

# State Water Management Outcomes Plan

## Chapter 1 Preliminary

### Part 1 Role of the State Water Management Outcomes Plan

The aim of the *Water Management Act 2000* (the Act) is to provide for the sustainable and integrated management of the water sources of the State for the benefit of both present and future generations. The Act provides for the establishment of this State Water Management Outcomes Plan (SWMOP) to set out the over-arching policy context, targets and strategic outcomes for the development, conservation, management and control of the State's water sources.

This SWMOP is the first of its kind and will have effect for five years from the date of its gazettal. It will then be reviewed and updated.

This SWMOP promotes the objects of the Act and its water management principles, and seeks to give effect to the NSW Government's salinity strategies. It is also consistent with government legislative obligations, Commonwealth international agreements and government policy. It has had regard to relevant environmental, social and economic considerations, and the results of monitoring and assessment programs.

The SWMOP explicitly provides for the protection and enhancement of the environmental services provided by aquatic ecosystems, while delivering a stronger and clearer framework for the use of water to meet human needs, including more secure access licences. It details the Government's commitment to effectively manage the important linkages between environment, human health, prosperous communities and profitable industries.

This SWMOP provides clear direction for all water management in New South Wales including (but not limited to) the creation of management plans addressing:

- water sharing,
- water use,
- drainage management,
- floodplain management,
- controlled activities and aquifer interference, and
- environmental protection.

In particular, it seeks to ensure that the NSW Government's Interim (Water Quality and River Flow) Environmental Objectives for NSW waters are explicitly addressed in future water resource management and action.

### Part 2 Content of this SWMOP

Over the last ten years or so, a wide range of policies and inter-government agreements have been developed which set in place principles, standards and processes to ensure better management of the State's water and related resources, promote rehabilitation of the State's environmental and social assets, and realise higher returns on each megalitre of water extracted. This SWMOP is grounded in these existing policies but, consistent with the requirements of the Act, it establishes short term targets that will drive the intent of these policies in more specific and tangible ways.

This SWMOP therefore sets both long term outcomes and 5 year management targets for water management. These are based on a principle of continuous improvement in the water-dependent environment and in the social and economic benefits the community receives from its water sources and their dependent ecosystems.

To ensure improvement, management objectives and targets must be responsive and adaptive to improved knowledge and changing social and economic circumstances and values. It is therefore appropriate that the management planning is staged over five to ten year cycles. The SWMOP will therefore be reviewed in five years allowing the subsequent generation and review of management plans to respond to any new directions or priorities.

The outcomes and targets identified in this SWMOP do not attempt to be exhaustive. Instead the focus is on those outcomes which reflect the highest priorities and/or are good indicators of overall improvement. Similarly the targets selected are those which are likely to achieve the greatest gains towards the outcomes in the short term. The targets do not therefore seek to establish an ultimate position or standard but rather to take a significant but practical step in the process of continuous improvement. Such steps will involve consultation with the community concerned and assessment of social and economic impacts.

In a few cases this SWMOP sets what might be termed “enabling” targets. These typically require identification and assessment to be completed within the five years as an essential prerequisite for determining a more specific management outcome. This recognises that in these cases, action cannot be taken in the short term without such information. Where the information is locally available then action should commence earlier.

The outcomes and targets span regulated river, unregulated river, groundwater, estuarine and coastal water sources. They are consistent with the Objects and provisions of Section 3 of the Act. In particular they:

- are in accord with the principles of ecologically sustainable development and will protect and/or restore water sources and their dependent ecosystems,
- seek to prevent declines and make improvements in the ecological health and productivity of water sources,
- promote recovery of threatened species and communities and the management of key threatening processes listed under the *Fisheries Management Act 1994* and the *Threatened Species Conservation Act 1995* (arising from the UN Biodiversity Convention),
- seek to protect and restore habitats, water sources, floodplains and dependent ecosystems,
- seek to protect and restore wetlands listed under the Ramsar Convention, and wetlands of national significance listed in the Directory of Australian Wetlands,
- seek to protect migratory waterbirds listed under the Convention on Migratory Species, and JAMBA and CAMBA agreements,
- seek to protect the Aboriginal customary and contemporary ties to water,
- seek to halt or reverse the decline in key water quality parameters,
- will foster social and economic benefits to the State,
- will foster benefits to Aboriginal people in relation to their spiritual, social customary and economic use of land and water,
- provide greater certainty and flexibility in the exercise of access rights,
- encourage water to move to higher value use,
- encourage water to be managed and used efficiently, and

- optimise the economic value of water diverted from water sources and encourage best practice in its use.

## Part 3 Water Quality and River Flow Objectives

In 1999, as part of its Water Reform package, the NSW Government worked closely with the community to develop Interim Environmental Objectives for Water Quality (WQOs), and River Flow (RFOs) for each catchment in New South Wales. Longer term objectives have been set for some individual catchments through Healthy Rivers Commission inquiries.

The Interim Environmental Objectives identify the broad goals to achieve long-term river health, maintain biodiversity and secure sustainable water sources for communities and industries dependent on water of a certain quality. Water quality objectives are based on measurable environmental values that provide the appropriate water quality for environmental and human-related needs. River flow objectives aim to improve and maintain river health by recognising the importance of natural river flow patterns in managing the riverine water sources.

The Interim Environmental Objectives are designed to support a range of values identified by the community, including:

### Water Quality Objectives (WQOs)

WQO 1	Aquatic ecosystems
WQO 2	Visual amenity
WQO 3	Secondary contact recreation
WQO 4	Primary contact recreation
WQO 5	Livestock water supply
WQO 6	Irrigation water supply
WQO 7	Homestead water supply
WQO 8	Drinking water at point of supply-Disinfection only
WQO 9	Drinking water at point of supply-Clarification and disinfection
WQO 10	Drinking water at point of supply-Groundwater
WQO 11	Aquatic foods (cooked)

### River Flow Objectives (RFOs)

RFO 1	Protect pools in dry times
RFO 2	Protect natural low flows
RFO 3	Protect important rises in water levels
RFO 4	Maintain wetland and floodplain inundation
RFO 5	Mimic natural drying in temporary waterways
RFO 6	Maintain natural flow variability
RFO 7	Maintain natural rates of change in water levels
RFO 8	Manage groundwater for ecosystems
RFO 9	Minimise effects of weirs and other structures
RFO 10	Minimise effects of dams on water quality
RFO 11	Make water available for unforeseen events
RFO 12	Maintain or rehabilitate estuarine processes and habitats

The *Water Management Act 2000* requires the SWMOP to be consistent with these Objectives, and states that all management plans developed under the Act should be consistent with government policy in relation to environmental objectives for water quality and river flow.

The Interim Environmental Objectives for Water Quality and River Flows should therefore be considered when assessing progress against the long term objectives and 5 year management targets

set in the SWMOP. In cases where longer term objectives have been set through the Healthy Rivers Commission, these individual objectives should be considered.

## **Part 4 Responsibilities for the Outcomes**

All management plans developed under the provisions of the *Water Management Act 2000* will be framed to be consistent with those targets that are relevant to a particular plan, and to the longer term outcomes, and should indicate the degree to which they will contribute to them. The degree to which each water management area should contribute to the achievement of a State target will depend upon:

- the degree to which the target is relevant to the area,
- the social and economic impacts,
- the relative management priorities, risks and costs, and
- the relative environmental importance.

In assessing the adequacy of any management plans prior to endorsement, the Minister will need to, in consultation with the Minister for the Environment, take into account the degree to which the management plan has addressed the relevant outcomes and targets.

Some water sources may already be better than a particular target while others which are currently below target, may seek to go measurably beyond it within the 5 years. Some water sources that are significantly below a SWMOP target, may achieve a positive result in moving towards the target but, in falling short, will need to seek further improvement in future planning cycles. In all cases, such action would be consistent with the principle of continuous improvement and, subject to appropriate cost for benefit considerations, will be supported as being consistent with the SWMOP.

Section 9 of the Act requires that all functions exercised under that Act must be in accordance with this SWMOP. This is a wide-ranging requirement and will affect much of the day-to-day work of the Department of Land and Water Conservation (DLWC) and others exercising functions on its behalf. For example, care must be taken to ensure that licences and approvals do not detract from the achievement of the SWMOP outcomes and targets, but as far as possible, positively contribute towards their achievement.

## **Part 5 Impact of the SWMOP**

This SWMOP is expected to:

- improve the quality of water sources and the health, productivity and diversity of their dependent ecosystems,
- increase the economic value of water extracted from water sources and used, and
- protect the long term interests of regional communities.

The implementation of management plans may result in transitional impacts and the Government may provide guidance on arrangements and assistance to help affected parties overcome any short term problems.

## **Part 6 Monitoring and reporting**

Monitoring compliance with the requirements of management plans, benchmarking and assessing changes in the state of our water ecosystems and in the economic and social factors influenced by water management actions, is clearly an essential component of the cyclic management planning established by the *Water Management Act 2000*.

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It is therefore required that water management provides for the collection of information which will allow:

- assessment of performance against the management targets,
- assessment of social and economic impacts, and
- benchmarking of current conditions and evaluation of future trends in respect to the long term outcomes.

A performance assessment strategy covering these three aspects will be established within six months of the gazettal of this SWMOP.

Management plans developed under the *Water Management Act 2000* should provide for the monitoring of performance of relevant local management targets and this information will be collated and reviewed to assess performance against the SWMOP targets. The Minister may provide guidance on objectives, strategies and performance indicators for this purpose (as required in a management plan under Section 35(1) of the Act). The monitoring and assessment of the long term outcomes, however, will be designed and undertaken through statewide programs and targeted local activities which ensure that sampling and analysis is carried out at a scale and density appropriate to deliver meaningful and cost effective information.

Several programs are already in place to monitor the physical, chemical and biological status and response of aquatic systems (eg. Integrated Monitoring of Environmental Flow (IMEF), fish, wetlands and waterbird surveys). Other programs provide social and economic data relevant to the analysis of social and economic responses to water management. Performance monitoring for this SWMOP will build, as far as possible, on these existing programs.

## **Chapter 2 Long term water outcomes and 5 year management targets**

### **Part 1 Long term outcomes for the environment, society and economic prosperity**

#### **Division 1 Environmental outcomes - Healthy, productive and diverse water ecosystems**

- (1) Primary ecological production maintained or improved, including:
  - (a) carbon cycling,
  - (b) production to respiration ratios, and
  - (c) carbon and food fluxes between rivers and floodplains, estuaries and coastal waters.
- (2) Degraded wetlands improved and those listed as wetlands of national or international significance protected and restored.
- (3) The diversity and abundance of native aquatic animals and plants protected and restored by addressing the cumulative impacts of water management on their habitats and life cycles. The status of aquatic communities to be informed through but not limited to:
  - (a) the abundance and diversity of invertebrate populations improved,
  - (b) native fish populations within their native range increased and the ratio of alien to native fish species reduced,

- (c) colonial waterbird breeding opportunities increased,
- (d) estuarine prawn populations improved, and
- (e) the status of threatened species populations and ecological communities improved.

## Division 2 Social outcomes - the community's basic needs and values sustained

- (1) Water supplies necessary to maintain or improve the health and well being of rural and urban communities assured.
- (2) Aboriginal traditional and contemporary dependencies on, and cultural association with water protected and improved. In particular:
  - (a) economic access to water increased,
  - (b) cultural and customary associations with water protected,
  - (c) opportunities for learning and information improved, and
  - (d) capacity for Aboriginal people's involvement in water management increased.
- (3) Incidents of blue green algal blooms affecting essential water supplies and recreational values reduced.

## Division 3 Economic outcomes - The economic value of water improved

- (1) The productive capacity of land and water maintained. In particular:
  - (a) rate of land degradation associated with irrigation activities reduced, and
  - (b) rate of increase in river salinity levels reduced.
- (2) Water use efficiency increased.
- (3) The economic efficiency of investment in water industries improved.

## Part 2 Five year water management targets

### Division 1 Limits on extractions

Five year target	Why is it needed?	What are the expected outcomes?
<p><b>Target 1</b> Limits on the total volume of water that can be extracted established, such that:</p> <p><b>Target 1a</b> Extractions in Murray-Darling Basin's regulated rivers limited to the level of the long term average annual extraction below the Murray-Darling Basin Ministerial Council (MDBMC) Cap which results from the long term impact of the environmental water rules</p> <p><b>Target 1b.</b> Extractions in Murray-Darling Basin's unregulated rivers limited to the MDBMC Cap level</p>	<ul style="list-style-type: none"> <li>• To preserve residual flows (RFO 2,3,4,6)</li> <li>• To maintain groundwater levels (RFO 8)</li> <li>• To maintain wetland inundation events (RFO 4)</li> <li>• To prevent the incidents of blue green algal blooms increasing</li> <li>• To protect water supply reliability</li> <li>• To protect downstream water supplies</li> <li>• To enable water to change ownership and to change location at which water can be extracted</li> </ul>	<ul style="list-style-type: none"> <li>• Primary ecological production maintained or improved</li> <li>• Degraded wetlands improved and significant wetlands protected and restored</li> <li>• Diversity and abundance of native aquatic animals and plants protected and restored</li> <li>• Assured water supplies to maintain or improve the health and wellbeing of rural and urban communities</li> <li>• Aboriginal traditional and contemporary dependencies on, and cultural association with water protected and improved</li> </ul>

<p><b>Target 1c</b> Long term average annual extraction limits which are ecologically sustainable, and which minimise downstream impacts, established in all coastal water sources</p> <p><b>Target 1d</b> Floodplain water harvesting extractions licensed and capped at 1993/94 levels in the Murray-Darling Basin, and at levels consistent with the long term average annual extraction limit in other water sources</p> <p><b>Target 1e</b> The long term average annual extractions for groundwater limited (or being phased down) to an ecologically sustainable level (the Sustainable Yield) as determined by detailed assessment of each groundwater source and consultation with the relevant management committee. In the absence of such an assessment, the following to apply: 100 percent of average annual recharge for a groundwater source where there is no significant ecosystem dependency; 70 percent of average annual recharge where there is significant ecosystem dependency</p> <p><b>Target 1f</b> Rules for adjustments to future available water determinations in the event that the extraction limits are exceeded, clearly prescribed in consultation with the relevant management committee, and acted upon</p>		<ul style="list-style-type: none"> <li>• Incidents of problem blue green algal blooms affecting essential water supplies and recreational values reduced</li> <li>• Water use efficiency increased</li> <li>• The economic efficiency of investment in water industries improved</li> </ul>
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## Division 2 Environmental management

Five year target	Why is it needed?	What are the expected outcomes?
<p><b>Target 2</b> All management plans incorporating mechanisms to protect and restore aquatic habitats, and the diversity and abundance of native animals and plants, with particular reference to threatened species, populations and communities and key threatening processes</p>	<ul style="list-style-type: none"> <li>• To protect or restore essential habitats</li> <li>• To protect or restore critical flows (RFO 1,2,3,4,5)</li> <li>• To protect or restore flow variability (RFO 6)</li> </ul>	<ul style="list-style-type: none"> <li>• Primary ecological production maintained or improved</li> <li>• Degraded wetlands improved and significant wetlands protected and restored</li> <li>• Diversity and abundance of native aquatic animals and plants protected and restored</li> </ul>
<p><b>Target 3</b> A network of aquatic reference sites based on</p>	<ul style="list-style-type: none"> <li>• To provide benchmarks for habitats and ecological -flow response assessment</li> </ul>	<ul style="list-style-type: none"> <li>• Primary ecological production maintained or improved</li> </ul>

<p>biogeographical regions identified, and the monitoring and management implications assessed</p>		<ul style="list-style-type: none"> <li>• Degraded wetlands improved and significant wetlands protected and restored</li> <li>• Diversity and abundance of native aquatic animals and plants protected and restored</li> </ul>
<p><b>Target 4</b> Environmental water rules and extraction limits established in regulated and unregulated rivers subject to a gazetted water sharing plan such that:</p> <p><b>Target 4a</b> Wherever the frequency of “end of system” daily flows would be less than 60 percent of the predevelopment level without environmental water rules or extraction limits, the flows increased to 60 percent of predevelopment levels or increased by at least 10 percent of the predevelopment frequency</p> <p><b>Target 4b</b> Frequency of “end of system” daily very low flows (as defined by local field investigation) protected or restored to predevelopment levels to maintain or restore their critical ecological functions, drought refuges and habitat connectivity. In the absence of such local assessments, protection extended up to at least the predevelopment 95th percentile</p> <p><b>Target 4c</b> The channel capacity of all lower river and effluent creek systems used for the delivery of regulated water determined. Subject to reasonable socio-economic impacts, limits on daily supply volumes established for effluent systems such that they do not exceed 80 percent of the channel capacity for more than 10 percent of days in each month of each year. Where daily supply volumes are currently substantially less than channel capacity, alternative limits established to reduce the impact of unseasonal flows arising from future access licence dealings</p> <p><b>Target 4d</b> A proportion of the natural drying phases reinstated in the core areas of</p>	<ul style="list-style-type: none"> <li>• To restore flow variability (RFO 6)</li> <li>• To restore high flow events (RFO 3)</li> <li>• To restore frequency and extent of wetland wetting and drying (RFO 4,5)</li> <li>• To improve base (dry period) flows (RFO 1,2)</li> <li>• To improve water quality</li> <li>• To reduce the incidents of blue green algal blooms</li> <li>• To increase the frequency of organic (food) inputs from instream benches and bars, riverbanks and floodplains</li> </ul>	<ul style="list-style-type: none"> <li>• Primary ecological production maintained or improved</li> <li>• Degraded wetlands improved and significant wetlands protected and restored</li> <li>• Diversity and abundance of native aquatic animals and plants protected and restored</li> <li>• Assured water supplies to maintain or improve the health and wellbeing of rural and urban communities</li> <li>• Aboriginal traditional and contemporary dependencies on, and cultural association with water protected and improved</li> <li>• Incidents of problem blue green algal blooms affecting essential water supplies and recreational values reduced</li> </ul>

terminal wetlands		
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### Division 3 Clear and legal access entitlements

Five year target	Why is it needed?	What are the expected outcomes?
<p><b>Target 5</b> Access rights for water access licensees clearly and legally specified in terms of share and extraction components</p>	<ul style="list-style-type: none"> <li>To clarify and secure licensed access to water</li> <li>To enable water markets to operate effectively</li> <li>To ensure extraction limits have effect</li> </ul>	<ul style="list-style-type: none"> <li>Water use efficiency increased</li> <li>The economic efficiency of investment in water industries improved</li> </ul>
<p><b>Target 6</b> The total volume of share components specified on access licences to be more closely matched over the term of a water sharing plan to the extraction limit of the plan, such that:</p> <p><b>Target 6a</b> For groundwater sources, the total volume of water specified on access licences reduced over the term of a water sharing plan to no more than 125 percent of the Sustainable Yield</p> <p><b>Target 6b</b> For surface water sources, a pathway for reducing the share components to 200 percent of the long term average annual extraction limit to be established not later than the end of the term of the SWMOP</p>	<ul style="list-style-type: none"> <li>To prevent unsustainable growth in water extractions</li> <li>To ensure the licensed rights better reflect actual availability of water.</li> </ul>	<ul style="list-style-type: none"> <li>Water use efficiency increased</li> <li>The economic efficiency of investment in water industries improved</li> </ul>
<p><b>Target 7</b> Mechanisms in place to enable Aboriginal communities to gain an increased share of the benefits of the water economy</p>	<ul style="list-style-type: none"> <li>To improve the economic wellbeing of the Aboriginal people</li> <li>To provide economic opportunities for Aboriginal communities</li> </ul>	<ul style="list-style-type: none"> <li>Aboriginal traditional and contemporary dependencies on, and cultural association with water protected and improved</li> </ul>
<p><b>Target 8</b> Daily extraction components specified and tradeable, subject to metering, reporting and compliance, for at least 50 percent of unregulated river access licences and for 80 percent of stressed unregulated rivers</p>	<ul style="list-style-type: none"> <li>To clarify and protect licensed access to water</li> <li>To protect downstream water supply</li> <li>To protect the flow regime (RFOs 1,2,3,6)</li> </ul>	<ul style="list-style-type: none"> <li>Primary ecological production maintained or improved</li> <li>Diversity and abundance of native aquatic animals and plants protected and restored</li> <li>Assured water supplies to maintain or improve the health and wellbeing of rural and urban communities</li> <li>Water use efficiency increased</li> <li>The economic efficiency of investment in water industries improved</li> </ul>
<p><b>Target 9</b> Supplementary water for</p>	<ul style="list-style-type: none"> <li>To clarify licensed access to water</li> </ul>	<ul style="list-style-type: none"> <li>Primary ecological production maintained or improved</li> </ul>

<p>regulated rivers clearly specified and volumetrically licensed such that:</p> <p><b>Target 9a</b> Flow thresholds for declaration of supplementary water access, which take into account environmental water needs, clearly specified</p> <p><b>Target 9b</b> Annual limits on supplementary water extractions, consistent with the long term average annual extraction limits, established in all regulated river water sources</p> <p><b>Target 9c</b> Rules for sharing between supplementary water access licence holders made explicit</p> <p><b>Target 9d</b> Supplementary access licence dealings made possible in regulated river water sources, subject to extraction limits and environmental assessment and Aboriginal spiritual and cultural constraints</p>	<ul style="list-style-type: none"> <li>• To enable extraction limits to have effect</li> <li>• To ensure that high flows are effectively managed</li> </ul>	<ul style="list-style-type: none"> <li>• Degraded wetlands improved and significant wetlands protected and restored</li> <li>• Diversity and abundance of native aquatic animals and plants protected and restored</li> <li>• Water use efficiency increased</li> <li>• The economic efficiency of investment in water industries improved</li> </ul>
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## Division 4 Groundwater dependencies

Five year target	Why is it needed?	What are the expected outcomes?
<p><b>Target 10</b> Degree of connectivity between aquifers and rivers assessed, and zones of high connectivity mapped to enable baseflows to the river to be maintained or improved</p>	<ul style="list-style-type: none"> <li>• To improve base (dry period) flows (RFOs 1,2)</li> <li>• To improve water quality</li> <li>• To protect downstream water supplies</li> </ul>	<ul style="list-style-type: none"> <li>• Primary ecological production maintained or improved</li> <li>• Degraded wetlands improved and significant wetlands protected and restored</li> <li>• Assured water supplies to maintain or improve the health and wellbeing of rural and urban communities</li> <li>• Incidents of problem blue green algal blooms affecting essential water supplies and recreational values reduced</li> </ul>
<p><b>Target 11</b> Groundwater dependent ecosystems identified and mapped for all priority aquifers, and the ecological water requirements assessed to enable local groundwater extraction rates and/or Sustainable Yields to be reviewed</p>	<ul style="list-style-type: none"> <li>• To sustain groundwater dependent vegetation (RFO 8)</li> <li>• To maintain water levels in wetlands such as hanging swamps (RFOs 4, 8)</li> <li>• To maintain springs</li> <li>• To maintain the ecology of the hyporheic zone (the zone in the river channel kept wet by groundwater seepage)</li> <li>• To maintain limestone cave</li> </ul>	<ul style="list-style-type: none"> <li>• Primary ecological production maintained or improved</li> <li>• Degraded wetlands improved and significant wetlands protected and restored</li> <li>• Diversity and abundance of native aquatic animals and plants protected and restored</li> <li>• Aboriginal traditional and contemporary dependencies on, and cultural association with water protected and improved</li> </ul>

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## Division 5 Basic and cultural needs

Five year target	Why is it needed?	What are the expected outcomes?
<b>Target 12</b> Measures in place in all water sources subject to a gazetted water sharing plan to protect domestic and stock rights from the impact of other water access and use	<ul style="list-style-type: none"> <li>To prevent excessive water extraction from threatening essential water needs.</li> </ul>	<ul style="list-style-type: none"> <li>Assured water supplies to maintain or improve the health and wellbeing of rural and urban communities</li> <li>Aboriginal traditional and contemporary dependencies on, and cultural association with water protected and improved</li> </ul>
<b>Target 13</b> The knowledge sharing, training and resources necessary to ensure that Aboriginal people have the capacity to be effectively involved in water management identified and addressed	<ul style="list-style-type: none"> <li>To more effectively engage Aboriginal people in water management</li> <li>To recognise the value of shared information and experience</li> </ul>	<ul style="list-style-type: none"> <li>Aboriginal traditional and contemporary dependencies on, and cultural association with water protected and improved</li> </ul>
<b>Target 14</b> Water sources, ecosystems and sites of cultural or traditional importance to Aboriginal people identified, plans of management prepared, and measures put in place to protect and improve them	<ul style="list-style-type: none"> <li>To ensure water access, works and use do not threaten or impact on Aboriginal sites, values or needs</li> </ul>	<ul style="list-style-type: none"> <li>Aboriginal traditional and contemporary dependencies on, and cultural association with water protected and improved</li> <li>Degraded wetlands improved and significant wetlands protected and restored.</li> <li>Diversity and abundance of native aquatic animals and plants protected and restored</li> </ul>

## Division 6 Water use efficiencies

Five year target	Why is it needed?	What are the expected outcomes?
<b>Target 15</b> At least 90 percent of approved water management works for the extraction of surface or ground waters (excepting domestic and stock bores) metered and reported in each water source that is subject to a gazetted water sharing plan	<ul style="list-style-type: none"> <li>To ensure compliance with water access rules and extraction limits</li> <li>To provide information on water use efficiency</li> <li>To enable an effective water market</li> <li>To protect access rights and environmental provisions</li> </ul>	<ul style="list-style-type: none"> <li>Assured water supplies to maintain or improve the health and wellbeing of rural and urban communities</li> <li>Primary ecological production maintained or improved</li> <li>Diversity and abundance of native aquatic animals and plants protected and restored</li> </ul>
<p><b>Target 16</b> Improved and extended water markets through:</p> <p><b>Target 16a</b> All share components of access licences tradeable</p> <p><b>Target 16b</b> Separation of existing water licences (excepting domestic and stock bores) under the <i>Water Act 1912</i> into water</p>	<ul style="list-style-type: none"> <li>To clarify and secure licensed access to water</li> <li>To ensure an effective and efficient water market</li> <li>To meet COAG competition requirements</li> <li>To encourage water to move to higher value uses</li> </ul>	<ul style="list-style-type: none"> <li>Water use efficiency increased</li> <li>The economic efficiency of investment in water industries improved</li> </ul>

<p>use approvals and water access licences completed for:</p> <p>100 percent of licences in water sources subject to initial round of gazetted water sharing plans</p> <p>50 percent of licences across the remainder of the State.</p> <p><b>Target 16c</b> Conversion factors and protocols established to facilitate trading and dealings between water sources, whilst also protecting existing access and environmental water.</p> <p><b>Target 16d</b> Reduced conversion factors only applied when necessary to offset increased losses associated with water supply delivery.</p> <p><b>Target 16e</b> Any unassigned access rights identified and clear mechanisms established for their future assignment</p> <p><b>Target 16f</b> Zones established where necessary for environmental protection and limits/constraints on water dealings in them made explicit</p> <p><b>Target 16g</b> Full public disclosure of access licence dealings and market prices</p>		
<p><b>Target 17</b> In determining the best environmental and health outcomes for an effluent management scheme, decisions to have considered all practicable options to replace high value water used for urban and industrial purposes with treated effluent</p>	<ul style="list-style-type: none"> <li>• To reduce wastewater</li> <li>• To encourage higher value use of water</li> <li>• To improve water quality</li> </ul>	<ul style="list-style-type: none"> <li>• Water use efficiency increased</li> <li>• .Incidents of problem blue green algal blooms affecting essential water supplies and recreational values reduced</li> </ul>
<p><b>Target 18</b> High quality return flows credited against town (local water utility) water access licences where all environmental requirements for a credit are met</p>	<ul style="list-style-type: none"> <li>• To make higher treatment of effluent cost effective</li> <li>• To improve downstream water quality</li> <li>• To protect low flows and downstream water supplies (RFO 2)</li> <li>• To reduce wastewater</li> </ul>	<ul style="list-style-type: none"> <li>• Water use efficiency increased</li> <li>• The economic efficiency of investment in water industries improved</li> <li>• Incidents of problem blue green algal blooms affecting essential water supplies and recreational values reduced</li> </ul>
<p><b>Target 19</b> Country town (local water utility) water consumption to decline by greater than 5 percent per head of population on average statewide, excluding</p>	<ul style="list-style-type: none"> <li>• To reduce the impact of growth in town water requirements on the rights of other users</li> <li>• To increase water use efficiency</li> </ul>	<ul style="list-style-type: none"> <li>• Water use efficiency increased</li> <li>• The economic efficiency of investment in water industries improved</li> </ul>

Sydney Water Corporation and the Hunter Water Corporation whose demand management targets are set in their operating licences		
<b>Target 20</b> Nil or minimal increase in basic domestic and stock rights resulting from rural subdivisions in sensitive or stressed water sources	<ul style="list-style-type: none"> <li>To protect groundwater levels and pressures</li> <li>To protect low flows in rivers (RFO 1, 2)</li> <li>To protect existing water uses and basic rights</li> </ul>	<ul style="list-style-type: none"> <li>Primary ecological production maintained or improved</li> <li>Diversity and abundance of native aquatic animals and plants protected and restored</li> <li>Assured water supplies to maintain or improve the health and wellbeing of rural and urban communities</li> <li>Incidents of problem blue green algal blooms affecting essential water supplies and recreational values reduced</li> <li>The economic efficiency of investment in water industries improved</li> </ul>
<b>Target 21</b> At least 60 high flowing bores (>5 litres per second) in the NSW Great Artesian Basin capped and piped	<ul style="list-style-type: none"> <li>To protect groundwater levels and pressures</li> <li>To reduce waste water</li> <li>To encourage higher value use of water</li> <li>To improve water quality</li> </ul>	<ul style="list-style-type: none"> <li>Assured water supplies to maintain or improve the health and wellbeing of rural and urban communities</li> <li>Water use efficiency increased</li> <li>The economic efficiency of investment in water industries improved</li> </ul>

## Division 7 Cost recovery

Five year target	Why is it needed?	What are the expected outcomes?
<b>Target 22</b> The NSW Government to seek full cost recovery in all practicable cases excepting where capital infrastructure cannot reasonably be funded by small numbers of water access licence holders. Water access licence holders to face water charges as determined by IPART	<ul style="list-style-type: none"> <li>To meet COAG water reform requirements</li> <li>To ensure that licensed rights to access water are appropriately valued</li> </ul>	<ul style="list-style-type: none"> <li>Water use efficiency increased</li> <li>The economic efficiency of investment in water industries improved</li> </ul>

## Division 8 Artificial barriers and openings

Five year target	Why is it needed?	What are the expected outcomes?
<b>Target 23</b> Review of all licensed weirs on 3rd order and larger rivers completed, a review of unlicensed structures on these rivers substantially progressed, a priority listing prepared, and action taken to:	<ul style="list-style-type: none"> <li>To restore water level variability within weir pools (RFOs 6,7)</li> <li>To improve habitat conditions within weir pools (RFO 9)</li> <li>To restore wetting and drying cycles within adjacent wetlands and riparian land (RFO 5)</li> </ul>	<ul style="list-style-type: none"> <li>Primary ecological production maintained or improved</li> <li>Degraded wetlands improved and significant wetlands protected and restored</li> <li>Diversity and abundance of native aquatic animals and</li> </ul>

<p><b>Target 23a</b> Ensure that there is no net increase in the number or total capacity of weirs in each water management area</p> <p><b>Target 23b</b> Remove at least 10, and structurally modify 15 of the priority weirs recommended for action across the State (eg install fishways)</p> <p><b>Target 23c</b> Establish improved operational protocols for priority operable weirs that will reduce their environmental impacts</p>	<ul style="list-style-type: none"> <li>• To improve base (dry period) flows (RFO 2)</li> <li>• To improve water quality</li> <li>• To reduce the incidents of blue green algal blooms</li> <li>• To increase the transfer of organic (food) inputs down rivers</li> <li>• To restore the movement of fish up and down rivers (RFO 9)</li> </ul>	<p>plants protected and restored</p> <ul style="list-style-type: none"> <li>• Incidents of problem blue green algal blooms affecting essential water supplies and recreational values reduced</li> </ul>
<p><b>Target 24</b> Review of all existing tidal barriers completed, and action taken to remove, or partially, or periodically open at least 100 tidal barriers/gates</p>	<ul style="list-style-type: none"> <li>• To restore wetting and drying cycles within coastal wetlands (RFO 4)</li> <li>• To reduce the incidence of acid drainage</li> <li>• To restore the movement of fish between estuaries and coastal rivers and floodplains.</li> <li>• To improve water quality downstream of dams</li> </ul>	<ul style="list-style-type: none"> <li>• Primary ecological production maintained or improved</li> <li>• Degraded wetlands improved and significant wetlands protected and restored</li> <li>• Diversity and abundance of native aquatic animals and plants protected and restored</li> </ul>
<p><b>Target 25</b> Action taken to (re)connect at least 60 percent of the natural 1 in 5 year flooded area to the river for 11 key rural floodplains by ensuring:</p> <p><b>Target 25a</b> The major flood paths and flood dependent ecosystems are mapped</p> <p><b>Target 25b</b> The significant barriers to flooding are identified and action to deal with the major barriers commenced</p>	<ul style="list-style-type: none"> <li>• To restore inundation frequency and duration in floodplain wetlands (RFO 4)</li> <li>• To sustain flood-dependent vegetation eg river red gums</li> <li>• To restore groundwater recharge events</li> <li>• To restore the connection between floodplain wetlands and rivers for transfer of organic matter, invertebrates and fish</li> </ul>	<ul style="list-style-type: none"> <li>• Primary ecological production maintained or improved</li> <li>• Degraded wetlands improved and significant wetlands protected and restored</li> <li>• Diversity and abundance of native aquatic animals and plants protected and restored</li> <li>• Aboriginal traditional and contemporary dependencies on, and cultural association with water protected and improved</li> </ul>
<p><b>Target 26</b> Dams responsible for cold water pollution identified, a priority listing prepared, and action initiated to ensure that the temperature regime below these dams is kept within the 20th to 80th natural percentile range for each month (or within bounds determined by site specific investigations), by ensuring:</p> <p><b>Target 26a</b> Structural modification of at least 2 priority dams</p> <p><b>Target 26b.</b> Improved operational protocols established for priority dams with existing temperature management infrastructure</p>	<ul style="list-style-type: none"> <li>• To restore natural temperature regimes in rivers (RFO 9)</li> <li>• To address the impact of cold water on the reproduction, survival and growth rates of native fish and the biodiversity of macroinvertebrate communities</li> </ul>	<ul style="list-style-type: none"> <li>• Primary ecological production maintained or improved</li> <li>• Diversity and abundance of native aquatic animals and plants protected and restored</li> </ul>

<p><b>Target 27</b> Frequency of artificial manipulations of coastal lagoon entrances reduced, and management strategies to improve natural flow dynamics recognising their consequences on ecosystems and social assets</p>	<ul style="list-style-type: none"> <li>• To maintain natural salinity regimes of coastal lagoons</li> <li>• To improve patterns of water inundation in coastal wetlands (RFO 12)</li> </ul>	<ul style="list-style-type: none"> <li>• Primary ecological production maintained or improved</li> <li>• Degraded wetlands improved and significant wetlands protected and restored</li> <li>• Diversity and abundance of native aquatic animals and plants protected and restored</li> </ul>
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## Division 9

## River channel rehabilitation

Five year target	Why is it needed?	What are the expected outcomes?
<p><b>Target 28</b> Percentage cover of native riparian vegetation within waterfront land increased consistent with an approved catchment management plan, or by at least 5 percent where it is currently less than 50 percent of the natural average on 3rd order and larger rivers</p>	<ul style="list-style-type: none"> <li>• To restore the shade and temperature characteristics of rivers</li> <li>• To increase the entrapment of nutrients moving overland to rivers</li> <li>• To restore the input of detritus (food) into rivers</li> <li>• To provide perching and roosting sites for birds</li> <li>• To restore wildlife corridors</li> <li>• To restore riparian habitats</li> </ul>	<ul style="list-style-type: none"> <li>• Primary ecological production maintained or improved</li> <li>• Diversity and abundance of native aquatic animals and plants protected and restored</li> <li>• Aboriginal traditional and contemporary dependencies on, and cultural association with water protected and improved</li> <li>• Incidents of problem blue green algal blooms affecting essential water supplies and recreational values reduced</li> </ul>
<p><b>Target 29</b> No net decrease in the length of natural river corridors through urban areas</p>	<ul style="list-style-type: none"> <li>• To restore the shade and temperature characteristics of rivers</li> <li>• To increase the entrapment of nutrients moving overland to rivers</li> <li>• To restore the input of detritus (food) into rivers</li> <li>• To provide perching and roosting sites for birds</li> <li>• To restore wildlife corridors</li> <li>• To restore riparian habitats</li> </ul>	<ul style="list-style-type: none"> <li>• Primary ecological production maintained or improved</li> <li>• Diversity and abundance of native aquatic animals and plants protected and restored</li> <li>• Incidents of problem blue green algal blooms affecting essential water supplies and recreational values reduced</li> </ul>

## Division 10

## Drainage management

Five year target	Why is it needed?	What are the expected outcomes?
<p><b>Target 30</b> Coastal floodplain areas with high water quality risk (eg acid drainage and/or oxygen depletion) addressed by:</p> <p><b>Target 30a</b> Areas of drained natural wetlands identified and mapped</p> <p><b>Target 30b</b> 7 pilot remediation projects completed</p> <p><b>Target 30c</b> Future program of land</p>	<ul style="list-style-type: none"> <li>• To reduce acid drainage problems</li> <li>• To restore wetting and drying cycles in coastal wetlands (RFO 4)</li> </ul>	<ul style="list-style-type: none"> <li>• Primary ecological production maintained or improved</li> <li>• Degraded wetlands improved and significant wetlands protected and restored</li> <li>• Diversity and abundance of native aquatic animals and plants protected and restored</li> <li>• The productive capacity of land and water maintained</li> </ul>

<p>rehabilitation developed and commenced</p> <p><b>Target 30d</b> No increase in acid drainage resulting from any new development in a mapped acid sulfate soil hotspot.</p>		
<p><b>Target 31</b> The peak volumes of urban stormwater runoff reaching natural watercourses reduced</p>	<ul style="list-style-type: none"> <li>• To improve water quality</li> <li>• To reduce the incidence of blue green algal blooms</li> <li>• To increase low flows</li> <li>• To reduce downstream storm events and storm pulses and associated erosion</li> </ul>	<ul style="list-style-type: none"> <li>• Primary ecological production maintained or improved</li> <li>• Diversity and abundance of native aquatic animals and plants protected and restored</li> <li>• Incidents of problem blue green algal blooms affecting essential water supplies and recreational values reduced</li> <li>• Assured water supplies to maintain or improve the health and wellbeing of rural and urban communities</li> </ul>
<p><b>Target 32</b> The adoption of water efficient and sensitive urban design measures in urban areas/rivers increased</p>	<ul style="list-style-type: none"> <li>• To improve water quality</li> <li>• To reduce the incidence of blue green algal blooms</li> <li>• To increase low flows</li> <li>• To reduce downstream storm runoff and associated erosion</li> </ul>	<ul style="list-style-type: none"> <li>• Primary ecological production maintained or improved</li> <li>• Diversity and abundance of native aquatic animals and plants protected and restored</li> <li>• Incidents of problem blue green algal blooms affecting essential water supplies and recreational values reduced</li> <li>• Assured water supplies to maintain or improve the health and wellbeing of rural and urban communities</li> </ul>
<p><b>Target 33</b> Zones of high irrigation salinity risk mapped, and irrigation accession rates assessed to enable action to be taken to stabilise or reduce accession rates within these zones</p>	<ul style="list-style-type: none"> <li>• To reduce the loss of productive land</li> <li>• To maintain crop yields</li> <li>• To reduce land salinisation</li> <li>• To reduce salt load to rivers</li> </ul>	<ul style="list-style-type: none"> <li>• Assured water supplies to maintain or improve the health and wellbeing of rural and urban communities</li> <li>• The productive capacity of land and water maintained</li> </ul>
<p><b>Target 34</b> Major irrigation drains to natural watercourses carrying saline discharges identified, and priority drains monitored to enable action to be taken to ensure no net increase in the load or concentration of the saline drainage (unless agreed to in an applicable management program with approved offset provisions)</p>	<ul style="list-style-type: none"> <li>• To minimise further increases in the discharge of salt from point sources</li> </ul>	<ul style="list-style-type: none"> <li>• Diversity and abundance of native aquatic animals and plants protected and restored</li> <li>• Assured water supplies to maintain or improve the health and wellbeing of rural and urban communities</li> <li>• The productive capacity of land and water maintained</li> </ul>

## Division 11

## River and groundwater quality

Five year target	Why is it needed?	What are the expected outcomes?
<p><b>Target 35</b> All management plans incorporating water quality objectives that have considered Government approved Interim Environmental Objectives, the current ANZECC Guidelines and the recommendations of relevant Healthy Rivers Commission Inquiries</p>	<ul style="list-style-type: none"> <li>• To improve water quality</li> <li>• To reduce the incidence of blue green algal blooms</li> <li>• To protect essential water supplies and recreational values</li> </ul>	<ul style="list-style-type: none"> <li>• Assured water supplies to maintain or improve the health and wellbeing of rural and urban communities</li> <li>• Diversity and abundance of native aquatic animals and plants protected and restored</li> <li>• Incidents of problem blue green algal blooms affecting essential water supplies and recreational values reduced</li> <li>• The productive capacity of land and water maintained</li> </ul>
<p><b>Target 36</b> River salinity maintained at levels consistent with the salinity targets specified in approved catchment management plans</p>	<ul style="list-style-type: none"> <li>• To reduce the rate of increase in river salinity</li> </ul>	<ul style="list-style-type: none"> <li>• Assured water supplies to maintain or improve the health and wellbeing of rural and urban communities</li> <li>• Diversity and abundance of native aquatic animals and plants protected and restored</li> <li>• The productive capacity of land and water maintained</li> </ul>
<p><b>Target 37</b> Sources of non-saline water contributing significant dilution flows downstream prioritised to enable action to be taken to protect these sources</p>	<ul style="list-style-type: none"> <li>• To maximise the opportunity for natural dilution of downstream salt pulses</li> </ul>	<ul style="list-style-type: none"> <li>• Assured water supplies to maintain or improve the health and wellbeing of rural and urban communities</li> <li>• Diversity and abundance of native aquatic animals and plants protected and restored</li> <li>• The productive capacity of land and water maintained</li> </ul>
<p><b>Target 38</b> Aquifer water quality vulnerability zones mapped and extraction limits reviewed to reduce the risk of lateral intrusion of poor quality water</p>	<ul style="list-style-type: none"> <li>• To protect groundwater quality</li> <li>• To protect domestic water supplies</li> </ul>	<ul style="list-style-type: none"> <li>• Assured water supplies to maintain or improve the health and wellbeing of rural and urban communities</li> <li>• The productive capacity of land and water maintained</li> </ul>