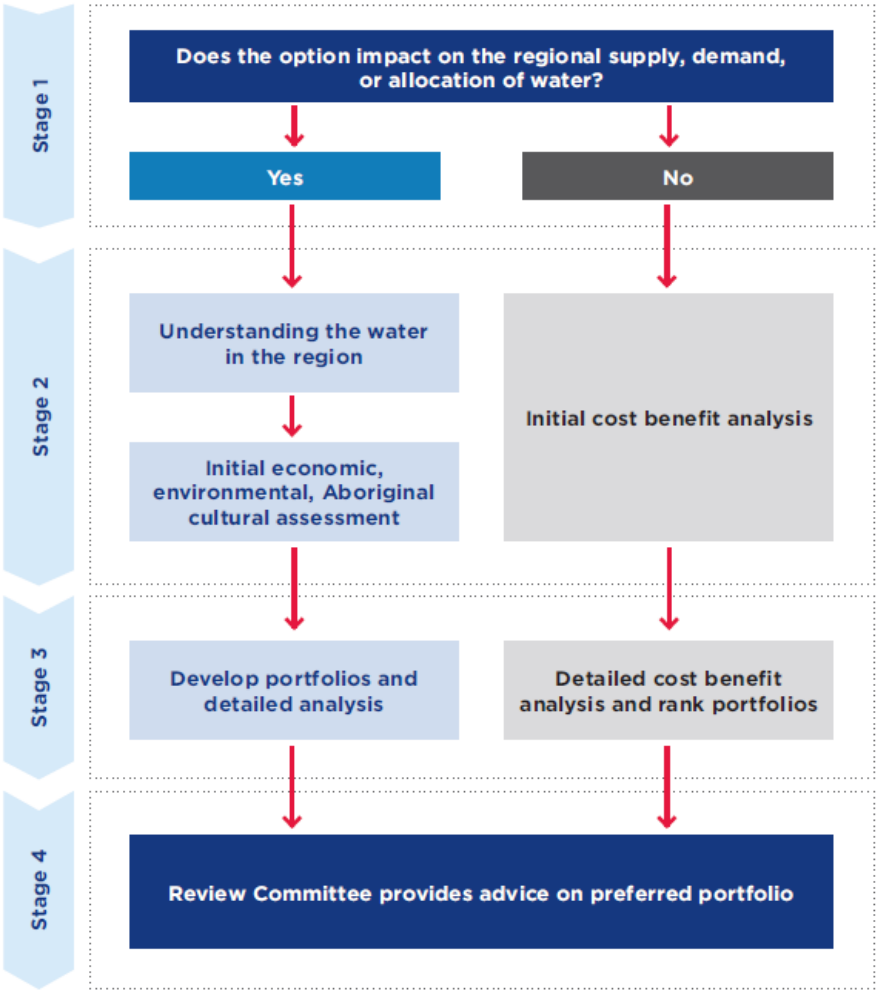
Phase 2 of the process will identify options that meet one or more of the defined objectives and then combine them in a way that maximises the value of the region's water resources.

[119] See RWS Guide, pp34 – 35 and 54-65.

This process will use the best and latest evidence, and a range of economic assessment tools to identify risks and opportunities associated with each option and assess individual options and packages of options in a transparent and consistent way.

The decision-making framework combines hydrologic, scientific and economic analysis, along with expert committees and stakeholder engagement, to consider trade-offs and support a decision on the best balance of options to deliver on objectives.

Figure 22. Regional water strategies decision making framework



The final strategy for each region will include:

- a final package of actions approved by the NSW Government
- a plan for implementing the strategy within clear timeframes which includes existing commitments
- clearly defined roles, responsibilities and governance arrangements for delivering each action or combination of actions
- well-defined opportunities for local and regional partnerships to deliver actions
- a schedule and plan for monitoring and reviewing each strategy.

Better understanding of water availability and risk with new climate modelling

As part of the regional water strategies we have developed improved methods to understand climate variability and risk. This major body of work, and the science undertaken to inform it,

has required significant investment of resources over the past three years. These data and models will need to be maintained and updated over the 2021 regulatory period so that regional water strategies continue to be based on the best available evidence, and to ensure that the climatic assumptions on which the strategies are based remain valid as our understanding improves.

The new climate data and modelling improves our understanding of past climate conditions and plausible climate futures. It provides a more accurate picture of the frequency, duration and magnitude of extreme climate events, such as extended droughts, and will underpin all strategies in the Water Strategy Program.

The new approach recognises the importance of climate risk to future water supplies, water management and infrastructure planning. It provides a better evidence base for water resource management strategic planning over the next 20 to 40 years. It is a key input to our robust decision framework, to evaluate the benefits and costs of any proposed management change (policy, planning or infrastructure).

We will use the new climate data and modelling information to help assess the merits of existing and new projects, plans and programs. We will also use it to review statutory instruments, plans and policies under *the Water Management Act 2000*, for example, and to review water accounting and allocation processes under specific water sharing plans.

This work provides us with the ability to better understand and communicate to water users and other stakeholders, climate and water-related risks and constraints, both now and into the future. The improved climate data will be used in our river system models to gain a better understanding of the water security and reliability risks faced by water users and the environment.

Using these updated hydrological models, the 12 regional water strategies will for the first time set out expected future surface water availability, region by region. This is a significant step forward. Making this information available publicly, will enable planners, water users and the market to make more informed land use and business decisions, and decisions about the risks of investing in water products.

The new approach recognises the importance of climate risk to future water supplies. Our approach to predicting our future climate risk is represented in Figure 23.

In the first step, we look at the past 130 years of recorded climate data and the climate drivers that influence past and present climate and identify patterns to the rainfall and evaporation rates over a decade or several decades.

Looking at the past 130 years does not however provide a long enough record to understand extreme events, especially long-term droughts.

We also need to understand what drives our climatic patterns so that we can better assess climate risks. For example, east coast lows are often responsible for the big rainfall events that fill our dams across the eastern seaboard, as occurred in February 2020.

Understanding past climate patterns and what drives those patterns, can help us predict what might happen in the future. Describing how climate patterns might change and vary in the future requires a lot of data to understand the characteristics of climate variability and change.

Our changing climate combined with Australia's high natural climate variability make predicting our future climate very uncertain, so we also need a better understanding of NSW's longer-term climate past (hundreds and thousands of years).

Paleoclimatic data: By analysing evidence from tree rings, river sediments and ice cores we can add 500 years to our knowledge of our climate history. When we study the data discovered in these longer records of time, we can detect past patterns of wet and dry that

go back 500 to 1000 years. We can see, for example, that there were a number of droughts that went for several decades between the 11th and 14th centuries.

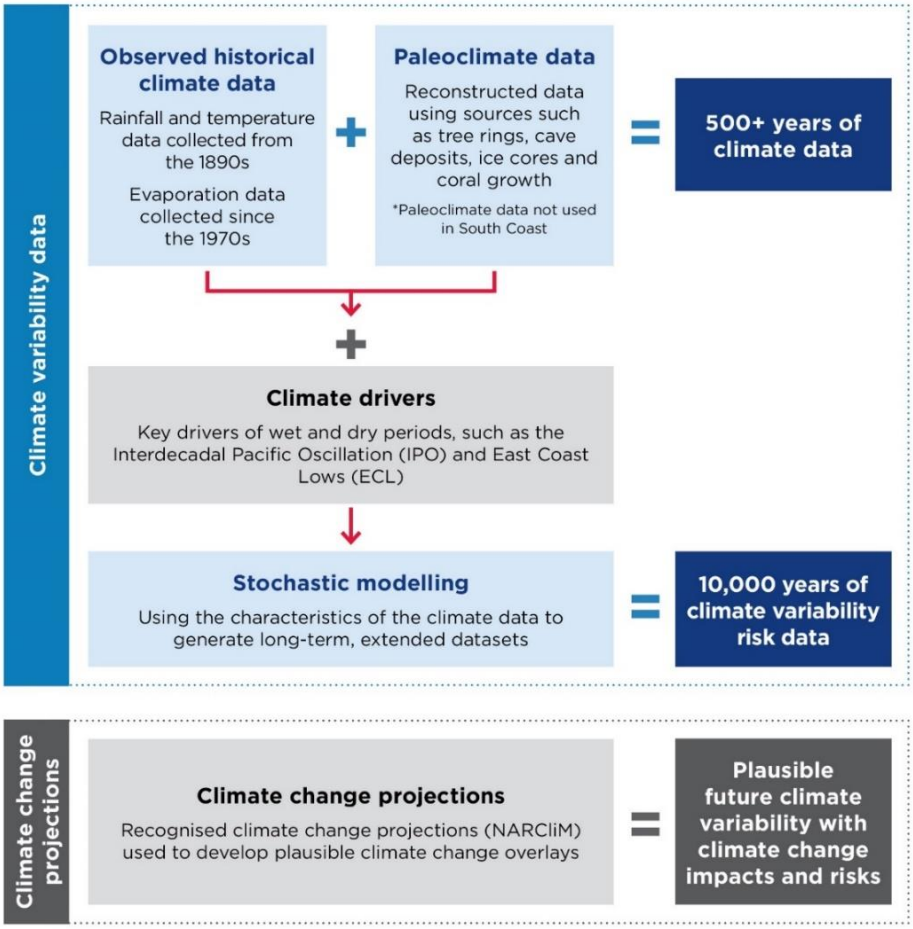
Paleoclimate research provides us with a much more extensive picture of past climates. It enables us to see how climate patterns and drivers have changed over a very long time, and what might happen in the future under similar circumstances as in the past.

In the next step, researchers apply **stochastic modelling** to our 500-year picture of past climate to look at possible climate sequences generated from 10,000 years of data. We are especially interested in the periods of wet and dry.

This modelling method allows us to generate a wealth of climate data that we use in our water models to test how resilient our water resources and waterways are likely to be under all possible combinations of droughts and flooding rains.

The final step incorporates climate-change projections into our water modelling, because we recognise that climate change will alter historical patterns of climate. This new approach has shown us that NSW's surface water supplies are likely to be less secure than we previously thought.

Figure 23. Illustration of new climate data and modelling approach



An expert panel convened by the NSW Office of the Chief Scientist and Engineer has examined the rigour and validity of our new climate-risk assessment method. The panel found that the method is fit for purpose, providing the best available knowledge of climate risk to inform NSW's regional water strategies. It also found the method to be consistent with best practice in the field, and a major advance over using only historical records (such as drought on record) or climate models alone.

The acquisition of this data and its incorporation into hydrological models represents a major financial and human resources investment by us, using NSW government funds over the last three years.

The development of climate data using the above method is continuing across the state, with data now prepared, or close to finalisation for most of the state. Preparatory work is underway to produce equivalent information in the Murray and Murrumbidgee, where interstate data sharing considerations have hampered progress.

Historic Service 2016-17 to 2019-20

Service levels

The following table reports against the output measures and performance indicators for regional water strategies in the 2016 regulatory period by year, as set out in IPART's 2016 final report. Although we have not yet met our target to complete six new regional water strategies we are well progressed and our forecast service outlines how we plan to meet our objectives under this activity within the 2021 regulatory period. Our observations on progress and performance over the 2016 regulatory period is discussed below.

Table 44. Output measures and performance indicators for the 2016 regulatory period W06-05 – Regional water strategies

	Output Measures	Performance indicator
	6 new regional water strategies will be completed.	Cumulative percentage of forecast regional water strategies being completed: Target 100%
2016-2020	• 1 Regional Water Strategy (Greater Hunter RWS) complete and in implementation phase • Expanded Regional Water Strategies Program established • 3 Draft strategies (Lachlan, Macquarie, Gwydir RWS) complete and awaiting public consultation. Following exhibition, finalisation will involve using economic decision framework to develop preferred option portfolios and recommendations. • Draft of Far North Coast and South Coast significantly advanced and being reviewed by agencies • Planning, research, inter-agency and council engagement commenced for remaining 6 strategies	• Completed = 17% of deliverables • Substantially complete – Due for completion first half 2021 = 50% of deliverables for period • Under development – Due second half 2021= 33% of deliverables for period Under development – additional to deliverables identified for period

Observations on progress and performance

Expanded scope for regional water strategies has required more resources

The Greater Hunter regional water strategy was the first to be developed and is now in implementation phase. In addition to the Greater Hunter regional water strategy, we are developing a further 11 regional water strategies. This includes the five regional water strategies we committed to in the 2016 regulatory period, three of which are substantially complete and awaiting public consultation. A significant amount of research, analysis and assessment work, beyond that anticipated for the 2016 regulatory period, is also underway to enable delivery of all remaining regional water strategies. These strategies will now be completed by 2021.

The initial costings and timeframes for delivery of the remaining regional water strategies program over the 2016 regulatory period were based on the forecast costs of the Greater Hunter regional water strategy, which was not yet complete at that time. They were also based on a strategy by strategy or project by project approach rather than a program approach with effective state-wide whole of government governance and coordination.

Following completion of that strategy in late 2018 we conducted a review of the approach taken, with support from consultants Deloitte and NOUS Group, and in consultation with a whole of government Senior Officers Group. As a result of this review the program objectives were expanded from covering only irrigation and local town water security, to include environmental and indigenous outcomes consistent with the *Water Management Act 2000*.

The expanded scope arising from the above review increased the issues to be considered and resulted in significantly greater complexity for development of the strategies. Additional research, analysis, assessment and engagement is required, and this has delayed completion of the other five strategies that were to be completed during the 2016 regulatory period. It is also clear that our initial costings for the development and implementation of the strategies was a significant under-estimate. They did not include resourcing for a program approach, including whole of government coordination and meaningful stakeholder engagement with councils, joint organisations, Aboriginal organisations in addition to customers. This expansion in scope is a core part of water resource management and helps deliver on the objects of the *Water Management Act 2000.*

The complexity and contested nature of water resource management in the Murray-Darling Basin has also required significant and specific additional effort for engagement and analysis of competing commitments across the relevant regional strategies. An additional strategy task in the Murray-Darling Basin regions has been to develop a sequencing framework for existing government commitments. We have also needed to manage sequencing of strategy development and engagement given the number of concurrent reforms, initiatives and commitments.

The extent of work commenced and delivered during the 2016 regulatory period is set out in Table 45.

Table 45. Key activities and achievements in reporting period for regional water strategies

Year	Activities
2016-17	• Contracts executed with WaterNSW for Gwydir, Macquarie and Lachlan water security studies • Commissioned hydrologic model upgrades, stochastic data generation and hydrodynamic estuary modelling for Greater Hunter • Commissioned the Horton River Dam investigations for the Gwydir
2017-18	• Commissioned preliminary engineering feasibility studies, distribution of benefits assessment and preliminary economic appraisal of preferred options for Greater Hunter • Long list of options developed for the Gwydir Regional Water Strategy • Long list of options developed for the Macquarie Regional Water Strategy • Preliminary planning commenced for the Far North Coast Regional Water Strategy • Preliminary planning commenced for the South Coast Regional Water Strategy

Year	Activities
2018-19	• Greater Hunter Regional Water Strategy released • Lachlan Regional Water Security Study completed • Funding application to Snowy Hydro Legacy Fund for expanded program completed • Developed structure, governance and program management for expanded program • Reviewed process for development of Greater Hunter strategy • Secured funding and executed contracts with WaterNSW and Hunter Water for business cases for four regional infrastructure projects • Development of context and long list of options commenced for the Far North Coast Regional Water Strategy. • Development of context and long list of options commenced for the South Coast Regional Water Strategy. • Paleo climatic Stochastic data produced for Macquarie region
2019-20	• Interim-Chief Strategy Officer appointed to lead development of the State Water Strategy (SWS) in alignment with the regional water strategies and the Greater Sydney Water Strategy, as part of the Water Strategy Program • Convened inter-agency workshops to inform development of the SWS • New division led by Executive director with resources for 35 FTE established 1 July 2019 • New Executive Committee chaired by Secretary and Senior Officers' Group established • Developed revised program objectives and stages based on lessons from Greater Hunter review • Greater Hunter Regional Water Strategy implementation commenced, including priority business cases • Climate data received for 7 strategies • Roundtable partnership arrangements established for local councils and joint organisations in the Gwydir, Lachlan and Macquarie • Gwydir, Lachlan and Macquarie hydrological models completed • Draft Gwydir, Lachlan and Macquarie strategies developed with WaterNSW, agencies, local councils and Aboriginal communities and submitted for public exhibition • Convened Aboriginal Advisory Working Group to guide engagement and development of Aboriginal outcomes • Climate risk method peer reviewed as best practice • Decision making framework, including options assessment process, developed and approved by Senior Officers' Group • Established specialist groundwater strategy unit given issues encountered • Continued analysis, research and stakeholder engagement in Far North Coast and South Coast • Commenced engagement with local councils in the Border Rivers, Namoi and Western regions • Commenced research and analysis for Border Rivers, Namoi, Western, Murray, Murrumbidgee and North Coast • Commenced engagement with Queensland, Victoria, MDBA and Snowy Hydro

Better alignment between water management and other NSW planning activities

In our targeted consultation on regional water strategies, people generally saw merit in a long-term strategy for water. However, many stressed that regional water strategies need to be linked with existing regional development and local planning activities to ensure that decisions and choices about water support these plans.

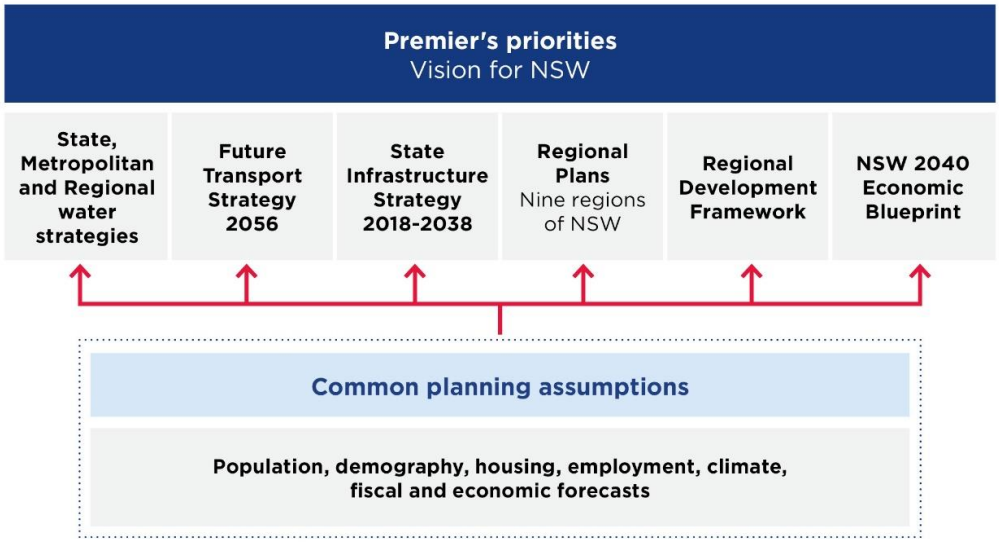
Regional water strategies are therefore being aligned with other key state economic, infrastructure and land use strategies, and will match-up with the following NSW Government strategies to make sure that policy and investment decisions are aligned and efficient:

- prioritised infrastructure policies and projects identified in the NSW State Infrastructure Strategy 2018-2038,[120]
- the nine Regional Plans that the Department of Planning finalised in 2017,[121] which set out long-term land use plans for regional NSW
- economic development directions set out in the NSW Regional Development Framework,[122]
- the 2019 NSW 2040 Economic Blueprint,[123] which sets the direction for our continued success in a changing world and expanding global economy,
- the Future Transport Strategy 2056,[124] the NSW Government's long-term transport masterplan and
- the Marine Estate Management Strategy 2018-2028.[125]

This has, and will, require additional resourcing, but will ensure that regional water strategies use the same set of planning assumptions as other strategies focused on regional NSW, and do not incorporate options that run counter to these strategies or undermine their effectiveness. Figure 24 illustrates the strategies that will use common planning assumptions to deliver on the Premier's priorities in a consistent way.

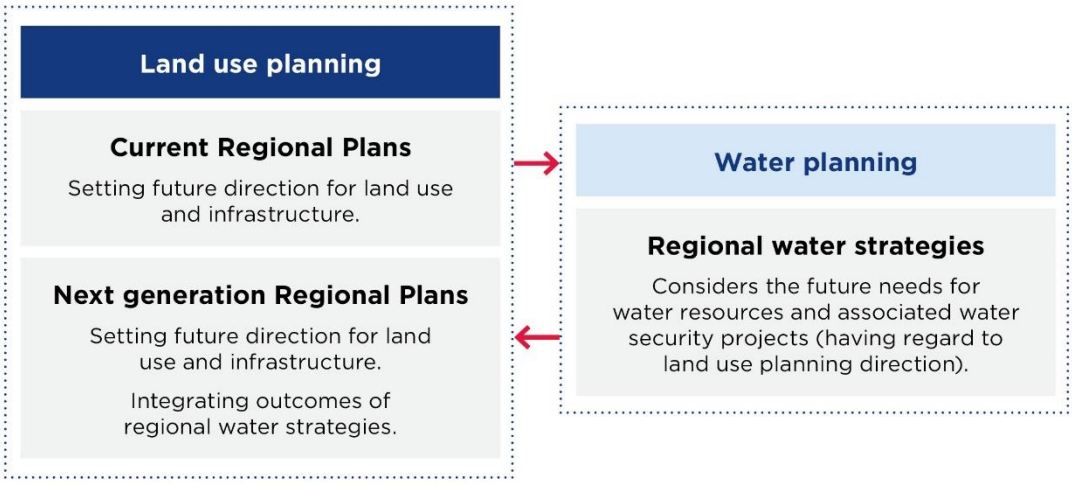
[120] Available at https://www.nsw.gov.au/projects/nsw-infrastructure-strategy-2018-2038
[121] Available at https://www.planning.nsw.gov.au/Plans-for-your-area/Regional-Plans
[122] Available at https://www.nsw.gov.au/regional-nsw/regional-development-framework
[123] Available at https://www.treasury.nsw.gov.au/nsw-economy/nsw-2040-economic-blueprint
[124] Available at https://future.transport.nsw.gov.au/
[125] Available at https://www.marine.nsw.gov.au/marine-estate-programs/marine-estate-management-strategy

Figure 24. Alignment of strategies for delivering NSW government priorities



In the future, when these other strategies are updated, they will also need to take into account the objectives and options included in the regional water strategies, as shown in Figure 25, we will need to ensure that we have the capacity to engage effectively on these matters, to ensure joined-up planning, and the most efficient and effective outcomes for the state and its communities.

Figure 25. Integrating regional land use and water planning



Forecast service and benefits 2020-21 to 2024-25

Service

This submission seeks funding for a team to oversee the finalisation of the remaining strategy documents, as well as the ongoing coordination, implementation and stakeholder engagement for each regional water strategy. These teams will be supported by a program manager and secretariat managing the program's governance.

We have invested significant energy and resources into establishing effective coordination for the program at the state-wide level - water sector and other government agencies - and regionally in 2019-20. The future success of the program will depend on this level of

governance and engagement being maintained and resourced during the 2021 regulatory period.

We will also need stakeholder involvement in the implementation of the strategies. As well as the new community engagement program, this will require engagement with government and sector stakeholders to ensure that their strategies, plans and investment decisions are informed by the opportunities, risks and constraints identified by the water strategies. As has been demonstrated during the development of the draft strategies, effective stakeholder engagement is human resource intensive. Such engagement is however key to ensuring that the strategies realise the outcomes and benefits intended – including community resilience, public confidence in decision making, and integrated approaches that are effective in achieving economic, social and environmental outcomes

We now have a better understanding of the general nature of implementation actions that will arise from the strategies and need to be accounted for in the 2021 regulatory period.

Following completion of the strategies, an implementation plan will be developed, setting out actions and timelines. Together with the State Water Strategy, the finalised regional water strategies will establish our work priorities over the next 5, 10 and 20 years. Strategy implementation activities are expected to involve:

- regulatory activities - the strategies will identify a range of regulatory activities that are necessary to implementation of the strategy in a practical sense. This may include amendments or updates to policy, statutory planning instruments and regulations, licensing and notification activities, and authorisations. Regulatory impact analysis, community consultation and preparation and approval of statutory instruments will be required, each involving a significant body of work
- infrastructure development - the scoping, high level costing, scheduling and initiation of infrastructure projects identified within the strategies will require appropriate program governance and oversight. Preparation of business cases for Infrastructure NSW gateway processes, environmental, social and economic assessment, and engagement with stakeholders will be required as part of strategy implementation to move infrastructure concepts adopted in the strategies into their appropriate capital delivery pathway
- water use and water user behaviour programs - the new climate data developed as part of strategy development will need to be communicated to stakeholders in a way that enables them to understand and make informed decisions based on the reliability and risk of the water resources on which they rely. A range of communication tools, appropriate to the needs of key stakeholder groups (general community, irrigators, indigenous communities and local government) will be required. These communication tools, together with programs to improve water efficiency and resilience, may assist water users to prepare for, and adjust to changing climatic conditions and changes to water management.

We also recognise the need for the strategies themselves to be evaluated and updated on an ongoing basis. A program of ongoing monitoring, evaluation and review (MER) of the strategies and their intended outcomes is also required to demonstrate effectiveness, accountability and transparency to government, stakeholders and the community. Critically, the MER program will identify if any key underlying assumptions in the strategy are no longer valid, and when a revision is required.

Benefits

The Water Sector in NSW will operate more effectively and efficiently (for customers and others) with strategic plans in place that have been developed in partnership with other agencies and stakeholders.

State and regional strategies provide a platform for water agencies to work together to avoid crisis management, reactive responses, and a siloed, project by project approach.

Improved processes

The regional water strategies will identify areas where further work is required to improve understanding of long-term conditions and outcomes, and to ensure strategies can be translated into effective action. This may include improvements in data collection and analysis, sequencing of programs, coordination and oversight of existing commitments, compliance action, and transparency measures. While the preferred portfolio of options will not be identified until each of the 12 regional water strategies is finalised, examples of the work already underway as part of the strategy program are discussed below.

Greater transparency – informing the market and identifying options

Regional water strategies look out over the next 20 to 40 years to understand how much water a region will need to meet future demand, the challenges and choices involved in meeting those needs, and the actions we can take to manage risks to water availability.

Each of the draft strategies includes a section that explains expected future water availability over the next 20, 40 and 60 years based on our now more sophisticated understanding of climate risks from new modelling.

Making this information available, and keeping it up to date, will enable water users and the market to make more informed decisions about the risks to inform their business planning.

Improving coordination and removing significant inefficiencies

Over the last five years, a large number of commitments, initiatives and reforms have been made relating to water resource management. There is significant overlap and some conflict between many of these, and they are not currently being progressed in a coordinated way. This can lead to significant duplication or gaps between water sector organisations.

The State and regional water strategies will improve coordination by mapping and sequencing commitments across all programs, statutory obligations, infrastructure projects and independent reviews.

The Water Strategy Program has already led to significant improvements in coordination across water agencies and other parts of the NSW Government. The preparation of the draft regional water strategies has been led by us and overseen by a whole of government Senior Officers Group and executive committee, chaired by the DPIE Secretary and involving the Department of Premier and Cabinet, Treasury, Infrastructure NSW, WaterNSW and Regional NSW. This governance framework has now been expanded to include the State and Greater Sydney water strategies.

An example of how regional water strategies have improved coordination

The development of the Western regional water strategy will integrate and sequence a complex range of projects, reforms, and initiatives being undertaken by us, WaterNSW and the Australian Government.

Stakeholders have been seeking a strategic approach to water management that recognises the connections across catchments and extends beyond water sharing plan boundaries.

There are multiple commitments in the Western region that interact with each other and will ultimately impact water sharing plans, infrastructure, environmental commitments and stakeholders across the entire Murray-Darling Basin. This includes commitments around:

- Western Weirs,
- Mole River Dam,

- Dungowan Dam,
- fish passage in the Northern Basin toolkit and Lower Darling,
- Menindee Lakes Project,
- Toorale Water Infrastructure Project and
- a range of options to improve connectivity.

Many of these projects and commitments are the direct result of regulatory requirements (e.g. Basin Plan), recommendations from independent reviews into water management and water security studies.

Integrating and sequencing these projects may involve re-negotiating timeframes to ensure the programs do not undercut each other. It will also involve detailed stakeholder engagement.

Figure 26 shows the interactions between different projects being considered as part of the Western regional water strategy and illustrates why it is important to take a coordinated approach to deliver them.

Figure 27 shows the sequencing of the projects to recognise dependencies between them.

Figure 26. Western regional water strategy projects and interactions

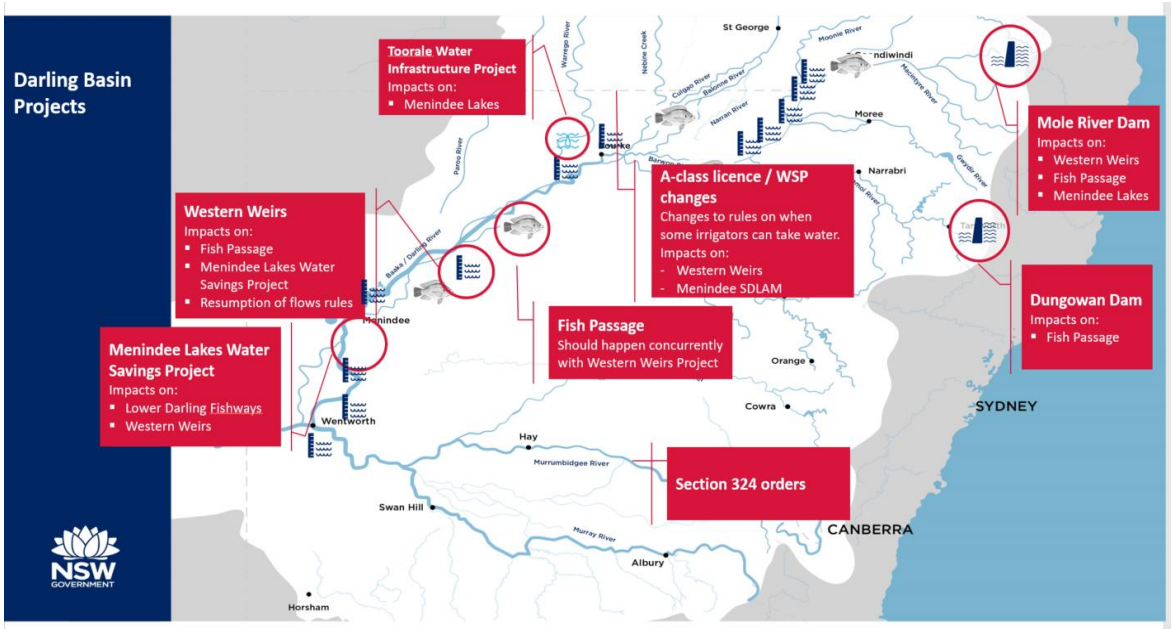
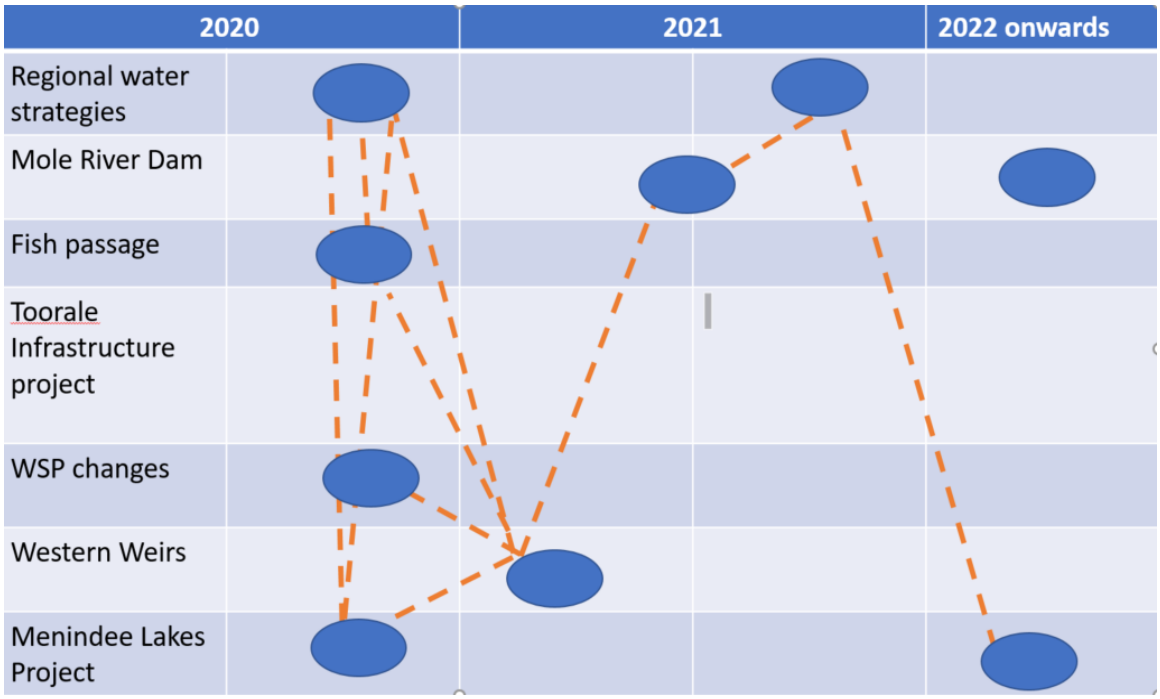


Figure 27. Western Regional water strategy existing timeframes and interactions



Water strategies bring together other water management activities

Regional water strategies draw on an extensive body of work and research done over the last five years. This includes work for the regional water strategies themselves, water resource planning, floodplain harvesting and environmental water reforms, Basin Plan implementation, Safe & Secure (town water utilities and supply) and water security studies undertaken by WaterNSW and local government Joint Organisations.

Many of the options, and much of the research and analysis, engagement and relationships developed through the Regional Water Strategy Program, will be used to inform development of the state water strategy. In addition, the state and regional water strategies will set the strategic framework and focus over the 2021 regulatory period for science, modelling, planning and policy work. The strategies are expected to include coordination and implementation of the following:

Water efficiency, town water and regulatory improvements

We are examining the overall use, allocation and efficiency of water within regions, to help deliver the social, cultural, and economic outcomes desired for these regional economies and their communities. We are considering the following:

- water efficiency projects (towns and industry)
- investigation of the potential impacts of land use changes and population growth on water resources (central to the need for and outcomes required from Integrated Water Management)
- development of a comprehensive policy on water use and appropriate water restriction levels for regional towns
- review of drought operation rules
- review of water accounting and allocation process
- improved data collection and storage

- training and capacity building programs, including for new climate data/modelling and managing groundwater resources sustainably.

Aboriginal outcomes

We have been working with Aboriginal peak organisations at a state-level for last 9 months to co-design a package of state-wide measures to improve outcomes for aboriginal and First Nations communities. Along with broader programs, some of the options and priorities identified through regional water strategies consultation that are core water management activities include:

- establishing a River Ranger program
- securing flows for water-dependent cultural sites
- developing a culturally appropriate water knowledge program
- reviewing Aboriginal cultural water access licensing
- funding to support Aboriginal people to purchase water entitlements
- establishing an Aboriginal Water Advisory Committee
- establishing a Regional Cultural Water Officer employment program

Improved environmental outcomes

The management of water access, flow and quantity is integrally linked with the environmental outcomes in waterways and for water dependent ecosystems. Regional water strategies will consider other aspects of water management and water infrastructure to effectively deliver these outcomes, including:

- cold water pollution mitigation measures
- environmental restoration works
- improved management of wetlands on private land
- NSW Fish Passage Strategy
- active management of flows in unregulated systems
- water quality restoration works
- floodplain management works
- diversion screens to prevent fish extraction at pump off times.

Groundwater

The critical importance of groundwater as part of an integrated understanding of water systems and water management has been starkly evident in the most recent drought. There was a wholesale shift to seeking and using groundwater resources as surface water dried up, with emergency town water supply, stock and domestic users taking often late and urgent action to secure groundwater access having exhausted other sources. Work underway and under consideration includes:

- developing a groundwater management framework that explicitly considers future climate risks and increasing demands on groundwater
- improving groundwater data collection, management and interpretation to improve the evidence base supporting groundwater management decisions
- advancing our understanding of the dynamic processes occurring within groundwater resources, and the ecosystems that depend on them
- ensuring access arrangements to groundwater are sustainable, integrated with surface water, consider water quality, and provide for environmental needs

- increasing clarity for groundwater users about groundwater management decisions
- safeguarding access to groundwater by cities and towns given a future where communities may rely more heavily on groundwater
- providing access to groundwater by Aboriginal peoples for cultural and economic purposes
- providing communities with the information and tools to make better groundwater use decisions.

Service levels

The Water Strategy Program, including regional water strategies will be an ongoing activity during the 2021 regulatory period. All 12 strategies will be completed and in implementation by 2021-22.

The strategies will play a key ongoing role in the ordering, sequencing and integration of existing and new reforms, and project commitments within each region. We propose that Action Plans will set out those actions to be implemented over the immediate two to five years to implement the strategies. Actions may include projects and programs, and any changes to regulation, policies and water sharing plans that operationalise water resource management. The Action Plans will be made publicly available, and reported against on an annual basis.

Effective monitoring, evaluation and review of the strategies will ensure that we adapt to changing circumstances and needs, and that the strategies themselves respond to new evidence. This will improve the State's performance in water planning and management, and ensure accountability.

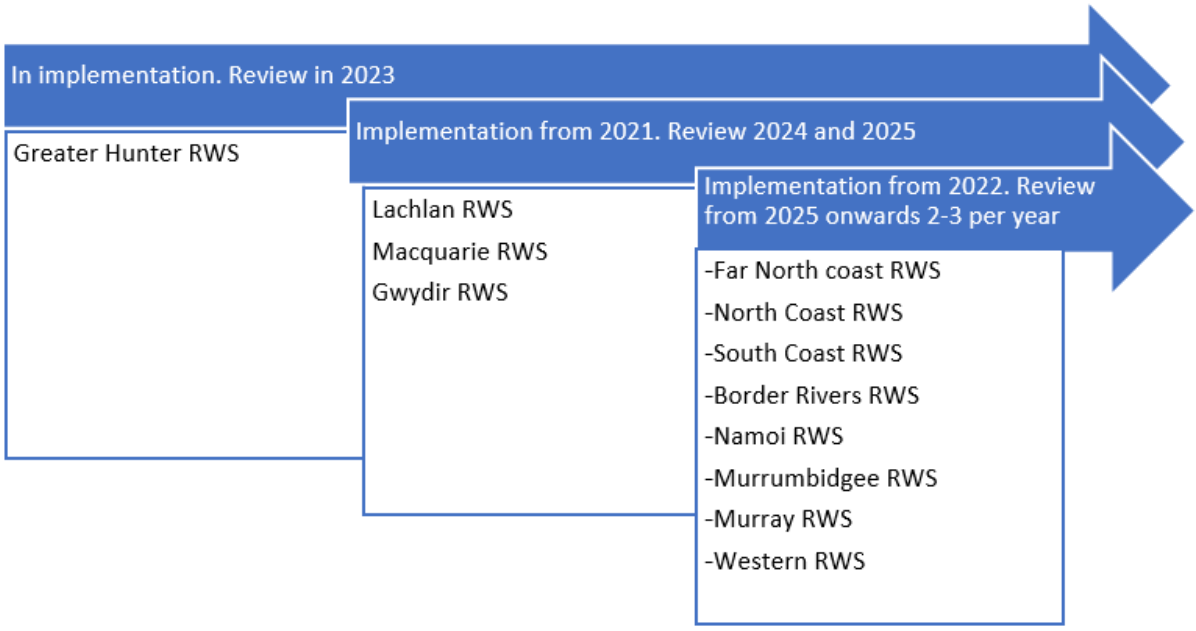
The monitoring and evaluation program will include:

- monitoring progress of actions and recommendations. Adjustments will be made to Action Plans, and as required also to the strategies, to ensure the overarching objective and outcomes of the regional water strategies are achieved.
- evaluating outcomes against baseline information. Data will be collected and analysed to help evaluate how well the actions implemented are achieving desired outcomes, and whether the data and tools remain capable of providing the insight and evaluation required by the strategies
- reporting outcomes. The findings and recommendations of the MER program will be publicly released at regular intervals and then used to improve implementation of the regional water strategies.

We have assumed that each strategy will need to be reviewed every 3-4 years to ensure that it continues to relevantly capture emergent trends and considerations, including those relating to population, land use, economy and environment (including ongoing improvements in climate science), and is adjusted to ensure outcomes are being achieved and incorporate learnings from implementation.

A rolling program of strategy update and review would come into effect towards the end of the 2021 regulatory period (ie as of 2023). To achieve resource levelling, it will be assumed that three regional water strategies are reviewed and updated each year. The ongoing program can be expected to look something like Figure 28 below.

Figure 28. Proposed phasing of Regional Water Strategy implementation and review



Our proposed output measures and performance indicators for the 2021 regulatory period are shown in the table below.

Table 46. Output measures and performance indicators for the 2021 regulatory period W06-05 – Regional water strategies

Output measure	Performance indicator
• Regional water strategies in place	• 4 of 12 regional water strategies in place by June 2021 • 9 of 12 regional water strategies in place by December 2021 • 12 of 12 regional water strategies in place by 2022
• Regional Strategies regularly reviewed	• Three regional water strategies updated annually, and associated Action Plan updated
• Forward program for implementation, monitoring, evaluation and review established	• Forward program for implementation and MER and public reporting published by June 2021
• Regional Water Strategy Action Plans developed	• Action Plan published with each Regional Water Strategy being finalised • Action Plan reported against annually

Metropolitan water plans

Service description and benefits

Metropolitan water plans are strategic, non-statutory plans that identify supply and demand measures in metropolitan areas of NSW to secure water supplies supporting population and business growth, including contingency measures for drought, and supporting environmental flow objectives through a mix of supply and demand measures.

They are special purpose plans within the Water Strategy Program, and their delivery will help meet the objectives and priorities of the program by identifying the best combination of measures to meet water security outcomes for users and manage and protect our water resources for the benefit of the environment and the communities who value them.

Within the Regional Water Strategies water management activity, we have plans in place for Greater Sydney and the lower Hunter region.

2017 Metropolitan Water Plan

The NSW Government released its first Metropolitan Water Plan for Greater Sydney in 2004, which set out the NSW Government's course of action for ensuring a sustainable and secure water system for Greater Sydney's people and rivers. As an adaptive plan, it is designed to be reviewed and updated periodically to ensure it is meeting its objectives. We have reviewed it three times since 2004, with the latest plan released in 2017, and an internal-to-Government update of it to capture lessons learned from the recent drought took place in 2020.

The 2017 Metropolitan Water Plan[126] outlines how water supply and demand is to be managed in the Sydney catchment (Sydney, the Blue Mountains and the Illawarra), with measures to ensure there is enough water to meet Greater Sydney's needs, withstand drought and accommodate population growth, as well as sustain the water resources. It guides WaterNSW, as the main water licence holder in the Sydney Basin. It informed the response to the recent drought, including the timing and scope of water restrictions, transfer of water from the Shoalhaven and timing for switching on the Sydney Desalination Plant as the drought worsened, prior to the February 2020 heavy rain event that resulted in dam levels increasing to over 80 per cent as result of which these measures ceased.

In its 2011 and 2016 WAMC final reports IPART assessed that the Metropolitan Water Plan fell within the National Water Initiative's (NWI) pricing principles category of 'localised water plan – plans developed to address specific water resource problems (quantity or quality) at a local level' and that on this basis, some costs of developing, implementing and reviewing the plan should be included in the definition of monopoly services.[127]

WaterNSW holds around 78% of licensed entitlement in the South Coast unregulated rivers water source, Sydney Water holds 2% and the remaining 20% of entitlements are outside Greater Sydney.

At the time of its last price determination in 2016 IPART decided that WaterNSW is the major impactor in the South Coast unregulated region. This is because, on behalf of its customers, WaterNSW creates the need for metropolitan water planning to ensure a suitable balance between water supply and demand over time, and that water access licences held by major water utilities meet this demand.[128] Based on the impactor pays principle, IPART allocated the user share of prudent and efficient Sydney metropolitan water planning costs solely to WaterNSW.

As a result, IPART decided to set a separate price for WaterNSW (to recover costs specific to the development of the Metropolitan Water Plan) as an additional fixed charge ($ per ML of entitlement) applied to the water access licences held by WaterNSW in the South Coast unregulated rivers water source. To calculate the charge, IPART calculated prices for this water source based on a notional revenue requirement that excluded metropolitan water

[126] Available at https://www.planning.nsw.gov.au/-/media/Files/DPE/Other/About-us/Metropolitan-Water/2017-Metropolitan-Water-Plan.pdf
[127] IPART, 2016, *Review of prices for the Water Administration Ministerial Corporation from 1 July 2016 – Final report*. Page 40. Available at https://www.ipart.nsw.gov.au/Home/Industries/Water/Reviews/Rural-Water/Prices-for-WAMCs-water-management-services?qDh=2
[128] Ibid. Page 108

planning costs and created a new charge specifically recovering those costs from WaterNSW in addition to the South Coast unregulated rivers water charges.

We propose to continue IPART's 2016 approach to recovering the costs of strategic water planning for Greater Sydney in the 2021 regulatory period. However, we propose a change to the activities on which the costs for the separate price are based, because it should be based on the full efficient costs of whole of system planning across a portfolio of water sources

In its 2016 Final Report, IPART assessed our metropolitan water planning activities against the definition of monopoly water management services in the *IPART Water Services Order 2004.* IPART accepted that some of these activities met the requirements of "water resource management for the purpose of long term, sustainable supply."[129] These were:

- water security planning activities to ensure that greater Sydney has a secure supply of water over the long term (which is the main purpose of the Metropolitan Water Plan),
- demand management activities to improve efficiency of water use, because under the NWI's pricing principles, measures to improve water use through water use efficiency programs (irrigation, commercial, urban) are included in water management services and
- environmental planning activities outlined in the Metropolitan Water Plan.

IPART's 2016 decision on which metropolitan water planning activities were "water resource management for the purpose of long term, sustainable supply" excluded costs related to planning for recycled water and desalination. They were excluded because IPART said "these activities are separate to WAMC's management of the water entitlement system"[130] based on NWI pricing principles and therefore their costs should not be recovered through water management charges. IPART removed 25% of our proposed metropolitan water planning costs from the notional revenue requirement to account for our recycled water and desalination planning activities.

We disagree with this approach. We argue that strategic water planning aims to create more secure and resilient water resources by identifying the best combination of options to meet the needs of cities and towns, water using industries, communities and the environment. The full range of measures to save, supply or substitute water should be considered to optimise the way we allocate water for extractive use and ensure we can protect water dependent ecosystems. We must have robust, integrated water planning that takes into account all viable options. Removing some very legitimate options from the planning framework could result in piecemeal investment decisions and suboptimal water management outcomes.

IPART has itself recently recognised that a full range of measures should be considered, stating in its 2020 review of Sydney Water Corporation's prices that "It is vitally important that Sydney Water, the NSW Government and other stakeholders conduct robust, coordinated planning – including consideration of all viable options – to identify the optimal suite and sequence of long-term water supply augmentation and conservation measures."[131]

Strategic regional water planning benefits all water users in each region by considering the potential economic impact of water availability, mitigating the risk of over-investment and

[129] IPART, 2016, *Review of prices for the Water Administration Ministerial Corporation from 1 July 2016 – Final report,* p41. Available at https://www.ipart.nsw.gov.au/Home/Industries/Water/Reviews/Rural-Water/Prices-for-WAMCs-water-management-services?qDh=2
[130] Ibid. p41
[131] IPART, 2020, *Review of prices for Sydney Water from 1 July 2020 – Final report*, p7. Available at https://www.ipart.nsw.gov.au/Home/Industries/Water/Reviews/Metro-Pricing/Prices-for-Sydney-Water-Corporation-from-1-July-2020

under-investment in water assets, considering options to address areas of market failure and improving environmental outcomes. In the same way that the Water Sharing Plans that document regional water planning provide clarity and certainty to water users over their share of available water, the Metropolitan Water Plan benefits the main water licence holder in the metropolitan area - WaterNSW - by addressing the risk of insufficient water being available to meet the needs of urban communities due to long-term growth or future droughts.

We propose that, based on the impactor pays principle, the user share of the full efficient costs of whole of system planning across a portfolio of water sources – as distinct from project level planning and government policy – should be paid by WaterNSW because of the long term coordinated planning benefits.

We do not propose that the costs of implementing projects arising from the Water Strategy Program should be recovered from WaterNSW through this WAMC price. For example, detailed design and delivery of desalination plants or recycled water schemes would be more appropriately recovered from users of these water sources. We do not include costs for those activities in the expenditures on which the specific separate price for WaterNSW is based.

Lower Hunter Water Plan

Hunter Water Corporation and DPIE Water, along with other regional stakeholders, are currently undertaking a review of the 2014 Lower Hunter Water Plan to ensure it reflects changing community values and priorities, while being both robust and adaptable in the long term. Release of the renamed Lower Hunter Water Security Plan is planned for 2021. It will include a portfolio of supply and demand measures which will ensure there is enough water to supply homes, business, and industry in the region for the future and during drought.

Implementation and review of the plan is funded by Hunter Water customers through their retail water prices that have been set by IPART. We charge Hunter Water directly for our efficient costs relating to the plan and, to reflect this arrangement transparently, our costs are reported through Hunter Water's Annual Information Return to IPART. This method of resourcing results in no net cost to the water management services funded through WAMC prices.

For the 2021 regulatory period we propose to continue to work within the budget agreed with Hunter Water and report in the same manner, with no net ongoing cost to the water management services funded through WAMC prices and consequently we do not propose either expenditures or output measures relating to the work we undertake on the Lower Hunter Water Plan in this submission.

Historic service levels 2016-2020

We reviewed the Metropolitan Water Plan

During the 2016 regulatory period we finalised the periodic review of the 2010 Metropolitan Water Plan and released a new plan in 2017. This involved:

- leading a whole of government process to review the plan, including input from agencies via a senior officers' group, a metropolitan water CEOs committee and expert advice of an independent panel, along with technical working groups for social research, environmental assessment and hydro-economic modelling
- investigating environmental flow approaches to improve the health of the Hawkesbury-Nepean river system, taking into account social, economic and environmental trade-offs

- Hydro-economic modelling and analysis to assess changes in water availability, options for improving security and reliability over time and during drought and the costs and benefits of these options
- A substantial community engagement program to support the review and the analysis of water security options, along with social research and choice modelling.

Cooperation across government agencies and water utilities, and peer review by experts outside government were also critical to the successful completion of the plan. Importantly, through a range of social research and engagement activities, the plan was formulated in consultation with community members and industry stakeholders.[132]

We responded to the drought

During the 2016 regulatory period, NSW experienced severe and prolonged drought. A key objective of the Metropolitan Water Plan was to ensure security and reliability of water supply during drought. During the drought, we set up an interagency committee to oversee deployment of drought response measures identified in the plan and ensure a coordinated response across water management agencies. Part of this was to undertake a drought management options study, which was a requirement of the Metropolitan Water Plan.

We coordinated preparation of the drought management options study by the water utilities and provided strategic oversight to shepherd the strategy through government processes.

The Government initiated the expansion of the Sydney Desalination Plant (SDP) and the Department was responsible for negotiating the expansion with SDP. This involved establishing an interagency negotiation team and an executive steering committee to endorse the Government's negotiating strategy with SDP.

We engaged consultants to assist us with the review of the Preliminary Expansion Plan submitted by SDP and advise Government on the appropriateness of proceeding with the project.

Following the rain event in February 2020, the Government decided to put the expansion on hold while we develop the Greater Sydney Water Strategy and identify all potential options for Sydney's water supply.

We started work on the Greater Sydney Water Strategy

During the 2016 regulatory period we began developing the Greater Sydney water strategy, which will replace the Metropolitan Water Plan.

The purpose of the strategy is to ensure water security, economic growth, community wellbeing and to guide water allocation and major infrastructure investment decisions for Greater Sydney.

We established an integrated team with Sydney Water and WaterNSW and engaged economic and engineering consultants to support the team. We also established formal governance groups to oversee the development of the Strategy.

We provide more detail on the Greater Sydney Water Strategy in the sections below.

Service levels

The following table is a report against the output measures and performance indicators specified for metropolitan water strategies in the 2016 regulatory period by year. We will

[132] https://www.planning.nsw.gov.au/-/media/Files/DPE/Other/About-us/Metropolitan-Water/2017-Metropolitan-Water-Plan.pdf

complete the reviews of metropolitan water strategies by the end of the 2016 regulatory period.

Table 47. Output measures and performance indicators for the 2016 regulatory period – W06-05 metropolitan water

	Output Measures	Performance indicator
Target	2 regional water strategies (metropolitan water plans) will be reviewed.	Cumulative percentage of forecast metropolitan water plans being reviewed: • 100%.
2016-17	Review of metropolitan water plan close to completion Review of Lower Hunter water plan underway	
2017-18	Review of the metropolitan water plan was completed in 2017. In accordance with the adaptive drought management measures in the metropolitan water plan, all drought measures from the metropolitan water plan were adaptively implemented in the recent drought as included in the Drought Management Options Study what is this to increase the drought resilience of Greater Sydney Review of the Lower Hunter water plan ongoing	Metropolitan water plan was completed in 2017 • 100%
2018-19	The Drought Management Options Study was drafted based on metropolitan water plan triggers Drought management options implemented as per metropolitan water plan triggers	The Drought Management Options Study draft was completed in February 2019 The drought management options were triggered according to the metropolitan water plan (or in advance due to unprecedented dam depletion rates)

	Output Measures	Performance indicator
2019-20	Lower Hunter Water Plan review In March 2020, an update to the metropolitan water plan was also completed which included actions from the lessons learnt during the recent drought in Sydney. The water strategy for Greater Sydney is being developed in collaboration with relevant utilities to plan for Greater Sydney's long-term water security and resilience. The water strategy for Greater Sydney is being developed in collaboration with relevant utilities to plan for Greater Sydney's long-term water security and resilience. It will replace the metropolitan water plan.	The review is well progressed and scheduled to be complete in mid-2021 • 80% complete The development of the Greater Sydney Water Strategy is underway

Forecast service and benefits 2021-25

Development of the Greater Sydney Water Strategy

We are developing the Greater Sydney Water Strategy to replace the Metropolitan Water Plan and are seeking to recover costs of this over the first two years of the regulatory period.

Population growth and climate change will increase the risk to a sustainable water supply. By 2040 Greater Sydney's population is forecast to grow by 1.9 million to 7.1 million people. This Strategy needs to accommodate an estimated increase in per year water demand of 50% to 65%.

Water in Sydney catchments is already fully allocated and periodically subject to severe drought. Managing our water resources and ensuring secure and reliable water supplies will need to include rainfall independent sources of water, either desalinated and or recycled purified wastewater and or stormwater.

Both WaterNSW and Sydney Water are forecasting potential investments worth many billions in the next decade. In 2018 the NSW Government accepted Infrastructure NSW's advice we need to improve integrated water resource planning to prioritise major water infrastructure investment decisions to meet the challenges facing a rapidly growing Sydney.

One of the key challenges is to identify the best mix of supply and demand options, including leveraging the significant reinvestment in wastewater systems to ensure that the most economic and affordable investment decisions are made. This requires an integrated water cycle management approach involving robust, place-based economic and engineering options analysis. Reforms to governance of the water sector are being considered to promote an integrated approach to solving this challenge.

The Greater Sydney Water Strategy will incorporate DPIE Water's response to the NSW Auditor-General's audit of DPIE and Sydney Water's performance against the water conservation requirements of the Metropolitan Water Plan. The Auditor-General found that we have not effectively supported water conservation initiatives in greater Sydney and recommended that we should establish clear governance structures and accountability

mechanisms to embed water conservation as a core activity in the sustainable, integrated management of Greater Sydney's water resources[133]

The Greater Sydney Water Strategy will provide confidence in security of Greater Sydney's water supply to 2040 to support economic growth and community wellbeing. It will support delivery of the Greater Sydney District Plan and identify highest economic value & most affordable investment decisions for water infrastructure. It will be based on an integrated water management (IWM) approach and identify any policy or regulatory changes required for implementation.

We will develop implementation and monitoring and evaluation plans for the Greater Sydney Water Strategy to ensure it can adapt to changing circumstances and needs, provide information on emerging issues, respond to new evidence and ensure accountability.

We propose that our prudent and efficient costs of delivering the Greater Sydney Water Strategy continue to be recovered from WaterNSW as the major user in the South Coast unregulated rivers.

Water Efficiency and Conservation Framework

Consistent with the findings of the NSW Audit Office's Performance Audit of Metropolitan Water Conservation, we acknowledge that more needs to be done in metropolitan Sydney to improve the level of water efficiency and conservation[134].

Outside of drought, water efficiency has the potential to provide prolonged and ongoing water savings to minimise the impact of increased water demand due to growth and other factors (climate change, changing water demands for urban cooling). If implemented using best practice design, implementation, evaluation and continual improvement, water efficiency programs can provide customers with ongoing savings, both in improved outcomes through less water use, and a reduction in large capital investment required to meet the increased water demands of a growing city.

During drought water efficiency has the potential to provide rapid response to preserve water supplies and to off-set the financial and social impact of water restrictions.

We will develop a water efficiency program for Sydney which will comprise programs delivered by both Sydney Water and DPIE. Sydney Water will deliver programs such as WaterFix (dwellings and strata), PlumbAssist and BizFix for business.

The DPIE programs will include an enhancement of regulatory programs such the Building and Sustainability Index (BASIX), the Water Efficiency Labelling Scheme and the National Building Rating Scheme (NABERS), enhancement of existing programs for low income households and contestable grants for local government and the private sector to promote water efficiency innovation and implementation.

[133] Audit Office of NSW, Water Conservation in Greater Sydney, 2020, p2
[134] Audit Office of NSW, Water Conservation in Greater Sydney, 2020, p2

Table 48. Proposed output measures and performance indicators for the 2021 regulatory period – W06-05 metropolitan water

	Output Measures	Performance indicator
	Greater Sydney Water Strategy as described in service description above is completed in 2021, including: -a water efficiency and conservation framework -a performance and monitoring framework	Greater Sydney Water Strategy is complete 100% by end of 2021
	Lower Hunter Water Security Plan review is complete by end of 2021	Lower Hunter Water Security Plan review is 100% complete by end of 2021

Operating Expenditure

Regional water strategies

During the 2016 regulatory period, our expenditure on developing regional water strategies has been funded through a combination of revenue from user charges and external funding. The external funding helped cover the higher costs of expanding the scope of the strategies and reflects their elevated priority as recommended in the State Infrastructure Strategy and adopted as an election commitment by the NSW Government.

For the 2021 regulatory period, a greater share of the costs of developing the remaining regional water strategies and implementing all 12 strategies will need to be recovered through user charges to reflect the impactor pays principle.

Our average expenditure on regional water strategies in the 2016 regulatory period from user charge revenue was $2.2 million per year, a total of $8.8 million over the period. So far we have recorded expenditure of an additional $5.7 million received from external sources over the period. This equates to a total of $14.5 million expenditure reported on this activity from 2016-17 to 2019-20.

We received external funding from Restart and the Snowy Hydro Legacy Funds over the 2016 regulatory period, which included commitment of:

- $7.5m from the Restart Fund from 2016-17 to 2019-20 to support the development of the Greater Hunter Regional Water Strategy, including program costs and the pilot of the new climate risk work, research and analysis for the Gwydir, Macquarie, Lachlan, Far North Coast and South Coast strategies
- $9.0m from the Snowy Hydro Legacy Fund to enable the establishment of a significantly expanded regional water strategy division within DPIE Water to effectively develop the remaining strategies, including coordinating work across DPIE Water and other agencies, undertaken more in-depth stakeholder engagement and to develop the decision making framework for options assessment. The funding has also supported the further development of the climate risk method, acquisition of data and revision of hydrological models.

An additional commitment of $6.4m from the Snowy Hydro Legacy Fund has provided for the development of business cases for the following Regional Water Strategy-identified infrastructure projects:

- Singleton pipeline (Greater Hunter);

- Lostock to Glennies pipeline (Greater Hunter),
- Macquarie re-regulating weir (Macquarie – Castlereagh) and
- Lake Rowlands to Carcoar pipeline (Lachlan).

These projects are also using the new climate data and updated hydrological models developed for the regional water strategies.

Preparation of the proposal has identified a likely error in the annual information return regarding under-reporting of some parts of this expenditure, or misallocation between activity codes. We will provide further advice and an updated annual information return to IPART.

Metropolitan Water

During the 2016 regulatory period, IPART determined that 75% of our proposed costs for metropolitan water management and security planning were prudent, based on recovering the costs of water security planning, demand management and planning for river health[135].

We propose that all costs related to developing the Greater Sydney Water Strategy are prudent, because all potential options contribute to making water available and improving water security, whether it is by reducing demand or increasing supply through current rainfall dependent sources or substitution with other sources of water, such as recycled water or stormwater. Incorporating other sources of water into the mix will allow sustainable management of water resources, while also making water available to meet growing demand.

Sydney has just experienced one of the worst droughts on record with unprecedented depletion rates in the dams. The 2017 Metropolitan Water Plan is an adaptive plan and was designed to be modified to the drought conditions being experienced and the findings from the Drought Management Options Study. This meant that during the 2016 regulatory period that the metropolitan water team was diverted from its anticipated function of forward planning activities to resource the drought response implementation activities.

The major cost over 2021-25 is staff time required to develop the implementation plan and MER framework for the Greater Sydney Water strategy. Additional staff and consultancies will be required, as the scope of the Greater Sydney Water Strategy is proposed to be broader than the metropolitan water plan, which focused on demand and supply, while the Greater Sydney Water Strategy will also encompass integrated water management i.e. water, wastewater and stormwater.

Proposed expenditure for the 2021 regulatory period

We propose to spend a total of $23.8 million[136] in the 2021 regulatory period, across the activity code.

We are seeking to recover $21.2 million over the period from WAMC prices for expenditure on regional water strategies, which will include:

- completing the remaining eight regional water strategies, currently under development
- developing the associated regional water strategy Action Plans to effect strategy implementation

[135] IPART, Review of prices for the Water Administration Ministerial Corporation, 2016 p4
[136] All expenditures are expressed in $2020-21 and are described in the Administrative Information paper accompanying this paper.

- developing and implementing a monitoring, evaluation, reporting and improvement program to assess and publicly report against Action Plan deliverables and outcomes
- ongoing review and update of all 12 regional water strategies, including development maintenance and updating of supporting data input and analysis
- ongoing engagement with stakeholders to develop, implement and update the RWSs and Action plans, and to ensure land use and infrastructure plans across the state are informed by the regional water strategies
- Progressing RWS initiatives through implementation of strategy actions, including project scoping, business case development for infrastructure options, progressing into the relevant capital or operating delivery pathways, contributing to development of strategic policy measures, and contributing to statutory planning amendment processes, where these are required as part of strategy outcomes.

We plan to spend a total of $2.6 million in 2021-22 and 2022-23 on the Greater Sydney Water Strategy.

This means that in the 2021 regulatory period, we propose to spend a total of $23.8 million on the W06-05 Water Strategy Program. This is 65% more than the average annual actual expenditure in the 2016 regulatory period and is shown in Table 4.

Table 49. Expenditure on regional planning and management activities W06-05 ($2020-21 $000)

Cost	2016 regulatory period				Extension	2021 regulatory period				
	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
IPART'S 2016 final report	2,313	2,454	2,187	1,269	1,269					
Actual DPIE Water operating expenditure	2,755	1,400	2,168	2,432						
Actual externally funded operating expenditure	0	0	1,612	4,079						
Actual externally funded capital expenditure	0	0	0	0						
Proposed DPIE Water operating expenditure						6,614	6,614	5,292	5,292	5,292
Regional Water Strategies						5,292	5,292	5,292	5,292	5,292
Metro Water Plan						1,322	1,322	0	0	0

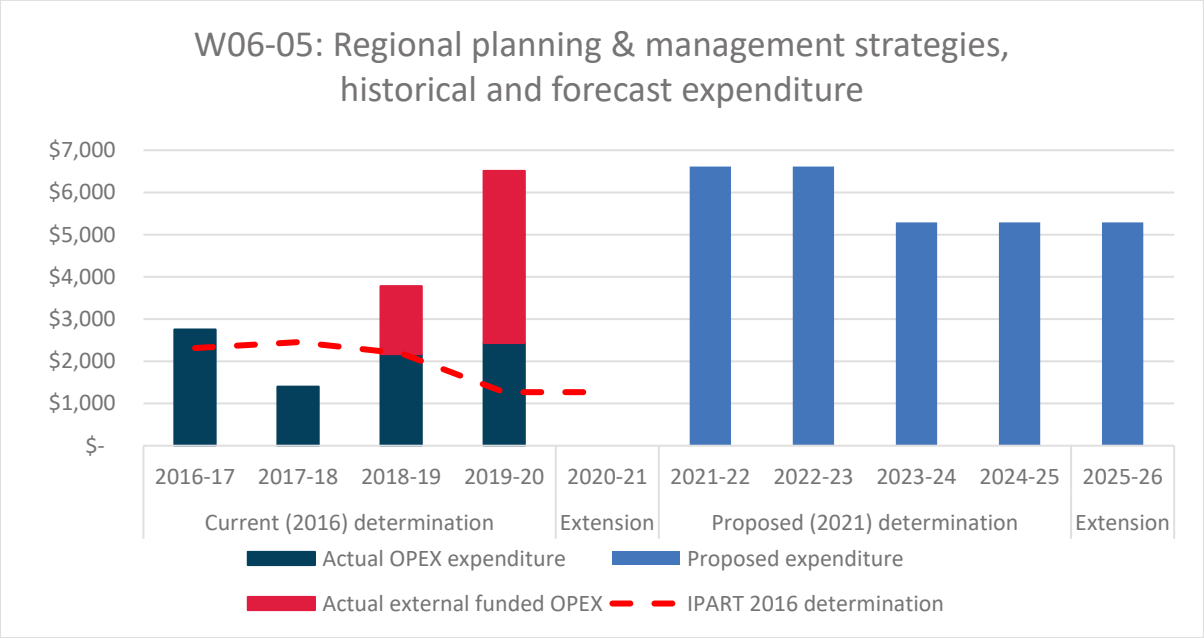
Cost	2016 regulatory period				Extension	2021 regulatory period				
Lower Hunter Plan *						0	0	0	0	0

* Lower Hunter Water Plan costs are charged to DPIE by Hunter Water on a fee for service basis and so have not been included in actuals or proposed costs as they are net 0

Notes: IPART's 2020–21 figure has been provided by IPART; actual operating expenditure is net of externally funded operating expenditure; DPIE Water's 2019–20 actual costs are 12/10 x actual costs for the 10 months to April 2020 and NRAR's 2019-20 actual costs are 12/11 x actual costs to May 2020; 2020–21 actual costs are unknown; 2025–26 costs are provided as required by IPART; please also refer to the Administrative Information document that is part of this submission.

The information in Table 49 is also set out in the following graph.

Figure 29. Expenditure on regional planning and management activities W06-05 ($2020-21 $000)



W06-06 Development of water planning and regulatory framework

This activity comprises the development of operational and regulatory requirements and rules for water access.

This is critical in water management due to the complexity of the statutory framework, the need to ensure that State-wide policies work on the ground (noting that each water source is a unique hydrological system) and that impacts of policies are identified and equitably managed. Given the number of competing interests for this precious resource, addressing these issues requires research, analysis, communication and consultation to meet community and government expectations of evidence based and objective decision making.

In the 2016 regulatory period we have developed and amended regulatory instruments and policies in response to issues that arise in a dynamic natural resource planning and policy environment.

In the 2021 regulatory period we will continue to review and make new and revised regulatory policies and instruments in response to community and key stakeholder needs and expectations, critical events such as droughts, external reviews or adaptive management processes.

Stakeholders asked for more information about water management, which is accurate and easy to access. We use the detailed feedback we receive to ensure our frameworks and plans meet stakeholder expectations.

We propose to spend a total of $9.1 million[137] in the 2021 regulatory period on this activity, an annual average of $2.3 million. The proposed annual average represents a 35% increase from the $1.6 million we spent on average annually so far during the 2016 regulatory period and is 6% lower than the amount IPART used when determining WAMC prices for 2016 ($2.4 million annual average), as set out in Table 50.

In this activity, we develop operational and regulatory frameworks for water access planning and management. We also develop regulatory instruments that provide a clear and consistent approach to regulating water sharing and access, such as access licence conditions, access licence dealing principles and various other orders made under the *Water Management Act 2000*.

A key component of this activity is the wide consultation we undertake as part of developing regulatory frameworks and instruments to ensure that, as far as possible, what we develop is fit for purpose and meets key stakeholder and/or community needs.

Statutory basis for service

Development of the water planning and regulatory framework to implement the requirements of the:

- Intergovernmental Agreement on a National Water Initiative.
- *Water Management Act 2000*
- *Water Act 1912*
- Murray Darling Basin Plan.
- Murray Darling Basin Plan Implementation IGA.
- NSW Floodplain Harvesting Policy.
- NSW Aquifer Interference Policy.

Stakeholder views

We reviewed stakeholder feedback over the 2016 regulatory period and found that of the four key themes identified were that customers want:

- improved information available to customers. Customers want more information about water management, which is accurate and easy to access.[138]

The feedback received shows that customers expect a higher level of service from activities such as this one, and lists some specific work that could be undertaken to do so, including better connectivity in planning, more public reporting, more information provided and improved timeliness of information being provided.

The strength of the frameworks we develop in this activity, to a large degree comes from the stakeholder engagement we do to ensure what we produce in our plans and other

[137] All expenditures are expressed in $2020-21 and are described in the Administrative Information paper accompanying this paper.
[138] KJA, DPIE IPART Price Submission - Stakeholder Engagement, Plain English Summary and final report, 27 February 2020, page 11

instruments meets stakeholder expectations. These frameworks support and structure our water planning. We propose expenditure for this activity that will allow us to embed accessible reporting and connectivity across all water management activities funded through WAMC prices.

Historic service 2016-17 to 2019-20 (4 years)

Service description and benefits

In this activity, we develop operational and regulatory frameworks for water access planning and management. Frameworks are initiated both proactively and in response to stakeholder and community concerns, external reviews and inquiries, legislative requirements and Basin Plan requirements.

We also develop regulatory instruments that provide a clear and consistent approach to regulating water sharing and access, such as access licence conditions, access licence dealing principles and various other orders made under the *Water Management Act 2000*.

DPIE Water has been delegated responsibility for administering aspects of the *Water Management Act 2000*, including amendments. The *Water Management Amendment Act 2018* has aligned NSW legislation with Basin Plan requirements, increased the efficiency of regulating water users and bolstered compliance and environmental provisions to help protect the rights of water entitlement holders and improve environmental outcomes.

A key component of this activity is the wide consultation we undertake as part of developing regulatory frameworks and instruments to ensure that, as far as possible, what we develop is fit for purpose and meets key stakeholder and/or community needs.

The frameworks developed in this activity are designed to provide transparent operation and decision making with regard to water sharing and access. They seek to balance economic, social, cultural and environmental outcomes. They also seek to reduce red tape, improve operational efficiency and provide appropriate monitoring and compliance mechanisms.

Service levels

The following table reports against the output measures and performance indicators specified in the 2016 regulatory period. There have been a significant number of outputs from this service over the course of the 2016 regulatory period. Annual forecasting of the number of regulatory instruments and policies developed or amended has not been done consistently, primarily as it is extremely difficult to predict in such a dynamic/responsive natural resource planning & policy environment.

Table 50. Output measures and performance indicators for the 2016 regulatory period W06-06

Progress	Output measures	Performance indicator
	Number of regulatory instruments and policies developed or amended according to an annual forecast: Target: Forecast on an annual basis	Percentage of annual forecast frameworks and regulatory instruments delivered according to schedule: Target: 100%
2016-17	Delivered: work to progress four regulatory instruments or policies and regulatory framework to establish NRAR.	No schedule was in place in 2016-17 due to overhaul of regulatory framework to establish NRAR.
2017-18	Target: Make/remake seven regulatory instruments or policies.	71% delivered according to schedule

Progress	Output measures	Performance indicator
2018-19	Delivered: work to progress nine regulatory instruments, plans or policies.	No schedule was in place in 2018-19 due to development of prioritisation framework.
2019-20	Delivered: work to progress regulatory instruments, plans or policies. Progress to date outlined below.	No schedule was in place in 2019-20 due to development of prioritisation framework.

Observations on progress and performance

While outputs have been consistently produced over the 2016 regulatory period, there is an ongoing very high workload within this activity and the capacity to progress key planning and policy matters has been limited. We regularly undertake a prioritisation process to ensure that the limited resources available are deployed against the projects with the highest needs, using a scoring system, with standardised criteria and definitions of the scales of urgency for each piece of policy work. The overall priority score considers factors including: environment, economic, social and cultural, governance and compliance, and stakeholder trust or confidence impacts in conjunction with the timing urgency of a policy or project. We use this process to determine which pieces of work have a higher and more immediate urgency, and therefore require a higher priority. This new framework will help guide the policy and regulatory work plan moving forward.

The extent of work commenced and delivered during the 2016 regulatory period is set out in Table 51.

Table 51. Key activities and achievements in reporting period for development of water planning and regulatory framework

Year	Activities
2016-17	• Commenced statutory review of the Water Management (General) Regulation 2011 • Published “Strategy for the controlled allocation of groundwater” • Amendments to Regulation to commence various regulatory amendments in the Water Management Amendment Act 2014 • Statute law revision amendments to streamline approval extension process

Year	Activities
2017-18	• Making regulations under the Natural Resources Access Regulator Act 2017 ('Natural Resources Access Regulator Regulation' 2018) • Concluded statutory review of the Water Management (General) Regulation 2011 and finalised public consultation process and drafting of new instrument. • Draft Water Take Measurement Policy • Remake of temporary water restrictions order for Botany Sands aquifer • Developed new regulatory requirements to support the operation of section 91I of the Water Management Act 2000 • Floodplain Harvesting Monitoring Policy • Controlled allocation order 2017 • Ran two "All-SAP" workshops involving all Stakeholder Advisory Panel members from across the NSW Murray-Darling Basin to work through key policy and regulatory issues • Co-ordinated NSW input to amendments made to the Murray-Darling Basin Plan • Participated in stakeholder consultation relating to Floodplain Harvesting Policy implementation • Established inter-agency governance groups to ensure more effective coordination and collaboration on water policy and planning processes in NSW – e.g. Regional Water Senior Officers Group • Participated in cross-jurisdictional forums such as the Basin Plan Senior Officials Committee, Basin Plan Implementation Committee and the National Groundwater Sub-Committee • Input into new externally facing website to make water policy and regulatory matters clearer and more accessible for stakeholders.

Year	Activities
2018-19	• Developed, published and implemented a new Extreme Events Policy in the NSW Murray-Darling Basin area. • Developed interim thresholds for water interception by commercial forestry plantations to complement the Commonwealth Government's Emissions Reduction Fund process • Finalised resolution of NSW planning assumptions under the Murray-Darling Basin Plan • Rebuilt relations with key Aboriginal stakeholder groups, including important Murray Darling Basin advisory groups - the Murray Lower Darling River Indigenous Nations and Northern Basin Aboriginal Nations - as well as NSW Local Aboriginal Land Councils on water regulation and access issues • Managed DPIE Water's involvement in the Indigenous Land Use Agreement negotiations with the Bandjalang, Yaegl and Barkandji Native Title holders and preparations for imminent Native Title claims • Conducted analysis and drafted a discussion paper relating to a review of harvestable rights on the coast • Developed draft NSW information paper on "Assessing the protection of planned environmental water" • Ran controlled allocation tender process in October 2018, including responding to stakeholder inquiries and matters arising through the implementation of the controlled allocation process • Amended the Access Licence Dealing Principles Order 2004 to facilitate new licensing arrangements relating to the Broken Hill pipeline and nomination of works by local water utilities • Input into Court cases and priority infrastructure projects (e.g. Broken Hill pipeline, Gunbar pipeline, etc.) • Planning and policy input into the Water Renewal Taskforce's work to implement the Water Reform Action Plan • Provided input into implementation of the Healthy Floodplains Project (including development of floodplain management plans) • Developed a Memorandum of Understanding with the Department of Defence on the remediation of contaminated groundwater at Williamtown RAAF base

Year	Activities
2019-20	• Ran controlled allocation tender process in October 2019, including responding to stakeholder inquiries and matters arising through the implementation of the controlled allocation process. • Assessed and responded to multiple requests from the Clean Energy Regulator for comment/endorsement of plantation forestry projects submitted under the Commonwealth's Emissions Reduction Fund. • Continued planning and policy input into the Water Renewal Taskforce's work to implement the Water Reform Action Plan • Amendments to the Water Management (General) Regulation 2018 made and published on NSW Legislation website delivering water access licence exemptions for temporary dewatering activities in certain water sources and a state-wide exemption for the incidental take of groundwater of 3ML or less per project per water source per year. • Completed draft amendments and remakes of all relevant water sharing plans to support the development of 20 water resource plans within the Murray-Darling Basin. • Commenced policy work relating to regulating areas that are experiencing intensive new irrigation development (particularly the Murray Lower Darling) to help satisfy NSW's obligations under the Basin Salinity Management Strategy 2030. • Commenced work on reviewing the Aquifer Interference Policy 2012 and development of related regulatory initiatives such as Managed Groundwater Recharge policy. • Progressed the review of coastal harvestable rights in preparation for a public consultation phase in the first half of 2020. • Development of a prioritisation framework to ensure that resources in the Water Policy branch are directed towards the highest priority planning and regulatory needs. • Significant input into the development and implementation of the Water Supply (Critical Needs) Act 2019. • Review of the WaterNSW operating licence.

Forecast service 2020-21 to 2024-25 (5 years)

This covers the last year under the 2016 regulatory period and the 4 years of the 2021 regulatory period.

Service levels

The following table reports against the output measures and performance indicators specified in the 2016 regulatory period.

Table 52. Output measures and performance indicators for the 2021 regulatory period W06-06

Output measure	Performance indicator
Regulatory policies and instruments are reviewed and/or developed pursuant to the priorities identified and set by DPIE Water from time to time.	Timely publication of documents including, where relevant: - discussion papers - draft policies/instruments - final policies/instruments.

New and revised regulatory policies and instruments are made or reviewed in response to ever changing community and key stakeholder needs and expectations, critical events such as droughts, external reviews or adaptive management processes. Regulatory, planning and policy issues vary from short term, small scale, relatively simple tasks to long term, large scale, highly complex projects.

Development of policies and instruments can be straightforward, but more often than not the issues to be addressed are complex and contentious with no simple answers. Addressing any such issues involves extensive research, analysis, communication and consultation to meet community and government expectations for rigour and procedural fairness.

By its nature this work does not lend itself to performance indicators based on numbers of policies or instruments, or time taken to develop them, but rather that the work done is appropriately prioritised and that the quality of the process meets government, stakeholder and community expectations.

Operating expenditure

The major cost in this activity is staff time (expressed as full time equivalent staff members (FTE)) working on the planning, policy and regulatory framework in response to water planning activities, community feedback and water user requirements.

Total staff numbers and capacity underpinning this program has been in a regeneration phase over the last few years following loss of highly experienced staff during the 2016 Transformation and other Departmental structure changes. Significant successful efforts have been made to bring much of the lost expertise back into DPIE Water and this has increased the skills and capacity of staff to undertake water planning, regulatory and policy activities. Because of the staffing issues, our development of many plans, reviews and policies has been slowed and delayed, and we have been heavily criticised for our delay in producing Water Resource Plans under the Murray-Darling Basin Agreement and for the speed with which we undertook consultation with Aboriginal nations as part of the water resource planning process as it was said to be rushed.

The expenditure proposed for this activity will support a significant reform program over the 2021 regulatory period, particularly to respond to new risks being realised through the current drought and the need for significant statutory and policy responses. Detailed analysis and long-term strategic planning under other WAMC activity codes is identifying risks and opportunities to substantially increase the long-term resilience of NSW's water sources. Statutory and policy reform will be key activities in being able to realise these improvements.

Other initiatives will extend across the regulatory period commencing in 2021, including an Aboriginal Water Strategy, which we will co-design in partnership with key Aboriginal bodies, to improve access to water for Aboriginal nations.

Most of these initiatives are also critical outside the drought context to build longer term resilience to respond to other pressures, such as growing populations and industry needs across major metropolitan and regional centres.

Updated modelling and other analysis being undertaken through other activities is providing a much clearer understanding of the risks and options to respond to these. We expect that a number of these responses will require planning and regulatory framework reforms.

Under resourcing of this area in the past has meant that it has not been possible to proactively drive these types of reforms. We have now resourced this activity to be able to more proactively drive reform and a reduction in capacity and capability at this stage would risk being able to respond effectively to risks and effectively improve the water management framework. Being proactive means that we can focus reforms on the most important opportunities rather than reacting to 'squeaky wheels', however this proactive approach requires sufficient experienced staff and time that needs to be funded.

We propose to spend a total of $9.1 million[139] in the 2021 regulatory period on this activity. Our proposed average annual expenditure is $2.3 million, which is 6% less than the average annual amount IPART used when determining WAMC prices in 2016 (and assessed by IPART then as being prudent and efficient). We have spent $6.7 million on this activity so far in the 2016 regulatory period (an average of $1.6 million annually) and have used a further $9.9 million in that period from Commonwealth funding. Actual and proposed expenditures are set out in the following table.

[139] All expenditures are expressed in $2020-21 and are described in the Administrative Information paper accompanying this paper

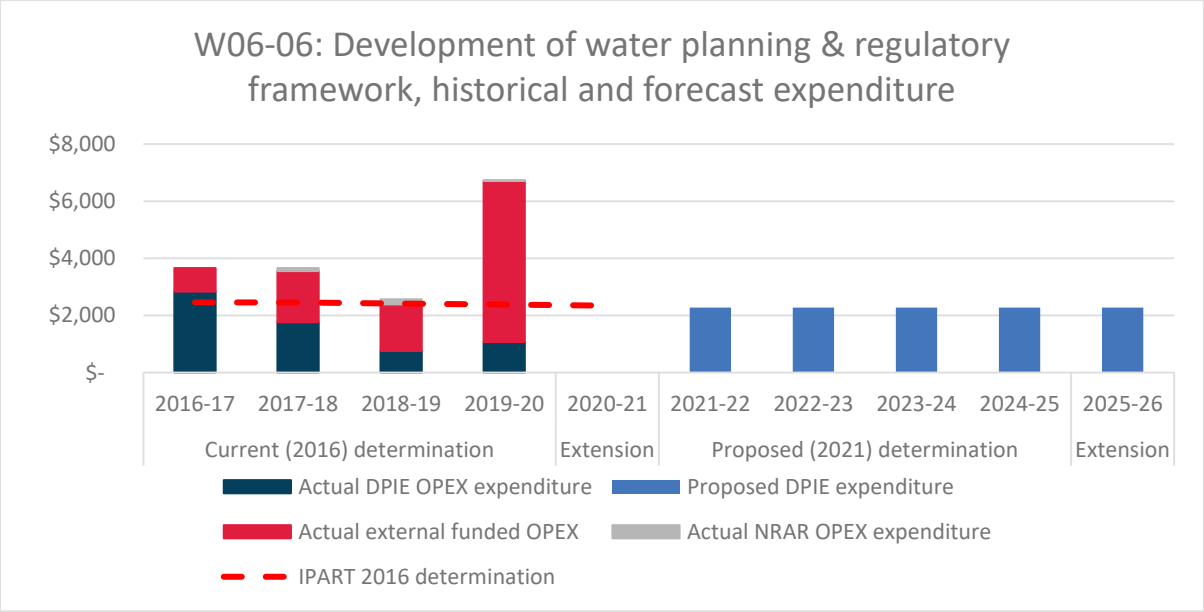
Table 53. Expenditure on development of water planning and regulatory framework W06-06 ($2020-21 $000)

Cost	2016 regulatory period				Extension	2021 regulatory period				
	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
IPART'S 2016 final report	2,458	2,453	2,416	2,380	2,344					
Actual DPIE Water operating expenditure	2,839	1,762	759	1,068						
Actual NRAR operating expenditure	0	107	178	27						
Actual externally funded operating expenditure	822	1,794	1,628	5,642						
Actual externally funded capital expenditure	0	0	0	0						
Proposed DPIE Water operating expenditure						2,278	2,278	2,278	2,278	2,278

Notes: IPART's 2020–21 figure has been provided by IPART; actual operating expenditure is net of externally funded operating expenditure; DPIE Water's 2019–20 actual costs are 12/10 x actual costs for the 10 months to April 2020 and NRAR's 2019-20 actual costs are 12/11 x actual costs to May 2020; 2020–21 actual costs are unknown; 2025–26 costs are provided as required by IPART; please also refer to the Administrative Information document that is part of this submission.

This information is also set out in the following graph, which shows that our proposed expenditure is at a level slightly under the prudent and efficient amount used by IPART when setting WAMC prices in 2016, but higher than actual expenditure during the 2016 regulatory period due to funding received from the Commonwealth being used for this activity.

Figure 30. Expenditure on development of water planning and regulatory framework W06-06 ($2020-21 $000)



W06-07 Cross border and national commitments

This activity comprises development of national and cross border water arrangements, including funding arrangements and operational programs to meet National and interstate commitments.

The activity ensures that NSW access to water is protected and not eroded through activities conducted and managed in other jurisdictions. It is a complex task that negotiates the rules governing NSW access to surface and groundwater across our shared boundaries primarily with Queensland, Victoria, South Australia, ACT and the Commonwealth.

We propose to spend a total of $8.0 million[140] in the 2021 regulatory period on this activity, an annual average of $2.0 million. The proposed annual average represents a 21% increase from the $1.6 million we spent on average annually so far during the 2016 regulatory period and is 114% higher than the amount IPART used when determining WAMC prices in 2016 ($931,000annual average), as set out in Table 54.

The activity seeks to protect the starting volume of water that can be shared by licence holders across much of NSW.

NSW cannot act alone in this space and we are working with our interjurisdictional colleagues to improve transparency and implement recommendations to improve governance and transparency. A key finding of the Review of Murray-Darling Basin Joint Governance Arrangements was that “All [external stakeholders] agreed that the job at hand is broader than the remit of any existing single committee or agency at both State and Commonwealth levels, so effective collaboration, coordination and cooperation are needed.”[141]

[140] All expenditures are expressed in $2020-21 and are described in the Administrative Information paper accompanying this paper.
[141] final report – Independent Review of the MDB Joint Governance Arrangements p3

Statutory basis for service

NSW has obligations under state and Commonwealth legislation, as well as a range of intergovernmental agreements.

It is important to deliver and meet the water resource and service delivery obligations under these agreements and legal instruments and to ensure that NSW is well represented in the implementation and review of existing agreements. We must also be a powerful advocate for NSW licence holders and negotiate for outcomes sought by NSW to ensure that these agreements and legal instruments will deliver balanced and fair outcomes and obligations.

Activities required to implement and negotiate cross border obligations are specified primarily under

- *Water Act 2007*
- Murray Darling Basin Plan 2012
- Murray-Darling Basin Intergovernmental Agreement 3 July 2008[142]
- Murray Darling Basin Reform Memorandum of Understanding 26 March 2008[143]
- Intergovernmental Agreement on Implementing Water Reform in the Murray Darling Basin of 5 June 2013[144]
- NSW Queensland Border Rivers Act 1947
- NSW Queensland Intergovernmental Agreement 2008
- Intergovernmental Agreement for the Paroo River between New South Wales and Queensland 2003
- Intergovernmental Agreement on a National Water Initiative
- Great Artesian Basin Sustainability Initiative

Many of the agreements are interlinked and govern funding arrangements made in accordance with the Intergovernmental Agreement on Federal Financial Relations.

The Murray Darling Basin covers an area of more than 1 million square kilometres and includes 75% of NSW, more than 50% of Victoria, 15% of Queensland, 8% of South Australia, and all of the Australian Capital Territory.

In 1987 the Murray–Darling Basin Agreement replaced the 1914 River Murray Waters Agreement, and has now been replaced by the 2008 Murray-Darling Basin Agreement which forms a schedule to the Commonwealth *Water Act 2007*. The Agreement sets out how water in the River Murray system is shared between Victoria, NSW and South Australia. It establishes how water available in the system each year is shared between States (their State share or bulk allocation).

The Basin Plan is a $13 billion reform to reset the balance between environmental and consumptive use of water and to establish a new sustainable water management system. The development of the Basin Plan was a lengthy and contested process, involving extended negotiation.

There is still significant work needed to ensure NSW is represented in Basin Plan implementation negotiations, and the next phase of Basin Plan implementation is going to be challenging. The package of supply measures to achieve equivalent environmental

[142] Available at https://www.coag.gov.au/sites/default/files/agreements/Murray_Darling_IGA.pdf
[143] Available at https://www.coag.gov.au/sites/default/files/agreements/Attachment-A-Murray-Darling-Basin-Reform-MOU.pdf
[144] Available at https://www.coag.gov.au/about-coag/agreements/intergovernmental-agreement-implementing-water-reform-murray-darling-basin

outcomes using 605 GL less water recovery is highly ambitious. For some key projects, realistic implementation timeframes are likely to extend beyond 2024, and it will be critical to ensure that NSW is able to seek a realistic implementation pathway to reduce the potential for poor outcomes for NSW water users, towns and communities.

Stakeholder views

We reviewed stakeholder feedback over the 2016 regulatory period and found that of the four key themes identified were that customers want:

- improved accountability for water management systems, which it says means "having strong evidence for its decisions and ensuring that evidence is available to and able to be understood by its customers."[145].
- improved information available to customers. Customers want more information about water management, which is accurate and easy to access.[146]

The feedback received shows that customers expect a higher level of service from activities such as this one, and lists some specific work that could be undertaken to do so, including better connectivity in planning, more public reporting, more information provided and improved timeliness of information being provided.

External stakeholders are often unsure of roles and responsibilities for managing Murray-Darling Basin water resources, and are concerned about the lack of engagement with the high-level committees and transparency in decision making. This is a key finding in the March 2019 final report of the Review of Murray-Darling Basin Joint Governance Arrangements, which stated "All external stakeholders contacted were confused as to who has what roles and responsibilities, and 'who is in charge?', or 'is there no-one in charge?' They were especially concerned about the lack of engagement with the high level committees and transparency in their decision making." [147]

The public debate around Basin management has become heated and polarised, fuelled by the complexity of decision-making, misinformation, uncertainty and drought, as noted in the Interim Inspector-General of the Murray–Darling Basin's March 2020 report on his Inquiry into the management of Murray-Darling water resources, which said "Fuelled by uncertainty, misinformation, misperceptions or misappropriation of available information, the public debate around Basin management has become increasingly toxic. It is creating division between the Basin States and even within communities themselves." [148]

Historic service 2016-17 to 2019-20 (4 years)

NSW is required to participate in over 35 groups and committees established to implement various aspects of the Basin Plan, border water sharing arrangements, manage the Great Artesian Basin and negotiate aspects of National Water Reform. Many of these committees are formally established under the Intergovernmental Agreements listed above. Key forums where decisions affecting NSW water management have been made include

- Council of Australian Governments (COAG) (now abolished and to be replaced by National Cabinet)

[145] KJA, DPIE IPART Price Submission - Stakeholder Engagement, Plain English Summary and final report, 27 February 2020, page 11

146 KJA, DPIE IPART Price Submission - Stakeholder Engagement, Plain English Summary and final report, 27 February 2020, page 11

[147] final report – Independent Review of the MDB Joint Governance Arrangements available at https://www.mdba.gov.au/sites/default/files/pubs/Review-of-MDB-joint-governance-arrangements-final-report.pdf

[148] Impact of lower inflows on state shares under the Murray–Darling Basin Agreement, Interim Inspector-General of Murray–Darling Basin Water Resources, 2020, available at https://www.igmdb.gov.au/sites/default/files/documents/iig_final_report.pdf

- MDB Ministerial Council
- National Water Reform Committee
- Basin Officials Committee, and a number of additional groups including committees and working groups on water resource planning, environmental water, water trade, monitoring and evaluation, salinity management and water quality
- River Murray Operations Committee
- Great Artesian Basin and National Groundwater Sub-committee
- Southern Connected Basin Environmental Water Committee
- Dumaresq-Barwon Border Rivers Commission
- Border Standing Committee (NSW / Qld)

The Council of Australian Governments (COAG) often included a dedicated Murray-Darling Basin side meeting, and although COAG has now been abolished in favour of a National Cabinet, it is likely that key decisions will in future be made through National Cabinet or an associated group of first Ministers, and strong NSW representation will be critical in establishing these processes.

The Basin Officials Committee and the MDBA have established among them, more than 30 (sub) committees, advisory panels, working groups and the like to assist them in various ways in carrying out their functions.

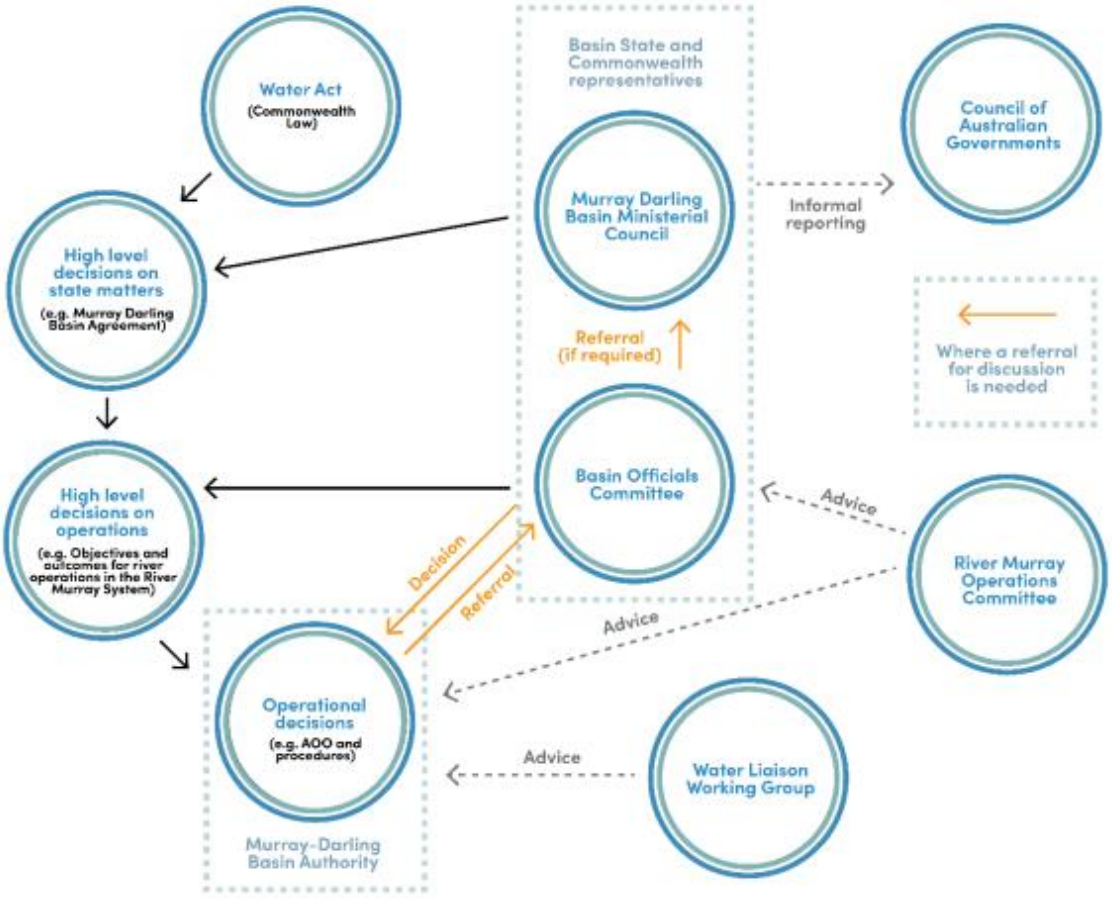
Most, but not all, of the sub-committees, have either instruments of establishment, signed by the Chief Executive of the MDBA, or written terms of reference of varying authority and detail, and the structure and governance arrangements are currently being revised and updated following a decision of the MDB Ministerial Council in December 2019.

Most, but not all of them, are chaired by a senior staff member of the MDBA with secretariat support provided by the MDBA, a significant call on resources.

Most, but not all of them, require membership from the Commonwealth and/or Basin state agencies, also a significant call on resources.

For example States are actively involved in River Murray operational decision-making. The Water Liaison Working Group (WLWG), which has members from the Commonwealth, NSW, Victorian and South Australian governments, meets fortnightly throughout the year to discuss current operational decisions and future operational planning (MDBA 2019h; MDBA 2019e). This includes discussion of issues such as risks associated with delivery, risks of capacity shortfall and whether water should be delivered above channel capacity or not. The WLWG updates both the River Murray Operations Committee (RMOC) and the Basin Officials Committee on operations through regular reporting and may escalate issues for decision if required.

Figure 31. Framework for Murray-Darling Basin operational decision-making and accountability



Source: Interim Inspector-General of Murray–Darling Basin Water Resources.

Service description and benefits

This activity protects NSW interests and ensures NSW users are not disadvantaged. Having a nationally agreed water reform agenda ensures NSW water users are managed consistently with other water users across the country, providing a stable business environment for NSW licence holders. Our representation at key advisory and stakeholder meetings is essential to ensure the interests of NSW licence holders are adequately represented. We report regularly to the Commonwealth and other State partners on NSW compliance with national agreements.

Key outcomes from cross border and national commitment activities during the 2016 regulatory period include

- negotiations for Intergovernmental Agreement on Implementing Water Reform in the Murray Darling Basin,
- negotiation of amendments to the Intergovernmental Agreement on Implementing Water Reform in the Murray Darling Basin 18 November 2016. These amendments reflect amendments to the Basin Plan made by the Water Legislation Amendment (Sustainable Diversion Limit Adjustment) Act 2016 that allows for a second notification of Sustainable Diversion Limit (SDL) adjustment measures by 30 June 2017 to maximise the benefits of the SDL adjustment mechanism. Ministers also

agreed to further revisions to timeframes for development and assessment of projects under the SDL adjustment mechanism,

- 17 March 2017 Ministerial Council agreed further changes to the timeframes for development and assessment of SDL adjustment measures. The revised timelines reflect recognition by the Basin Officials Committee that many of the proposed measures are complex and require additional time for assessment to resolve outstanding business case issues,
- August 2019 Ministerial Council endorsed amendments to the IGA relating to the implementation of measures to improve environmental outcomes in the northern Murray–Darling Basin. First Ministers signed the amendments on 9 August 2019,
- Northern Basin Review (NBR)
  - NSW participation in intergovernmental forums was critical to ensuring that the NBR allowed an additional 70GL to be retained for consumptive use in the Northern Basin including NSW's Macquarie, Castlereagh, Border Rivers, Namoi and Gwydir valleys, and
  - total financial contribution to New South Wales and Queensland of up to $180 million (GST exclusive) for approved projects associated with the implementation of the Northern Basin Toolkit,
- Water Efficiency program - incorporation of additional socio economic criteria to assess Commonwealth Water Efficiency Program projects and improve Commonwealth resource allocation - $1.5 billion Water for the Environment Special Account funds,
- NSW is currently implementing a State-led efficiency measures project with $500,000 funding under the Murray-Darling Basin Water Infrastructure Program,[149]
- Border Rivers – improved governance and reform in the Border Rivers Commission, and operational efficiencies in managing Border Rivers Agreement, saving $100,000 per year,
- Negotiation of $97.8million funding for SDL Adjustment Mechanism projects, and
- Negotiation and signing of a Memorandum of Understanding with the Government of Israel to cooperate on water efficiency and technology.

NSW will fulfil the requirements of the Murray Darling Basin Plan implementation agreement while mitigating impacts to NSW licence holders.

A strategic management plan is being revised for the Great Artesian Basin (GAB) in consultation with other jurisdictions and coordinated under the Great Artesian Basin Senior Officials Committee (GABSOC). The GABSOC is accountable to the Commonwealth parliamentary secretary for water and the GAB jurisdictional water ministers.

Community consultation is undertaken as part of developing the intergovernmental agreements and through representation on community consultation committees. This will aim to ensure that the interests of NSW are considered.

Service levels

We coordinate technical input across DPIE Water and the NSW Government to ensure there is a consistent portfolio of NSW negotiating positions and conducts/supports negotiations on

[149] As set out in the Project Agreement for Murray-Darling Basin Water Infrastructure, New South Wales-led Efficiency Projects, available at http://www.federalfinancialrelations.gov.au/content/npa/environment/national-partnership/NSW_PA_Final.pdf

behalf of NSW to ensure that the implementation of intergovernmental agreements deliver the best possible outcomes for the people of NSW.

Specified outputs

- Development and implementation of operational programs to meet NWI commitments.
- Biennial assessments on progress with implementing NWI agreements on water reform agenda.
- Participation in relevant interstate committees progressing NWI and COAG water reform initiatives.
- Development of interstate water sharing arrangements through MDB and Border Rivers agreements and ACT arrangements

The table below shows our output measures and performance indicators for the 2016 regulatory period. Throughout the 2016 regulatory period we have fully participated in interstate processes to manage water.

Table 54. Output measures and performance indicators for 2016 regulatory period W06-07

Output measure	Performance indicator
Full participation in interstate processes to manage water.	Compliance with key interstate agreements: 100%

Forecast service 2020-21 to 2024-25 (5 years)

In the 2021 regulatory period, we expect that new detailed and complex negotiations will be required to prevent serious impacts to NSW licence holders in the Murray-Darling Basin, and to prevent poor social, environmental and economic outcomes, as the legislated deadline for the Basin Plan approaches in 2024.

This will require negotiation around revised or new intergovernmental agreements, amendments to Commonwealth legislation, a legislated reconciliation process, which must be done in a way to ensure that the focus of other jurisdictions remains on outcomes and benefits rather than a strict focus on an arbitrary timeframe.

As the statutory timeframe is currently due to expire within the regulatory period, it is essential that these activities are prioritised during this period otherwise poor outcomes may be locked in for years or decades to come.

Key activities going forward are:

- the negotiation and implementation of River Murray delivery shortfall sharing arrangements with the other jurisdictions
- development and implementation of water trading arrangements including a new arrangement between NSW and ACT
- review of proposals under the Commonwealth Water Efficiency Program
- negotiation of the constraints management strategy
- measures to facilitate environmental water delivery and use
- negotiation to support NSW licence holders in the future implementation of the Basin Plan, including SDL adjustment mechanism, water recovery proposals, reconciliation
- Negotiate further funding and new programs that deliver enhanced social, environmental and economic outcomes in the Murray-Darling Basin

- Seek enhanced opportunities for water efficiency technology and innovation in NSW from other jurisdictions and nations
- Continued reform and improvements in the management of the NSW-Qld Border Rivers.

Other activities that have driven cost increases are:

- increased cooperation with Israel on water technology. This was recommended by a parliamentary inquiry to improve technology for water use in NSW, and should have positive long term outcomes for NSW water users[150]
- delivery of phases 2 and 3 of NSW's Basin Salinity Management 2030 (BSM2030)[151] strategy obligations.

Basin Salinity Management 2030 Strategy

Audit and reporting has been streamlined as part of the Basin Salinity Management 2030 (BSM2030) [152] strategy, with a comprehensive audit occurring every two years commencing in 2017. The first audit covered the period from July 2015 to June 2017 identified that there was a significant risk of NSW not being able to deliver on its BSM2030 obligations and recommended that *'NSW, as a matter of urgency, should ensure it has the dedicated resourcing required to meet its obligations to conduct the reviews of salinity entries on the registers'*[153]. The most recent Audit Report (covering the period from July 2017 to June 2019) reiterated its view that NSW continues to be under-resourced to complete required activities and that there is an absence of appropriate irrigation development policy frameworks. NSW response to the Audit recommendations stated: '*NSW acknowledges that more resourcing is required both in terms of internal staffing and operational capacity to deliver BSM2030 obligations.*' In addition, the 2017-19 Audit Report identified NSW as a major risk to the delivery of BSM2030 and in breach of Schedule B (Schedule 1 to the Water Act 2007 *Cth*) legislative obligations.

Currently, NSW contributions to the agreed BSM2030 Implementation Plan are not achievable because of resourcing constraints which have resulted in:

- reduction in capability and capacity to coordinate and implement NSW BSM2030 commitments in recent years (due to various restructures and other mechanisms)
- significant delays in delivery and implementation across many elements of the strategy
- several outstanding Register Entry reviews requiring attention.

Key actions undertaken by DPIE Water to address these issues included an external review of the program that provided guidance on the level of resourcing required to deliver NSW's BSM2030 obligations (Jacobs, 2018), recruitment of a dedicated program manager, establishing a program steering committee and developing a project plan based on the review's findings (of which the Basin Salinity Management Advisory Panel endorsed in 2019). The project plan has three phases:

[150] Memorandum of Understanding between the State of New South Wales and the Ministry of Energy of the State of Israel on Water Resources Management and Development Cooperation 2019
[151] Further information is available at https://www.mdba.gov.au/publications/mdba-reports/basin-salinity-management-2030
[152] Further information is available at https://www.mdba.gov.au/publications/mdba-reports/basin-salinity-management-2030
[153] Recommendation 2, Report of the Independent Audit Group for Salinity 2015-2017 (2018). https://www.mdba.gov.au/sites/default/files/pubs/report-independent-audit-group-salinity-2018_0.pdf

- *Phase 1* (2018-19 to 19-20): Acquisition of resources and capacity building within key DPIE Water groups, improved program governance, commencement of outstanding Register Entry reviews and identification of core salinity monitoring sites.
- *Phase 2* (2020-21 to 23-24): Completion of Register Entry reviews, establishing Irrigation Development Policy Frameworks, evaluation of salinity risks within each catchment, review the salinity monitoring network (including the relevancy of End of Valley (EoV) sites); and, increase community engagement (including the development of communication products).
- *Phase 3* (2024-25 to 25-26): Evaluate End of Valley (EoV) targets, update catchment tributary models and undertake a BSM2030 Mid-term Review (in consultation with the MDBA).

Service levels

The table below shows proposed output measures and performance indicators for the regulatory period commencing in 2021.

Table 55. Output measures and performance indicators for the 2021 regulatory period W06-07

Output measure	Performance indicator
Full participation in interstate processes to manage water.	Compliance with key interstate agreements (for example, BSM2030): 100%

Operating expenditure

In an environment where the demands on water resources are increasing and the supply of water is becoming more constrained the negotiation of cross border water sharing arrangements that reflect contemporary trends and protect the interests of NSW licences holder can only become more difficult and complex.

The cost this activity relates primarily to staff time involved in developing and responding to national and interstate activities and proposed changes to these commitments. The driver for this activity is the need to maximise water management outcomes for NSW water users.

During the 2016 regulatory period the costs associated with this activity were higher than expected due to significantly more complex and protracted negotiations around basin plan settings than anticipated, particularly the Northern Basin Review, the Sustainable Diversion Limit (SDL) adjustment mechanism, disallowance of a key basin plan amendment and proposed disallowance of a second amendment, development of stronger socioeconomic neutrality criteria for water efficiency measures, and the basin compliance compact.

The proposed expenditure allows for some elevation of existing levels of service in this activity. Over the 2016 regulatory period we benefited from supplementing the cost of these activities from other external funding sources, which are no longer available for the 2021 regulatory period. In addition, expected outputs will be high during the period as the Basin Plan implementation is currently scheduled for completion in 2024, where negotiations will focus on securing extensions to ensure an adequate timeframe is available to deliver improved benefits and outcomes beyond this date, requiring a greater staff resourcing (expressed as FTEs) in the regulatory period commencing in 2021.

It is widely considered that some of these Basin Plan commitments will be difficult to meet within the statutory timelines and extensions as well as program amendments will need to be

negotiated. The Productivity Commission drew attention to these matters in its 2019 report[154].

In addition significant parts of the Basin Plan and potentially some of the long standing intergovernmental agreements will require ongoing and complex negotiations to account for the expected impacts of climate change.

Governance arrangements for many of the Basin related committees has been the subject of an independent review. Following a Ministerial Council decision to update the governance arrangements in December 2019, it will be important for NSW to provide a strong voice in leading these reforms to ensure a streamlined and transparent governance arrangement is put in place, which will likely remain in place for the next decade or more.[155]

In addition, our forecast operating expenditure incorporates the resources required to meet our obligations under the BSM2030 strategy.

We propose to spend a total of $8.0 million[156] in the 2021 regulatory period on this activity, an average annual spend of $2.0 million. Average annual expenditure in the 2016 regulatory period is $1.6 million, which is substantially higher than the prudent and efficient expenditure used by IPART when determining WAMC prices in 2016, as set out in the following table.

Table 56. Expenditure on cross border and national commitments W06-07 ($2020-21 $000)

Cost	2016 regulatory period				Extension	2021 regulatory period				
	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
IPART'S 2016 final report	900	886	873	1,066	1055					
Actual DPIE Water operating expenditure	1,468	1,421	1,528	2,144						
Actual externally funded operating expenditure	0	0	40	25						
Actual externally funded capital expenditure	0	0	0	0						
Proposed DPIE water operating expenditure						1,981	1,971	1,971	2,037	2,037
Proposed DPIE Water BSM2030 operating expenditure^						646	635	635	702	753

[154] The Productivity Commission, Murray Darling Basin Plan: Five-year assessment, 2018 https://www.pc.gov.au/inquiries/completed/basin-plan#report

[155] Claydon, Greg, Review of The Murray Darling Basin Joint Governance Arrangements 2019. https://www.mdba.gov.au/sites/default/files/pubs/Review-of-MDB-joint-governance-arrangements-final-report.pdf

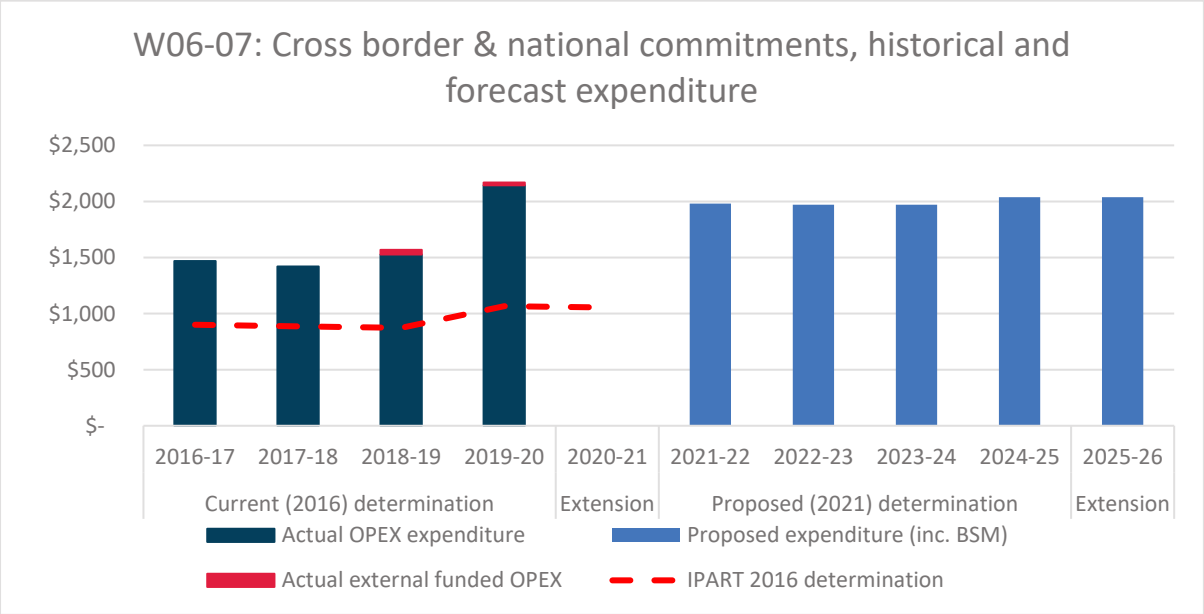
[156] All expenditures are expressed in $2020-21 and are described in the Administrative Information paper accompanying this paper.

^ Basin Salinity Management (2030) costs are included in the Proposed DPIE water operating expenditure (line above)

Notes: IPART's 2020–21 figure has been provided by IPART; actual operating expenditure is net of externally funded operating expenditure; DPIE Water's 2019–20 actual costs are 12/10 x actual costs for the 10 months to April 2020 and NRAR's 2019-20 actual costs are 12/11 x actual costs to May 2020; 2020–21 actual costs are unknown; 2025–26 costs are provided as required by IPART; please also refer to the Administrative Information document that is part of this submission.

This information is also set out in the following graph.

Figure 32. Expenditure on cross border and national commitments W06-07 ($2020-21 $000)



W07 Water management works

There is only one activity within this group, which is to undertake water management works to reduce the impacts arising from water use or remediate water courses.

W07-01 Water management works

This activity comprises undertaking of water management works to reduce the impacts arising from water use or remediate water courses.

Throughout this regulatory period, we have delivered significant river works that assist in maintaining channel capacity and stabilising river banks. In addition, NSW has continued to manage salt interception schemes to mitigate salinity impacts on surface water systems.

Stakeholders asked for improved accountability for water management systems, including better connectivity in planning, more public reporting, more information provided and improved timeliness of information being provided[157].

[157] See *Detailed Paper B What our stakeholders have told us and how we have responded for more* detail on what are stakeholders have told us about what is important to them, including improved accountability for water management decisions

We propose to spend a total of $11.5 million[158] in the 2021 regulatory period on this activity. Average annual expenditure in the 2016 regulatory period is $1.1 million with forecast expenditure 172% higher at $2.9 million annually as set out in Table 56.

In this activity we reduce erosion and salinity impacts, and restore riverbank stability. Erosion impacts are addressed by restoring river frontage through structural erosion controls, such as log and rock revetment, fencing to exclude stock and protect revegetation, and assistance with off-stream stock watering and planting of local native species.

Salinity impacts arising from changed land use and irrigation practices are mitigated by the operation and maintenance of salt interception schemes. With in-stream salinity forecast to increase over time, on-going management of these schemes is essential to maintain agreed salinity levels in the River Murray system.

A risk-based approach has been adopted for this service, which means that resources and effort are focused on high priority areas.

Statutory basis for service

River works service level agreements negotiated with relevant impactors and stakeholders.

Operation and maintenance of salt interceptions schemes in compliance with salinity management requirements and legislative obligations:

Water Act 2007 (Commonwealth):

- Salinity management requirement in Chapters 5, 9 and 11 of Murray Basin Plan.
- Performance of works arrangements that enable NSW to comply with its formal salinity credit obligations in Schedule B to Murray Darling Basin Agreement in Schedule 1 under Part 1A of Water Act.
- Joint Venture asset management obligations listed within the Joint Venture Work Plan – Schedule 1 Murray-Darling Basin Agreement.
- *Water Management Act 2000* – Release of water from Blowering Dam for the use by downstream water users, and the provision of environmental flows as defined in the *Act* and in accordance with the Murrumbidgee Water Sharing Plan. Legislative responsibility to assess the impact of the erosion control works on the stability of the river channel through this *Act*.

Stakeholder views

We reviewed stakeholder feedback over the 2016 regulatory period and found that of the four key themes identified were that customers want:

- improved accountability for water management systems, which it says means “having strong evidence for its decisions and ensuring that evidence is available to and able to be understood by its customers.”[159].

The feedback received shows that customers expect a higher level of service from activities such as this one, and lists some specific work that could be undertaken to do so, including better connectivity in planning, more public reporting, more information provided and improved timeliness of information being provided. We identified that future work to improve

[158] All expenditures are expressed in $2020-21 and are described in the Administrative Information paper accompanying this paper.
[159] KJA, DPIE IPART Price Submission - Stakeholder Engagement, Plain English Summary and final report, 27 February 2020, page 11

accountability would be to publish our evidence and update water Users on the results of programs and policies.

Historic service 2016-17 to 2019-20 (4 years)

Salinity remains an issue in NSW providing significant economic, environmental and social challenges for the Murray-Darling Basin. It requires ongoing and proactive management to ensure that salinity levels in the Basin rivers and catchments do not exceed agreed levels. Challenges to date have been met by partner agencies working collaboratively to achieve in-river salinity targets and by ensuring that any land or water management actions that cause an increase in salinity are offset by actions that provide a decrease in salinity.

As a signatory to the Murray-Darling Basin Agreement, NSW has agreed to on-going management of salinity, including the operation and management of Salt Interception Schemes (SIS). These schemes are used to divert saline groundwater and drainage water away from the river system. The Buronga SIS costs are shared between the NSW Government (71%, recovered through WAMC water management charges) and the Murray Darling Basin Joint Venture Program (MDBA 29%)

The river works component of this activity focuses on mitigating the impact of water releases from dams and includes the maintenance of bank stability and channel capacity within the Tumut River reach. Works delivered under this program include revegetation, log and rock revetment, weed control, stock control fencing and installation of off-stream watering points. Environmental monitoring, covering 75km of riverbank, is also undertaken annually.

Specified outputs

Delivery of the Tumut River Works program and subsequent on-ground activities has shown continual increases in the extent of high priority areas of erosion remediated (and maintained) over the duration of the program (2016-17 to 2018-19).

The following river works were completed between 2016-17 and 2018-19:

- Erosion control management through the installation of rock walls to stabilize banks (2.3km).Vegetation management (including revegetation works) to improve bank stability (5.5km).Willow management (i.e. lopping, poisoning, burning) to maintain channel capacity
- Snag management/removal to maintain channel capacity
- Anabranch management

As a result of the above works, channel output capacity at Tumut was maintained at 9,200 ML/day providing a stable main channel capable of carrying sufficient capacity to suit the needs of both irrigation demand and power generation.

Salt Interception Schemes

In total, 154,000 tonnes of salt was diverted from the Murray and Darling River systems through NSW Joint Venture Salt Interception Scheme operations. Of this, approximately 53,000 tonnes is removed annually by the Buronga scheme. All schemes generally operated in a full-time capacity between 2016-17 and 2018-19.

NSW maintained a credit balance (>38EC credits) on the Salinity Register during the period 2016-17 to 2018-19. The operation and maintenance of Salt Interception Schemes in NSW generates salinity credits that are shared between the Basin States and the Commonwealth, contributing to meeting the Basin Salinity Target (<800 EC at Morgan, 95% of the time) as prescribed in Schedule B of the Murray-Darling Basin Agreement.

In general, DPIE SIS Operations work closely with our interstate counterparts to standardise systems and operational componentry to improve program delivery and effectiveness. The Operations teams' core responsibility is to maintain and operate the facilities to ensure peak performance.

The following table shows our performance against the output measures and performance indicators set out in IPART's 2016 final report. The figures show that the output measure – 90% high priority areas of erosion identified and remediated – was not met in 2016-17. We achieved 66%; and, 80% in 2017-18 and 2018-19. The target initially proposed was considered an end of program target (not a yearly target) and does not take into account natural climatic events such as flooding that essentially 'resets the clock' i.e. following an extreme event, the program is focused on repair and maintenance rather than completing new works.

Table 57. Output measures and performance indicators for the 2016 regulatory period W07-01

	Output measure	Performance indicator
	High priority areas of erosion identified and remediated: • Target: 90%. Maintain salinity (Electrical conductivity EC) credits for NSW.	Channel output capacity at Tumut maintained at 9,200ML/day.

Forecast service 2020-21 to 2024-25 (5 years)

River Works

NSW have existing contractual arrangements with Soil Conservation Service to deliver various river works as per the Tumut River Management Plan and via a cost sharing agreement between NSW and Snowy-Hydro Ltd. Annually, work sites are identified via boat inspections and where appropriate/required on-ground inspections are also carried out. Sites are then prioritised, work requirements determined and landholder liaison and agreement undertaken. The works program is aimed at completing high priority work but will also undertake work of a medium and low priority on the same property or in the vicinity at the same time in order to maximize efficiency. This approach enhances productivity by minimizing relocation costs of plant and personnel. On-ground delivery of works include:

- Rock work: covering an eroding river bank with a layer of rock to prevent further erosion; and, establishing groynes to redistribute/'break-up' flow and provide in-stream aquatic habitat
- Log pile fields designed to reduce water velocity
- Snag management: removal to minimize bank erosion and maintain channel capacity; and, relocation to downstream low risk areas to provide aquatic habitat/refuge areas
- Willow management: revetment and lopping are the primary management activities, with poisoning also undertaken where appropriate.
- Protecting the integrity of anabranches through further investigation of key processes and bank stability activities i.e. revegetation and installing pile fields
- Vegetation management including revegetation and weed management activities

This new funding period will enable additional benefits as set out in the Tumut River Management Plan to be achieved during the next period.

Salt interception schemes

The operation and maintenance of Salt Interception Schemes are delivered by DPIE Water in conjunction with WaterNSW and SA Water. This activity contributes to NSW agreed obligations to the management and operation of the Buronga SIS (delivered through the MDBA led, Joint Venture program) and the state-owned Billabong SIS.

SIS generally operate on a 24 hour basis of which power consumption forms a large component of total expenditure. Operational and maintenance activities include replacement of bores, maintenance of head works and pipeline repairs, disposal basin maintenance, meter repairs/replacement, acid dosing of bores, replacement of electrical components, weed management, etc. In addition, funds are also used to monitor groundwater impacts of the schemes. There have been financial savings during this period as a result of a change in power service provider and whole of government negotiated supply contract.

Table 58. Output measures and performance indicators for the 2021 regulatory period W07-01

	Output measure	Performance indicator
	High priority areas of erosion identified and remediated: • Target: 90%.	Channel output capacity at Tumut maintained at 9,200ML/day.
	Maintain salinity (Electrical conductivity EC) credits for NSW.	SIS operated and maintained in accordance with the Buronga Operations and Maintenance Manual

Operating expenditure

The cost of water management works relates to specific water management projects. The cost is allocated on the value of works in each of the pricing water sources creating the need for this work to be undertaken.

The SIS program has recently seen an increase in resourcing/in-house capacity and therefore are able to undertake both required annual planned maintenance and operations as well as completing any outstanding/additional operational/maintenance issues that are a legacy of past program resourcing issues. Additional funding for the Buronga SIS is required to meet requirements as set out in the MDBA Joint Venture Annual Workplan 2019-20 to 2022-23.

Complementary to this activity, a Joint Venture funded Responsive Management trial is currently underway to assess the impact of reduced SIS operations on river/riparian health. This initiative is designed to optimise the operation of schemes to achieve budget savings whilst also managing any adverse impacts in terms of salinity, ecology, social and economic outcomes. Outcomes from this responsive management trial (due for completion in 2025/26) will inform future SIS operations.

Additional funding is required to implement the Tumut River Works program as per the Tumut River Works Plan. Currently, some of the activities outlined in the Tumut River Works Plan are not being undertaken, which may lead to perverse outcomes including reduced channel capacity, bank instability, damage to Aboriginal cultural heritage, decrease in instream habitat and a decrease in wetland community functionality. Full implementation of the management plan will lead to improved outcomes across a multitude of areas resulting in a range of cultural, ecological, social and economic outcomes. Currently, the river works program has primarily focused on erosion management (which constitutes 60% of the total works program); however, additional funds would enable further work to be undertaken with respect to Aboriginal Cultural Heritage Management, native vegetation management and wetlands management.

In addition, further efficiencies in program reporting, asset management and monitoring will be achieved through the development of a 'fit for purpose' database, similarly to what is used in other comparable river works programs and will build upon these successes. This will enable further transparency of works undertaken and assist in the communication of outcomes to external stakeholders (including the general public and local communities).

Currently, a review is being undertaken regarding Billabong SIS operational performance. Additional funds will be required to implement/deliver report recommendations to further improve and maintain scheme performance.

We propose to spend a total of $11.5 million[160] in the 2021 regulatory period on this activity. Average annual expenditure in the 2016 regulatory period is $1.1 million with forecast expenditure 172% higher at $2.9 million annually as set out in the following table.

Table 59. Expenditure on water management works W07-01 ($2020-21 $000)

Cost	2016 regulatory period				Extension	2021 regulatory period				
	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
IPART'S 2016 final report	1,017	1,001	986	972	965					
Actual DPIE Water operating expenditure	1,028	1,165	992	1,047						
Actual externally funded operating expenditure	0	0	2,253	5,151						
Actual externally funded capital expenditure	0	0	0	0						
Proposed DPIE Water operating expenditure						2,872	2,878	2,884	2,891	2,891

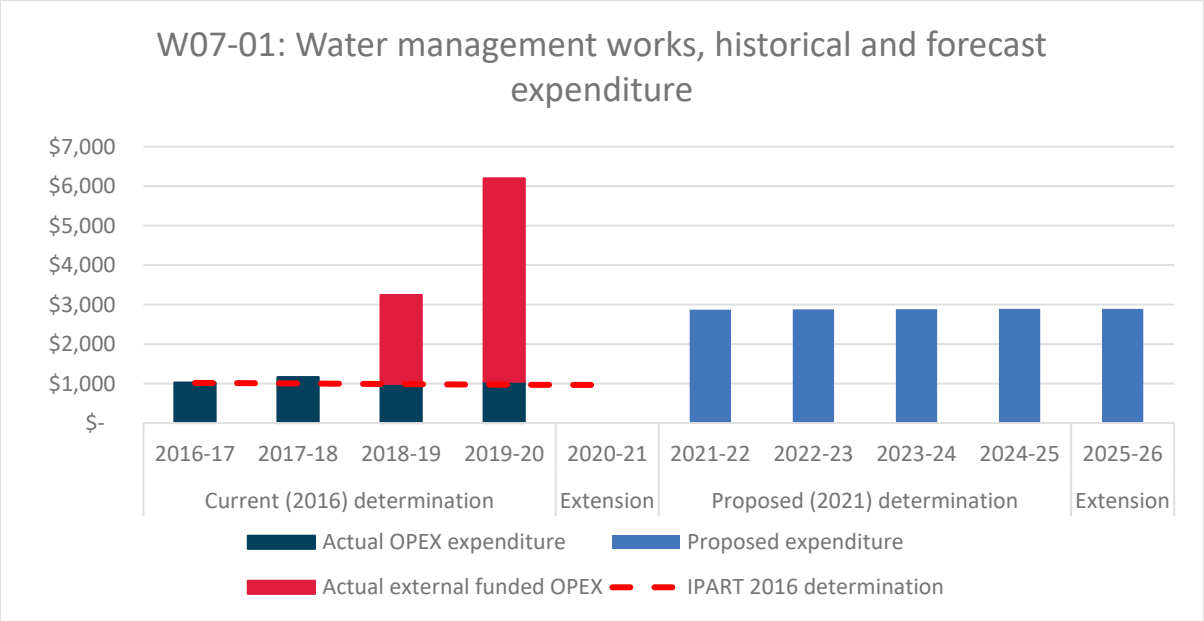
Notes: IPART's 2020–21 figure has been provided by IPART; actual operating expenditure is net of externally funded operating expenditure; DPIE Water's 2019–20 actual costs are 12/10 x actual costs for the 10 months to April 2020 and NRAR's 2019-20 actual costs are 12/11 x actual costs to May 2020; 2020–21 actual costs are unknown; 2025–26 costs are provided as required by IPART; please also refer to the Administrative Information document that is part of this submission.

2017-18 – reported overspend by 16% is misleading as this figure ($1,165, 343) also includes external funding ($441,984) from Snowy Hydro for both the Tumut River and Upper Murray River Works Program thereby overinflating the costs reported against W07-01. Actual costs in 2017-18 equate to $723,359 i.e. 72% IPART. This underspend was primarily attributed to a delay in the delivery of some project activities due to a lack of internal capacity i.e. inadequate resourcing/staffing levels. Whilst, this did not impact the output measure (maintain salinity credit) it does however affect individual scheme performance and efficiency.
Note: 2025-26 costs are provided as required by IPART; please also refer to the Administrative Information document that is part of this submission.

[160] All expenditures are expressed in $2020-21 and are described in the Administrative Information paper accompanying this paper.

This information is also set out in the following graph.

Figure 33. Expenditure on water management works W07-01 ($2020-21 $000)



W08 Water regulation management

All costs proposed for WAMC activity W08-01 in the 2021 regulatory period are for activities undertaken by WaterNSW, and are covered in their separate submission to IPART for WAMC prices.[161]

Activity W08-99 is proposed to be removed in the 2021 regulatory period and water consent overheads will instead be incorporated in W09-01. More information is provided in the W09-01 section.

W08-02 Consents management and licence conversion

This activity is undertaken by both DPIE Water and WaterNSW and comprises transcribing of water sharing provisions into licence conditions and the conversion of licences to the Water Management Act 2000.

In the 2016 regulatory period, we have converted a great many licences that had been issued under the terms of the *Water Act 1912* to issuance under the *Water Management Act 2000*. This has occurred as the 20 water sharing plans under the latter act have been finalised, because those plans set out water allocation rules and conditions that are then incorporated into licences in the area covered by each plan. Now that water sharing plans cover all water sources in NSW, we expect to have converted almost all licences by the start of the 2021 regulatory period. Some with unique circumstances will take longer and will require work in the 2021 regulatory period.

We have undertaken consents management tasks throughout the 2016 regulatory period and this will continue in the 2021 regulatory period. This involves transcribing water sharing provisions into licence conditions and then maintaining those conditions on licences in response to any changes made to water management plans, which will occur as the 20

[161] WAMC activity W08-01 transferred to WaterNSW as part of the 2016 water transformation project. Further information on it is set out in Detailed Paper K and further information on the water transformation project is set out in Detailed Paper C; both Detailed Papers form part of this submission.

water sharing plans are reviewed every ten years. The plans are designed to be adaptive, so that they can be brought up to date for what is known about the relevant water source using available data, technology and modelling capabilities and incorporating what we have learnt about how plans can be better plans. Accurately recording and registering entitlements and security interests that have been granted provides water users and the wider public with confidence in the stability of the licence regime, and allows for water to be traded as required under the National Water Initiative.

We propose to spend a total of $2.6 million[162] in the 2021 regulatory period on this activity. Average annual expenditure in the 2016 regulatory period is $141,000 (NRAR average annual expenditure of $65 thousand) with forecast expenditure 213% higher at $643,000 annually (all DPIE proposed cost) as set out in Table 59. The prudent and efficient cost (average annual of $1.3 million) that was used by IPART to determine WAMC prices in 2016 was entirely allocated to WaterNSW in the 2016 regulatory period.

Statutory basis for service

Consents management and licence conversion to support the *Water Management Act 2000:*

- Chapter 3, Part 2, Division 3 – conditions, duration and amendment to access licences (s.66-70) that relates to the imposing of conditions on a licence after it has been granted
- Chapter 3, Part 3, Division 3 - conditions and duration of approvals (Sections 100-106) that relates to the imposing of conditions on an approval after it has been granted
- Provisions under Chapter 9, Schedule 10 - conversion of former entitlements to access licences and approvals.

Historic service 2016-17 to 2019-20 (4 years)

Service description and benefits

When Water Sharing Plans (WSPs) are made for the first time for a water source, all *Water Act 1912* licences for the water source must be converted to water access licences (WALs) and approvals under the *Water Management Act 2000*. To do this, the relevant aspects of the old licences are transferred to the new WALs and approvals. This requires investigation and confirmation as to the correct holders and/or tenancy arrangements for approximately 20% of converted licences, and recording of security interests (arising from land benefited under *Water Act 1912* licences) on about 50% of converted licences where the financial risks to affected parties warrant it.

In doing this, we ensure that entitlements are granted and security interests are registered to the rightful owners and financial institutions respectively. In addition, more WALs are available for trading, increasing water market activity and enhancing the value of water. This is a fundamental aspect of the National Water Initiative and is addressed in the *Water Management Act 2000* via the ability for both temporary and permanent dealings. Implementation of WSP conditions will result in the better protection of water sources and improve river health, as well as providing greater security for licence holders.

Each WSP includes mandatory conditions, which are imposed on WALs and approvals covered by the plan. To do this the mandatory conditions, which may be expressed in general terms, have to be expressed in terminology appropriate for licence or approval conditions, then the individual licence or approval holder is advised by written notification

[162] All expenditures are expressed in $2020-21 and are described in the Administrative Information paper accompanying this paper.

and records are made on registers in accordance with procedures set out in the *Water Management Act 2000*. This occurs whenever a WSP is made, remade at 10-yearly intervals, amended, split or amalgamated. Additionally, mandatory conditions are sometimes required to be imposed to give effect to specific provisions of the *Water Management Act 2000* or associated regulations.

Application and implementation of properly worded mandatory conditions on WALs and approvals is essential for the implementation of WSPs, because this:

- ensures water users clearly understand their rights and obligations in relation to water access, metering and recording obligations and operating in a manner consistent with each WSP,
- supports the roll out of the non-urban water metering framework, because the mandatory conditions imposed on WALs and approvals that specify conditions for metering equipment standards and associated recording and reporting requirements give effect to that framework
- enables NRAR to undertake compliance and enforcement functions associated with water take.

We also undertake ongoing correction of details on licences and approvals as they are identified as part of activity W08-02.

Tasks shared by DPIE Water, NRAR and WaterNSW

Since commencement of the 2016 regulatory period, a number of changes have been made in who undertakes consents management and licence conversion tasks, with the functions of activity W08-02 shared between DPIE Water, NRAR and WaterNSW.

Until September 2016, our predecessor, DPI Water owned the Water Licensing System (WLS) and undertook all consents management and licence conversion tasks,

In September 2016, ownership of the WLS was transferred to WaterNSW along with many tasks relating to consents management and licence conversion. Our predecessor, DPI Water, continued to draft mandatory conditions and apply them in the WLS at the point of licence remake or conversion and provided instruction to WaterNSW to undertake notification by bulk mail out.

In April 2018, when NRAR commenced operations, it took over the functions of:

- licence conversion at scale as water sharing plans were finalised,
- specifying wording of mandatory conditions required to implement provisions in WSPs under the *Water Management Act 2000* and associated Regulations,
- loading these conditions into the registers and
- making corrections to licence condition parameters as needed

WaterNSW at this stage retained the functions of:

- licence conversions on an ad hoc one-off basis (for example for controlled works to flood works),
- producing WAL certificates and
- verification of details for the Land Registry Service.

In September 2019, DPIE Water took over responsibility for developing mandatory conditions for imposition on licences and approvals:

- at or after the commencement of a water management plan,
- on review / amendment of a water management plan,

- to give effect to adaptive environmental water outcomes, and
- to give effect to conditions required by the Act or Regulations.

DPIE Water is also responsible for undertaking various administrative steps required to apply conditions to licences and approvals in the WLS and convenes an interagency working group (including NRAR and WaterNSW) that resolves conditioning issues and proposes condition improvements.

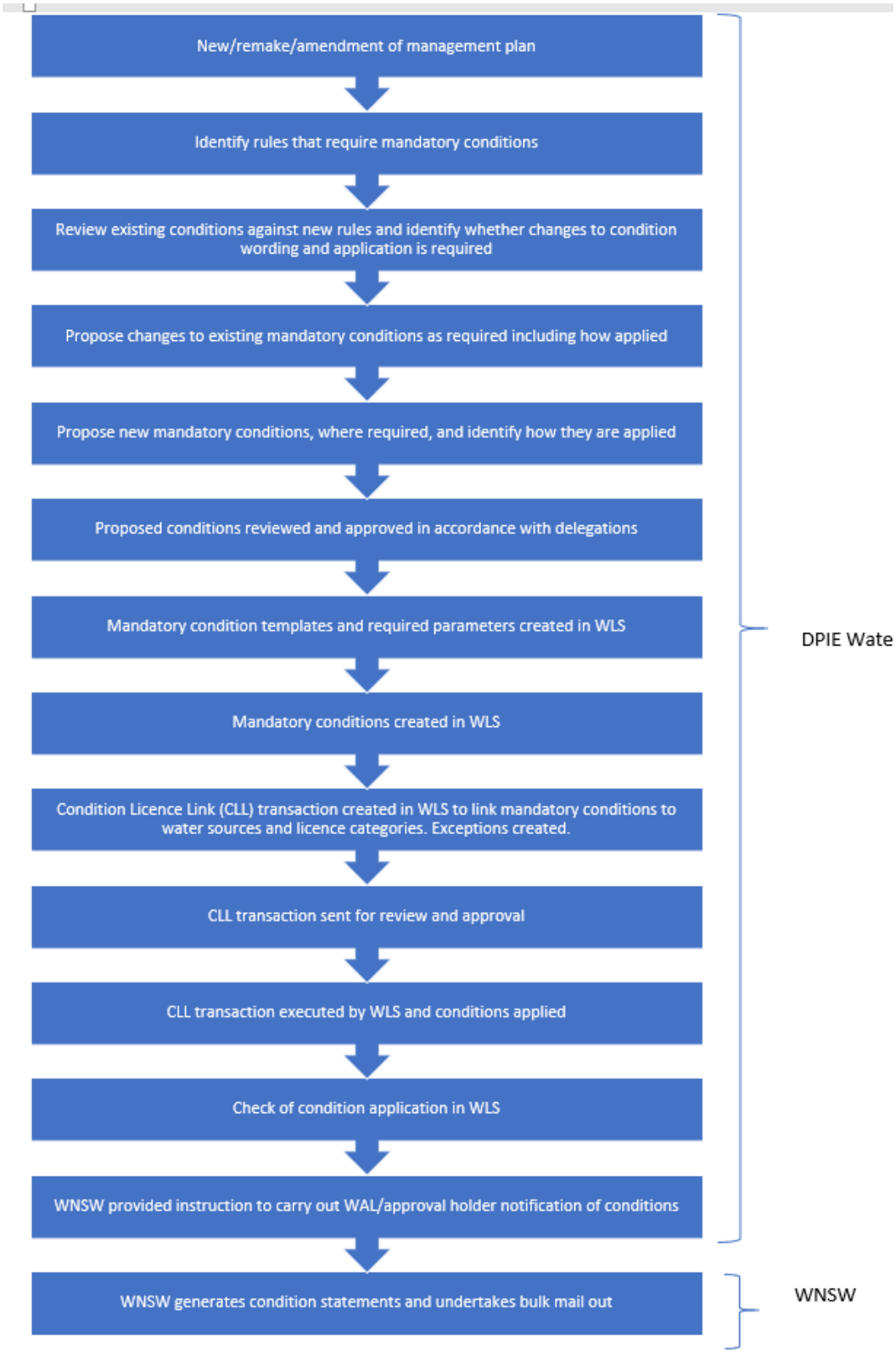
As WaterNSW still owns the WLS, it checks the application of new or amended conditions in it (once we have uploaded them) to the extent needed to ensure the integrity of the WLS is maintained. DPIE Water also checks the application of conditions to the WLS as a step in its quality assurance process.

WaterNSW also still:

- manages administrator access for the WLS
- notifies stakeholders of mandatory conditions once they have been determined by DPIE Water,
- develops discretionary conditions,
- determines volumes applied to existing non volumetric Water Act 1912 licences to be converted,
- processes surrendered or cancelled licences,
- manages security interests,
- updates information and
- Land Registry Service dealings.

The tasks performed by DPIE Water and WaterNSW since September 2019 within activity W08-02 are set out in the following diagram. We expect this arrangement to continue through the regulatory period commencing in 2021, although note that there will be less work carried out on conversions because water sharing plans covering all relevant water sources in NSW were finalised during the 2016 regulatory period. Consequently, we expect that by the end of 2020, most *Water Act 1912* licences in NSW will have been converted to *Water Management Act 2000* water licences and approvals, other than a small number with outstanding specific issues to be resolved.

Figure 34. Consents management and licence conversion tasks undertaken by DPIE Water and WaterNSW



Service levels

The following table reports against the output measures and performance indicators set out by year in IPART's 2016 final report.

Table 60. Output measures and performance indicators for the 2016 regulatory period W08-02

Progress	Output measures	Performance indicator
	Annual number of licences recorded on the public register plus number of access licence and approvals with updated conditions: Target: All licences recorded on public register – the number varies from year to year.	Percentage of access licences and changes to licence details recorded on the public register within two months of implementation or update of sharing plan: Target: 90%
2016-17	Reporting about these outputs and performance indicators will be made by WaterNSW in its separate submission	
2017-18		
2018-19		
2019-20		

Forecast service 2020-21 to 2024-25 (5 years)

This covers the last year under the 2016 regulatory period and the four years of the 2021 regulatory period.

Service levels

Conversion of water licences from *Water Act 1912* to *Water Management Act 2000* will be effectively completed by the commencement of the regulatory period commencing in 2021, so there will not be any significant ongoing activity.

We will continue the functions transferred from NRAR in September 2019 of

- specifying wording of mandatory conditions required to implement provisions in WSPs under the *Water Management Act 2000* and associated Regulations,
- loading these conditions into the registers and
- making corrections to licence parameters as needed.

The following table sets out proposed output measures and performance indicators for the regulatory period commencing in 2021 for the tasks we undertake.

We note that WaterNSW will propose its own output measures and performance indicators in its separate submission.

Table 61. Output measures and performance indicators for the 2021 regulatory period W08-02

Output measure	Performance indicator
Conditions are developed for imposition on licences and approvals after the commencement, review or amendment of a water management plan; to give effect to an adaptive environmental water outcome and to give effect to conditions required by the *Water Management Act 200* and associated Regulations.	Conditions uploaded into the register within 6 months of the event requiring • Target: 100%

The service level is appropriate because the service levels are constrained by the legislative requirements of providing a minimum time for recording tenancy and security interests.

Operating expenditure

When determining WAMC prices in 2016, IPART did not include any expenditure relating to this activity to our predecessor, DPI Water. IPART did, however, include prudent and efficient expenditures of $1.3 million[163] on average annually, which it allocated in full to WaterNSW.

DPIE Water, NRAR and WaterNSW have all performed tasks in this activity during the 2016 regulatory period.

We, DPIE Water and NRAR, recorded a total expenditure for this activity in the 2016 regulatory period of $0.7 million.

Most expenditures relating to activity W08-02 in the 2016 regulatory period were incurred by WaterNSW, as WaterNSW was delegated responsibility for this activity from September 2016 (under the Deed of Business Transfer) until September 2019 when most tasks returned to DPIE Water. The separate submission by WaterNSW to IPART for WAMC prices will provide an explanation of its expenditures and outputs.

All of the revenue from the expenditures found by IPART to be prudent and efficient for this activity for the 2016 regulatory period was allocated to WaterNSW. We propose that from the start of the 2021 regulatory period, allocations should be made to both DPIE Water and WaterNSW reflecting respective workloads based on the levels of expenditure IPART considers to be prudent and efficient.

We propose to spend a total of $2.6 million[164] in the 2021 regulatory period on this activity, an average annual expenditure of $0.7 million. Water NSW has advised that it proposes to spend a total of $4.2 million, or $1.3 million on average annually, from 2021. Again, although it does not form part of our proposal, we provide WaterNSW's proposed expenditures and the amount IPART found to be prudent and efficient in 2016 in the table below for transparency.

This expenditure information is set out in the following table.

[163] All expenditures are expressed in $2020-21 and are described in the Administrative Information paper accompanying this paper

[164] All expenditures are expressed in $2020-21 and are described in the Administrative Information paper accompanying this paper.

Table 62. Expenditure on consents management and licence conversion W08-02 ($2020-21 $000)

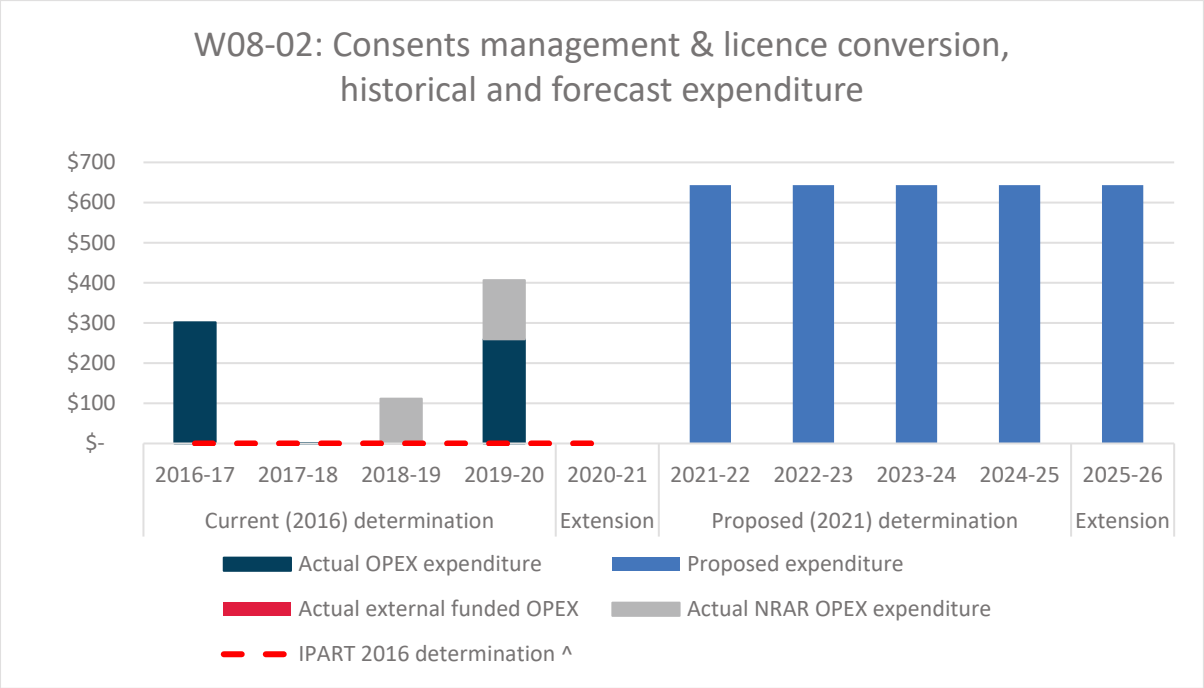
Cost	2016 regulatory period				Extension	2021 regulatory period				
	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
IPART'S 2016 final report^	0	0	0	0	0					
Actual DPIE Water operating expenditure	302	1	0	259						
Actual NRAR operating expenditure	0	0	112	147						
Actual externally funded operating expenditure	0	0	0	0						
Actual externally funded capital expenditure	0	0	0	0						
Proposed DPIE Water operating expenditure						643	643	643	643	643
*IPART'S 2016 final report allocated to NSW provided for transparency^*	*1,279*	*1,260*	*1,241*	*1,222*	*1,204*					
Proposed WaterNSW opex provided for transparency						*747*	*766*	*768*	*742*	*753*

^ The expenditure IPART found to be prudent and efficient in 2016 was allocated to WaterNSW

Notes: IPART's 2020–21 figure has been provided by IPART; actual operating expenditure is net of externally funded operating expenditure; DPIE Water's 2019–20 actual costs are 12/10 x actual costs for the 10 months to April 2020 and NRAR's 2019-20 actual costs are 12/11 x actual costs to May 2020; 2020–21 actual costs are unknown; 2025–26 costs are provided as required by IPART; please also refer to the Administrative Information document that is part of this submission.

This information is also set out in the following graph.

Figure 35. Expenditure on consents management and licence conversion W08-02 ($2020-21 $000)



W08-03 Compliance management

This activity is undertaken by the Natural Resources Access Regulator (NRAR) and comprises on-ground and remote monitoring activities (including investigations and taking statutory actions) to ensure compliance with legislation, including licence and approval conditions.

NRAR, an independent body that has strong powers to oversee compliance with and enforcement of water regulation in NSW, started operations in early 2018. Tasked with rebuilding trust in the community around water use and access, it has adopted an out and about 'boots on the ground' approach to monitoring alleged illegal activity that already has effectively re-established a compliance presence that affirms the value of water as an asset, protected from those who attempt to obtain it unlawfully.

We have built up to a current workforce of over 90 compliance staff, many recruited over the last two years, who enable a visible compliance and enforcement presence. Along with using remote sensing, satellite imagery and drones, increased staff levels have bolstered our capability to detect breaches of and enforce water rules. Water investigation rates have dramatically increased. The 20th prosecution commenced in May 2020, almost triple the rate of prosecution immediately prior to our establishment, and clearly reflecting our resolve to enforce compliance with the rules. The increased staffing level 'boots on the ground' staffing approach, necessarily brings with it additional costs.

To lessen inadvertent non-compliance, we are making available to water users material that helps them navigate the complex laws and regulations around water use, and meeting with water users to explain those laws and regulations. We recognise that the vast majority of water users want to comply, but the regime is complex.

We are also involved in the roll out of new metering rule reforms that will provide better accounting for and transparency of water take, as part of the “no meter, no pump” principle proposed by Ken Matthews[165].

We are already effectively delivering on commitments under the Water Reform Action Plan and meeting legislative requirements.

We are committed to transparency and publish our progress and outcomes via Annual Progress Reports.

NRAR did not exist at the time of DPI Water’s submission to IPART for WAMC prices in 2016. The significant increase in funding for NRAR over that sought in 2016 for compliance management comes from a greatly increased scope of activities.

Deficiencies in the way compliance had been undertaken and resulting community concern, was pointed out in a number of investigations that have taken place during the 2016 regulatory period.

The first of these investigations, by Ken Matthews in 2017, led to the establishment of NRAR. In response to the interim Matthews report, the then Minister for Regional Water announced immediate action on the issues identified in the interim report and advised of a new independent Natural Resource Access Regulator.[166] The NSW Government enacted the Natural Resources Access Regulator Act in November 2017, saying that the key building block in its response to the Matthews [interim] report was the establishment of an independent NRAR.[167] The Minister subsequently wrote to the NRAR chair indicating that the creation of NRAR was a key part of the NSW Government’s water reform agenda and that the creation of NRAR signalled a genuine commitment by the government to address the challenges in delivering effective water regulation.[168]

Matthews identified that “Budgetary resourcing of the reform projects will be a key success factor” to the ongoing work of NRAR[169], and that “Reforms go nowhere without resources to complete the work"[170]. The Matthews final report notes that a major risk to the successful long-term management of water was the allocation of the necessary resources, with the major critical resource constraint being human resources.[171]

A 2018 review by the NSW Ombudsman also referred to the need for better resourcing of water compliance management, stating that compliance and enforcement functions for water were “seriously under-resourced”, that there was “seriously inadequate resourcing to properly protect the state’s increasingly scarce and valuable water resources” and referring to “chronic under-resourcing of the compliance and enforcement roles”, going on to say that “it is vital that any water compliance and enforcement effort is adequately funded and

[165] Matthews, K. (Matthews final report), *Independent investigation into NSW water management and compliance* – Interim Report, September 2017 p.5
https://www.industry.nsw.gov.au/__data/assets/pdf_file/0016/120193/Matthews-interim-report-nsw-water.pdf
[166]Blair, N Minister Blair’s Response to Matthews Interim Report Media release 11 September 2017
https://www.industry.nsw.gov.au/water/news/minister-blairs-response-to-matthews-interim-report
[167] 2017 Natural Resources Access Regulator Bill 2017 Second Reading Speech Legislative Assembly Hansard 22 November 2017
[168] The Hon Niall Blair MLC, *Letter of Expectations* - from Minister Blair to Mr. Craig Knowles, Chair, NRAR OM/18/271, 27 February 2018, available at
https://www.industry.nsw.gov.au/__data/assets/pdf_file/0008/142793/Letter-of-expectations-to-the-NRAR-Chair.pdf
[169] Matthews, K. (Matthews final report), *Independent investigation into NSW water management* and compliance - Advice on implementation, November 2017 p.10
[170] Ibid. p.2
[171] Ibid. p.2

resourced and staffed by qualified experienced persons with investigative experience in dealing with offences where the burden of proof is beyond reasonable doubt". [172]

Further information on these reviews of NSW's water management and other investigations is provided in Detailed Paper A Context.

In addition to the independent findings of various investigations, increased funding for compliance management is supported by:

- the need to confirm NRAR's independence,
- increasing public interest in water management and compliance and
- low licensee understanding of their legal obligations for water management.

Confirming NRAR's independence

A key recommendation in the Matthews interim report was the creation of an independent regulator that reports to a board rather than to the Minister, and to separate the regulator from other water management functions such as policy, planning and delivery, and this has been effected by the NSW Government's legislative changes in 2017 and 2018 that set up NRAR and amended the *Water Management Act 2000* to strengthen compliance capabilities.

A substantial amount of our funding in the 2016 regulatory period has been from the NSW Government, as part of its commitment to quickly and effectively change the way water resource laws are enforced in NSW.

Given the benefits flowing to all water users from a more robust and effective compliance and enforcement regime, where compliance and enforcement are separated from setting of policy and regulation, users should fund a greater proportion. Further, recovery of costs is consistent with IPART's impactor pays principle as compliance activities would not be undertaken in the absence of licensed extraction.

Dedicated resourcing is a necessary co-requisite for any genuine and effective separation of these water compliance activities from broader water management activities.

Increased public interest in water management

Increased interest by the public in water compliance and enforcement is evidenced by:

- over 5,500 enquiries received by NRAR in 2018-19, NRAR's first full financial year of operation[173]
- over 38% increase in alleged breaches from 2017-18 (609) to 2018-19 (845)[174]

This increased public interest presents several efficiency opportunities for NRAR to maintain public confidence in the enforcement of water laws, namely:

- increased availability of information about how to comply guides licensee to voluntary compliance
- increased public interest encourages water users to proactively respond to public scrutiny
- increased media attention and our public reporting[175] of our activities, including compliance outcomes and convictions, contribute to the transparency of our actions.

[172] NSW Ombudsman, Investigation into water compliance and enforcement 2007-17, November 2017 p28
[173] NRAR, Natural Resources Access Regulator Progress Report 2018-19, August 2019, p.25
[174] NRAR, Natural Resources Access Regulator Progress Report 2018-19, August 2019, p.25
[175] NRAR compliance outcomes and public register are at https://www.industry.nsw.gov.au/natural-resources-access-regulator/reports-data

This transparency is in turn a contributor to maintaining public confidence regarding the enforcement of water laws, which benefits the social licence of water users.

This increase in public interest also generates increased workload for our customer service and compliance management functions, which face further increases in demand for resources arising from higher service level expectations from the public than were evident prior to 2016.

We must have the resources and capacity to respond to increased public interest in a manner that maintains public confidence as required by our legislative objectives.

Growing demand for our regulatory services

The size of the regulated community is growing, and the nature of this regulated community is also changing.

The number of water approval applications increased from 6,746 in 2016-17[176] to 8,183 in 2017-18[177].

In addition, the scope of NRAR's activities is changing:

- we are currently processing up to 1,800 new floodplain harvesting licences that are scheduled to be in place by 1 July 2021 and will require future compliance assurance. Efficient ongoing future compliance assessment of these licences, given the complex nature of floodplain harvesting events, will be reliant on staff capability, and innovative technology such as satellite imagery to assist the targeting of monitoring, audit and enforcement operations for floodplain harvesting.
- new water sharing plan rules introduce obligations on water users in relation to individual daily extraction limits and first flush flows. First flush flows and environmental releases may be explicitly protected by ministerial order (s324 Water Management Act), or as otherwise provided for in individual water users' licence conditions. As the NSW water compliance agency, we must develop operational plans for monitoring compliance against these new rules and in response to protected releases.
- additional compliance activities will be generated by amendments to metering requirements provided by the Water Management (General) Amendment (Metering) Regulation 2018. Specified water licensees will be required to install meters and/or telemetry to meet the new technical standards provided by the amendment.

We will need to conduct compliance activities to ensure that meters are installed as required. In 2018, 8,516 sites were metered. Under the new metering regulations, we estimate that 22,237 sites will be metered by December 2023.[178] We are required to regulate these meters, particularly monitoring and auditing new meter installations to give assurance that they are accurate.

Further, the private certification scheme (DQP scheme) where duly qualified personnel certify installations requires compliance assurance from NRAR to ensure the integrity of the whole meter program.

In the longer term, these meters will create efficiencies by helping NRAR to deploy staff to the right matters, enabling some desktop auditing and analysis of telemetered data. However, in the implementation period additional costs will be incurred.

[176] IPART, *Performance against WAMC Output Measures for 2017-18 – Complete Report* IPART 28 March 2019 p.1
[177] Ibid. p.2
[178] NSW Department of Industry NSW non-urban water metering framework Industry guide – works requiring a meter November 2018

Licensee understanding of legislative obligations

Approximately half of the respondents to a qualitative self-assessment survey of small to medium sized licensees NRAR commissioned in 2019 described their understanding of licence obligations as medium or low. Some had no knowledge of how much water they could take, and some were confused about their recording requirements. Participants estimated that only 20% of licensees have an excellent level of knowledge about water rules, and that about 80% comply all the time. The licensees interviewed believed the reason most users follow the water laws is that they have a genuine desire to 'do the right thing'.

Based on this survey and the results of previous mass quantitative surveys by the former NSW Office of Water, it is clear there is significant opportunity to improve compliance levels through education and communication to help people understand water laws and enable them to voluntarily comply.

This is a central component of a coordinated and modern compliance management approach that will reach a larger audience at smaller cost and tap into social motivators to drive licensee compliance. Water users also prefer education and communication to punitive tools as a first measure to drive compliance; a recent water user survey has confirmed that education and communications are valued services provided by NRAR.

Statutory basis for service

The key legislative requirements that drive NRAR's compliance activities as they relate to water management activities funded through WAMC prices are:

- s11(e) and Schedule 2 to the *Natural Resources Access Regulator Act 2017*, which sets out the specific functions and powers from the *Water Management Act 2000* that are conferred on NRAR.
- *Water Management Act 2000*, which provides water management principles that NRAR has a duty to promote, creates offences and penalties, a licensing and approvals framework, and provides investigation and enforcement powers
- *Water Act 1912* that creates offences and penalties for certain licences that remain in force under that Act.

We have specific regard to the overarching expectations of the NSW Government as to how we should achieve these objectives, that were elaborated on in the Minister's letter of expectations provided to the Chair of the Board[179] just before it commenced operations, directing that we:

- adopt a service-based approach in our interactions with stakeholders,
- maintain constructive relationships with other government organisations with intersecting roles to support a whole-of-government approach to water regulation and management,
- embed ethics and transparency into the organisation,
- adopt a risk-based approach so our activities are targeted, proportionate, and informed by intelligence and data and
- ensure expenditure is prudent and efficient, so that there is no unnecessary increase in regulatory costs.[180]

[179] The Hon Niall Blair MLC, *Letter of Expectations* - from Minister Blair to Mr. Craig Knowles, Chair, NRAR OM/18/271, 27 February 2018 https://www.industry.nsw.gov.au/__data/assets/pdf_file/0008/142793/Letter-of-expectations-to-the-NRAR-Chair.pdf

[180] The Hon Niall Blair MLC, Letter of Expectations - from Minister Blair to Mr. Craig Knowles, Chair, NRAR OM/18/271, 27 February 2018, available at

Historic service 2016-17 to 2019-20 (4 years)

Service description and benefits

Historic Service Description

In 2015, the then DPI Water[181] outlined its water compliance program for the 2016 regulatory period, which included investigations, monitoring, audit and education, but with an apparent focus on increasing voluntary compliance via audits, advice and education. At that time DPI Water noted that:

> 'a large portion of the community think they can take water illegally. This represents a significant risk to the water rights system. Without effective compliance and enforcement, it will be difficult to optimise the economic and social outcomes from non-urban water resources. DPI Water's water management activities are undermined by illegal water extraction. It needs to visibly demonstrate that it measures and enforces compliance to address these perceptions and provide water users with confidence that it manages compliance for all users.' [182]

From 2016 to 2018 compliance management services were provided by DPI Water and WaterNSW. Because of deficiencies in the way water resources were being managed, and widespread public displeasure with this as illustrated by the Mathews Review, NRAR was set up. The second reading speeches for our constituting act, the *Natural Resources Access Regulator Act 2017* states Government's expectations about:

> restoring the community's confidence in water resource regulation in New South Wales. It represents the beginning of a period of reform and improvement for compliance and enforcement [183]

and that NRAR

> will perform an important role in putting in place new standards to ensure effectiveness and transparency of compliance activities [184]

and will have

> a clear mandate to drive the delivery of transparent and effective compliance and enforcement of water in New South Wales. Following the NSW Ombudsman's progress report the Government will ensure that compli*ance* and enforcement is prioritised and put at the heart of the Government's reforms[185]

The NSW Government's expectations for NRAR were further clarified and expanded in a Ministerial letter of expectations from the Hon. Niall Blair to the Chair of NRAR, which frames and supports NRAR's principles, policies and activities, saying that NRAR has

https://www.industry.nsw.gov.au/__data/assets/pdf_file/0008/142793/Letter-of-expectations-to-the-NRAR-Chair.pdf

181 DPI Water 2015 Submission to IPART: For prices from 1 July 2016 – on behalf of the Water Administration Ministerial Corporation pp157-158

182 Ibid p158

183 NRAR Bill 2017 Second Reading Speech - Legislative Council Hansard 18 October 2017

184 Ibid.

185 NRAR Bill 2017 Second Reading Speech - Legislative Assembly Hansard 22 November 2017

> the mandate to establish and deliver an effective, efficient, transparent and accountable compliance and enforcement regime for water management in New South Wales

and that the

> Regulator is uniquely placed to substantially lift the standard of natural resources regulation in New South Wales and become a leading example of best-practice regulation to regulators across Australia. [186]

Our Establishment Plan[187] set out our approach to implementing the requirements of the *Water Management Act 2000.*

We commenced with receipt of a substantial caseload from the former compliance agencies – DPI Water and WaterNSW - and then also received an increasing number of new allegations within our first two years of operation. Against all metrics the volume of activity has increased each year. We therefore focused on increasing staff levels to enable a visible "boots on the ground" regulatory presence to manage this caseload, be directly responsive to allegations of non-compliance to restore public confidence in water compliance, and to create general deterrence to non-compliance.

A comprehensive account of our activities and achievements in our first year of operations in 2018-19 is available in our published 2018-19 Annual Progress Report.[188]

The following table shows a substantial increase in investigation and enforcement activities since we commenced operations in April 2018. This increased activity has continued in 2019-20 despite COVID19 restrictions since March 2020.

Table 63. Increase in compliance activity since NRAR's formation in 2018

Activity	2017-18	2018-19	2019-20*
Cases received	632	845	1,478
Prosecutions commenced	0	9	12
Investigations finalised	537	809	1 491
Penalty Notices	16	50	174
Statutory Notices	82	109	133
Inspections	86	340**	785

* forecast based on 10 months of actual data

**since 30 April 2018

186 The Hon Niall Blair MLC, Letter of Expectations - from Minister Blair to Mr. Craig Knowles, Chair, NRAR OM/18/271, 27 February 2018
https://www.industry.nsw.gov.au/__data/assets/pdf_file/0008/142793/Letter-of-expectations-to-the-NRAR-Chair.pdf

187 Natural Resources Access Regulator Establishment Plan 2018
https://www.industry.nsw.gov.au/__data/assets/pdf_file/0007/145546/NRAR-Establishment-Plan-2018.pdf

188 Natural Resources Access Regulator Progress Report 2018-19
https://www.industry.nsw.gov.au/__data/assets/pdf_file/0007/272689/NRAR-progress-report-2018-19.pdf

Service levels 2016-17 to 2018-19

The compliance management outputs and performance indicators contained in IPART's 2016 final report are outlined in the following table, along with output measures and performance indicators achieved in 2016-17 to 2018-19.

The compliance management outputs for the 2016 regulatory period were breach reports. However, moving forward, we consider breach reports to be an input into the compliance process as they are the first step in many compliance actions rather than an output.

We also believe that the breach report figures, as advised in the AIR for 2017-18 may be incorrect due to the relative immaturity of NRAR systems and processes at this time. The figures reported in the NRAR annual report are a better representation of outputs and performance measures in this period. We undertake to improve these reporting processes in the 2021 regulatory period.

Table 64. Output measures and performance indicators for the 2016 regulatory period W08-03

Output measure	Performance indicator
Number of breach reports received: Current: 600. Forecast: 600.	Percentage of non-basic landholder rights approvals audited each year: 2%. Percentage of properties audited that are in compliance with licence and approval conditions (excluding those audited as part of investigating an alleged breach): 90%. Percentage of breach reports risk assessed within 14 days of receipt: 90%. Percentage of all cases finalised within 6 months: 70%

Reported progress 2016-17

Output measure	Performance indicator
Output measure (OM28) (target) Number of breach reports received: • Current: 600 • Forecast: 600 *Reported by WaterNSW* Number of breach reports received: • Current: 396 Forecast: 600	**Performance indicator** (target) • Percentage of non-basic landholder rights approvals audited each year: 2% • Percentage of properties audited that are in compliance with licence and approval conditions (excluding those audited as part of investigating an alleged breach): 90% • Percentage of breach reports risk assessed within 14 days of receipt: 90% • Percentage of all cases finalised within 6 months: 70% *Reported by WaterNSW* • Percentage of non-basic landholder rights approvals audited each year: 0% • Percentage of properties audited that are in compliance with licence and approval conditions (excluding those audited as part of investigating an alleged breach): 0% During the reporting period, the priority was ensuring that customer service levels were maintained during a period of significant agency reform and ensuring higher priority licensing activities were the focus. • Percentage of breach reports risk assessed within 14 days of receipt: 90% • Percentage of all cases finalised within 6 months: 72%

Publicly reported progress 2017-18

Output measure	Performance indicator
WaterNSW reported (1 July 2017 to 29 April 2018): **Output Measure** • Current: 351 (From 1 July 2017 to 29 April 2018). • Forecast: 0 – (All Water Regulation Compliance activities have transferred to NRAR from 30 April 2018).	*WaterNSW reported (1 July 2017 to 29 April 2018):* **Performance indicators** • Percentage of non-basic landholder rights approvals audited each year: 0% • Percentage of properties audited that are in compliance with licence and approval conditions (excluding those audited as part of investigating an alleged breach): 0% Whilst there was no formal program of extensive compliance-specific approval audit during the period, experienced WaterNSW field officers conducted in excess of 9,000 physical on-site water-meter reads at various locations across the state. The primary purpose of these visits was to record water usage (via reading the meter), however, these field officers have a good general knowledge of applicable conditions and lodge an Alleged Breach Notification if they conclude the circumstances observed may not be in compliance with the approval conditions. 51 Alleged Breach Notices were lodged by these field officers as a result of their activities. • Percentage of breach reports risk assessed within 14 days of receipt: 74%. • Percentage of all cases finalised within 6 months: 50%.

Output measure	Performance indicator
NRAR reported (30 April 2018 to 30 June 2018): **NRAR output measure** Number of breach reports received between 30 April 2018 and 30 June 2018: 131 **Note** that NRAR believes that the figures above have been incorrectly reported to IPART in that year's AIR and that the correct figure for ABNs for the full year 2017-18 is 632. NRAR undertakes to improve its reporting processes in relation to these matters in the 2021 regulatory period.	*NRAR reported (30 April 2018 to 30 June 2018):* **NRAR Performance indicators** • Percentage of non-basic landholder rights approvals audited between 30 April and 30 June 2018: 0.17%[1] (equivalent to 1% per year) • Percentage of properties audited between 30 April and 30 June 2018 that are in compliance with licence and approval conditions (excluding those audited as part of investigating an alleged breach): 100%[2] • Percentage of breach reports received between 30 April 2018 and 30 June 2018 that were risk assessed within 14 days of receipt: 53.7% • Percentage of all cases finalised between 30 April and 30 June 2018 that were finalised within 6 months of receipt: 80% Note that these activities were undertaken in the first two months of NRAR's operation when NRAR was establishing systems and processes and recruiting staff. [1] Pre-water sharing plan conversion data was used in calculating the number of non-basic landholder rights approvals. [2] This figure includes audits that specifically targeted water take during a temporary water restrictions order

Output measure	Performance indicator
Publicly reported progress 2018-19	
Reported by DPIE **Output Measure** • Current: 1,293 • Forecast: 2,088 **Note** that NRAR believes that the figures above have been incorrectly reported to IPART in that year's AIR and that the correct figure for ABNs in 2019-19 is 845. NRAR undertakes to improve its reporting processes in relation to these matters in the 2021 regulatory period.	*Reported by DPIE* **Performance indicators** • Percentage of non-basic landholder rights approvals audited each year: 0% • Percentage of properties audited that are in compliance with licence and approval conditions (excluding those audited as part of investigating an alleged breach): 0 Audits conducted. No formal audits were conducted to determine compliance with licence and approval conditions in the reporting period, as NRAR focused its resources on the monitoring of environmental watering events. This reflected NRAR's compliance priorities in the prevailing climatic conditions. NRAR's compliance monitoring during the reporting period has focused on: i) the protection of environmental water flows, which is a commitment under the Murray-Darling Basin Compliance Compact, and a priority specified in NRARs Regulatory Priority Statement. ii) water bottlers and intensive horticulture These priorities have sought to respond to community expectation in NRAR's first years of operation, as a foundation to regaining public confidence in water compliance in NSW. This resourcing priority has resulted in delays to the development of audit priorities. **Note** that NRAR believes that the audit figure of 0 has been incorrectly reported to IPART in that year's AIR. NRAR undertakes to improve its reporting processes in relation to these matters in the 2021 regulatory period. Monitoring and audit projects for 2020 are specified in NRAR's business plans, and results of these projects will be published. • Percentage of breach reports risk assessed within 14 days of receipt: 91.79% • Percentage of all cases finalised within 6 months: 76%

NRAR's start up approach

We spent our first 12 months building capacity, increasing staff from 69 to 146 (which includes NRAR staff not working on monopoly services funded through WAMC prices), establishing fundamental operational systems, and having a visible on-ground presence.

The higher visibility and presence was needed to deal with a substantial caseload we inherited from our predecessor compliance agencies – WaterNSW and DPI Water - to regain public confidence in water laws as a foundation and prerequisite to implementing a more modern approach, and to respond to increasing levels of pubic reporting of alleged breaches of water law where this increase resulted from:

- the severity of the drought in 2018-19 which increased contest for the available water resource, increased motivation for non-compliance and increased community vigilance on water use and compliance,
- the prominence of media coverage of water management and compliance (such as the Four Corners "Pumped" investigation[189]), increasing community awareness of water compliance and
- the establishment of NRAR, which created an expectation within the community of responsiveness to allegations of non-compliance with water laws.

Allegations of non-compliance with water laws by the public has decreased in recent months possibly as a result of recent rains which has reduced the severity of the drought in some areas of NSW and because of COVID-19 which has reduced public sightings and therefore reporting of possible non-compliances.

While it is hard to tell whether the recent lower level of pubic reporting of non-compliance will persist, we are using the opportunity to refocus some of our resource on activities that drive voluntary compliance.

We can flexibly allocate our resources between responsive enforcement required to maintain public confidence in water laws, and proactive, intelligence led campaigns that drive voluntary compliance in a more efficient manner.

Forecast Service 2020-21 to 2024-25 (5 years)

As required by our statutory objectives, we seek to be an effective, efficient, transparent and accountable regulator that maintains public confidence in the enforcement of the state's laws. Ideally this is achieved by maximising voluntary compliance levels as the most efficient means, where accountability for good water resource outcomes rests with the regulated community for the benefit of all water users and the community. The reality is that compliance needs to use a mix of measures to drive voluntary compliance, as well as use enforcement to respond to serious deliberate breaches of the law.

We clearly need to take a different approach than our predecessors to respond to the new statutory objectives and progress toward a modern compliance approach.

NRAR's approach over the next five years

We are now focused on building our capability over the 2021 regulatory period to be a best practice, modern regulator that delivers compliance management in an effective, efficient, transparent, and accountable manner.

This is best achieved by driving voluntary compliance through progressively sophisticated, intelligence led audit, monitoring, communication and education programs that ensure the regulated community is aware of and understands how to comply with the law and

[189] Available at https://www.abc.net.au/4corners/pumped/8727826

appreciates the benefits of a well-regulated water management framework. This approach needs to be underpinned by a continued enforcement presence that provides a deterrence through penalties for serious and deliberate non-compliance.

We have adopted the Australasian Environmental Law Enforcement and Regulators Network's (AELERT) [190] Modern Regulators Improvement Tool (MRIT) as the framework to guide our progress toward being a best practice, modern regulator.

The MRIT assesses the level of maturity of four regulatory characteristics, each of which has three attributes. The regulatory characteristics are:

- leadership and culture
- vision, role and strategy
- capability and improvement
- governance and delivery

We have identified four MRIT attributes as fundamental building blocks for our capability build over the next three to five years, that focus on improving NRAR's effectiveness, efficiency, transparency and accountability that will enable NRAR to drive voluntary compliance. The four MRIT attributes are:

- training and procedures: ensure our staff understand our regulatory remit and operate in the most effective and efficient manner possible,
- stakeholder and community engagement: an opportunity to build trust and confidence by educating the regulated community about water laws and their obligations, and better understanding their needs and how to improve of our compliance approaches,
- risk based compliance planning:[191] to allocate regulatory effort and response based on an assessment of risks to water resources and public confidence, and characteristics of the regulated community. This is an important element of efficiency, ensuring we are intelligence led, and spends most of our time on the most important matters to protect water sources for water users and
- problem solving approach: to resolve actual or emerging problems by rearranging resource, skills and solutions around the problem rather than traditional functional structures. To achieve this, we will continue compliance work that reacts to community reports and will also progressively take a proactive approach to encouraging voluntary compliance using a mix of regulatory and non-regulatory tools.

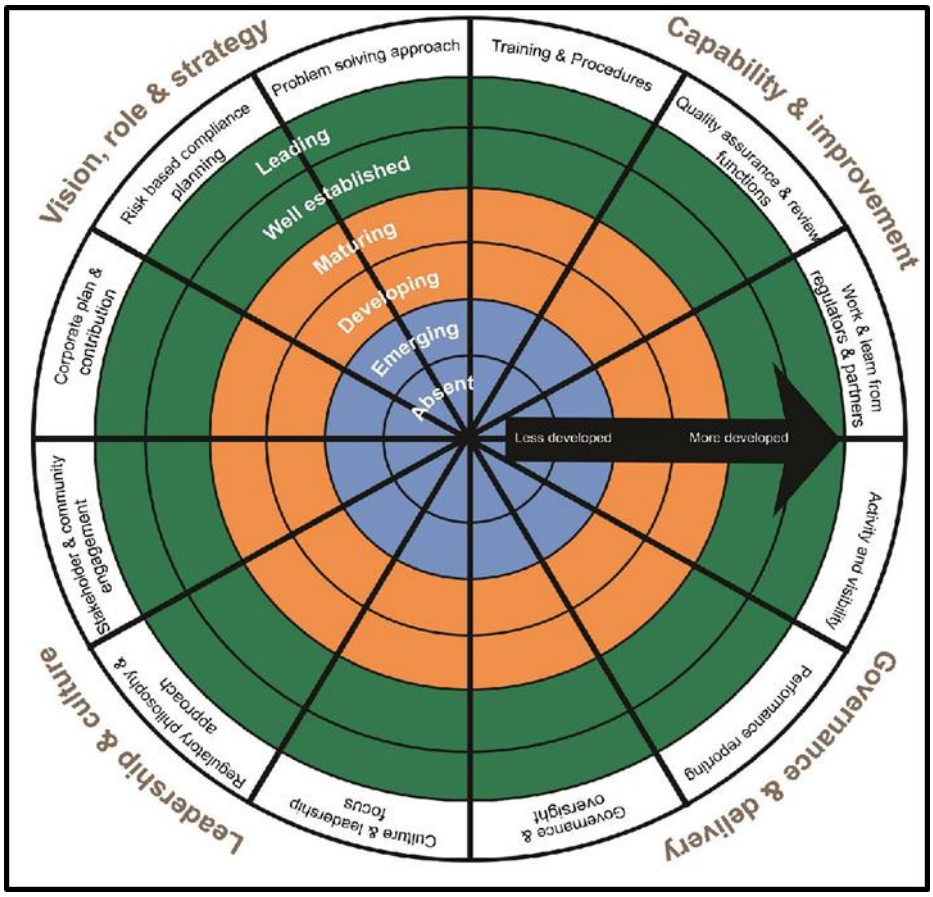
These priorities are embedded throughout our approach to providing compliance monopoly services.

The figure below illustrates the MRIT. A more detailed description of the MRIT is provided in Attachment A at the end of this section of activity W08-03 compliance management.

[190] Australasian Environmental Law Enforcement and Regulators network (AELERT), *Modern regulator improvement tool (MRIT)*

[191] Risk-based compliance planning, and a problem-solving approach are fundamental expectations for all NSW regulators under the NSW Government's Quality Regulatory Services Initiative which requires a risk based, outcomes focused approach

Figure 36. The AELERT modern regulatory improvement tool



How NRAR operationalises compliance

Our approach to compliance management and our regulatory priorities are described in a series of published strategic documents including the Regulatory Policy, Regulatory Framework and Regulatory Priority documents.

These strategic published documents are supported by other published policy, procedure and guidelines such as Prosecution Guidelines, an NRAR Quality Policy Statement[192], and unpublished operational plans specific to each project or compliance matter to be addressed.

The Regulatory Policy describes our compliance approach, including regulatory principles, processes, and regulatory and non-regulatory tools available to respond to compliance matters. Under the Regulatory Policy, we take a proportionate response to non-compliance based on the seriousness of the non-compliance, the culpability of the offender and their willingness to become compliant. The tools range from communications, education, advice and audit for less serious matters, to punitive statutory responses such as legal directions, penalty notices and prosecution in the courts for the most serious and deliberate non-compliances.

The Regulatory Policy is given effect through supporting documents, including:

[192] NRAR, NRAR Quality Policy Statement, April 2019
https://www.industry.nsw.gov.au/__data/assets/pdf_file/0004/274144/NRAR-quality-policy-statement.pdf

- NRAR Regulatory Framework[193], which:
    - describes NRAR strategies, plans and processes
    - describes how NRAR prioritises work based on risk and
    - sets outcomes to be achieved by NRAR's compliance activities
- NRAR Priority Statement[194] (current March 2019 – March 2021), which describes the risk-based priorities for NRAR over the foreseeable future, based on evidence on water resource impacts and the likelihood of impacts, and is given effect in:
    - responsive investigation and enforcement work, through a triage process that accounts for the technical seriousness of the allegation, the public interest, the compliance history of the alleged offender and whether the alleged offence is on-going or urgent. The triage process prioritises each alleged breach to ensure NRAR's investigative resource is focused on the most serious allegations.
    - proactive compliance work, by implementing projects that respond to priority issues identified in the priority statement, or by intelligence of new and emerging issues.

We manage our compliance resources in such a manner that it can pivot between these approaches depending on immediate drivers where:

- externally responsive investigation and enforcement ensures public confidence is maintained in the enforcement of water laws, and
- proactive compliance work is based on an intelligence-led and risk-based approach to design and deliver monitoring, audit, inspection, education and communication campaigns that primarily seek to motivate voluntary compliance in an efficient manner.

Responsive compliance activity

Responsive compliance activities are initiated by reports of an alleged compliance incident to us. Following a preliminary review of the information to determine that there is a likely breach of water laws, we may treat the matter as an Alleged Breach Notification (ABN) which is then triaged to prioritise it for further assessment or investigation depending on the nature and severity of the incident. ABNs may also be generated by our own intelligence systems and proactive work which identify a likely serious non-compliance that requires an immediate investigative responsive.

ABNs are recorded in a secure case management system.

Our investigative staff investigate matters that are assessed as likely to be a serious breach of the law, and then respond to confirmed breaches in a manner proportionate to the seriousness of the non-compliance, culpability of the offender and willingness of the offender to remedy any non-compliance. Responses range from an advisory letter or an official warning for less serious matters, to a statutory direction to remediate harm or punitive responses such penalty notices and prosecutions for the most serious matters.

[193] NRAR, Natural Resources Access Regulator Regulatory Framework - How the Natural Resources Access Regulator delivers outcomes-focused and risk-based regulation January 2019 https://www.industry.nsw.gov.au/__data/assets/pdf_file/0018/212517/NRAR-regulatory-framework.pdf
[194] NRAR, Natural Resources Access Regulator Regulatory Priorities March 2019—March 2021, April 2019 https://www.industry.nsw.gov.au/__data/assets/pdf_file/0020/227324/NRARs-regulatory-priorities-2019-to-2021.pdf

Proactive compliance activity

We inherited a compliance approach which underpinned the expenditures estimates of 2016, that was almost entirely reactive to ABNs.

We are working to develop and progressively shift the balance to include proactive approaches that are intelligence led, identifying and resolving problems before they have a substantial impact on water resource management outcomes and other water users.

This is a more efficient means of achieving higher compliance levels than responsive compliance work, as the available tools have greater reach to the regulated community than individual case investigation required by the responsive compliance approach.

Proactive compliance also generates public confidence in water regulation through high visibility and activity and provides social licence for water licence holders to continue to use water where compliance issues are resolved or compliance rates are demonstrably high based on the independent evidence of the regulator.

Proactive compliance activity is intelligence led rather than reactive to individual incidences, relying on data analytics and intelligence before commencing action. Data and intelligence is obtained from the ABN process and other intelligence sources such as the water accounting system, satellite imagery and other agencies. This intelligence is used to identify target areas and issues for monitoring, audit, inspection and communication and education activities. Data and intelligence is also used to help design fit-for-purpose campaigns to address those issues.

Proactive compliance may employ a mix of compliance tools to promote voluntary compliance.

Examples of our proactive approach to date include:

- having ‘boots on the ground’ NRAR staff presence to shepherd the environmental flows in the northern connectivity events in early 2019 to reach targeted destinations and thereby protect the public’s investment in these flows,
- monitoring and communications campaigns near Coffs Harbor related to the emerging horticultural sector in this region and
- a campaign in the greater metropolitan region to assess compliance levels and ensure a high visibility of NRAR staff on-ground as a general deterrence in an area with a high concentration of water licensees.

Our progressive shift to a more proactive compliance approach is expected to drive regulatory efficiency in the long term as it encourages voluntary compliance, focuses on solving known compliance problems and issues, prevents incidents from occurring and therefore reduces the responsive compliance burden for us, and improves water resource outcomes for water users using a range of tools proportional to non-compliance types.

However, it should be recognised that proactive compliance will not reduce ABNs in the short term and may initially increase reported incidents of non-compliance as our presence and education encourages additional reporting by the public.

Benefits of compliance management for water users

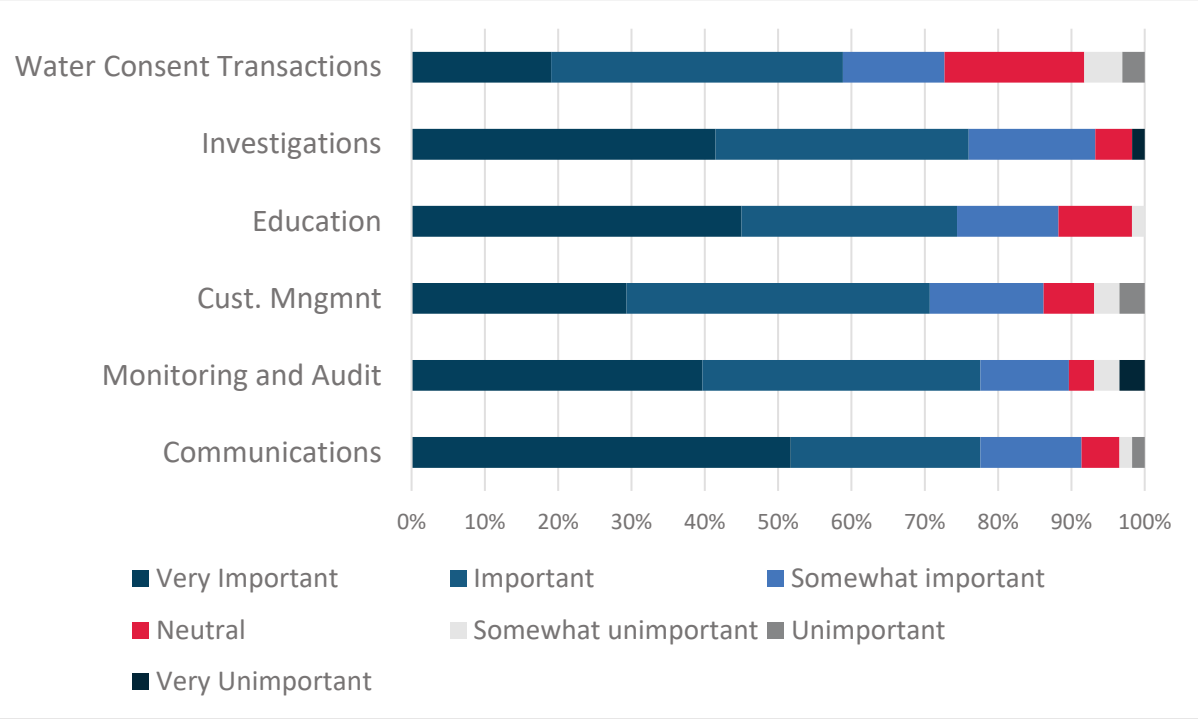
Our compliance activities directly benefit water users by:

- providing information and guidance to assist water users in complying with their legal obligations under water laws,
- providing greater certainty of access to available water for water licence holders for individual productive activity, through our actions in reducing and discouraging water theft,

- providing protection of individual water users' property rights and the value of those property rights in the water market through our actions in reducing and discouraging water theft, noting the significant value of water property rights [195] and
- providing improved compliance assurance, which underpins public confidence in the water management framework in NSW, which in turn supports the collective "social licence" of water users to access public resource.

In February and March 2020, we presented to WaterNSW Customer Advisory Groups (CAGs) across NSW on NRAR's services, and then invited water users at these CAGs to rate the importance of these services to water users. We received 58 responses to this survey, with over 55% of respondents agreeing that each service was important or very important to water users, and over 70% of respondents rating compliance management related services as important or very important. The full results of this survey are shown in the figure below.

Figure 37. Water user rating of NRAR activities



Proposed service levels 2019-20 to 2024-25

The proposed compliance management outputs and performance indicators proposed for the 2021 regulatory period are outlined in the table below.

[195] The value of water entitlements in Southern Murray Darling Basin alone was estimated in 2015-16 by the Productivity Commission National Water Reform Productivity Commission Inquiry Report (p5) to be at least $13 billion.

Table 65. Output measures and performance indicators for the 2021 regulatory period W08-03

Output measures	Performance indicators
Publishing compliance activity by water sharing plan on a monthly basis.	Percentage of water licence holders audited and / or inspected each year. 4.5%
Continue to publish Annual Progress Reports	90% of incoming public reports will be assessed and prioritised within 5 days working days of receipt.
	90% of public informants will be contacted (by letter or a telephone call) within 15 working days of lodging an alleged breach with NRAR.
	90% of high priority cases will be assigned to an investigator within 15 working days of receipt.

The rationale for our proposed changes to previous output measures and performance indicators is essentially to include only measures and indicators that are within our control, and measures that promote our statutory objectives, including efficiency. In particular, we propose to:

- cease the output measure on the number of alleged breach reports received on an annual basis as it is an input rather than an output, and is not within our control. We propose that this measure be replaced with a commitment to publish compliance activity on a monthly basis, as both the report and the compliance activity included in the reports are our outputs, and they promote transparency and demonstrate activity volumes,
- delete the indicator on percentage of properties audited that are in compliance with licence and approval conditions (excluding those audited as part of investigating an alleged breach), as this is a reflection of the performance of the licensee and approvals holders that are not specifically a measure of NRAR's effectiveness, and may provide a perverse incentive for an auditor to overlook non-compliances,
- delete the measure of percentage of all cases finalised within 6 months as cases should be investigated to a high standard commensurate with the risk they present rather an arbitrary timeframe, and that risk profile of cases may change over time. Cases are also already timebound by the statute of limitations in the Water Management Act,
- amend the performance indicator for audit from 2% of non-basic landholder rights approvals audited or inspected each year to 4.5% of water licence holders each year, consistent with water audit and inspection rates used in other jurisdictions. For example, South Australia undertook audits or inspections for 4.5% of its water licensees in 2018-19)[196] This level of audits and inspections means that water licence holders could expect to be audited or inspected once every 20 to 25 years on average, which reflects the need for a stronger audit and inspection program than has been historically undertaken in NSW, enables a better understanding of general compliance rates across the landscape, and responds to water user expectations that we can publicly report on compliance rates.
- tighten the performance indicator relating to timeframes for breach reports to be risk assessed by reducing the timeframe for 90% to be risk assessed from 14 days to 5 days,

[196] Synergies Economic Consulting, DPIE-Water: Benchmarking Review for Water Licence Compliance, June 2020

- include new performance indicators for:
    - 90% of public informants to be contacted (by letter or a telephone call) within 15 working days of lodging an alleged breach with us,
    - 90% of high priority cases to be assigned to an investigator within 15 working days of receipt, as this promotes efficiency and timeliness of processes within our control and

In relation to audit and inspection rate, we asked a consultant, Synergies, to benchmark our proposed auditing rate and compliance costs against those of other comparable regulated industries. Synergies found that auditing rates vary widely across different compliance authorities, and that there is no single, standard industry benchmark for compliance costs or audit rates. Synergies concluded that NRAR's rate of 4% to 5% is at the lower end of the scale and compares to the rate used by the South Australian Department of Water for assessing water licence compliance (4.5%), the ATO audit rate for tax returns (4.6%), and AFMA's rate of inspections of landed fish (3.2%). The Synergies Report also found that NRAR's compliance expenditure per licence on issue does not appear to be untowardly high relative to other authorities with similar licencing and compliance functions in the natural resources industry.[197]

Operating Expenditure

Historic Operating Expenditure

The context for water compliance management has changed substantially since IPART determined WAMC prices in 2016, as a consequence of the independent investigations into water management and government's response in establishing NRAR. Since NRAR's establishment, following crisis and external reviews, the compliance services have been very different from those forecast before 2016.

A significant step change in compliance management expenditure was required to:

- enable us to meet our expanded mandate, with additional activities required to meet our delegated responsibilities, including:
    - effectiveness through explicit investment in more on-ground staff, greater staff capability, robust procedures, and quality assurance of processes and decisions,
    - transparency and accountability through the operation of public registers, annual reporting to the Minister and increased public reporting,
    - efficiency through trialling and applying innovative approaches and technologies and improved use of efficient compliance tools, including more extensive use of communication of compliance outcomes as deterrence, and education to guide voluntary compliance and
    - public confidence through a more visible on-ground presence and broader stakeholder engagement, communications, and monitoring public sentiment and
- raise previously existing compliance operations to acceptable standards.

The compliance management funding used by IPART when determining WAMC prices in 2016 is inadequate for us to meet the legislated requirements implemented since 2016. Under that funding level, we would be limited to approximately 20 staff, investigating about 350 cases from over 1,800 ABNs we forecast in 2021-22. There would not be any intelligence-led audits, monitoring or inspections and minimal data analytics to deploy staff

[197] Synergies Economic Consulting, DPIE-Water: Benchmarking Review for Water Licence Compliance, June 2020

efficiently, and no communication and education to amplify deterrence and guide voluntary compliance. This would be to the detriment of all water users who need the public to have confidence that the state's water laws are being complied with and properly enforced and to the immediate detriment of downstream users.

Future Operating Expenditure

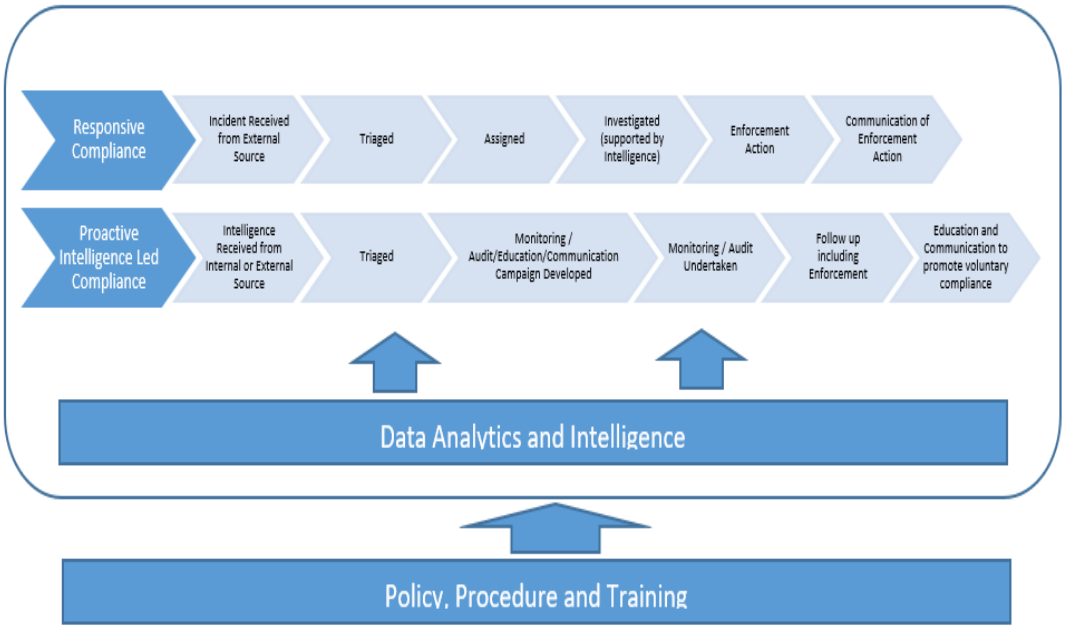
NRAR approach to compliance management

As previously described, our modern approach to compliance management enables us to pivot between:

- responsive investigation and enforcement of reported incidents to ensure public confidence is maintained in the enforcement of water laws and
- proactive compliance work that is intelligence-led, delivering planned monitoring, audit, inspection, education and communication campaigns to respond to intelligence and solve or avert emerging compliance issues primarily through motivating voluntary compliance, but always underpinned by an option to enforce where serious and deliberate non-compliances are detected.

This approach is depicted in the following figure.

Figure 38. NRAR's reactive and proactive approach to compliance management



This approach enables us to choose from a suite of regulatory and non-regulatory compliance responses to solve individual and collective compliance issues. We will apply the tool or mix of tools that will be most effective and efficient to solve the matter, and that also responds proportionately to the magnitude and seriousness of the compliance incident or issue to be addressed.

The tools available to us include:

- traditional responsive compliance, which investigates and enforces serious breaches of the law,
- intelligence-led campaigns that identify collective compliance issues or emerging issues and then employs monitoring, audit, inspection, communication and/or education tools and

- general random audit programs that provide compliance assurance and serves as a general deterrence to all water users.

NRAR's initial focus

We have initially focused on ensuring a high visibility and presence in the field and a highly responsive approach to community reports of non-compliance to regain public confidence in water laws as a foundation and prerequisite to implementing a more modern approach, and to respond to increasing levels of pubic reporting of alleged breaches of water law.

We have focused most of our compliance management resource on investigation and enforcement activity in our initial two years of operation. The enforcement outcomes provide a specific deterrent that underpins audit, monitoring, education and communications to promote voluntary compliance.

Intelligence led compliance activity that motivates voluntary compliance is far more efficient than full investigation and enforcement of individual reports of non-compliance, and is better for water users and the community as it averts unlawful water take and subsequent punitive actions by NRAR and prevents impacts on water sources in the first place.

The efficiency is achieved as education, communication and monitoring and audit have a larger reach across water users for less resource input by us. We therefore seek to drive voluntary compliance as the most efficient means of increasing compliance levels.

Our strategic intent is therefore to progressively shift a portion of our compliance management resources to intelligence led campaigns and audit programs to realise increased efficiency in driving compliance outcomes, while retaining the ability to pivot between the approaches as circumstances dictate.

Our compliance activity in our first two years of operation has been heavily driven by inherited caseload and increasing ABNs received from the public, other government agencies or generated by NRAR activities. The number of ABN's we received has increased from 494 in 2016-17 to 845 in 2018-19 and is expected to exceed 1,500 in 2019-20. Should current trends continue, we forecast that the ABN number will increase over the 2021 regulatory period to over 1,900 in 2024-25, as shown in the table below.

Consequently, we recognise the challenge over the 2021 regulatory period is to both improve efficiency of investigation and enforcement activity and to curtail the forecast ABN growth through progressive resource shift into proactive compliance activity that increases voluntary compliance levels and averts ABNs. We also need to invest resource into auditing general compliance rates to:

- understand voluntary compliance levels and where we can better guide water users to compliance,
- provide intelligence for education, communications and enforcement campaign design and
- respond to water users' requests for us to publish compliance rates.

Table 66. Alleged Breach Notices forecasts 2019-20 to 2024-25

	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
ABNs	1 562	1 825	1 966	1 809	1 926	1 931

These forecasts are derived from extrapolating historical data across four different scenarios (related to weather and compliance impacts) and then averaging the scenario forecasts.

In the interests of transparency and accountability for the new regulator, we provide below a lot of detail about how we are delivering better water resource management compliance and enforcement across NSW.

Staffing levels are the major cost driver for the compliance management service. Our forecast compliance management staffing resources needs for 2021-22 are presented by broad function in the table below. The specific activities undertaken in each function are described below.

Table 67. NRAR's forecast compliance staffing rates

Compliance Task	Full Time Employees (FTE)
Call centre, triage and CIRAM management	4.5
On-ground - investigation, enforcement, Monitoring and Audit	64
Data analytics and intelligence	11
Training and procedure (allocated to compliance management)	9
Communications education and reporting	5
Total	93.5

Call centre, triage and CIRAM management

We receive reports of incidents from the public and other agencies through a call centre and online through an NRAR email address. Incidents may be identified as alleged breaches (ABNs), which are then triaged as low, medium or high. We also generate ABNs through our own audits, inspections and intelligence work.

We have 2 FTE managing the receipt of incidents. In 2016, DPI Water included these FTE under the customer management monopoly service (activity code W10-01) definition, but their role is critical to and more logically aligned with the compliance management service and so we have accounted for them in compliance management for the 2021 regulatory period.

ABNs that represent a likely breach of legislation are entered into our case management system - an IT application known as CIRAM.

We have 2 FTE managing the triage of ABNs. ABNs are prioritised using a risk-based tool to identify relative priority, and then allocated to the appropriate NRAR compliance team for investigation or response. High priority cases are all investigated. Medium priority cases are either investigated or addressed as part of proactive campaigns. Low priority cases are used as intelligence to inform new proactive campaign work.

We operate the triage process centrally to ensure consistency across the state.

Our triage framework assesses whether the ABN relates to any of our published Regulatory Priorities, the compliance history of the alleged offender, the alleged scale and seriousness of harm to other water users and the environment, and other factors such as the level of public interest. The triage criteria are under regular review by an internal governance group to ensure it responds to new or emerging issues and are applied consistently.

The triage process is used to ensure ABNs are allocated to staff with relevant experience and capability to manage the seriousness of the matter. This process seeks to allocate staff resources in an effective and efficient manner.

The ABNs also form part of our intelligence, and inform future monitoring, audit, inspection, communications and education programs.

We keep those people who reported alleged breaches informed of progress and case outcomes in order to maintain public confidence in water compliance management.

We allocate 0.5 FTE to manage the contract with the CIRAM service provider, lead the internal CIRAM governance group, provide administrative assistance to staff on CIRAM use, and develop user requirements for CIRAM system upgrades.

On-ground Compliance

We have 64 FTE undertaking on-ground compliance activities such as investigation and enforcement, monitoring, inspections and audit. This FTE can pivot between responsive compliance approaches (such as investigation and enforcement) and intelligence-led compliance approaches (such as monitoring, audit and inspections)

On average a single responsive investigation takes 13 FTE days to finalise, noting there is a large range in case finalisation times based on case complexity. We forecast 1,825 ABNs for 2021-22. Should one-third of these ABNs (608 ABNs) be investigated at 13 business days per ABN, approximately 35 FTE is needed to manage this case load.

Based on our experience in our first two years of operation, one FTE can undertake approximately 60 audits or inspections per year. For us to meet the performance indicator to audit or inspect 4.5% (the mid-point of our proposed range for audits of 4% to 5%) of the 38,000 water licences in NSW, we will need 29 FTE.

Staff undertaking audit, inspection and monitoring work also undertake stakeholder engagement work, education at field days and other activities to promote voluntary compliance that are not easily quantified.

We will need to find substantial efficiencies to manage the forecast ABN case load and to meet the proposed performance indicator to audit or inspect 4.5% of licensees annually. We will achieve these efficiencies by:

- progressively improving procedure through case review processes and continuous review of procedure under the quality management system,
- improved staff capability and experience to be achieved through investment in and implementation of a capability development plan due by the end of 2020 as described later,
- increased use of technology such as satellite imagery and drones and
- improved desk top monitoring approaches such as metering telemetry.

The total on-ground compliance staff required in 2021-22 is 64 FTE (35 FTE for investigation and 29 FTE for monitoring, audit and inspection). These FTE will pivot between responsive and proactive compliance activity.

We compared this level of on-ground compliance FTE to data contained in the 2009 NSW Ombudsman report to the Director General of the then Department of Water and Energy, which stated that ten compliance FTE responsible for managing approximately 600 breach allegations per year at that time, were able to investigate about 20 per cent of these allegations, equating to 12 allegations being investigated per compliance FTE per year. This can be compared to our average case finalisation of approximately 17 cases per FTE per year.

Based on this data, we would require approximately 59 FTE for responsive investigations to manage the 700 ABNs triaged as medium or high priority in 2018-19, and 100 FTE to manage the forecast 1,200 ABNs triaged as medium or high priority in 2019-20.

Given we have 64 on-ground compliance FTE in total, including staff that undertake monitoring, audit and investigations, our current performance compared to this historic benchmark demonstrates that our investigative staff are already operating at a much higher level of efficiency than in 2009.

As ABNs have been increasing in recent years, we have been improving our efficiency in line with the increase in ABNs as we are managing an increasing caseload with the same amount of resources.

We estimate that 64 FTE is enough to manage our current and expected ABN volumes plus a substantial monitoring, audit and inspection program subject to the following conditions:

- continued investment in improving staff capability,
- investment in data, analytics and technology to help determine when field deployment will be effective and where to deploy staff, and to improve investigative efficiencies in the field and
- realisation of improved efficiencies in work procedures and systems resulting from 'start-up' learnings of NRAR and continuous review of procedure through a quality management system approach.

Legal staff

The NSW Ombudsman recommended that the government

> takes action to ensure appropriate legal support is embedded with and easily accessible to compliance staff to enable early guidance on briefs and evidence collection. [198]

We have established a dedicated, small team of 4.5 FTE legal staff, who are critical to both the effectiveness of the regulatory action we take and to continuous efficiency improvement in how responsive compliance work is undertaken through:

- development of guidance and training material for frontline compliance staff
- providing guidance to investigation staff on drafting statutory notices,
- managing legal challenges to directions and penalties issued by NRAR,
- providing guidance on prosecution briefs and evidence collection and
- leading post-case reviews of complex investigations to support process improvement and organisational learning.

These 4.5 FTE are employed by DPIE. We pay their costs to DPIE, and therefore they are included in this submission as operating costs rather than employee costs.

We incur additional legal costs for barristers and expert reports during the course of investigations and prosecutions. These costs are partially recovered through court decisions following successful prosecutions and are excluded from this submission.

Data analytics and intelligence

We have 11 FTE dedicated to data analytics and intelligence for compliance management, including 0.5 FTE employed by DPIE and reimbursed to DPIE by us.

Data analytics and intelligence staff assist both responsive and proactive compliance work.

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[198] NSW Ombudsman Special Report available at https://www.ombo.nsw.gov.au/__data/assets/pdf_file/0006/57903/Water-compliance-and-enforcement-a-special-report.pdf

Our data analytics and intelligence staff undertake several core activities including:

- extracting data and analysing information collected in the case management system (CIRAM), water accounting system and water licensing system to scope, target and inform compliance campaigns, and individual investigation and enforcement matters,
- providing data analysis and leading the development of the Regulatory Priority statement, which in turn informs risk and priority setting across all our regulatory activities including in the ABN triage process,
- assessing new and emerging technologies for their suitability and application in compliance activities, such as telemetry to collect metering data and drones to improve field inspections and
- providing spatial and satellite imagery and analysis to target and inform investigations, audits and monitoring campaigns and ensure this on-ground staff resource is deployed efficiently.

This service ensures staff are deployed to the most serious matters and assist in investigating matters in an efficient manner.

Satellite imagery is proving particularly useful in our data and intelligence services as shown by the following case study.

Case study on use of satellite imagery

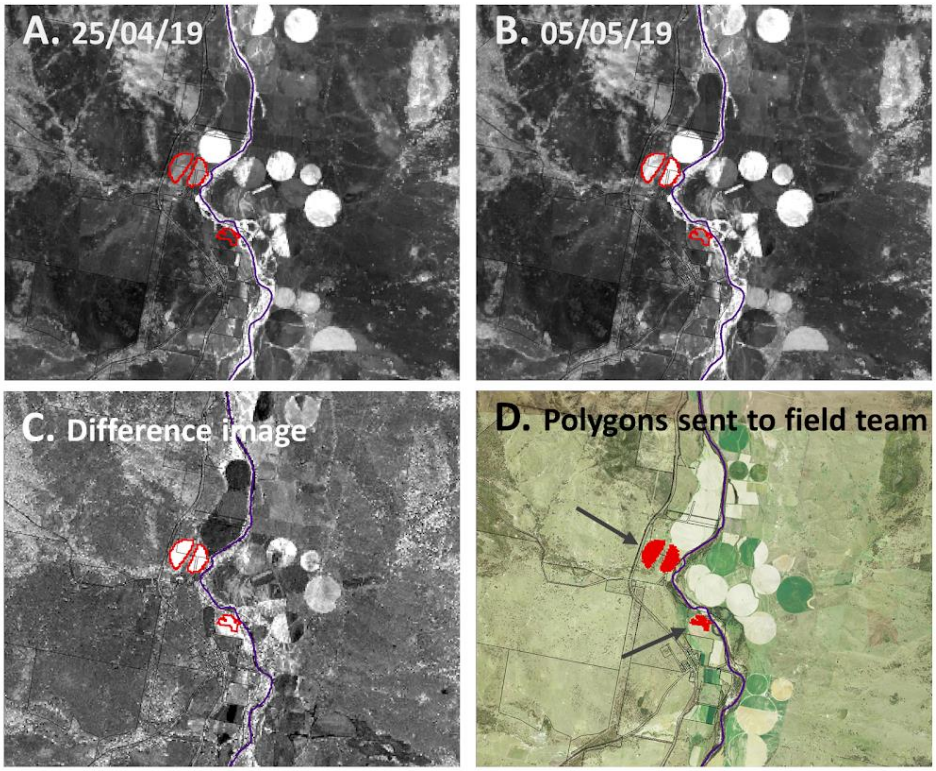
Satellite imagery enables us to track the movement of protected environmental flows along inland river systems, the filling and emptying of dams and channels and direct application of water to crops and paddocks in near-real time

We have also made rapid progress in methods that link well-established remote sensing technology with data analytics of licensing, and hydrological data. This has enabled us to pinpoint properties where crop area and water demand appear to exceed combined surface water and groundwater entitlements and water trades. It is also allowing us to identify properties which appear to be using basic landholder entitlements for commercial irrigation and other unauthorised purposes.

We employed this approach during a recent temporary restrictions order under s324 *Water Management Act 2000*. We were able to use this intelligence to target our activities and reduce the number of field operations staff required during the event from 20 to 9.

The capability developed by regulatory innovation over the past six months is being continually refined and modified to respond to our operational teams' feedback. This has allowed remote sensing to progress from operational planning to more effectively directing deployment during field campaigns, such as protection of environmental flow releases from dams and S.324 declarations of protected water from tributary rainfall-runoff events. Collaboration with DPIE Water Analytics, the MDBA, Geoscience Australia and the Bureau of Meteorology has supported our rapid progress in developing this capability and ensured the active sharing of technical learnings and compliance information.

Figure 39. Near real time Sentinel imagery to identify crop and soil moisture changes during S.324 protected environmental flow releases from Glenlyon Dam in the Border Rivers region.



Education, communications and reporting

Our 5 FTE who undertake communications, education and reporting, advise the regulated community of their obligations under water legislation and licensing and inform the wider community of our enforcement and monitoring activities.

DPI Water's 2016 submission to IPART for WAMC prices included education and communications FTE in the activity W10-01 customer management. We have included these FTE in compliance management instead for the 2021 regulatory period, as we consider them crucial to the compliance management service.

We use communications to highlight instances of non-compliance where the licence holder is subject to a penalty, magnifying our responsive compliance work and providing a general deterrence underpinning our proactive work.

The reach of communications is evident by a recent compliance campaign undertaken by us, which completed 10 property inspections and assessed 46 water supply works and licences. We designed a communications and engagement program to support this work that involved meeting with relevant local stakeholders, media releases, and print and radio interviews, resulting in six print articles, 25 online articles (or republishing of the media release), two radio interviews, and nine social media posts related to the campaign. Based on the circulation data available for these media outlets and membership of the stakeholder organisations we met with, we estimate that the communications and engagement program had the potential to reach up to 1.1 million people.

We use education programs to reach a large number of water licensees at relatively low cost. Education helps the regulated community understand their obligations and how to comply.

The former NSW Office of Water undertook a survey of over 600 water licensees in 2012-13, which found that 53% rated that they had only some knowledge, low knowledge or no knowledge of the conditions of their licence or approval. The research found fairness, social reputation of water users, peer reputation and morals ranked highly as motivators for compliance. This research was confirmed by more recent qualitative research we commissioned in 2019 with small to medium sized water users. Participating water users reported similarly low levels of knowledge of their licence conditions and identified similar drivers of compliance to the earlier research, such as a genuine desire to 'do the right thing' and social reputation. Education clearly has scope for increased use as both an effective means to drive voluntary compliance as well as an efficient compliance management option.

We undertake education work through a variety of delivery methods, including active engagement with individuals and groups of licensees, and passive provision of education materials on the NRAR website, via mail-outs or at field days. These activities are designed to reach large audiences for a small resource investment by us and are an efficient and effective tool for driving voluntary compliance.

We also publish monthly compliance activity reports that directly contribute to the statutory objectives of transparency in operations and maintaining public confidence that water laws are being enforced. These reports are broken down by water sharing plan to increase transparency of our compliance presence and activities for water users and the public at a more local scale.

This reporting is an important element of our statutory obligation for transparency, and concurrently is a strong motivator to water users for compliance. A survey of over 600 NSW water licensees in 2012-13 found fairness, social reputation, peer reputation and morals ranked highly as motivators to comply[199].

Communications, education and reporting are important elements of our compliance management approach, and key contributors to our statutory objectives to be an effective, efficient and transparent regulator, and to maintain public confidence in the enforcement of water laws.

Training and procedure

We are using the AELERT MRIT to guide our progress toward our vision of being a modern, best practice regulator. 'Training and procedure' is one of the four MRIT attributes we will focus on over the next five years. We have 12 FTE focused on training and procedure across the organisation of which 9 FTE have been attributed to compliance management, an allocation based on the proportion of frontline NRAR staff involved in compliance management that are supported by training and procedure work (74.85%).

Operational policy and procedure is a new proposed cost to the compliance management W08-03 cost code, to help us:

- ensure we have comprehensive policies in place to support compliance officers in properly performing their roles and
- introduce quality assurance processes to ensure consistency in decision making among different areas across the state.

[199] Australian National University (Darren Sinclair) and Faculty of Law, UNSW Australia (Cameron Holley), Water extraction in NSW: Stakeholder views and experience of compliance and enforcement A report of a survey of water users February 2015 http://www.connectedwaters.unsw.edu.au/sites/all/files/Water-extraction-in-NSW-stakeholder-views-of-compliance-and-enforcement-survey-report.pdf

We recognise that procedure is fundamental to undertaking compliance management effectively, to an accountable standard, transparently and consistently. We have therefore committed to developing an accredited quality management system (QMS) by the end of 2021 as part of our MRIT focus on training and procedures.

To progress toward an accredited QMS, we have so far:

- mapped many of our procedures, which include allocation of clear role accountabilities,
- developed an e-library of readily accessible, searchable and up-to-date policies and procedures, and trained staff in the use of this e-library and
- developed a Quality Manual which explains our commitment to quality and continuous review and improvement, and sets roles and accountabilities for delivery of those commitments

We are now establishing processes to track procedure review to ensure procedures remain contemporary, and a quality assurance practice through periodic internal auditing of our implementation of our procedures.

Both the Ombudsman[200] and Matthews reports identified that investment in staff capability and training was an essential component of an effective compliance approach. Specifically, Matthews[201] recommended induction training for all staff, ethics training for senior leadership and a minimum level of training for investigation staff in investigation techniques, natural resource management legislation and water management policy. The Ombudsman recommended that NRAR undertake regular training at all levels to ensure compliance officers and senior management have a comprehensive knowledge of the water regulation regime in NSW. We have taken on board these recommendations as we set up our operational practices, because they underpin the robustness of the way will enforce water compliance in NSW.

We have already undertaken significant staff training to induct new staff, ensure all staff have received ethics training and to understand basic systems and procedures for compliance management work. We are now developing a staff capability development plan by December 2020 that will identify capability needs and gaps over a three-year horizon, and design measures to fill these gaps through training, coaching, mentoring and recruitment strategies. We will examine the prospects of a graduate development program as part of this capability plan, with a view to attracting and developing the missing capabilities at least cost.

We are planning to reduce investment in training from 2023, once the functional capability frameworks are well-established.

Total Compliance Management Costs

Our total FTE and costs for the compliance management service are shown in the table below. These costs are largely driven by the FTE.

The costs in the table below include:

- FTE cost – this cost is based on the average NRAR salary only and does not include cost items such as superannuation, leave loading and payroll tax. (It excludes labour costs for the NRAR Board, the NRAR licensing and approvals function, the NRAR dam safety function and the Commonwealth-funded NRAR floodplain harvesting

[200] NSW Ombudsman, 2018 Water: Compliance and Enforcement 17 August 2018 pp63-64
[201] Matthews, K. (Matthews interim report), Interim Report - *Independent investigation into water management and compliance in NSW*, September 2017 p.42

team as these functions are not included in monopoly services funded through WAMC prices.)

- employee cost – this cost was advised to us by DPIE and is a percentage of FTE cost, taking into account superannuation, payroll tax, workers compensation allowances and annual leave, sick leave and long service leave,
- overhead cost – this cost was advised to us by DPIE and covers a proportion of DPIE overheads (not NRAR overheads) such as corporate services and strategy, human resources legal services, economic services, media and communications, ministerial liaison office and senior management,
- other operating expenditure – this cost is for NRAR non-labour operating costs and includes:
    - cost for travel, vehicles, computers, training and similar expenditure required to allow an efficient and prudent compliance management function to operate. These costs are set by DPIE at 17.23 % of the FTE cost plus the employee cost.
    - CIRAM – CIRAM is our case management system and supports consistent case management record keeping, secure data storage and enables reporting to meet transparency and accountability objectives. CIRAM also allows data and intelligence staff to conduct analysis on compliance trends, thus supporting the more efficient and effective deployment of resources. We have an annual contract with a service provider which provides CIRAM licences and support services to us. These costs in 2019-20 were $361,000 and are forecast to be similar through the 2021 regulatory period (adjusted for CPI).
    - Data Analytics software licensing - our data analytics and intelligence function has ongoing costs for software licences and subscriptions for analytical tools and spatial and satellite imaging tools. These software licences are solely used by the compliance management function. These costs in 2019-20 were $125,000 and are forecast to be similar through the 2021 regulatory period (adjusted for CPI).
    - Legal – our legal costs are charged to us by DPIE. These legal costs are almost completely related to compliance management activities. These costs in 2019-20 were $720,000 and are forecast to be similar through the 2021 regulatory period (adjusted for CPI).

Table 68. NRAR compliance management costs 2020-21 to 2024-25 ($2020-21 $000)

	2020-21	2021-22	2022-23	2023-24	2024-25
FTE	84.2	93.48	93.48	91.24	91.24
FTE cost	9,958	11,056	11,056	10,790	10,790
Employee cost	2,263	2,512	2,512	2,452	2,452
Overhead cost	1,939	2,153	2,153	2,116	2,116
Other operating expenditure	3,403	3,635	3,635	3,579	3,579
Total	17 577	19 356	19 356	18 922	18 922

Compliance reforms costs not included in this submission

The NSW Government is committed to the reforms in the Murray-Darling Basin Compliance Compact signed in December 2018, after our establishment and initial funding envelope were determined. These reforms are:

- metering: validation processes for installed meters (meter auditing). NSW metering reforms require specified water licensees to install meters, and in some cases telemetry by 2023. We are expected to undertake an auditing program to validate the implementation of this reform.
- protecting environmental water – water sharing plans (WSPs) and enforcement of new individual daily extraction limits on licences within specified WSPs.
- floodplain harvesting licence monitoring and audits.

We estimate the cost to undertake this auditing work to support these reforms is approximately $6.3 million per year. These costs are not included in our forecast compliance management needs included in this submission. Implementation of these reforms from a compliance perspective will be managed at no additional direct cost to water-users, either through the reallocation of existing resources or through additional funding.

External Revenues and Other Adjustments to Compliance Management Costs

The costs for compliance management activities need to be adjusted to remove costs that should not be borne by water users or that can be reasonably recovered through other means. These cost adjustments are:

- potential revenue to us from regulatory actions
- potential partial funding from Commonwealth Government we will seek for some activities in the Murray-Darling Basin and
- removal of compliance management costs associated with Controlled Activity Approvals, as these relate primarily to the building of structures on or near watercourses rather than water use under a water licence. As such the impactor pays principle dictates that these costs should be borne by Controlled Activity Approval holders and not water users.

Potential income from Regulatory Actions

Revenue from penalties and fines resulting from our regulatory action against water licensees which are returned to us[202], including monies from:

- penalty Infringement Notices (PINs) issued under the Water Management Act (section 365 of the Act deals with penalty notices and Schedule 7 of the Regulations sets the penalty amounts) and
- notices issued under section 60G of the *Water Management Act*, which charge up to 5 times the value of water unlawfully taken (where this value is determined by the Regulations). 60G charges only apply to a subset of Act breaches that relate to water being unlawfully taken.

While this revenue source varies according to compliance levels:

- based on current 2019-20 data NRAR forecasts we will receive approximately $75,000 in PIN revenue and
- the combined revenue from PINs and s60G notices is expected to be in the order of $470,000 per year over the course of the 2021 regulatory period.

[202] This analysis includes revenue from penalty notices, 60G awards and court derived moieties. Some court costs awarded are retained by the Crown Solicitor's Office to offset their costs.

We will use these revenues only for activities that improve the effectiveness of compliance management and not to activities that generate more compliance work.

The benefit of these revenues should flow to water users by reducing the compliance management costs outlined above by the anticipated $470,000 revenue. Compliant water licensees therefore receive some benefit from the revenues we receive.

Potential Commonwealth funding

NRAR is reducing the revenue requirements for Compliance Management to account for assumed Commonwealth funding.

The Murray-Darling Basin Compliance Compact (MDBCC) is a joint commitment by the Australian Government and Murray-Darling Basin states to restore public confidence in water resource management in the Basin by providing transparency, accountability and consistency to compliance and enforcement practices by governments. This commitment closely aligns with our objectives.

Under the MDBCC, we are required to develop and maintain annual audit priorities in accordance with our Regulatory Policy, which requires an annual risk-based operational plan detailing audit priorities. The operational plan and our associated compliance procedures will include validation processes for required installed meters and audits of water take by stock and domestic and other rights holders when the potential impact on the environment and other users is assessed as sufficiently high.

In addition, the MDBCC outlines an extensive work program for the Barwon-Darling Catchment in NSW. Under this program, improved compliance frameworks are required to be introduced which identify annual audit priorities. Strategic audits in the Barwon–Darling have been identified as a compliance priority and we will be focusing our compliance monitoring activities and seeking to improve compliance in the Barwon–Darling catchment.

We will seek some funding assistance from the Commonwealth for this work for the 2021 regulatory period, where the Commonwealth contribution helps develop and test audit methodologies, systems and approaches that could be used by other Basin states. We estimate that approximately 8 FTE per year will be needed to develop and test these methods at a cost of approximately $1.57 million per year. We will seek 66% of these costs from the Commonwealth on the basis that the methodologies and systems developed can be used across the broader Basin. We have assumed that we will be successful in seeking this funding, which reduces the total compliance management costs to water users.

Controlled Activity Approval compliance costs

Our compliance management includes compliance costs related to auditing, inspecting, investigating and enforcing compliance with Controlled Activity Approvals (CAAs). CAAs relate to approvals for structures built on or adjacent to watercourses. CAA compliance activities are undertaken by our compliance staff but are not necessarily related to licensed water use and as such should not be funded by licensed water users through WAMC prices as these licensed water users are not the impactors.

The costs related to CAA work our staff undertake, which is not a monopoly service funded through WAMC prices, i.e. work that is not a service as defined in the *Independent Pricing and Regulatory Tribunal (Water Services) Order 2004,*[203] *need* to be removed from the expenditures we propose to be used in determining WAMC prices in the 2021 regulatory period.

Our analysis is that 13.93% of ABNs relate solely to CAAs. Details of this calculation are provided in Attachment B at the end of this description for activity W08-03 compliance

[203] More information on this Order is provided in Detailed Paper C of this submission.

management. That percentage - 13.93 % - of the costs of on-ground compliance staff is $1.878 million, which we consider should be removed from compliance management costs borne by water users.

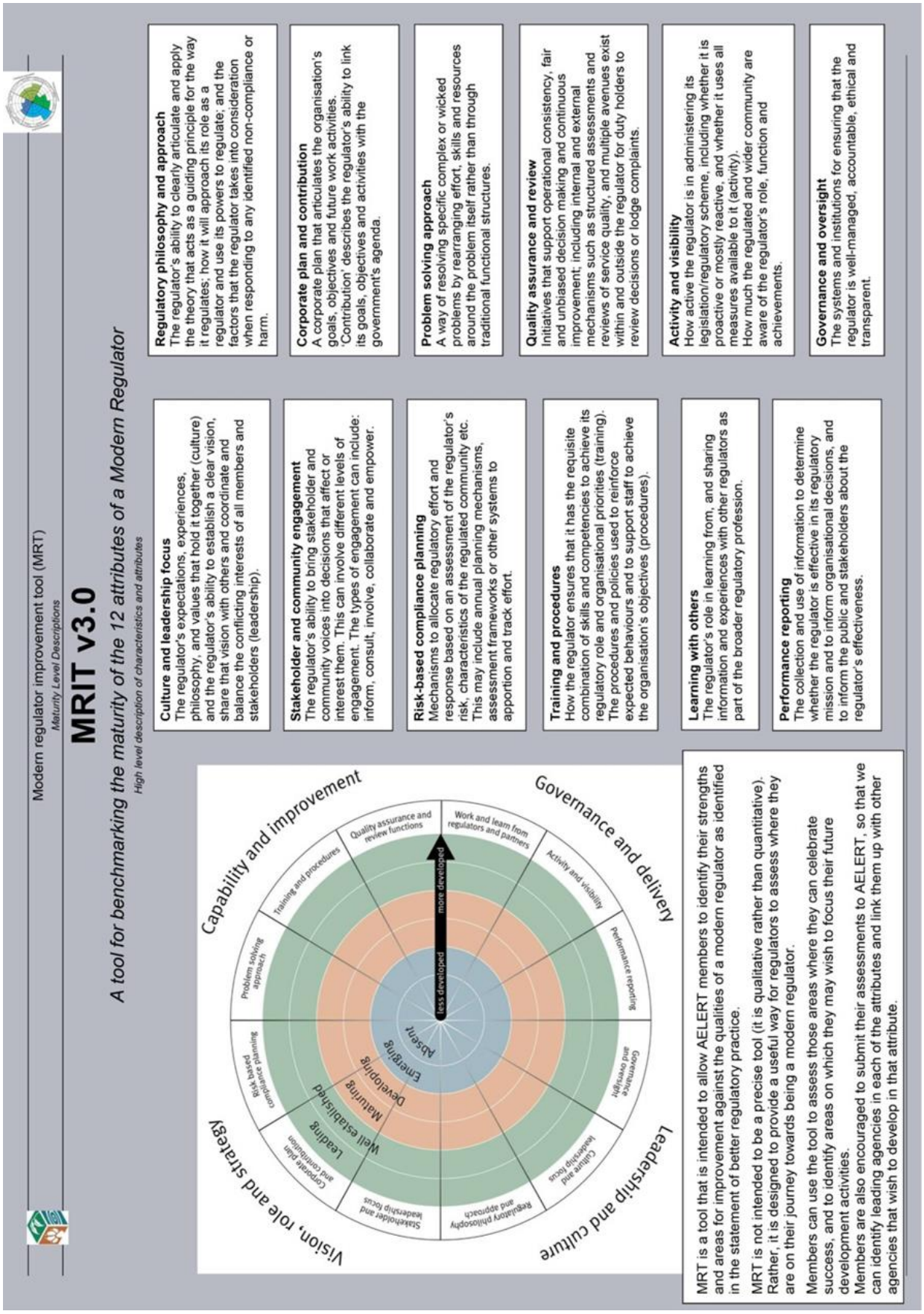
The total efficient costs of our compliance management services are approximately $19 million per year. With cost adjustments outlines above and presented in the table below, we propose to spend a total of $63 million[204] in the 2021 regulatory period on this activity, or $15.8 million annually.

Table 69. NRAR compliance management costs 2020-21 to 2024-25 following adjustments ($2020-21 $000)

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
Total compliance management costs	**17,563**	**19,356**	**19,356**	**18,922**	**18,922**	**18,922**
Compliance Adjustments						
Hypothecation		470	470	470	470	470
Commonwealth funding		1,035	1,035	1,035	1,035	1,035
Controlled Activity Approvals		1,876	1,876	1,876	1,876	1,876
Total compliance reductions		**3,381**	**3,381**	**3,381**	**3,381**	**3,381**
Adjusted Compliance costs	**17,563**	**15,975**	**15,975**	**15,541**	**15,541**	**15,541**

[204] All expenditures are expressed in $2020-21 and are described in the Administrative Information paper accompanying this paper.

Attachment A to W08-03 compliance management: MRIT Approach



Attachment B to W08-03 compliance management: derivation of the CAA adjustment factor

Our compliance management costs outlined above include compliance costs related to auditing, inspecting, investigating and enforcing compliance with Controlled Activity Approvals (CAAs). CAAs relate to approvals for structures built on or adjacent to watercourses. CAA compliance activities are undertaken by NRAR compliance staff but are not necessarily related to licensed water usage and as such should not be funded by licensed water users through WAMC prices as these licensed water users are not the impactors.

Many holders of CAAs may also be water users and some of the structures involved may relate to water use (for example structures that house pumps) or impact on water use and availability (for example a causeway across a stream). Thus, there is a level of crossover and ambiguity between CAA compliance and compliance management that is a monopoly service funded by WAMC prices.

We have undertaken analysis that has identified 13.93 % of ABNs relate solely to CAAs. The working that supports this calculation follows.

In calendar year 2019 CIRAM showed a total of 1,916 ABNs with 532 of those categorised as having a CAA component.

We sought to internally review this categorisation due to the fact that some ABNs may have include multiple factors and the belief that the CAA component of some ABNs may have been overstated due to a combination of high workload, newly employed staff and the fact that some cases may be complex and involve elements of CAA breaches and water take breaches.

We undertook the following sampling activity and re-examined ABNs triaged as CAA breaches.

Table 70. Analysis of ABNs with a CAA component

	CIRAM CAAs 2019	Sample Size	CAA Analysis Categories					Solely CAAs as % of sample
			Solely water take issue	Predominantly water take issue	Multiple incl. CAAs	Solely CAAs	Other/ unknown	
Total	532	317	30	86	27	159	11	50.16%

Our compliance management costing excludes the “solely CAAs” category from further a compliance management analysis as water users should not have to fund investigations and enforcement of breaches that are solely CAAs.

Based on the above analysis and the percentages the above table could be recast as set out in the following table.

Table 71. Sole CAA ABNs as a % of ABNs based on analysis

ABN Category	Total ABNs 2019	ABNs categorised as having a CAA component	CAA adjustment factor based on sampling	Actual Sole CAA ABNs when ABNs are adjusted	Sole CAA ABNs as a % of ABNs based on analysis
Total	1 916	532	50.16%	266.8	13.93%

W09-01 Water consent transactions

This activity is undertaken by NRAR and comprises transactions undertaken on a fee for service basis, including dealings, assessments, changes to conditions and new applications for water licences and approvals.

In the early 2020 survey conducted by NRAR 59% of respondents identified NRAR's water consent transaction activity as being either important or very important. It should be recognised that not all respondents would use this service.

We propose to spend a total of $5.3 million in the 2021 regulatory period on water consents transactions. Over the current regulatory period, average annual expenditure is $1.9 million (NRAR average annual expenditure is $0.77m, averaged over 2018-19 and 2019-20 to reflect the years it has been established). Forecast expenditure 32% lower at $1.3m annually as set out Table 77.

We also show the historical costs of water consent overheads (W08-99) for the 2016 regulatory period in Table 77. We intend to remove this WAMC cost code in the 2021 regulatory period in line with IPART recommendations. The historical W08-99expenditures over the 2016 regulatory period are not included in the calculations of paragraphs above. DPIE Water's total expenditure allocated to W08-99 is $568,000 and NRAR's total expenditure is $107,000.

Statutory basis for service

The water consent transactions activity is required by licensing and approval requirements under the *Water Management Act 2000*:

- Chapter 3 Water Management Implementation – Part 2 Access Licences
  - Division 2 (s61 – s64) relating to the granting of access licences.
  - Division 3 (s66 – 68B) relating to licence conditions including the imposition and revocation of conditions
  - Division 6 (s77 -77A) relates to the surrender and cancellation of licences
- Chapter 3 Water Management Implementation – Part 3 Approvals
  - Division 1 s89 relates to water use approvals and s90 relates to water management work approvals. Under s91 it is an offence to take water without a licence, or to construct or use water supply works, flood works or drainage works without an approval. Division 2 -(s92-98 and 99A) relating to applications for approvals –
  - Division 3 (s100 – 105) relating to conditions and durations of approvals
  - Division 4 (s107-109) relating to the amendment and surrender of approvals
- Chapter 4 - Part 1

- Divisions 3 and 4 (s128-130 and s132-134) inclusion and exclusion of land within the operating area of irrigation corporations

In addition, our water consent transactions activity includes functions delegated to us with respect to the *Water Act 1912*. In particular we undertake functions in connection with:

- Part 2 of that act relating to water rights and works including application for licences, determination of these licence applications, licence amendments and licence revocations and cancellations (s10,11 11A, 12,13A, 13AA, 13B-13F, 14, 14A, 15, 17A-17C)
- Part 5 of that act relating to Artesian Bores including application to licence bores and the conditions and cancellation of these licences (113 -116, 116A-116C, 117D, 117G-117H)

Our primary functions for water consent transactions relate to applications for water access licenses and water management works and use approvals, both under the *Water Management Act 2000*. The NRAR functions are only undertaken for the entities outlined below.

We undertake these transactions under delegation from the Minister. This delegation has recently been amended so that the delegation flows from the relevant Minister to the NRAR Board to NRAR staff. This recent delegation (dated 6 April 2020) covers the Ministerial functions relating to water licences and approvals under the *Water Management Act 2000* and the *Water Act 1912*.

Historic service 2016-17 to 2019-20 (4 years)

Service description and benefits

Water consent transactions were undertaken by DPI Water until the Water Transformation in 2016. At that time, legislative functions were redistributed between DPI Water and WaterNSW, including dividing the customer base for water consent transactions under clause 4.2 of the Deed of Business Transfer. This Deed specified licensing functions to be retained by DPI Water including licensing and approvals for government agencies, state owned corporations, water utilities and water supply authorities, licensed network operators, mining companies, irrigation corporations, aboriginal communities and businesses, floodplain harvesting, major developments and schools and hospitals.

Since its establishment in April 2018, NRAR has undertaken licensing and approvals functions under the *Water Management Act 2000* and the *Water Act 1912* by delegation from the Minister and departmental secretary, for the entities specified under clause 4.2 of the Deed of Business Transfer 2016[205] between the then Department of Industry, Skills and Regional Development and WaterNSW.

The delegations have recently been amended in April 2020 to delegate these same functions direct from the Minister to the NRAR Board, who will then delegate to NRAR staff.

The functions delegated to NRAR are outlined below:

Licences

Functions of the Minister:

- under s61-64 of the *Water Management Act* to determine access licences

[205] Clause 4.2 Deed of Business Transfer 2016 Department of Industry, Skills and Regional Development and Water NSW

- under s66-68B of the *Water Management Act* to impose conditions on access licences, revoke discretionary access licence conditions and amend access licences
- to undertake functions of the Minister specified by conditions on an access licence
- under s77 and 77A of the *Water Management Act* in relation to the surrender and cancellation of an access licence
- in relation to exemptions from access licensing under clause 21 of the *Water Management (General) Regulations 2018*, clause 14 of schedule 4 of the Regulation (approving watering for human needs) and clause 15 of schedule 4 of the Regulation (approving a program of taking water for environmental work construction)

Approvals

Functions of the Minister:

- under 25(1)(b) of the *Water Management (General) Regulation 2018* to require an application for approval under part B of the *Water Management Act* to be accompanied by an assessment of the impact of the water use, work or activity concerned and issue requirements under 25(2)of the Regulation for the preparation of that assessment
- to consult with Dams Safety NSW under s91AA of the *Water Management Act* in relation to approvals for the construction and use of dams and flood retarding basins
- in connection with the advertising of approvals under 26 of the Regulation
- in connection with the determination of application for approvals under s92-98 and 99A of the *Water Management Act*
- in connection with the imposition, revocation and extension of conditions relating to approvals under s100-105 of the *Water Management Act*
- in connection with the amendment and surrender of approvals under s107-108 of the *Water Management Act* and clause 29-30 of the Regulation
- in connection with obtaining security or fulfilment of obligations under approvals under clause 32 of the Regulations
- under an approval condition
- relating to exemptions from the Act and the Regulation

The delegation instrument also confers to NRAR the functions of the Ministerial Corporation under Part 2 and Part 5 of the Water Act 1912 relating to licensing, as well as functions relating to fees and charges, the publication of notices, and the activities of public utilities under the *Water Management Act*.

Service Description

General

Water consent transactions are activities that manage the issue, trade and amendment of water access licences, water allocations and water approvals under the *Water Management Act 2000*. Water access licences are tradeable assets that include a right to a share of the available water in a specified water source. Most licenses can be transferred, subdivided, mortgaged and bequeathed.

Allocations are the amount of water credited by WaterNSW to an access licence following available water determinations made by DPIE Water for each category of licence in a water source. Water allocations are also tradeable.

Water approvals are required for the construction and use of water supply works such as pumps, dams and bores, and for the application of water to land. These approvals typically apply for 10 years, after which they can be extended on application. The approvals are attached to land and are held by the occupier of that land. The holder changes with land occupation. New approvals can be issued and existing approvals can be amended.

Water consent transactions are charged on a fee for service basis, where users of the transactions pay a fee intended to reflect the costs of the transactions. These fees are contained in a fee schedule, under which different categories of water consent transactions pay different fees.

We propose to use the user share determined by IPART in its 2019 review of user shares[206] and allocate 100% of water consent transaction costs to users of the transactions.

NRAR's involvement in water consents transactions

NRAR has undertaken water consent transactions since its establishment in 2018 for the following entities[207]:

- Government agencies, including local councils and the Commonwealth
- State owned corporations
- major water utilities, water supply authorities, and local water utilities
- licensed network operators under the Water Industry Competition Act 2006
- mining companies
- irrigation corporations
- Aboriginal communities and businesses
- floodplain harvesting
- schools and hospitals

NRAR undertakes water consent transactions for approximately 2000 water access licences in NSW.

NRAR also undertakes the following activities that are not monopoly services funded through WAMC prices and therefore are not addressed in this submission:

- controlled activity approvals (CAA) under s91 *Water Management Act* for all applicants, as these approvals regulate activities undertaken on waterfront land and do not necessarily relate to water supply or water take,
- Integrated development assessment under the *Environmental Planning and Assessment Act 1979*, for activities that require consent under that Act and that also require a subsequent licence and/or an approval from NRAR,
- Providing advice to DPIE Planning functions in relation to state significant developments and state significant infrastructure as defined in the *Environmental Planning and Assessment Act*, and
- Providing advice to planning authorities in relation to strategic land use planning instruments such as Local Environmental Plans, and review of environmental factors.

The costs to NRAR for these activities have not been included in this submission.

For the entities for which NRAR undertakes water consent transactions that are monopoly services funded by WAMC prices, NRAR determines:

- applications for Water Access Licences under s63 of the *Water Management Act*, and imposes conditions as required or permitted by s65 of the Act. Applications can relate to new activities or seek an amendment to an existing licence)[208]

[206] IPART, Rural Water Cost Shares WaterNSW Water Administration Ministerial Corporation, Water Final Report, February 2019
[207] The entities are specified in clause 4.2 of the Deed of Business Transfer 2016 between the (then) Department of Industry, Skills and Regional Development and WaterNSW.
[208] NRAR can also suspend a licence under s78 of the Act.

- water management works approvals [209] and water use approvals [210] for the entities and approval types specified above under s95 of the *Water Management Act*. Applications can relate to new activities, or amendments and time extensions of existing approvals.

NRAR's water consent transaction process involves six steps as set out below. These processes have not substantially changed from those used by DPIE Water at NRAR's commencement of operation in 2018.

- Pre-Application - involves the provision of NRAR advice to applicants. Pre-application work seeks to improve the quality of information provided by applicants, thus increasing the efficiency with which NRAR can assess applications
- Application Receipt - involves receiving and registering applications and fees, entering details into the water licensing system and referring the application to technical assessment experts in NRAR's licensing and approvals teams
- Initial Review – involves ensuring the application is complete, verifying the applicant's right to apply (and that the activity is not exempt) and ensuring the application is assessed by staff with expertise commensurate with the nature of the application
- Assessment - involves NRAR undertaking assessments to meet its obligations under the *Water Management Act*, including s9 which requires NRAR to take all reasonable steps to promote the water management principles set out in s5 of the Act. To give effect to these principles through water consent transactions, NRAR undertakes both a rules-based assessment and an impact assessment:
    - Rules-based assessment - involves checking the proposed activity against water sharing plan rules, controlled allocation orders, local management rules and trading rules relevant to each application. These determine whether an application can be approved.
    - Impact assessment - involves case by case investigation to consider potential local impacts[211] and appropriate approval or licence conditions to control any impacts to acceptable levels, or whether to refuse the application in the event the impacts are not able to be appropriately mitigated. Impact assessment also includes considering and resolving objections lodged under s93 of the Act. In some cases where significant risks are identified NRAR may require the applicant to commission third-party experts to determine the extent of those risks and how they might be mitigated. Note that NRAR seeks expert assistance from DPIE-Water (Water Science) as needed for assessment work.
- Advertising – involves advertising of water supply works approval applications and water use approval applications for new works in local and state-wide newspapers to invite submission from third parties, in accordance with statutory obligations

Supervision and determination – involves senior staff supervising and determining licence and approval applications. The process may take a substantial amount of time if licensing or approval decisions are contentious, if there are large numbers of valid objections, or if a decision is appealed in court.

[209] Water management works approvals confer a right to the holder to construct and use at a specified location as follows:

- Water supply works (s90(2) Water Management Act 2000)
- Drainage works (S90(3))
- Flood works (s90 (4))

[210] Water use approvals confer a right on the holder to use water for a specified purpose at a specified location (s89 Water Management Act 2000)

[211] Impacts could include impacts on adjoining pumps or bores, Aboriginal heritage sites, native vegetation, threatened species, wetlands, land degradation, salinity, soil compaction, geomorphic instability, hydrology, water logging, acidity, contamination and water quality.

WaterNSW

WaterNSW is making a separate submission in relation to water consent transactions. The water consent transactions undertaken by WaterNSW cover all entities other than those administered by NRAR under the Deed of Business Transfer.

The separation of water consent transactions roles between NRAR and WaterNSW results in WaterNSW assessing and issuing about 95% of licences and approvals under the *Water Management Act*.

While the NRAR and WaterNSW licence processes may be similar, the applications assessed by NRAR are generally larger and more complex including for mining operations, irrigation corporations involving larger volumes of water and water utilities often involving complex and critical matters such as groundwater and town water supplies. So, while NRAR's applicant base constitutes only about 5% of the licences in NSW, these licences regulate about 43% of the water share available in NSW. Consequently, the nature of the licence and approval applications processed by NRAR are often:

- unique, requiring the design of case-by-case assessment methods
- higher risk levels to sustainable water resource outcomes, which warrant more thorough assessment
- under high scrutiny from the public, media, special interest groups and sometimes the courts.

Any comparison of the NRAR water consent transaction fees with existing or proposed WaterNSW fees are likely to be misleading as the costs and work tasks involved in processing these transactions will differ with the nature of the applicants.

NRAR therefore seeks to establish a fee schedule separate to WaterNSW, with the NRAR fee schedule being commensurate with the scale and complexity of applications it is responsible for assessing under the Deed of Business Transfer.

Table 72. Numbers and Volume of Licences issued by NRAR

	Number of licences	% of all licences	Annual sum of water share component (ML)	Average volume per licensee (ML/year)	% of water share component
WaterNSW	36 073	94.75	11,992,664.7	332	57.21
NRAR	1 998	5.25	8,968,709.874	4,489	42.79
Total	38 071	100	20,961,374.57		100

Source: Data extracted from Water Licensing System (WLS). Licensees incorporated into NRAR data included all councils, energy producers, State Owned Corporations (Hunter Water and Sydney Water), five irrigation corporations, and state and federal water licensees, identified using searches of WLS, and then a manual check of all licensees with maximum water take over 5,000ML. The average volume data was calculated from the annual entitlement on each licence.

Service Benefits

The water consent transactions activity allows water users to undertake activities in a lawful manner while protecting other water user property rights associated with water access licences and minimising environmental impacts of water take and use at a particular location. From an economic perspective the water consent transactions activity allows:

- water licence holders and allocation holders to trade their rights. This trade in rights allows both parties to the trade to benefit and results in improved efficiency in water markets, and
- water licence holders to better utilise water rights and land occupation by allowing construction of works. This in turn improves the productive efficiency of the land and the water being used.

If water consent transaction activities were not undertaken then either:

- trades in water rights and allocations and construction of works would not occur, with the losses in efficiency, or
- trades in water rights and allocations and construction of works would occur, but with no regulatory oversight, with the potential to result in negative impacts to other water users, watercourses and water flows.

Overall, water consent transactions confer property rights associated with water access licences protect other water users and seek to mitigate environmental impacts associated with the take and use of water at a location.

Service levels

Service levels set out in IPART's 2016 final report for WAMC prices are shown in the following table:

Table 73. Output measures and performance indicators for 2016 regulatory period W09-01

Progress	Output measure	Performance indicator
	Number of applications processed, Current, 6,000 Forecast, Process all applications received.	Percentage of applications for licence dealings assignment of shares (71Q) processed within 20 days 90%. Percentage of applications for new access licences processed within 40 days 80%. Percentage of applications for water management work and use approvals processed within 60 days, 80%. Percentage of applications to extend a water management work approval processed within 20 days 90%. Percentage of applications for an approval for a bore for domestic and stock rights processed within 10 days 90%. Percentage of legal searches completed within the preferred processing time frame 95%
2016-17	Note NRAR did not exist at this time. No performance was reported for NRAR.	
2017-18	NRAR commenced on 30 April 2018, and reporting on these output measures was not undertaken by NRAR for this financial year.	

Progress	Output measure	Performance indicator
2018-19	*Reported by DPIE* **Output Measure** • Number of applications processed by NRAR, Received 3,279 and issued 2,140 *Reported by WaterNSW* **Output Measure** Applications processed - 7,392 (Numbers includes WaterNSW & NRAR)[212]	*Reported in DPI Water AIR to IPART* **Performance indicators** • Percentage of applications for licence dealings assignment of shares (71Q) processed within 20 days, NA for NRAR • Percentage of applications for new access licences processed within 40 days, 68% within 40 working days • Percentage of applications for water management work and use approvals processed within 60 days, 79% within 60 working days • Percentage of applications to extend a water management work approval processed within 20 days, 63.8% within 20 working days The drought has significantly increased the number of applications and enquiries received by NRAR during the 2018-19 financial year and consequently the ability to process all applications. In addition, NRAR had to focus resources in working with councils to ensure adequate town water supply was maintained. • Significant organisational change and review of business functions over the past three years has also impacted resourcing and NRAR's capacity process applications within the targeted processing times.

[212] NRAR recognises that this figure previously reported is not consistent with the figure of 416 actions contained in this paper. NRAR believes that the larger figure previously reported includes figures for all licences managed by NRAR rather than just those licences which are related to the W09-01 Water Consents Transactions cost category.

Progress	Output measure	Performance indicator
2018-19		*Reported by WaterNSW (Numbers include WaterNSW & NRAR performance)* **Performance indicators** • Percentage of applications for licence dealings assignment of shares (71Q) processed within 20 days, 98% • Percentage of applications for new access licences processed within 40 days, 93% θ Percentage of applications for water management work and use approvals processed within 60 days, 80% • Percentage of applications to extend a water management work approval processed within 20 days, 90% • Percentage of applications for an approval for a bore for domestic and stock rights processed within 10 days, 89% Percentage of legal searches completed within the preferred processing time frame, 100%

Forecast service 2020-21 to 2024-25 (5 years)

Our proposed service standards for water consent transactions are set out below. These service standards marginally increase the service standard timeframe for approvals, reflecting the greater complexity of assessment work required for the NRAR applicant base compared to the broader applicant base covered by the 2016 service standards outlined in the table above.

These service standards remain constant for the term of the regulatory period. There are no year to year variations in activity.

Service levels

The following table sets out our proposed output measures and performance indicator.

Table 74. Output measures and performance indicators for the 2021 regulatory period W09-01

Output measure	Performance indicator
Water Access Licence – time taken to determine applications	80% applications determined within 45 days
Works and Use Approvals – time taken to determine applications	80% applications determined within 65 days
Approvals Extensions – time taken to determine applications	80% applications determined within 25 days

Forecast Volumes

We have forecast water consent transactions using three scenarios, namely,

- Scenario 1: average volumes from the past three financial years continuing over the 2021 regulatory period
- Scenario 2: extended drought conditions, which we expect will generate more water supply works approval applications for bores for town and domestic supplies. We have assumed this scenario will increase supply works approvals by 10% annually from this financial year to 2022-23, followed by a return to average volumes experienced over the past three years, and
- Scenario 3: drought continues to 2022-23, followed by average climate conditions which stimulates investment into further water supply infrastructure and maintains water supply and use approvals at 10% above the average volumes observed over the past three financial years.[213]

We use only data from the past three financial years, as the year prior was 2015-16, which partially reflects volumes received by DPI Water before the 2016 Deed of Business Transfer. The number of applications dealt with by the former DPI Water from 2015-16 and then by us from April 2018 to end of 2018-19 are shown in the following table.

[213] Only impacts approval volumes

Table 75. Number of applications processed between 2015-16 and 2018-19

Licence/approval type	Consent category	2015-16	2016-17	2017-18	2018-19
Water access licences	Zero share	35	7	9	6
	New specific purpose	4	2	1	2
	New controlled allocations	1		7	6
Work approvals	Extensions	559	196	375	235
	Work approvals	381	148	78	48
	Use approvals		3		
	Combined approvals	45	16	16	32

The average total number of water consent transactions under the three scenarios outlined above is estimated at 416 per year, or a total of 1,664 transactions over the next four-year regulatory period, as shown in the following table.

Table 76. Forecast water consent transactions

Licence/approval type	Consent category	Average volume per year
Water access licences	Zero share	7
	New specific purpose	2
	New controlled allocations	7
Work approvals	Extensions	269
	Work approvals	104
	Use approvals	3
	Combined approvals	24
Total		416

Water Supply (Critical Needs)

The *Water Supply (Critical Needs) Act 2019* responds to the unprecedented drought conditions being experienced in NSW. It creates a pathway for critical water infrastructure developments that are urgently needed to secure water supplies for regional towns.

As the demand for declarations and authorisations is driven by users, we propose to introduce a new consent transaction charge to recover the costs associated with this water management service. This ensures that the impactor-pays principles are applied effectively and transparently and that other users are not subsidising the costs.

Our detailed proposals for consent transaction charges covering our existing services that are now undertaken by NRAR or DPIE Water and the Water Supply (Critical Needs) Authorisation Assessment Charge are outlined in **Detailed Paper J – Other revenue.**

Operating expenditure

In 2015, DPI Water forecast approximately 6,000 consent transactions per year over the 2016 regulatory period, requiring 17.5 FTE per year and an annual operating expenditure of $2.07 million ($2015-16).

At this time Synergies Economic Consulting examined the DPI-water consent transaction costs and determined in its report to IPART dated January 2016 that:

> *The proposed charges appear efficient, though there should be continued opportunities to refine business process and resource utilisation to continue to reduce costs over time. Accordingly these fees should be subject to an ongoing saving at the same level as proposed for DPI Water's other operating costs. We therefore recommend IPART accept DPI Water's proposed water consent transaction charges, but are subject to the 1.5% efficiency adjustment each year.*

IPART's 2016 WAMC price determination confirmed the proposed charges with some adjustments, including the 1.5% per year efficiency adjustment recommended by Synergies Economic Consulting. After the adjustment, IPART estimated DPI Water's revenue from water consent transaction charges would be $2.03 million per year ($2015-16)[214].

All of the revenue from the expenditures found by IPART to be prudent and efficient for this activity for the 2016 regulatory period were allocated to WaterNSW. We propose that from the start of the 2021 regulatory period, allocations should be made to both DPIE Water and WaterNSW reflecting respective workloads based on the levels of expenditure IPART considers to be prudent and efficient.

In 2018-19, NRAR's revenue from water consent transactions was $138,476 and its costs for these transactions was $605,766. In 2019-20, we estimate from our accounts that our full year revenue from activity W09-01 will be approximately $250,000 and its costs for these transactions will be approximately $817,000[215].

Proposed operating costs are shown in the table below. We estimate that the existing fee structure would only result in $256,000 recovery of costs[216] compared to approximately $563,000 to provide the service.

The NRAR figure of $563,000 is based on a staff survey of time taken to undertake certain approval and licensing tasks and subsequent analysis of the costs. This cost figure is conservative as it took the lower of a "top down" or "bottom up" approach to calculate the costs. NRAR recognises that the cost figure in its accounts is higher than $563,000 but

[214] IPART'S 2016 final report on WAMC Prices page 151

[215] Note that the estimated costs of NRAR's water consent transaction service are taken from NRAR's accounts. However, for the purpose of modelling the proposed fee structure, NRAR has sought to recover only $563,000 which has been derived by a staff survey to estimate time to undertake one assessment type. The discrepancy is likely due to the accounts representing a total time allocation of staff, relative to the fee model using time for an individual assessment.

[216] As per forecasts of current expected revenue for 2018-19 escalated to $2020-21 dollars

NRAR believes it is more appropriate to use the lower cost figure in order to ensure lower fees and charges are passed through to applicants.

This shortfall results from NRAR administering larger and more complex licence and approval types than the current fee structure envisaged. Consequently NRAR seeks an amended fee schedule for the NRAR applicant base, to fully recover its costs for future water consent transactions in the 2021 regulatory period.

We propose to establish a separate water consent transaction fee schedule to the WaterNSW fee schedule, with our fee schedule being commensurate with the scale and complexity of applications we are responsible for under the Deed of Business Transfer. Our fee schedule seeks to recover our full costs of administering water consent transactions on a user pays basis.

Our staff who work on water consent transactions solely undertake this work, meaning the full costs can be calculated and attributed to licence and approval applicants.

In 2019 we engaged consultants Nous Group to develop a proposed licensing and approvals fee schedule for water consent transactions that more accurately reflects the cost of the work we undertake. The aim was to develop an efficient and equitable licensing and approvals fee schedule based on an analysis of the costs attributable to each type of water consent transaction. It proposed:

- fee categories reflecting the transaction types we undertake and
- fee amounts for each fee category to reflect the costs we incur with our current systems and procedures.

Nous Group's methodology involved a "bottom up" cost analysis and a "top down" review to normalise any anomalies in the bottom up approach. The "bottom-up" cost analysis included several steps:

- developing design principles for our fee schedule such that the schedule is based on up-front fees and is simple for applicants to understand and simple for us to administer,
- estimating costs of the different types of licensing and approval activities we undertake via a staff survey and
- normalising these costs via a "top-down" review to account for over or under estimation of costs in the survey.

This process resulted in the NRAR licence and approvals fee cost recovery model; our proposed fees are the output of this model.[217]

Proposed efficiency gains

The water licensing system (WLS) is owned by WaterNSW. We use the WLS to manage

- licence and approval types and
- other assessment tasks such as controlled activity approvals, and integrated development assessment for consent authorities under the *Environmental Planning and Assessment Act 1979* including state significant development.

We are asking WaterNSW to deliver two packages of WLS functionality improvement over the 2021 regulatory period:

[217] Note that the Nous Group's model included consideration of non-WAMC licensing and approval activity but the costs and proposed fees contained in this submission are only based on the water consent transactions subject to IPART regulation.

- package 1 will deliver improvements to conditions and more readily identify links between licences and approvals, and improve search functions and
- package 2 will deliver some small administrative functionality improvements for licensing and approvals, such as making certain fields mandatory to improve system searching and reporting capability.

Some parts of these packages will improve functionality for all licence and approval and assessment work while others will improve the functionality of only licence and approval types covered by this submission. We estimate that 49% of the first package and 18% of the second package relate to water consent transactions subject to IPART's decision for the 2021 regulatory period.

These WLS improvements will improve the quality of the water consent transaction service and the experience for applicants as we will need to make fewer enquiries with the applicant to link existing licences and approvals, to ensure consistency of new instruments issued.

We pay WaterNSW for functionality changes. WaterNSW has provided a quote (in $19-20) to us estimating the costs of these improvements to be $47,370 for Package 1 and $57,345 for Package 2. We propose to recover the portion of these costs that are attributable to water consent transactions subject to this submission through an additional fee component to each application we assess over the regulatory period.

To calculate this additional fee component, we have divided our licensing and approval costs attributable to monopoly services funded by WAMC by the forecast total 1,664 water consent transactions expected to be undertaken over the regulatory period. We calculate the additional fee component for WLS improvements as $20.15 for each application:

(49% x $47,370) + (18% x $57,345))/1,664 applications).

Our proposed fee schedule includes different fee categories that are better suited to the applicant base that we serve, and sets fees at levels that would fully recover the costs of water consent transactions we undertake.

Our proposed fee structure results in significantly higher application fees for our applicant base that reflects the larger, more complex applications we receive, such as those for mining operations, irrigation corporations and water utilities.

NRAR's water consent transactions differ from Water NSW water consent transactions as they typically involve large volumes of water, increased complexity, high levels of environmental and economic impact, increased public scrutiny and critical matters such as town water supplies.

Table 77. Expenditure on water consents transactions W09-01 ($2020-21 $000)

Cost	2016 regulatory period				Extension	2021 regulatory period				
	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
IPART'S 2016 final report	0	0	0	0	0					
Actual DPIE Water operating expenditure	945	515	1,427	1,840						
Actual NRAR operating expenditure	0	39	658	878						

Cost	2016 regulatory period				Extension	2021 regulatory period				
	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
W08-99 Water consents overhead – actual DPIE expenditure*	137	112	319	0						
W08-99 Water consents overhead – actual NRAR expenditure*	0	9	98	0						
Actual externally funded operating expenditure	0	0	1,140	1,775						
Actual externally funded capital expenditure	0	0	0	0						
Proposed DPIE operating expenditure^						764	764	764	764	764
Proposed NRAR operating expenditure^						563	563	563	563	563

^ Revenue for W09-01 is recovered on a fee for service basis

*These historical W08-99 are not included in W09-01 actual expenditure totals. Actual annual expenditure for W08-99 have been included in this table to reflect that we propose to remove this activity code.

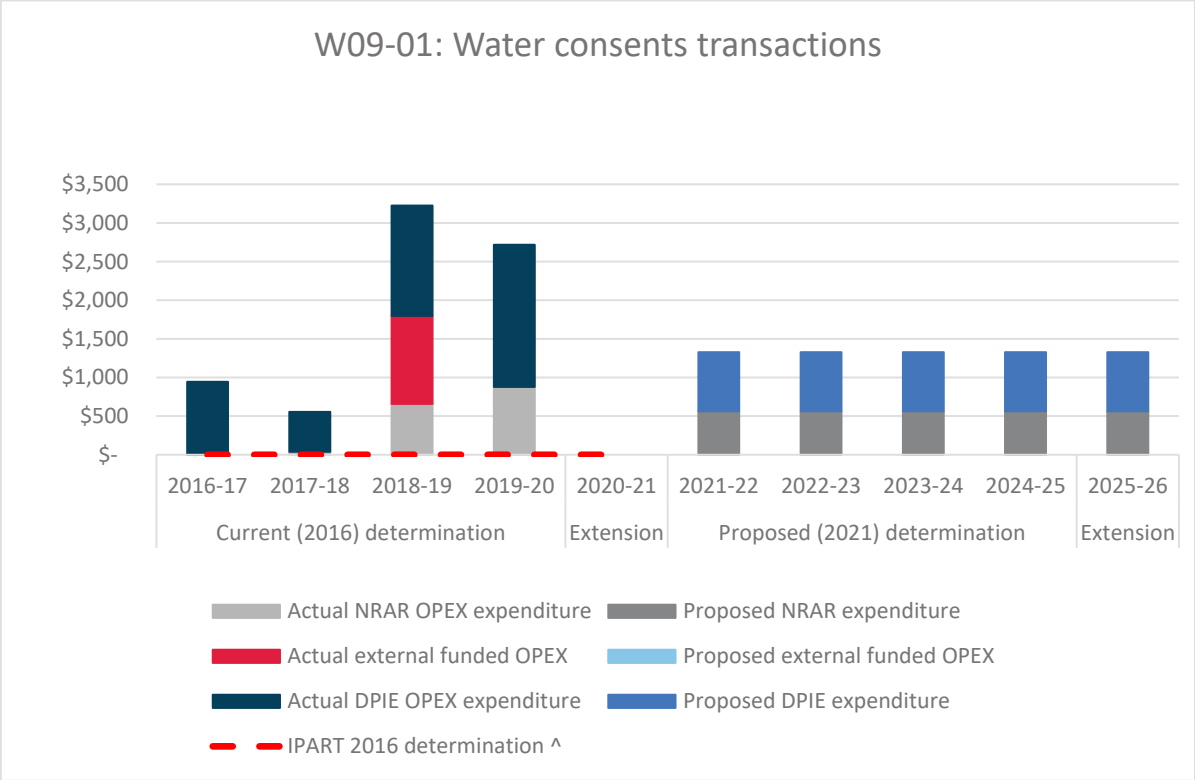
Notes: IPART's 2020–21 figure has been provided by IPART; actual operating expenditure is net of externally funded operating expenditure; DPIE Water's 2019–20 actual costs are 12/10 x actual costs for the 10 months to April 2020 and NRAR's 2019-20 actual costs are 12/11 x actual costs to May 2020; 2020–21 actual costs are unknown; 2025–26 costs are provided as required by IPART; please also refer to the Administrative Information document that is part of this submission.

Following recommendations from a consultant review by CIE of WAMC cost allocations, DPIE Water and NRAR propose to remove the water consent overheads (W08-99) activity code. This decision is in line with IPART's recommendation in the 2019 Rural Water Cost Share review[2] and is also consistent with WaterNSW's treatment of W08-99.

We have not proposed any W08-99 costs for the 2021 regulatory period. Instead W09-01 includes an overhead rate as detailed in the on-cost and overhead section at the end of this paper.

This information is also set out in the following graph

Figure 40. Expenditure on water consents transactions W09-01 ($2020-21 $000)



W10 Business and customer services

All costs proposed for WAMC activity W10-03 in the 2021 regulatory period are for activities undertaken by WaterNSW, and are covered in their separate submission to IPART for WAMC prices.[218]

W10-01 Customer management

This activity is undertaken by NRAR and comprises all customer liaison activities; including responding to calls to licensing and compliance information lines; and producing communication and education materials such as website content and participation in customer forums.

NRAR's survey of stakeholders undertaken in early 2020 showed 70% of respondents identified NRAR's customer management activity as either "very important" or "important". In our review of stakeholder engagement over the 2016 regulatory period we found that stakeholders related all four themes to this activity.

We propose to spend a total of $2.3 million[219] in the 2021 regulatory period on this activity. Average annual expenditure in the 2016 regulatory period is $1.1 million (Average annual DPIE expenditure of $0.1 million) with forecast expenditure 47% lower at $0.6 million annually as set out in Table 74.

[218] WAMC activity W08-01 transferred to WaterNSW as part of the 2016 water transformation project. Further information on it is set out in Detailed Paper K and further information on the water transformation project is set out in Detailed Paper C; both Detailed Papers form part of this submission.
[219] All expenditures are expressed in $2020-21 and are described in the Administrative Information paper accompanying this paper.

In this activity in the 2016 regulatory period we dealt with enquiries regarding NRAR, water compliance, and water consent transactions. We also delivered stakeholder and community communications and education materials. For the 2021 regulatory period we have substantially reduced actual costs as some of our functions relating to customer management, such as managing inquiries regarding compliance and providing compliance related education, have been reallocated to 08-03 compliance management.

Statutory basis for service

In previous determinations of WAMC prices, IPART has recognised the need for customer management activities that underpin all other water management activities that are funded through WAMC prices. Whilst there is no specific legislative requirement to communicate with customers (and the wider public), the tasks costed in activity W10-01 - responding to calls to licensing and compliance information lines, producing communication and education materials such as website content and participation in customer forums - primarily relate to servicing water users' property rights and transactions, and other user-driven needs. An interface with water users and the community via both direct enquiry channels and broader general communication and education channels is essential support for the range of WAMC activities delegated to NRAR.

Stakeholder views

In NRAR's survey of stakeholders undertaken in early 2020 70% of respondents identified NRAR's customer management activity as either "very important" or "important".

We reviewed stakeholder feedback over the 2016 regulatory period and found that of the four key themes identified were that customers want:

- clear and transparent enforcement of the water management framework[220]
- monitoring they can trust, and that a 'robust, accurate and reliable water monitoring system is supported and expected by customers'[221]
- improved accountability for water management systems, which it says means "having strong evidence for its decisions and ensuring that evidence is available to and able to be understood by its customers."[222].
- improved information available to customers. Customers want more information about water management, which is accurate and easy to access.[223]

The feedback received shows that customers expect a higher level of service from activities such as this one, and lists some specific work that could be undertaken to do so, including becoming better customer managers, the need for additional compliance officers to monitor compliance, more transparency in regard to monitoring activities undertaken and work to address feedback from the community and users in relation to pricing and the perception of the work the NRAR undertakes[224].

[220] KJA, DPIE IPART Price Submission - Stakeholder Engagement, Plain English Summary and final report, 27 February 2020, page 8
[221] KJA, DPIE IPART Price Submission - Stakeholder Engagement, Plain English Summary and final report, 27 February 2020, page 9
[222] KJA, DPIE IPART Price Submission - Stakeholder Engagement, Plain English Summary and final report, 27 February 2020, page 11
[223] KJA, DPIE IPART Price Submission - Stakeholder Engagement, Plain English Summary and final report, 27 February 2020, page 11
[224] KJA, DPIE IPART Price Submission - Stakeholder Engagement, Plain English Summary and final report, 27 February 2020, page 9

Historic service 2016-17 to 2019-20 (4 years)

Service description and benefits

In IPART's 2016 final report, customer management included all customer liaison activities, including enquiries management responding to calls relating to licensing and compliance (including receipt of ABNs) and general calls, and producing communication and education materials.

NRAR has undertaken customer management since its establishment in 2018.

Enquiries Management

Enquiries management includes responding to water user and community contact in relation to:

- general enquiries regarding NRAR
- enquiries regarding water compliance, and
- enquiries regarding water consent transactions.

These enquiries are primarily by referral of calls from the DPIE call centre or via NRAR's email address.

We currently allocate 3.5 full time equivalent staff members (FTE) to enquiries management, which includes 2 FTE managing receipt of ABNs[225] and 1.5 FTE managing general enquiries and water consent transactions.

The enquiries management function acts as an interface between NRAR and individual water users and individuals in the community. The function is required to facilitate the exchange of information between NRAR, water users and the community. These activities contribute to ensuring NRAR's effectiveness, transparency and accountability and contribute to maintaining community confidence in NRAR's water compliance activities.

NRAR also deals with enquiries related to matters that are not monopoly services that are funded through WAMC prices. These include assessment of state significant development and integrated development assessment under the *Environmental Planning and Assessment Act 1979*. These enquiries have been excluded from NRAR's FTE forecasts and cost forecasts in this submission.

Communication and Education

Communication activities include developing and publishing general communications material about NRAR and water law, and communications material relating directly to specific compliance activities undertaken by NRAR such as audit campaigns or prosecutions.

Education activities include developing and distributing general education material and programs and education material and programs that relate to a specific compliance project.

NRAR currently allocates 2.5 FTE to communications, which includes 2 FTE managing compliance related communication and 0.5 FTE managing general communication and website management.

[225] Note that the two FTE for receipt of ABNs will be accounted for in W08-03 Compliance Management from 2021-22.

NRAR currently allocates 2.5 FTE to education, which includes 2 FTE allocated to education for specific compliance management education[226] and 0.5 FTE allocated to developing general education materials.

These activities contribute to ensuring NRAR's effectiveness, transparency and accountability, contribute to maintaining community confidence in NRAR's water compliance activities, and assist to efficiently drive voluntary compliance through guiding water licensees about how to comply and generating general deterrence to non-compliance. As such the communications and education activities contribute to NRAR meeting its objectives under s10 of the NRAR Act to maintain public confidence and to operate efficiently, effectively and transparently.

The need and value of education and communication is apparent from an NRAR commissioned research project in 2019 that interviewed approximately 40 small to medium-sized water licensees. Approximately 50% of these licensees rated their own knowledge of their licence conditions as medium or low. This supports NRAR's focus on education and communication campaigns as an efficient means of improving compliance. Furthermore, a recent survey of water users undertaken by NRAR found that 78% of respondents rated NRAR's communication activity as "very important" or "important" and 74% of respondents rated NRAR's education activity as "very important" or "important".

If these customer management activities were not undertaken or undertaken at a reduced level then NRAR would not be able to:

- manage customer enquiries effectively or in a timely manner, which would result in reduced quality and timeliness of information exchange of importance to water users and the community
- provide communication material or maintain its website, which enable an efficient deterrent to future non-compliance. NRAR would also not meet its statutory obligations under the NRAR Act to publish details of convictions and its annual report, and
- provide education material and programs that guide waters users to voluntary compliance in a more efficient manner than enforcement.

If customer management activities were undertaken at a reduced level, this would reduce NRAR's effectiveness, efficiency, transparency and accountability and potentially reduce public confidence in water compliance activities.

Service levels

Specified outputs

NRAR was established in 2018. Prior to 2018 all customer management functions were undertaken by WaterNSW and / or DPI Water.

NRAR was allocated 15% of the customer management costs at the time of its establishment in 2018, based on IPART's 2016 final report for WAMC prices. For the purposes of this submission NRAR has assumed 15% of the 2016 projected enquiry volumes, or 1500 enquiries per year, as a benchmark to compare output measures.

The service levels for customer management for the 2016 regulatory period, as set out in IPART's 2016 final report, are shown in the table below. This measure relates to enquiries management and there is no quantitative service measure set for communications and education.

[226] Note that the two FTE for managing compliance related education are accounted for in W08-03 compliance management from 2021-22.

Table 78. Output measures and performance indicators for the 2016 regulatory period W10-01

Progress	Output measure	Performance indicator
	Number of enquiries: Current: 10,000. Forecast: 10,000.	Percentage of enquiries directly responded to at the time of the call/email: Current: 90%. Forecast: Maintain or improve current status.
2016-17	NRAR did not exist in 2016-17. Reporting on these output measures was undertaken by Water NSW.	NRAR did not exist in 2016-17. Reporting on these performance indicators was undertaken by Water NSW.
2017-18	NRAR commenced on 30 April 2018, and reporting on these output measures was undertaken by Water NSW for this financial year.	NRAR commenced on 30 April 2018, and reporting on these output measures was undertaken by Water NSW for this financial year.
2018-19	Number of enquiries: Forecast: 10,000 Forecast: 1,500 for NRAR (adjusted to 15% of 2016 WAMC customer management forecast) Reported by NRAR Output Measure 5463 calls[227] and 6336 emails	Reported by NRAR 0% Calls to NRAR are answered by the Department's Customer Service staff and are then transcribed and forwarded to NRAR for action, and are not directly responded to at the time of the call. NRAR responds to 90% Email enquiries within the processing times specified in its Service Level Agreement (between 48 hours and 5 working days for various application classifications).

[227] Telephone calls are first received by the Department's Customer Service staff (CS Connect) and then forwarded to NRAR for action. The number of CS Connect enquiries logged by the Department and sent to NRAR for action in 2018-19 was 5,463.

Progress	Output measure	Performance indicator
2019-20	Number of enquiries: Forecast: 10,000 Forecast: 1,500 for NRAR (adjusted to 15% of 2016 WAMC customer management forecast) Reported by NRAR Output Measure 5701 calls and11645 emails	Reported by NRAR 0% Calls to NRAR are answered by the Department's Customer Service staff and are then transcribed and forwarded to NRAR for action, and are not directly responded to at the time of the call. NRAR responds to 90% Email enquiries within the processing times specified in its Service Level Agreement (between 48 hours and 5 working days for various application classifications).

NRAR has clearly been managing a higher volume of enquiries than the assumed benchmark of 1,500 enquiries per year.

The enquiries recorded in the table above includes enquiries regarding licensing and approvals, compliance and general matters. The NRAR Progress Report 2018-19[228] indicates that of 5500 calls in 2018-19, 3200 related to licensing, 1300 related to compliance and 1000 related to general matters.

While there are no explicit performance indicators for communications and education, NRAR is required by legislation to publish certain information on its website. In 2018-19 the NRAR website had 58,502 views and based on an extrapolation of website view data for the first 11 months of 2019-20 NRAR expects the website views to be about 28,800 for 2019-20.

Forecast service 2020-21 to 2024-25 (5 years)

Forecast Changes to the Scope and Nature of the Activities

In setting WAMC prices in 2016, IPART included all customer liaison activities as customer management, and NRAR has accounted for these activities as customer management since its establishment in 2018.

However, NRAR proposes that for the 2021 regulatory period, some NRAR activities currently allocated to customer management should be allocated to compliance management as they are an essential part of a modern approach to compliance management. These activities include:

- receipt of ABNs,
- communication activities that relate to compliance activities undertaken by NRAR such as an audit campaign or a prosecution, and
- education activities that relate to compliance projects and information.

These activities account for 2 enquiries management FTE, 2 communications FTE and 2 education FTE. NRAR has accounted for these FTE under W08-03 compliance

[228] NRAR Progress Report 2018-19 page 25

management as these activities are an essential part of the workflow for a modern compliance management approach. Categorising these costs as compliance management rather than customer management costs will provide a more accurate reflection of Customer management and compliance management activities under NRAR's business approach.

Consequently, the activities that NRAR includes in customer management for the 2021 regulatory period are:

- general enquiries management
- production and publication of generic education and communications material, and
- management of NRAR's website

These activities account for 2.5 FTE comprising 1.5 FTE for managing general enquiries, 0.5 FTE to manage general communications and 0.5 FTE to manage general education.

Service Levels

The proposed service levels for customer management activities for the 2021 regulatory period are shown in the table below.

Note that the current performance indicator has been removed and a new performance indicator is proposed. This proposed change in performance indicators reflects the NRAR call centre business model where NRAR enquiries are received by email, including telephone enquiries which are transcribed into emails at the CSP call centre and then sent to NRAR.

Note that these measures relate only to enquiries management, consistent with the 2016 IPART final report and there is no proposed quantitative service level measure set for general communications and education.

Service levels

Table 79. Output measures and performance indicators for the 2021 regulatory period W10-01

Output measure	Performance indicator
Percentage of enquiries through nrar.enquiries@nrar.nsw.gov.au	90 % of enquiries through nrar.enquiries@nrar.nsw.gov.au responded to within 24 hours.

There are no year to year variations in this proposed performance indicator.

Based on the 2018-19 and 2019-20 telephone and email figures there was growth of 47% of email and calls combined. NRAR intends to manage any continued growth in email and telephone enquiries with same resource, providing an efficiency improvement over the regulatory period.

Operating expenditure

IPART's 2016 final report allocated $1.73 million to the customer management function. These activities were deemed to be 100% recoverable from customers. From 2016 to 2018 the bulk of customer management activity was undertaken by WaterNSW.

Prior to NRAR's establishment in 2018, IPART advised the Minister on the reallocation of revenue to NRAR. As a result, 15% of funding for W10-01 customer management was transferred to NRAR, or an average annual funding of $0.28 million over the remainder of the 2016 regulatory period. This amount of $0.28 million was not adequate to manage:

- the expanded customer management role envisaged for NRAR under the NRAR Act, which included expanded obligations for transparency, accountability and the maintenance of public confidence which in turn required communications and education resources, and
- the number of calls and emails received by NRAR in 2018-19 and 2019-20, which was higher than those forecast in IPART's 2016 final report.

NRAR believes that the actual cost of providing this service in 2019-20 shown in the table below more accurately reflect the costs of providing the customer management service.

2021 regulatory period

The total FTE requirement and costs of customer management are shown in the table below. The cost reduces between 2020-21 and the 2021 regulatory period as NRAR is proposing that the costs of 6 FTE previously accounted for under customer management be accounted for in compliance management to reflect NRAR's compliance management approach.

The operating costs for customer management have been calculated based on:

- salaries, which is based on the average NRAR salary only and does not include cost items such as superannuation, leave loading and payroll tax. Note that the average NRAR salary costs has excluded costs of the NRAR Board, the NRAR licensing and approvals function, the NRAR dam safety function and the Commonwealth-funded NRAR floodplain harvesting team as these functions are not monopoly services funded through WAMC prices.
- employee related costs, which is calculated based on DPIE advice as a set percentage of salary cost and accounts for superannuation, payroll tax, workers compensation allowances, annual leave, sick leave and long service leave.
- overhead costs, which are a set amount advised by DPIE per hour per employee, and cover a proportion of department overheads (not NRAR overheads) such as corporate services and strategy, human resources, general legal services, economic services, media and communications, ministerial liaison office and senior management.
- other Operational Expenditure which includes NRAR travel, vehicle, computer, training and similar expenditure required to allow an efficient and prudent customer management service. These costs are set by DPIE at 17.23 % of the salary cost plus the employee cost. Operational expenditure for customer management also includes the costs of DPIE call centre services to NRAR

The costs shown in the table below for the regulatory period from 2021-22 consist of salary and employee on-costs (approximately $360,000 per year), DPIE overhead costs (approximately $60,000 per year), an allocation of NRAR's non-labour operating costs[229] (approximately $60,000 per year) and the DPIE call centre cost (approximately $100,000 per year).

These NRAR customer management costs are expected to remain steady in real terms over the term of the term of the 2021 regulatory period.

The customer management costs for 2021-22 onwards represent only the costs for general enquiries management (including DPIE call centre costs charged to NRAR), the production of general education and communications material and the management of NRAR's website. This service is required to meet NRAR's statutory objectives, and to ensure water users and the general public can access relevant information about water compliance. NRAR will

[229] These costs include an allocation for NRAR costs such as IT and training.

manage an anticipated growth in enquiries with the same resource over the 2021 regulatory period, representing a net efficiency gain in this service.

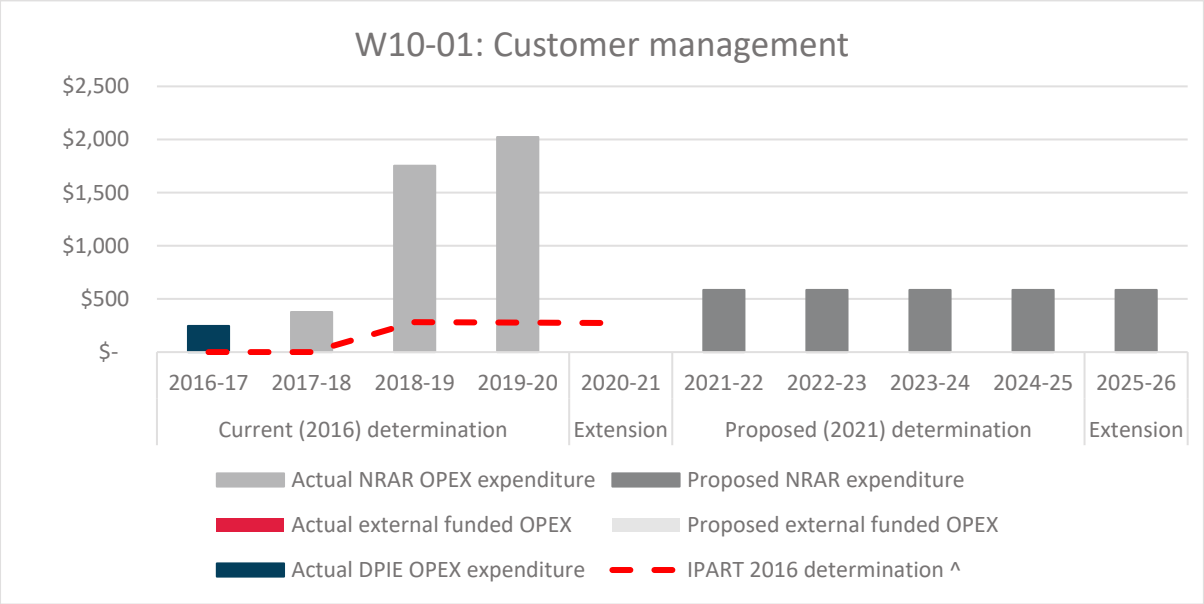
Table 80. Expenditure on customer management W10-01 ($2020-21 $000)

Cost	2016 regulatory period				Extension	2021 regulatory period				
	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
IPART 2016 determination ^	0	0	282	278	274					
Actual DPIE Water operating expenditure	246	0	0	0						
Actual NRAR operating expenditure	0	377	1,753	2,023						
Actual externally funded operating expenditure	0	0	0	0						
Actual externally funded capital expenditure	0	0	0	0						
Proposed NRAR operating expenditure						585	585	585	585	585

^ Reallocation of revenue from WaterNSW to NRAR in W10-01 (15%) occurred when NRAR was established in 2018 (total annual average W10-01 in IPART's 2016 final report is $1,894)

Notes: IPART's 2020–21 figure has been provided by IPART; actual operating expenditure is net of externally funded operating expenditure; DPIE Water's 2019–20 actual costs are 12/10 x actual costs for the 10 months to April 2020 and NRAR's 2019-20 actual costs are 12/11 x actual costs to May 2020; 2020–21 actual costs are unknown; 2025–26 costs are provided as required by IPART; please also refer to the Administrative Information document that is part of this submission.

Figure 41. Expenditure on customer management W10-01 ($2020-21 $000)



W10-02 Business governance and support

This activity comprises the business systems and processes that support organisation-wide activities; including asset management, annual reporting and pricing submissions to IPART.

Average annual expenditure in the 2016 regulatory period is $1.0 million with forecast expenditure allocated across other activity codes within corporate overheads. The following table reports the expenditure for the 2016 regulatory period only.

Table 81. Expenditure on business governance and support W10-02 ($2020-21 $000)

	2016 regulatory period				Extension
	2016-17	2017-18	2018-19	2019-20	2020-21
IPART's 2016 final report	1,955	1,925	1,896	1,851	1,824
Net revenue requirement allocated to DPIE/NRAR*	0	0	0	0	0
Actual DPIE Water operating expenditure	1,188	221	724	1543	
Actual NRAR operating expenditure	0	0	0	377	
Actual externally funded capital expenditure*	80	15	0	0	

*Note: According to IPART's recommendations to the Minister regarding reallocation of funding (March 2018) when NRAR was established, all W10-02 net revenue requirement is considered for licencing and therefore allocated to WaterNSW.

Historic service 2016-17 to 2019-20 (4 years)

The following table shows our performance against the output measures and performance indicators set out in IPART's 2016 final report. The figures show that we have consistently completed our annual reporting on time.

Table 82. Output measures and performance indicators for the 2016 regulatory period W10-02

Progress	Output measure	Performance indicator
	Annual reporting to IPART and ACCC. Annual performance reporting to customers.	Annual reporting within agreed timeline from end of financial year: Reporting to IPART and ACCC: 4 months. Reporting to customers: 6 months.
2016-17	DPIE Water Annual reporting to IPART and ACCC completed.	DPIE Water reported to IPART and ACCC within the timeframes agreed – 30 November and 8 December 2016.
2017-18	DPIE Water Annual reporting to IPART and ACCC completed.	Reported to IPART and ACCC within the timeframes agreed – as it was first report after the function split the period was extended to 7 months after the end of June 2017.
2018-19	IPART Financial reporting is completed at an Activity Code level. Cost driver information from WaterNSW is necessary for calculating the revenue and other financial information at the detail level requested by both ACCC & IPART. DPIE Water has agreed timelines for submission of the detailed Financial Spreadsheet component of the WAMC AIR to align with WaterNSW timelines for providing cost driver information. ACCC financial reporting will be submitted at the timelines agreed above to align with WaterNSW timelines for providing cost driver information.	DPIE Water Annual reporting to IPART and ACCC completed within the agreed timeframes. Timely performance reporting to IPART facilitated reporting to customers within 6 months of the financial year.

Forecast service 2020-21 to 2024-25 (5 years)

In February 2019, IPART's review of cost shares[230] discussed activity codes that it defined as categories of cost, rather than activities. Stakeholder submissions to that IPART review concurred that reducing the number of activity codes would make things simpler.

For the 2021 regulatory period IPART asked that we consider removing this activity code and incorporating the associated costs across other activity codes in a transparent and cost-reflective way.

We asked our consultant (the CIE) to analyse the options for this activity code in the 2021 regulatory period. Our consultant concurred with IPART's suggestion and recommended we remove the Business and Governance Support (W10-02) cost code and

[230] IPART 2019, final report Rural Water Cost Shares: WaterNSW Water Administration Ministerial Corporation, pp. 62-63, February 2019. Available at

incorporate these costs into corporate overheads and allocated across the entire department.

Within this Price Proposal and associated documents we have included future costs for W10-02 within corporate overheads. This is discussed further below.

On-cost and overhead costs

On-cost rate

On costs are employee costs which are additional to salary (excluding overheads, which are discussed later in this section). On-costs are applied as a percentage mark-up on base salary. A singular on-cost rate is applied to DPIE and NRAR staff delivering water management services funded by WAMC prices, as those staff reside within the DPIE and equally incur the employment on-costs represented below.

The average annual on-cost rate over the 2021 regulatory period is 22.72%. The specific components that make up on-costs and their contribution to the total on-cost rate over the 2021 regulatory period are displayed in Table 76.

Table 83. Components of DPIE and NRAR on-cost rate (percentage mark-up on base salary)

DPIE and NRAR On-cost components	Average annual rate over the 2021 regulatory period (2021-22 to 2024-25)
Superannuation	10.75%
Payroll tax	5.45%
Leave loading	1.35%
Long service leave	2.84%
Workers compensation	1.00%
Higher duties	0.83%
Maternity leave	0.50%
Total	**22.72%**

The driver of increases in on-cost over the 2021 regulatory period is the superannuation rate increase in NSW (incrementally from 10% in 2021 to 11.5% in 2024-25) over the 2021 regulatory period as per the *Superannuation Guarantee (Administration) Act 1992* (Cth). The proposed on-cost rate represents a reduction from the rate applied by IPART in 2016 when setting WAMC prices (approximately 22.96% of base salary).

Overhead rate

Overhead costs are expenses that are indirect costs (not directly tied to production). Full cost recovery requires that an appropriate overhead component be recovered in the WAMC prices. Overhead costs are applied as a monetary rate per hour per FTE delivering monopoly services funded by WAMC prices. A single overhead rate is used for all DPIE

Water and NRAR staff as those staff reside within the DPIE and have access to the same overhead services.

DPIE and NRAR have compared this unit rate per full time equivalent staff members (FTE) hour method against overhead alternative cost allocation methods and consider the proposed approach the best balance between practicality and cost reflectivity.

The overhead rate for DPIE Water and NRAR for the delivery of water management services over the 2021 regulatory period is $14.83 per hour per FTE. This rate assumes that the average amount of hours accounted to each FTE is 1,553 per year and the rate is applied to the approximately 259 DPIE Water and NRAR FTE which undertake water management activities. The high level method of allocating overheads cost is to use the equation:

$$\frac{Total\ net\ overheads}{(Total\ DPIE\ Water\ and\ NRAR\ FTEs) * (average\ worked\ hours\ per\ FTE)}$$

In the 2016 WAMC price review, IPART and its consultant Synergies commented that our predecessor DPI Water's overhead costs were higher than other government departments of similar size. Further, it benchmarked DPI Water's 2016 determined overhead costs (using a PwC report on Commonwealth and State Government agencies) to be around 20% of operating costs, compared with 7% to 14% for its peer group.[231]

The proposed total DPIE Water/NRAR overheads over the 2021 regulatory period are approximately 12% of total DPIE Water/NRAR operating expenditure and is within the benchmark set by IPART and Synergies in 2016.

The proposed overhead rate of $14.83 ($2020-21) represents a 45% reduction from the rate used by IPART when it determined our prices in 2016, which was $24.35 in $2015-16 ($26.94 in $2020-21), so that our proposed total overhead cost has decreased by approximately 38.5% compared to the previous WAMC submission.

The overhead rate is made up of services that support the delivery of DPIE Water's and NRAR's monopoly services funded by WAMC prices and are similar to those used by IPART in determining WAMC prices in 2016. The three main components that make up aggregate net overheads are corporate service costs, accommodation costs and business and governance costs (formerly W10-02). These components and their relative contribution to overheads is broken down in the following table.

[231] Synergies, 2016, DPI Water Expenditure Review – Final Report Prepared for IPART, p9

Table 84. Components of DPIE and NRAR on-cost rate (percentage mark-up on base salary) ($2020-21, $000)

Component	Subcomponent	Calculation method	Rate (annual average)	Overhead cost (annual average)
Corporate services	Corporate services	% of Net Revenue Requirement	4.0%	$1,764
	Places Performance and Culture		1.4%	$617
	Legal and governance		0.9%	$397
	Strategy and Reform		0.3%	$132
	MLO		0.1%	$44
Accommodation cost	Workstation rate	$ rate per FTE	$8 per FTE p.a.	$2,064
W10-02 Business and Governance	Annual Information Returns and next WAMC pricing submission to IPART	Bottom up analysis of FTE and project costs are found in Table 3	2.75 FTE in DPIE and 1.6 FTE in NRAR, as well as $193 in project costs	$942
Aggregate net overhead costs				$5,960
Overhead rate				$14.83 per hour per FTE

DPIE has made an assessment of the sub components of corporate services overheads which are relevant to the DPIE Water group. The rates for the relevant sub components are calculated using the budget for each sub component, and are a percentage of total DPIE expenditure (excluding grants and subsidies). These rates were calculated based on the percentage of the DPIE cluster expenses related to shared service provision across government. This method is considered the most reasonable way of allocating corporate services overheads given the availability of data. Assessments using alternative methods of allocating corporate services overheads specifically to DPIE Water have been deemed less realistic in terms of cost reflectivity to date.

The workstation rate used to calculate the accommodation portion of overheads represents a weighted average of the typical average regional fixed workstations costs and the 'agile' workstation rate used in non-regional offices, based on the working location of DPIE Water and NRAR staff. The use of a workstation rate helps to overcome the typically fixed nature of accommodation costs by representing a per FTE rate, which is used for sub-tenancy agreements between agencies (i.e. non-profit). This rate does not cover costs of fit out, asset depreciation or make-good.

Following recommendations from a consultant review by CIE of WAMC cost allocations[232], DPIE and NRAR are proposing to remove the Water Consent Overheads (W08-99) and

[232] The Centre For International Economics, 2019, WAMC Activity Cost Allocation

Business and Governance Support (W10-02) WAMC activity codes, and to incorporate these costs into WAMC overheads. This decision is in line with IPART's recommendation in the 2019 Rural Water Cost Share review[233] to consider removing said activity codes, with the costs that would otherwise be allocated to these activities to be distributed via a cost allocation process to related activities. This is also consistent with WaterNSW's treatment of W08-99 and W10-02.

In an effort to guard against any double-recovery of overheads between NRAR and WaterNSW, there are no proposed costs, which would have been originally attributed to Water Consents Overheads (W08-99), being attributed to DPIE Water and NRAR overhead costs. As the majority of water consent transactions functions are proposed to be delivered by WaterNSW in the 2021 regulatory period (see W09-01 earlier in this Detailed Paper E), we propose that NRAR will not seek revenue for these overheads, and that instead they sit with WaterNSW.

DPIE and NRAR have allocated costs that would have been attributed to W10-02 toward overheads in the 2021 regulatory period. These proposed costs are attributed to the delivery of business and governance in the development of WAMC's Annual Information Returns to IPART each financial year over the 2021 regulatory period. Additionally, the bulk of proposed costs are attributed to the development of the next WAMC pricing submission. The proposed annual average revenue requirement over the 2021 regulatory period for business and governance services by DPIE Water and NRAR amount to an annual average of $0.942m, broken down further in the following table. The proposed average annual business and governance costs over the 2021 regulatory period ($0.942m) is slightly less than the average over the 2016 regulatory period ($0.983m).

Table 85. Proposed expenditure in business and governance (originally W10-02) costs which have been transferred into overheads ($2020-21, $000)

	2016 regulatory period				Extension	2021 regulatory period				
	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
IPART'S 2016 final report	1,937	1,925	1,880	1,851	1,824					
Net revenue requirement allocated to DPIE/NRAR*	0	0	0	0	0					
Actual DPIE Water operating expenditure	1,188	221	724	1,543						
Actual NRAR operating expenditure	0	0	0	377						
Actual externally funded capital expenditure*	80	15	0	0	0					
Proposed DPIE Water operating expenditure						365	395	956	563	563

[233] IPART, 2018, Rural Water Cost Shares – Draft Report, p53

	2016 regulatory period				Extension	2021 regulatory period				
	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
Proposed NRAR Water operating expenditure						195	248	495	549	549

*Note: According to IPART's recommendations to the Minister regarding reallocation of funding (March 2018) when NRAR was established, all W10-02 net revenue requirement is considered for licencing and therefore allocated to WaterNSW.

Accurate costs

Financial systems, including ring-fencing expenditure related to the monopoly services

In our 2015 submission to IPART we outlined the key elements of our accounting systems that allow us to track and ring-fence expenditure related to the monopoly service.[234]

> There are two key elements of the systems that track expenditures – the general ledger and the project or costing system. The general ledger tracks expenditures by the nature of the cost and the organisation structure; the project ledger tracks expenditures by the nature and funding source of the activities being undertaken. The project ledger together with its associated processes and controls is the core system that provides the tool to track expenditures on monopoly service activities.

Our accounting systems remain largely the same and continue to record costs through timesheets and purchase orders. Our designated activity managers are accountable for the financial performance of the project, including authorising expenditures and labour time allocated to the project. Each project is designated a code that identifies how it is funded.

The operating cost forecasts contained within our submission have been developed by the responsible activity managers and will be used to manage budgets throughout the 2021 regulatory period.

Annual and Special Information Returns to IPART

We prepare annual financial and performance reports on behalf of the Water Administration Ministerial Corporation (WAMC) on its price regulated monopoly service activities and submit these reports to IPART for publication.

The IPART Annual Information Request (AIR) has two components, the AIR spreadsheet holding expenditure information and the output measures report documenting actual performance against prescribed activity performance indicators.

In addition, we receive and respond to an annual water planning and management information request as part of the ACCC's Annual Water Monitoring Report. The information is publicly released via the ACCC website.

[234] DPI Water submission to IPART For prices from 1 July 2016 – on behalf of the Water Administration Ministerial Corporation, 11 September 2015

Output measures

IPART's 2016 final report on WAMC's maximum prices included a set of output measures against which we reported in each year of the regulatory period. Reports of our achievements against these measures can be found on IPART's website[235]

The output measures relate to a range of activities including surface water and groundwater quantity and quality monitoring, floodplain management plan development and compliance, customer and billing management.

We propose to maintain the majority of these output measures to ensure continuity in the time series of outputs and outcomes of the water management services provided, that are funded through WAMC prices. We have modified a small number of measures to more accurately reflect the current status of some projects and programs and to continue to strive to achieve stretch targets in our service delivery.

Our current and proposed measures and indicators are outlined in the table below

235 https://www.ipart.nsw.gov.au/Home/Industries/Water/Reviews/Rural-Water/Prices-for-WAMCs-water-management-services/29-Mar-2018-WAMC-Output-Measures-for-2016-17/Report-WAMC-Output-Measures-for-2016-17

Activity	Outputs	Measures and Indicators for the 2016 regulatory period	Measures and Indicators for the 2021 regulatory period
W01-05 Surface water ecological condition monitoring The provision of a surface water ecological condition monitoring system to assess the health of water sources; including design and application based on the River Condition Index for rivers, flood plains and wetlands.	Provision of the information for the six components of the River Condition Index: • Hydrology • Geomorphology • Riparian • Biota • Disturbance • Water quality.	*Output measure (OM5)* River condition index updated: Target: • an updated report completed each year, outlining the attributes updated and the proportion of the state/water sources covered.	*Output measure* River Styles, WaQI and the RCI updated Target: • areas covering 50% of surface water WSPs over five years. • WaQI extended to coastal WSP areas. • WaQI incorporated into the RCI. River and groundwater HEVAE extended to cover coastal WSP areas.
		Performance indicator Percentage of the state for which the River Condition Index (RCI) is completed in current year: Target: ○ 10% completed each year. ○ 100% of all RCI completed for the state by the end of 10 years.	*Performance indicator* River Styles, WaQI and RCI spatially updated in time for WSP evaluations. • Target: 100% completed on time River Styles, WaQI, RCI and HEVAE available on DPIE website. Technical reports for HEVAE and WaQI updates peer reviewed and published on DPIE website. • Target: 100% available on website

Activity	Outputs	Measures and Indicators for the 2016 regulatory period	Measures and Indicators for the 2021 regulatory period

W04-01 Surface water modelling
 	
The development, upgrade and application of surface water resource management models, for use in water planning and to assess performance in terms of statutory requirements, interstate agreements, regional water supply optimisation and third-party impacts on NSW stakeholders.
	Models developed for NSW River basins for:
	• Reporting on model conceptualisation and structure, processes, calibration, data sources for stakeholder information.
	• Long-term extraction limits.
	• Reliability and sequencing of water take.
	• Reliability and sequencing of water availability for entitlement types.
	• Time series and statistical analysis of river flows and floodplain/wetland watering.
	• On-farm water management.
	• Daily stream salinity.
	• Modelling to support water planning at a regional scale, including hydrologic/economic optimisation models for regional water strategies and metro water planning.
		Output measure (OM11)
		Number of models/analyses annually:
		• Target: 26/2,800
		
		Performance indicators
		The percentage of surface water share component in NSW covered by models subject to annual assessments:
		• Target: 95%
		  ○ Regulated river: 100%
		  ○ Unregulated river: 50%
			Output measure
			Number of models maintained annually:
			• Target: 26
			
			Performance indicators
			All models updated with an additional year of climate and hydrologic data each year
			An average of five models per year have a performance review
			• Target: five performance reviews and upgrade per year

Activity	Outputs	Measures and Indicators for the 2016 regulatory period	Measures and Indicators for the 2021 regulatory period
W04-02 Groundwater modelling The development and upgrade and use of groundwater resource water sharing and management applications, and for resource impact and balance assessments.	Regional groundwater models for groundwater sources covered by water management plans that are capable of providing: • Long-term sustainable extraction limits. • Details of aquifer interference. • Local water table details. • Water balance details. • Technical assessment of development proposals.	*Output measure (OM12)* Number of models/major aquifer analyses annually: • Target: 22/2,200	*Output measure* Number of models maintained annually: • Target: 22 Note: several may be merged but overall modelling coverage the same or larger
		Performance indicator Percentage of volume of groundwater share component subject to modelling assessment annually: • Target: 50%	*Performance indicator* All models updated with an additional year of climate and hydrologic data are subjected to a performance review to ensure they remain acceptably calibrated. • Target: 25% subject to performance review per year

Activity	Outputs	Measures and Indicators for the 2016 regulatory period	Measures and Indicators for the 2021 regulatory period

W04-03 Water resource accounting
 	
The development and update of water resource accounts and information on NSW water sources, for use by external stakeholders, and for internal water planning, management and evaluation processes.
	• General purpose water accounting reports (GPWAR).
	• Reporting and analysis of water resource accounting obligations.
	• Miscellaneous analysis and reporting.
		Output measure (OM13)
		Number of outputs for water accounting reports, reporting obligations and required ad hoc:
		• Target:
		  ○ 17 valleys
		  ○ 17 analysis reports
		  ○ 20 miscellaneous studies
			Output measure
			Annually:
			• Nine detailed GPWARs (11 Water Sources)
			• Approximately 50 miscellaneous analysis reports
			• Approximately 35 reports to meet state and federal compliance reporting obligations.
			• Environmental Water Register updated

		Performance indicators
		Percentage of entitlement by water type covered by the water accounting reports:
		• Target:
		  ○ Regulated river: 100%
		  ○ Unregulated river: 60%
		  ○ Groundwater: 95%
			Performance indicators
			GPWARs published within 12 months of the end of the water year.
			Respond to data analysis requests within prioritised timeframes.
			All accounting inputs into statutory report requirements provided annually.
			Environmental Water Register available online with a currency of 1 week
			• Target:
			  ○ Regulated river: 100%
			  ○ Unregulated river: 60%
			  ○ Groundwater: 95%

Activity	Outputs	Measures and Indicators for the 2016 regulatory period	Measures and Indicators for the 2021 regulatory period
W05-01 Systems operation and water availability management The preparation and implementation of the procedures and systems required to deliver the provisions of water management plans; and operational oversight to ensure plan compliance, the available water determinations and the assessment of compliance with long term extraction limits.	Implementation procedures and systems. Water availability determinations. WaterNSW operations compliance monitoring and annual reporting. Audit of Water Sharing Plan operations.	*Output measure (OM14)* Annual compliance review on WaterNSW work approval conditions. Available Water Determinations (AWD) issued: Target: • Regulated river: at least monthly AWD for all licence categories for all water sources • Unregulated river and groundwater: annual AWD for each water source	*Output measure* Implementation programs prepared and implemented progressively for all WSPs by the end of the 5-year regulatory period. Assessment of compliance with long term extraction limits as specified in WSPs. Target: • AWDs issued for all WSPs at the commencement of the water year. • For regulated rivers at least monthly AWD review assessments for all licence categories for water sources (until full allocation reached).
		Performance indicator Annual compliance review on WaterNSW submitted within 3 months of receiving input data from DPIE Water. Timeliness of AWDs: • Target: 100%	*Performance indicator* All completed implementation programs published. Annual reports published for all completed implementation programs Compliance with Long Term Average Annual Extraction Limit (LTAAEL) assessed annually in accordance with rules set out in respective WSPs AWDs published on our website within 1 week of being made. Timeliness of AWDs: • Target: 100%

Activity	Outputs	Measures and Indicators for the 2016 regulatory period	Measures and Indicators for the 2021 regulatory period
W05-03 Environmental water management The development and collaborative governance of environmental flow strategies and assessments; and the use of environmental water to achieve environmental outcomes.	Collaborative management of planned environmental water in regulated and unregulated rivers. Collaborative management of adaptive and held environmental water in regulated rivers. Measurement of the outcomes of environmental water delivery (in selected valley(s). Snowy River and Murray River increased flows. Cold Water Pollution management and science development.	*Output measure (OM16)* Delivery of Snowy and Snowy Mountain River increased flows. Conditions on major dam work approvals to implement environmental watering plans and to mitigate cold water pollution impacts on receiving waters. Monitor and evaluate water resource plans to determine environmental outcomes.	*Output measure* Provision of advice to Environmental Water Advisory Groups (EWAGs) to inform annual environmental watering priorities. Snowy license review implemented by 2021. Annual analysis and evaluation of the PPM operations. Implementation of better environmental water management in the northern Basin
		Performance indicator Percentage of occasions that Snowy and Snowy Mountain River daily flow target achieved: • Target: 98% of occasions.	*Performance indicator* Input provided to 5 EWAGs each year. Report on implementation published on DPIE website. Annual report on PPMs implementation published on DPIE website. Annual progress report published on the environmental water hub on the DPIE website.

Activity	Outputs	Measures and Indicators for the 2016 regulatory period	Measures and Indicators for the 2021 regulatory period
W05-04 Water plan performance assessment and evaluation. The assessment, audit and evaluation of the water management plans' appropriateness, efficiency and effectiveness in achieving economic, social and environmental objectives.	Performance and assessment strategy document. Identification of key knowledge gaps related to assessment of plan management rules. Publication of ecosystem response conceptual models and preliminary reports that describe ecology/flow management outcomes and provide adequate advice. Assessment of water plan amendment provisions. Assessment of level of plan achievement of: • Economic objectives • Environmental objectives • Social/cultural objectives Audit and assessment of the level of implementation of provisions in plans. Each WSP audited every 5 years to determine if its provisions are being actioned. Completion of evaluation reports for the WSPs as they expire.	*Output measure (OM17)* Number of valleys being assessed under the performance and assessment strategy: • Target: 24 Number of plan audits completed (5 yearly): • Target: 32 Number of plan evaluations completed: • Target: 17	*Output measure* WSP evaluation reports prepared. Target: • reports for 29 WSPs over 5 years (approximately 50% of the total WSPs)
		Performance indicators Percentage of plans incorporated into ecological performance and assessment programs: • Target: 100% Percentage of plans audited within statutory requirement: • Target: 100% Percentage plans evaluated that have come to term: • Target: 100%	*Performance indicators* Evaluations prepared prior to formal WSP reviews by NRC. • Target: 100% Assessments and evaluations published on DPIE website. • Target: 100%

Activity	Outputs	Measures and Indicators for the 2016 regulatory period	Measures and Indicators for the 2021 regulatory period
W06-01 Water plan development (coastal) The development, review, amendment, and extension or replacement of water management plans, and the consultation activities associated with developing these plans for the coastal water sources.	WSPs completed for all non-MDB water sources. Implementation of the WSP ecosystem performance and assessment strategy. Review and remake or extension of each WSP as it expires.	*Output measure (OM18)* • 5 WSPs will be reviewed and replaced/extended. • 7 WSPs will be reviewed. • 1 WSP will be reviewed and merged into an existing WSP.	*Output measure* WSPs reviewed and remade or extended for ten years as they expire in accordance with s 43A of the *Water Management Act 2000.* Target: • 11 WSPs over five years (42% of the total coastal WSPs) • Outstanding mid-year amendments are assessed and either resolved or scheduled to be addressed in the plan remake process
		Performance indicator Cumulative percentage of forecast WSPs reviewed, replaced/extended or merged: • Target: 100%	*Performance indicator* Requests made to the NRC to conduct a review of plans due for expiration by year seven of the plan. • Target: 100% Draft plans are available on DPIE website for public consultation for a minimum of 40 days • Target: 100% Factsheets outlining proposed changes to plans and issues raised in submissions are available during consultation • Target: 100% Final plans are available on the NSW legislation website. • Target: 100%

Activity	Outputs	Measures and Indicators for the 2016 regulatory period	Measures and Indicators for the 2021 regulatory period
W06-02 Water plan development (inland) The development, review, amendment, and extension or replacement of water management plans; the development of additional planning instruments to comply with the Commonwealth Water Act; and the consultation activities associated with developing these plans for the inland water sources.	Water Resource Plans development for MDB water sources. Implementation of the WSP Ecosystem Performance and Assessment Strategy. Each WSP audited every 5 years to determine its provisions are being actioned. Completion of evaluation reports for the WSPs as they expire. Remake or extension of each WSP as it expires. WRP assessment tasks.	*Output measure (OM19)* • 8 WSPs will be reviewed and replaced/extended. • 2 WSPs will be reviewed. • 3 WSPs will be reviewed and merged into an existing WSP. • 22 WRPs will be completed.	*Output measure* WSPs reviewed and remade or extended for ten years as they expire in accordance with s 43A of the Act. Target: • 18 WSPs over 5 years (56% of the total inland WSPs) • Outstanding mid-year amendments are assessed and either resolved or scheduled to be addressed in the plan remake process. • Five WSPs will be audited in accordance with s 44 of the Act

Activity	Outputs	Measures and Indicators for the 2016 regulatory period	Measures and Indicators for the 2021 regulatory period
		Performance indicators Cumulative percentage of forecast WSPs reviewed, replaced/extended or merged: • Target: 100% Cumulative percentage of forecast WRPs completed: • Target: 100%	*Performance indicators* Requests made to the NRC to conduct a review of plans due for expiration by year 7 of the plan. • Target: 100% Draft changes to plans are available on DPIE website for public consultation for a minimum of 40 days • Target: 100% Undertake targeted and public consultation for each WSP that is being amended or remade after the NRC review • Target: 100% Factsheets outlining proposed changes to plans and issues raised in submissions are available during consultation • Target: 100% Final plans are available on the NSW legislation website. • Target: 100%

Activity	Outputs	Measures and Indicators for the 2016 regulatory period	Measures and Indicators for the 2021 regulatory period
W06-03 Floodplain management plan development The development, review, amendment and extension or replacement of Floodplain Management Plans in collaboration with DPIE Environment Energy and Science (formerly OEH.)	Floodplain Management Plan (FMP) development. Remake of each FPH as it expires.	*Output measure (OM20)* Number of FMP completed or remade: • 5 new FMPs will be developed Progress in implementing floodplain harvesting licensing	*Output measure* Prioritisation of replacement of existing Water Act 1912 FMPs Develop three priority *Water Management Act 200* compliant FMPs
		Performance indicator • Cumulative percentage of forecast FMPs completed: • Target: 100%	*Performance indicator* Publishing prioritisation of Water Act 1912 FPHs for replacement by *Water Management Act 200* compliant plans Complete technical investigations of floodway network, flood behaviour and environmental, cultural, socio-economic and existing floodplain assets for three floodplains Development of draft FMPs Public exhibition of draft FMPs • Target: Three
	Drainage Management Plan (DMP) development. Remake of each DMP as it expires.	*Output measure (OM21*) Number of DMPs completed or remade: • 0 new DMPs will be developed.	*Output measure* Completion of the drainage management framework (2020-21) Development and commencement of seven drainage management plans

Activity	Outputs	Measures and Indicators for the 2016 regulatory period	Measures and Indicators for the 2021 regulatory period
W06-04 Drainage plan development. The development, review, amendment, and extension or replacement of Drainage Management Plans, to address water quality problems associated with drainage systems.		*Performance indicator* • N/A	*Performance indicator* Approved drainage management framework communicated across Government and to key stakeholders Meetings held between other Government agencies, local government, industry groups and landholders Reduced regulatory burden - by 'switching off' approvals required under other legislation once an agreed plan is made Drainage management plans published on the legislation NSW website. • Target: Seven

Activity	Outputs	Measures and Indicators for the 2016 regulatory period	Measures and Indicators for the 2021 regulatory period
W06-05 Regional planning and management strategies The development, evaluation and review of regional water strategies, metropolitan water plans and other planning instruments, including the associated stakeholder engagement.	Development of regional water strategies, which integrate and set priorities for related special-purpose plans (for example water sharing plans). Evaluation and ongoing adaptive management of the metropolitan water plans for greater Sydney and the lower Hunter. Development, assessment and review of planning instruments.	*Output measure (OM22)* • 2 regional water strategies (metropolitan water plans) will be reviewed. • 6 new regional water strategies will be completed.	*Output measure* **Regional** Regional water strategies in place Regional Water Strategy Action Plans developed. Regional Strategies regularly reviewed Forward program for implementation, monitoring, evaluation and review established **Metropolitan** Greater Sydney Water Strategy is completed in 2021, including: -a water efficiency and conservation framework -a performance and monitoring framework Lower Hunter Water Security Plan review is complete by end of 2021

Activity	Outputs	Measures and Indicators for the 2016 regulatory period	Measures and Indicators for the 2021 regulatory period
		Performance indicator Cumulative percentage of forecast metropolitan water plans being reviewed: • Target: 100% Cumulative percentage of forecast regional water strategies completed: • Target: 100%	*Performance indicator* **Regional** 4 of 12 regional water strategies in place by June 2021 9 of 12 regional water strategies in place by December 2021 12 of 12 regional water strategies in place by 2022 Action Plan published within 3 months of each Regional Water Strategy being finalised Action Plan reported against annually Three regional water strategies updated annually, and associated Action Plan updated Forward program for implementation and MER and public reporting published by June 2021 **Metropolitan** Greater Sydney Water Strategy is complete 100% by end of 2021 Lower Hunter Water Security Plan review is 100% complete by end of 2021
W06-06 Development of water planning and regulatory framework The development of the operational and regulatory	Developed, amended and refined regulatory instruments and policies putting in place an improved regulatory	*Output measure (OM23)* Number of regulatory instruments and policies developed or amended according to an annual forecast: • Target: forecast on an annual basis.	*Output measure* Regulatory policies and instruments are reviewed and/or developed pursuant to the priorities identified and set by the Department from time to time.

Activity	Outputs	Measures and Indicators for the 2016 regulatory period	Measures and Indicators for the 2021 regulatory period
requirements and rules for water access.	framework for water management planning. Requirements for issuing new water licences clearly defined and understood by users. Requirements for equitable water take defined and improved.	*Performance indicator* Percentage of annual forecast frameworks and regulatory instruments delivered according to schedule: • Target: 100%.	*Performance indicator* Timely publication of documents including where relevant: ○ discussion papers ○ draft policies/instruments ○ final policies/instruments.
W06-07 Cross border and national commitments The development of interstate water sharing arrangements and the implementation of operational programs to meet national and interstate commitments.	Development and implementation of operational programs to meet NWI commitments. Biennial assessments on progress with implementing NWI agreements on water reform agenda. Participation in relevant interstate committees progressing NWI and COAG water reform initiatives. Development of interstate water sharing arrangements through MDB and Border Rivers agreements, and Snowy and ACT arrangements.	*Output measure (OM24)* Full participation in interstate processes to manage water. *Performance indicator* Compliance with key interstate agreements: • Target: 100%	*Output measure* Full participation in interstate processes to manage water. *Performance indicator* Compliance with key interstate agreements (for example, BSM2030): • Target: 100%
W07-01 Water management works The undertaking of water management works to reduce the impacts arising from water	Water management works to mitigate resource impacts: • Riverbank protection • Salt interception schemes.	*Output measure (OM25)* High priority areas of erosion identified and remediated: • Target: 90%. Maintain salinity (EC) credits for NSW.	*Output measure* High priority areas of erosion identified and remediated: • Target: 90%. Maintain salinity (EC) credits for NSW.

Activity	Outputs	Measures and Indicators for the 2016 regulatory period	Measures and Indicators for the 2021 regulatory period
use or remediate water courses.		*Performance indicator* Channel output capacity at Tumut maintained at 9,200ML/day.	*Performance indicator* Channel output capacity at Tumut maintained at 9,200ML/day. SIS operated and maintained in accordance with the Buronga Operations and Maintenance Manual
W08-02 Consents management and licence conversion The transcribing of water sharing provisions into licence conditions and the conversion of licences to the Water Management Act.	Licences cleansed for conversion to WMA. Volumetric licence conversions. Water sharing provisions transcribed into licence conditions. Development of discretionary conditions.	*Output measure (OM27)* Annual number of licences recorded on the public register plus number of access licence and approvals with updated conditions: • Target: All licences recorded on public register – the number varies from year to year.	*Performance indicator* Conditions are developed for imposition on licences and approvals after the commencement, review or amendment of a water management plan; to give effect to an adaptive environmental water outcome and to give effect to conditions required by the Water Management Act 200 and associated Regulations.
		Performance indicator Percentage of access licences and changes to licence details recorded on the public register within two months of implementation or update of sharing plan: • Target: 90%	*Performance indicator* Conditions uploaded into the register within 6 months of the event requiring. • Target: 100%

Activity	Outputs	Measures and Indicators for the 2016 regulatory period	Measures and Indicators for the 2021 regulatory period
W08-03 Compliance management The on-ground and remote monitoring activities (including investigations and taking statutory actions) to ensure compliance with legislation, including licence and approval conditions.	Compliance education, monitoring and breach management/ enforcement/ investigation.	*Output measure (OM28)* Number of breach reports received: • Target: 600	*Output measures* Publishing compliance activity by water sharing plan on a monthly basis. Continue to publish Annual Progress Reports
		Performance indicators Percentage of non-basic landholder rights approvals audited each year: 2% Percentage of properties audited that are in compliance with licence and approval conditions (excluding those audited as part of investigating an alleged breach): 90% Percentage of breach reports risk assessed within 14 days of receipt: 90% Percentage of all cases finalised within 6 months: 70%	*Performance indicators* Percentage of water licence holders audited and / or inspected each year. 4.5% 90% of incoming public reports will be assessed and prioritised within 5 days working days of receipt. 90% of public informants will be contacted (by letter or a telephone call) within 15 working days of lodging an alleged breach with NRAR. 90% of high priority cases will be assigned to an investigator within 15 working days of receipt.

Activity	Outputs	Measures and Indicators for the 2016 regulatory period	Measures and Indicators for the 2021 regulatory period
W09-01 Water consents transactions Transactions undertaken on a fee for service basis; including dealings, assessments, changes to conditions and new applications for water licences and approvals.	Water consents transactions processed. Licences in compliance with regulatory requirements.	*Output measure (OM30)* Number of applications processed: • Target: Process all applications received	*Output measure* Water Access Licence – time taken to determine applications Works and Use Approvals – time taken to determine applications Approvals Extensions – time taken to determine applications
		Performance indicators • Percentage of applications for licence dealings assignment of • shares (71Q) processed within 20 days: 90% • Percentage of applications for new access licences processed within 40 days: 80% • Percentage of applications for water management work and use approvals processed within 60 days: 80% • Percentage of applications to extend a water management work approval processed within 20 days: 90% • Percentage of applications for an approval for a bore for domestic and stock rights processed within 10 days: 90% • Percentage of legal searches completed within the preferred processing time frame: 95%	*Performance indicators* Water Access Licence – 80% applications determined within 45 days Works and Use Approvals – 80% applications determined within 65 days Approvals Extensions – 80% applications determined within 25 days

Activity	Outputs	Measures and Indicators for the 2016 regulatory period	Measures and Indicators for the 2021 regulatory period
W10-01 Customer management All customer liaison activities; including responding to calls to licensing and compliance information lines; and producing communication and education materials such as website content and participation in customer forums.	Timely responses to customer enquiries.	*Output measure (OM31)* Number of enquiries: • Target: 10,000	*Output measure* Percentage of enquiries through nrar.enquiries@nrar.nsw.gov.au
		Performance indicator Percentage of enquiries directly responded to at the time of the call/email: • Target: Maintain or improve on 90%	*Performance indicator* 90 % of enquiries through nrar.enquiries@nrar.nsw.gov.au responded to within 24 hours.
W10-02 Business governance and support The business systems and processes that support organisation-wide activities; including asset management, annual reporting and pricing submissions to IPART.	Business systems, processes and administration for commercial operation of government monopoly water services.	*Output measure (OM32)* • Annual reporting to IPART and ACCC. • Annual performance reporting to customers.	Activity code moved to overheads
		Performance indicators • Annual reporting within agreed timeline from end of financial year: • Reporting to IPART and ACCC: 4 months. • Reporting to customers: 6 months.	