



## NSW Extreme Events Policy

### **Policy framework for the management of NSW Murray–Darling Basin water resources during extreme events**

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NSW Extreme Events Policy

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**More information**

[www.industry.nsw.gov.au/water](http://www.industry.nsw.gov.au/water)

**Acknowledgments**

New South Wales acknowledge and pays its respect to all the Traditional Owners and their Nations of the Murray–Darling Basin.

We acknowledge Aboriginal people as Australia’s First Peoples and as the Traditional Owners and Custodians of the land and water on which we rely.

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## Glossary

Acronym	Meaning
AWD	Available water determination
Basin Plan	Basin Plan 2012 made under the <i>Commonwealth Water Act 2007</i>
BLR	Basic landholder rights
CAG	Customer Advisory Group (WaterNSW)
Cth	Commonwealth
CWAP	Critical Water Advisory Panel
EPL	Environment protection licences
GDE	Groundwater-dependent ecosystem
IRG	Incident response guide
IWCM	Integrated water cycle management
LG Act	<i>Local Government Act 1993</i>
LWU	Local water utilities
NSW	New South Wales
OEH	NSW Officer of Environment and Heritage
the department	NSW Department of Industry
the regulation	Water Management (General) Regulation 2018
WM Act	<i>Water Management Act 2000</i>
WSP	Water sharing plan

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## Introduction

NSW is currently experiencing one of its driest periods on record. Winter was much drier than expected, resulting in failing crops and water shortages.

Some areas of the state did receive some welcome rainfall at the end of August and October 2018, which provided a little relief for stock and domestic water; unfortunately it will not come close to the recovery needed heading into the hotter months.

The Department of Industry is implementing drought contingency measures in the Lower Darling and Barwon-Darling river systems and the Namoi, Gwydir and Macquarie river systems in northern inland NSW following extended dry conditions.

Drought and adverse water quality events, such as algal blooms, are an inevitable part of water management in Australia. These types of extreme events have and will continue to occur periodically.

This policy sets up a framework to manage extreme events in a structured and proactive way. It provides a clear and transparent framework for making decisions during extreme events including what decisions need to be made, when they are made and who makes them. This information allows water users to make plans during extreme events with confidence and provides more certainty for the water market.

Past droughts in NSW have been severe enough to require the suspension of water sharing plans and alternative ways of allocating scarce water.

The Extreme Events Policy builds on experience gained during past drought onset and drought conditions.

It is designed to facilitate early intervention and delay the need to suspend certain water sharing arrangements so that suspension will only occur during more severe water stress and water quality events.

## Objective and purpose

The key objective of the Extreme Events Policy is to improve resilience and provide certainty for communities:

- during drought and periods of water shortage
- in the event of a water quality event of an intensity, magnitude and duration that is sufficient to render water acutely toxic or unusable for established local uses and values.

The policy establishes the principles for managing extreme events for each major water source in the NSW Murray–Darling Basin. It provides a transparent decision-making framework based on an assessment of risk and need in the face of competing priorities and demands.

The policy framework establishes a staged approach and provides a range of measures for water managers to deploy as conditions deteriorate. It proposes timely intervention to extend the likely period during which water will be available for the highest-priority uses through each extreme event.

The framework balances the need to be adaptive in response to changing circumstances with the need for certainty, to improve longer term planning.

The policy has been developed to:

- respond to the need to manage extreme events under the NSW framework
- improve the transparency and effectiveness of management during extreme events by formalising and building on existing drought and water quality measures
- outline the process that will be adopted to manage water leading up to and during an extreme event
- establish the guiding principles and tools to manage water during extreme events through water-source-specific incident response guides, which will support NSW's water resource plans (WRPs) in meeting the requirements of section 10.51 of the *Basin Plan 2012* (Cth) (see Appendix B)
- promote consistency in the development and implementation of region-specific incident response guides
- set out the statutory functions under the NSW *Water Management Act 2000* (WM Act) and the NSW *Local Government Act 1993* (LG Act) that may be exercised to manage extreme events.

## Use of incident response guides

The primary focus of the incident response guides (IRGs) in managing water during extreme events is to secure critical human water needs and give effect to the water sharing priorities in the WM Act in the specific WRP area that each guide covers. Critical human water needs in the Murray–Darling Basin areas are defined in the WM Act.

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### **WM Act, section 60(3C) Rules of distribution applicable to making of available water determinations**

Critical human water needs are the needs for a minimum amount of water that can only reasonably be provided from Basin water resources, required to meet:

- a) core human consumption requirements in urban and rural areas; and
  - b) those non-human consumption requirements that a failure to meet would cause prohibitively high social, economic or national security costs.
-

The policy will help all inland water managers, basic landholder rights (BLR) users (including native title holders), other consumptive water users and anyone else involved or interested in water management to understand how NSW Murray–Darling Basin water sources will be managed should an extreme event occur.

## Scope

The Extreme Events Policy applies to all NSW groundwater and surface water sources within the Murray–Darling Basin.

An extreme event is defined in section 10.51 of the *Basin Plan 2012* and in the WM Act. It includes extreme dry periods, extreme water quality events, and any other type of event that has led to a management plan previously being suspended in the past 50 years.

Under this policy, an extreme event may include:

- **an extreme dry period**, such as the conditions during the Millennium drought
- the actual or imminent **structural failure** of a state-owned water storage that may cause a severe water shortage
- **an extreme water quality event**, such as blackwater, salinity, water pollution and a blue-green algae outbreak.

The definition of an extreme event in this context does not include flood events. The management of flood events is not covered by the policy as it involves different considerations. When NSW river systems experience severe flooding, water sharing plan rules continue to operate. Flood emergency planning is done under a separate process consistent with the *State Emergency and Rescue Management Act 1989*. The State Emergency Services, Bureau of Meteorology and WaterNSW are the agencies responsible for managing the effects of flood and providing emergency response to affected communities.

This policy does not impact the introduction or staging of NSW Government drought support measures.

## Outside of the Basin

On the coast, apart from the catchments of the Hunter, Hawkesbury Nepean and Shoalhaven that service major urban centres and state-significant development, catchments are mostly smaller and unregulated (without major state-owned and operated dams). Smaller coastal urban water supplies are managed by councils and local water utilities (LWUs). The NSW Government's ability to actively manage these systems is limited.

Coastal water sharing plans (WSPs) have been developed in this context and provide the framework for managing the allocation of water resources during periods of water stress. They are also consistent with the principles of the Extreme Events Policy and can be suspended by the minister (in full or in part) under section 49A of the WM Act during severe water shortages.

In large coastal catchments with significant urban centres, water restriction regimes and water savings and efficiency programs support water security for urban populations during periods of water stress and drought. The focus is on system optimisation for large urban water supplies and providing up-to-date information during dry periods to reduce demand until inflows recover and increase resilience. Improving water efficiency and water security during drought are a key focus of regional water strategies.

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## Long-term water security across NSW

Development of regional water strategies is addressing the longer-term risk to critical human needs and the risk to other uses, including the environment, and the trade-off between these in priority catchments.

In developing regional water strategies, an economic risk assessment is undertaken to assess the economic impact of reduced availability for general-security licence holders, high-security licence holders and major water utilities. Options to improve water security are then identified, including new or modified infrastructure and possible changes to WSPs. These are considered in the context of the risk assessments and climate analysis to make sure that options would be viable through climate change.

An assessment of possible changes to WSPs is undertaken to identify potential third-party impacts. Proposed infrastructure options are also assessed to make sure that the benefits are effectively distributed across water users.

## Statutory functions

The Minister for Regional Water (or delegate) has various powers under the WM Act and the LG Act to manage NSW Basin water resources during extreme events and to secure water resources to meet critical human water needs. These include:

- the power to impose a temporary water restriction order (section 324 of WM Act)
- the power to suspend all or part of a WSP, which has the effect of altering the rules of priority for the making of available water determinations while a suspension is in place (sections 49A, 49B, 60(3) and 60(3A) of WM Act).

The water supply authority also has the power to impose water use restrictions (clause 141 of the Water Management (General) Regulation 2018).

A more comprehensive list of powers available to manage extreme events is included in Appendix C.

## Policy framework

The policy framework for responding to extreme events in NSW involves a staged approach. Higher levels of intervention will be introduced as the criticality of an extreme event increases. Assessment of the levels of criticality will vary depending on whether the water source is a regulated river, unregulated river or a groundwater water source.

## Incident response guides

The IRGs provide a framework to guide implementation of the policy. The IRGs include information on the indicators and thresholds for water source areas and will identify the types of conditions that constitute each stage of an event based on how critical the water quality or availability of water has become.

Stage 1 is a precursor to a potential extreme event and normal management operations continue during this stage. It includes situations where inflows are lower than usual or where minor water quality incidents may have occurred.



Stage 2 is where it has become apparent that there is:

- an emerging water shortage or potential drought, characterised by any one or more of the following:
  - an inability to deliver 100% of high-priority account water and maximum expected use of general security under normal river operation practices
  - groundwater level and/or pressure declines potentially or actually impacting on groundwater availability to high-priority, groundwater-dependent ecosystems (GDEs), BLRs and/or LWUs
  - groundwater drawdown to levels that could lead to aquifer subsidence
- an emerging water quality issue characterised by:
  - the need for minor adjustments to treat raw water to the minimum quality required for the intended use (minor cost)
  - water quality still being able to meet other established local values and uses.

Stage 3 is where there is:

- a severe drought and/or water shortage where one or more of the following applies:
  - only restricted high-priority demands, and restricted remaining general-security account water can be delivered
  - there is a continuing unacceptable decline in groundwater level or pressure
  - there are unacceptable drawdown impacts on 'efficiently constructed' BLR bores (i.e. levels below the pump or deeper than the bore)
  - there is evidence of aquifer compaction
- a severe local water quality event to the extent that:
  - major adjustments are needed to treat raw water to the minimum quality for the conditions (major cost)
  - water quality cannot meet some established local values and uses.

Stage 4 is where there is:

- a critical drought and/or water shortage where one or more of the following applies:
  - only restricted town water supply, stock and domestic and other restricted high-priority demands can be delivered
  - the decline in water level poses a risk to long-term availability of the groundwater resources—subsidence, and/or mobilisation and induced flow of poorer water quality
  - access by 'efficiently constructed' BLR bores is significantly impacted
- a critical water quality event where one or more of the following applies:
  - it is not possible to treat raw water with standard processes to meet health-related values identified in the Australian Drinking Water Guidelines
  - raw water is likely to remain untreatable over the longer term
  - water quality is unable to meet most established local values and uses.

The general management approaches available during each stage are outlined in Table 1.

Table 1 Management approaches during stages of the incident response guide framework

Stage based on level of risk	Agency/management approaches	WSP Normal rules	WSP Contingency/operational measures	Suspension of parts of a WSP
<b>Stage 1</b>	Normal management operations—long-term planning, including drought security planning.	In force		
<b>Stage 2</b>	Operational adjustments may be required. Emergency management readiness implemented. Inter-agency critical water advisory panel for surface water sources established and updated regularly (by WaterNSW). Minister advised. Initial communications with potentially affected communities and stakeholders.	In force	Possibly activated	
<b>Stage 3</b>	Adjustments to management operations. Emergency management on stand-by. Critical water advisory panel operational and meeting for both groundwater and surface water sources, with regular ministerial updates. Communications with affected communities and stakeholders increased.	Possibly also in force	In force	Possibly activated
<b>Stage 4</b>	Normal operations untenable, emergency management activated. State agency/regional response implemented if required/triggered. Critical water advisory panel maintained, with regular ministerial updates. Regular communications with affected communities and stakeholders increased.		In force	In force

## Local advice during extreme events

To ensure solutions are appropriate and fit-for-purpose, critical water advisory panels (CWAPs) will be formed in a water management area when the level of an extreme event reaches Stage 2 for surface water sources and Stage 3 for groundwater sources, as set out in Table 1. Panel members will include representatives from relevant government agencies and water delivery authorities, as explained below in the section on Governance and decision-making.

Advice provided by CWAPs will be valuable in informing the management approach taken by NSW Department of Industry.

## Principles

The principles detailed in this section will be used to inform the development and implementation of the IRGs. These principles will be integrated wherever possible to encourage a consistent approach to extreme event management.

### ***Principle 1—Every attempt will be made to maintain the operation of the statutory water sharing plans***

Implementation of the principles in this Extreme Events Policy and the IRGs is not business as usual. It will only occur in an extreme event. The details and nature of measures that may be adopted are particular to each region and are outlined in the IRGs.

Statutory water sharing plans have been developed to operate in a range of climate circumstances, and water availability decisions made in accordance with these plans consider severe historical droughts and associated periods of very low inflows. The plans are robust and only in extreme circumstances would suspension of their provisions be required to meet critical human water needs.

Suspension of water sharing plan provisions will only be considered if an extreme event triggers a Stage 3 or Stage 4 level of criticality as set out in Table 1. These triggers will be outlined in individual IRGs, as they may vary depending on the water source area.

### ***Principle 2—The local requirements for critical human water needs will be recognised and prioritised***

The WM Act prioritisation framework identifies critical human water needs as the highest priority (section 60(3) of the WM Act) when making available water determinations once any plan provisions are suspended. Each IRG provides further detail to guide decisions on what the local specific critical human needs are so that they can be recognised and prioritised during each extreme event.

The process set out in IRGs involves evaluating priorities and establishing CWAPs to consult potentially affected parties to make sure that local knowledge, perspectives and advice are taken into account in developing management responses.

### ***Principle 3—The market will continue to operate for as long as possible during extreme events***

This principle recognises that the dealings provisions in the WM Act provide significant opportunities for trade of water access licences and allocations for the optimal use of available water. Often in circumstances when no new allocations (available water determinations) can be announced by government due to no or low inflows, there are significant volumes of water already held in the accounts of licence holders.

Maintaining market mechanisms for as long as possible will help to provide certainty during extreme events by allowing water users to buy and sell water entitlements, including for

environmental watering purposes. Some market restrictions may be required to complement temporary water restrictions to protect water sources.

***Principle 4—Licence holders within licence categories should be treated equally***

Providing critical human water needs can be met, all licence holders of the same category or subcategory of access licence will be treated equally where possible, irrespective of what the water is used for. Alternative sharing arrangements within a licence category or subcategory should be a last resort.

***Principle 5—Certainty should be maximised***

IRGs will provide greater certainty about potential changes to water sharing arrangements by providing a clear and transparent framework for making decisions about any changes that will be made, consistent with the priorities in the WM Act. Most importantly, this is intended to provide the community with confidence that critical human water needs will be met.

This certainty will assist water users in weighing up their risks and making their own business decisions.

***Principle 6—Management strategies will be fit for purpose***

IRGs will identify a range of fit-for-purpose management strategies that will be guiding, not binding, so that the most appropriate measures to deal with the particular circumstances can be adopted.

CWAPs will be formed in each water management area when the criticality level of an extreme event reaches Stage 2 in surface water areas and Stage 3 for groundwater resources to ensure responsive whole-of-government decision-making, and local and community water priorities are considered in water management during extreme events. Members of these panels will include representatives from relevant government agencies and water delivery authorities.

***Principle 7—Local stakeholder consultation should inform management responses so that they are fair***

This policy and IRGs have been developed in consultation with stakeholder advisory panels operating in each Basin Plan area. The IRGs form part of the WRPs made under the *Basin Plan 2012*. All WRPs, including the IRGs, will be publicly exhibited before they are submitted for Commonwealth Government for accreditation. The broader community and all stakeholders and interest groups will have an opportunity to comment on the IRGs before they are finally adopted.

Implementation of policy measures during an extreme event will also be informed by consultation with local communities as outlined in the IRGs. As an extreme event is emerging, the CWAP will seek the views of local communities, interest groups and water users to develop fair management strategies that are fit for the local circumstances.

***Principle 8—Learnings from previous extreme events will inform the development and implementation of IRGs***

Measures implemented during previous extreme events will be reviewed and considered in developing and implementing the IRGs. This includes being informed by the circumstances that previously led to the suspension of a water sharing plan (see Appendix A).

The IRGs will include information on the characteristics of each water source with respect to extreme events. The information will be reviewed following each extreme event and updated if required.

The definition of criticality (extreme event triggers) and response measures may change, and can be updated, as new information becomes available, after an event or after a measure has been implemented, such as infrastructure enhancement works.

IRGs will be reviewed every five years to assess their effectiveness in guiding responses and implementing measures during any extreme events.

**Principle 9—Connectivity of systems should be considered**

Connectivity between water sources will be considered to ensure water is available to meet critical human water needs in connected systems during an extreme event. This includes interconnections between surface water and groundwater sources as well as longitudinal connections between surface water sources.

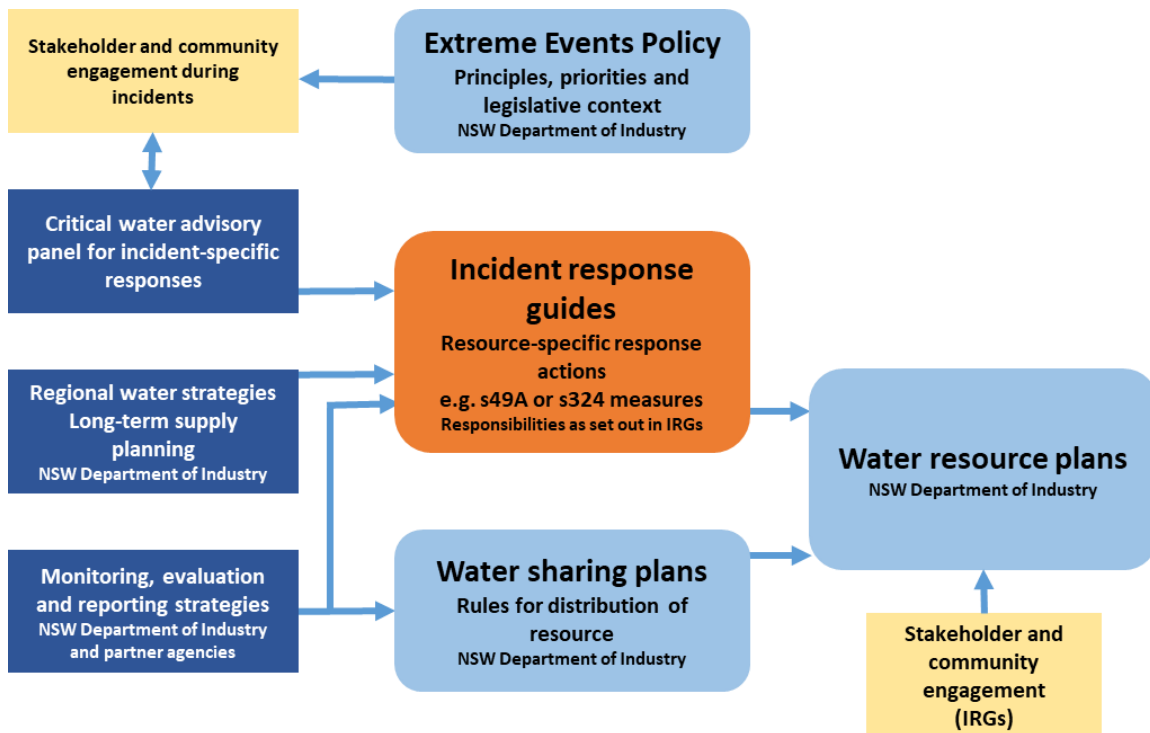
When considering restricting access to a lower-priority use to provide water to a higher-priority use in separately managed but hydrologically connected systems, the other principles identified in this policy should also be considered. A number of additional factors must also be carefully weighed:

- the relative priority between the access restriction (lower) and the access provision (higher)
- the severity of the extreme event
- the alternative options available to meet the higher-priority needs
- the physical constraints to delivery
- any unintended impacts.

## Governance and decision-making

The diagram in Figure 1 highlights the interaction of this policy, supporting IRGs, WSPs and WRPs. The diagram also shows the opportunities for stakeholder engagement in extreme event management.

**Figure 1 Relationships between the Extreme Events Policy, related plans, strategies and advisory groups**



Decisions that are made during periods of water stress for communities, industries and the environment, need to be made transparently and through an established approach so that, as far as possible, water users, other key stakeholders and the community generally know what to expect.

## Determining stages of criticality for extreme events

The Executive Director, Water within NSW Department of Industry—Lands & Water is responsible for determining the criticality stage for each WRP area. These decisions will be guided by the evidence base outlined in Table 2 and Table 3 for drought or water shortage, and for water quality events respectively.

As events escalate in criticality, a range of measures may be adopted by governments and non-government LWUs. The broad intent of these measures at the various stages of criticality are also shown in the tables.

For water quantity in regulated rivers, WaterNSW provides the department with assessments of water availability at least monthly. This includes any recommendation that a change in drought stage may be required. The Executive Director, Water approves any change in stage within expected announced timeframes.

For groundwater sources, assessments are conducted annually, and drought stage announcements are made on 1 July as required. Drought stages will also be reported for the Barwon–Darling unregulated river on the NSW Department of Industry website and in WaterNSW’s weekly water availability reports.

The management of extreme water quality events relies to a large extent on the local uses and options for local treatment. This means that communication during these events needs to be tailored to the specific local circumstances. NSW Department of Industry, in partnership with other NSW Government agencies, will provide advice to local water users and managers about the risks and treatment options during a water quality event.

NSW Department of Industry may seek advice from relevant agencies before increasing the level of criticality above Stage 1. This will depend on the type of event. For example, for:

- water shortage events, WaterNSW is a relevant agency
- water quality events, WaterNSW, NSW Environment Protection Authority, NSW Office of Environment and Heritage, local councils would be relevant agencies.

## Toolkit of extreme event measures

The IRGs will provide a toolkit of measures for water managers to select from, allowing them to introduce more stringent measures to support the highest-priority needs as an event becomes more critical. The generic toolkits of measures for drought or water shortage events for surface water and groundwater are provided in Appendix D, which also shows the toolkit of measures for use in water quality events.

The toolkit measures will be selected from these options and adapted for each IRG area. Further information on operational and management measures for each water resource area will be detailed in the IRGs.

Each measure in Appendix D has an associated decision-maker or authority under delegations applying from September 2018. Decisions to suspend or recommence provisions of a WSP will be recommended to the Minister for Regional Water by NSW Department of Industry. If the minister accepts a recommendation, he/she will seek concurrence from the Minister for the Environment.

## Advice and recommendations

As outlined in Principle 6, the CWAPs will be established when the criticality level of an extreme event is declared at Stage 2 or above for surface water, and Stage 3 or above for groundwater. The key role for this panel is to provide advice to NSW Department of Industry on appropriate response measures and criticality levels.

Panel members will be drawn from relevant government agencies and water delivery authorities, depending on the type of event. Representatives may include (but are not be limited to):

- NSW Department of Industry
- WaterNSW
- NSW Environment Protection Authority
- NSW Department of Primary Industries—Agriculture
- NSW Office of Environmental and Heritage
- NSW Department of Primary Industries—Fisheries
- NSW Health—Water Unit
- NSW Department of Premier and Cabinet
- Local Land Services

NSW Department of Industry will consider advice provided by the CWAP and any other relevant inputs. Recommendations will then be developed and presented with evidence for decision by the appropriate decision-maker.

Table 2 Determining the stage of criticality for water quantity extreme events









Criticality	Evidence base for surface water	Evidence base for groundwater	Broad intent of measures
<b>Stage 1</b> Normal management 	Can deliver all account water under normal river operations practices.	Groundwater levels remain within acceptable ranges, with annual recovery as expected given rainfall/recharge events	Provide certainty for water use planning.  Long term water security and emergency/drought contingency planning
<b>Stage 2</b> Emerging drought/water shortage 	Unable to deliver 100% of high priority account water <b>and</b> maximum expected use of general security under normal river operations practices.	Unacceptable groundwater level and or pressure declines potentially or actually impacting on groundwater availability to high priority GDEs, BLRs and/or LWUs  Drawdown to levels that could lead to aquifer subsidence	Operational measures in the current water year to reduce transmission losses and prevent potential future failure to supply water in accounts (surface water).  Limit potential impacts in local areas via dealings restrictions and potential local area access restrictions (groundwater)  <hr/> Drought response readiness (LWUs)
<b>Stage 3</b> Severe drought/water shortage 	Only able to deliver restricted high priority demands <b>and</b> restricted remaining general security account water.	Continuing unacceptable groundwater level or pressure declines  Unacceptable drawdown impacts on 'efficiently constructed' BLR bores (i.e. levels below the pump or deeper than the bore)  Evidence of aquifer compaction	Restricting access to account water, restricting trade, and suspending some WSP rules in addition to increased operational measures to prevent potential future failure to supply water in accounts (surface water).  Restrict access from bores in all affected areas.  Drought management/restrictions (LWUs).
<b>Stage 4</b> Critical drought/water shortage 	Only able to deliver restricted town water supply, stock and domestic and other restricted high priority demands.	Water level declines pose a risk to long term availability of the groundwater resources - subsidence, and/or mobilisation and induced flow of poorer water quality  Access by 'efficiently constructed' BLR bores significantly impacted	Suspension of some WSP rules.  Severe restrictions required to prioritise remaining supplies for critical human water needs (surface water and groundwater).  Avoidance of permanent damage to aquifers (compaction or salinization)  Emergency drought management measures/restrictions (LWUs).



Table 3 Determining the stage of criticality for water quality extreme events

Criticality	Evidence base for surface water and groundwater	Broad intent of measures
Stage 1 Normal management 	Raw water able to be treated with usual methods  Water quality able to meet other established local values and uses	Long term water quality management planning  Ongoing monitoring and reporting of water quality and pollution events  Water quality risk assessments
Stage 2 Emerging water quality issue 	Raw water able to be treated with some adjustments (minor cost) to usual methods  Water quality able to meet other established local values and uses	As above, and  Deployment of additional treatment processes (LWUs)
Stage 3 Severe local water quality event 	Raw water able to be treated with major adjustments (major cost) to usual methods  Water quality unable to meet some established local values and uses	Restricting/prohibiting access to protect public health and safety. Communication of water quality risks to water users Deployment of major treatment processes (LWUs)  Preparedness/deployment of emergency response measures (LWUs)
Stage 4 Critical water quality event 	Raw water: <ul style="list-style-type: none"> <li>Unable to be treated to meet health-related values identified in the Australian Drinking Water Guidelines</li> <li>Likely to remain untreatable over the longer term</li> </ul> Water quality unable to meet most established local values and uses	As above, and  Flush rivers if possible using stored water and uncontrolled (supplementary) flows  Full implementation of supply side emergency measures (LWUs)  Employ <i>Essential Services Act 1988</i> and the <i>State Emergency and Rescue Management Act 1989</i> if required

## Returning to standard management practices following an extreme event

As conditions improve, a conservative, risk-based approach will be taken when making decisions to conclude measures that were implemented during stages 2 to 4. This is to ensure that de-escalation does not exacerbate conditions, causing the decision to be reversed. Consultation with key stakeholders is expected to occur prior to any decision being made. Providing certainty to the market is also a key consideration.

For water quantity, a decision to de-escalate measures to lower stages will be made only where supply of account water will not be prejudiced for a period of 12 months. A return to Stage 1 (normal operations) is based on the resumption of water sharing plan operation in full for a period of at least 12 months.

Decisions to recommence suspended water sharing plan provisions earlier than at the end of the water year will be made by the Minister for Regional Water with the concurrence of the Minister for the Environment. All other decisions may be made by the Executive Director, Water.

For water quality events, a return to standard operations will occur when raw water is able to be effectively treated with the usual methods and the water quality is able to meet other established local values and uses.

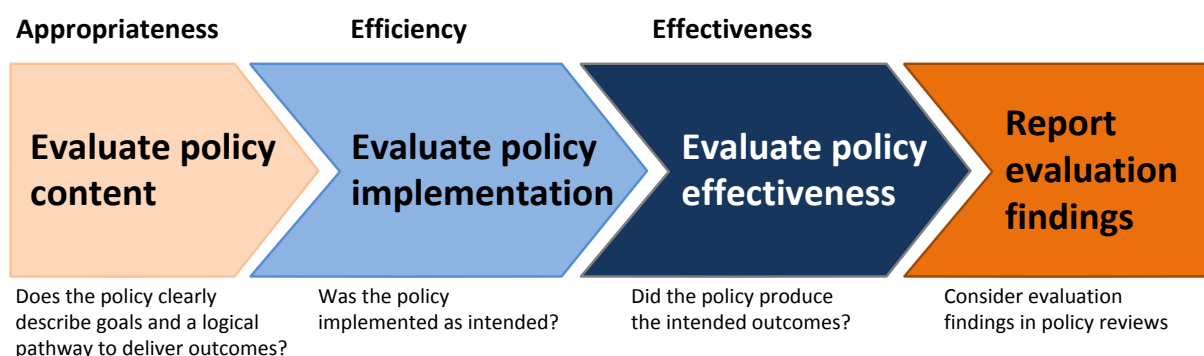
## Policy evaluation and review

The policy evaluation framework outlined below will be used to assess the effectiveness of this policy and to inform policy reviews. The evaluation framework is consistent with NSW Government Program Evaluation Guidelines. This policy will be evaluated and reviewed every five years, or earlier if there is a stage 3 or 4 event, to:

- review context and ongoing appropriateness of policy content
- assess whether implementation was efficient and as intended
- evaluate effectiveness in improving water security during extreme events.

Policy evaluation will identify any issues arising or opportunities for improvement that occur during the review period, particularly if there was a need to declare Stage 2 or above for any water sources. Evaluation findings will be considered in policy reviews.

**Figure 2 Policy evaluation framework**



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## Appendix A—Suspension of water sharing plans

The NSW *Water Management Act 2000* (WM Act) has historically provided for the suspension of water sharing plans only during a severe water shortage (section 49A).

The WM Act was amended in 2018 to enable the suspension of plan provisions in the Murray–Darling Basin to manage extreme events more broadly, including if water quality is so poor that it renders water toxic or unusable for established local uses and values (section 49B).

Examples of NSW WSPs that have been suspended under section 49A of the *Water Management Act 2000* include

- ***Water Sharing Plan for the Lachlan Regulated River Water Source 2003***—suspended on 1 July 2004 due to a severe water shortage. The plan recommenced on 16 September 2011
- ***Water Sharing Plan for the Macquarie and Cudgegong Regulated Rivers Water Source 2003***—suspended on 27 July 2007 due to a severe water shortage. The plan recommenced on 16 September 2011
- ***Water Sharing Plan for the Murrumbidgee Regulated River Water Source 2003***—suspended on 10 November 2006 due to a severe water shortage. The plan recommenced on 16 September 2011
- ***Water Sharing Plan for the NSW Murray and Lower Darling Regulated Rivers Water Sources 2003***—suspended on 10 November 2006 due to a severe water shortage. The plan recommenced on 16 September 2011.

## Appendix B—Extract of *Basin Plan 2012* section 10.51

The following is a direct extract from the Basin Plan 2012 made under the *Commonwealth Water Act 2007*.

### ***Basin Plan 2012***

#### **10.51 Measures in response to extreme events**

- (1) A water resource plan must describe how the water resources of the water resource plan area will be managed during the following types of events:
  - (a) an extreme dry period;
  - (b) a water quality event of an intensity, magnitude and duration that is sufficient to render water acutely toxic or unusable for established local uses and values;
  - (c) any type of event that has resulted in the suspension of a statutory regional water plan in the past 50 years (including a transitional water resource plan or interim water resource plan).
- (2) If an event of a type listed in subsection (1) would compromise a Basin State's ability to meet critical human water needs in the water resource plan area, the water resource plan must set out measures to meet critical human water needs during such an event.
- (3) The water resource plan must provide that, if new scientific information suggests a change in the likelihood of an event of a type listed in subsection (1) occurring (for example, due to climate change), consideration must be given to whether, as a result of this new information, the water resources should be managed differently.

## Appendix C—Applicable statutory powers

Table 4 Statutory powers applicable to management of extreme events in NSW

Legislation	Circumstance/trigger	Summary of powers/provisions
Sections 5(3), 58 and 60(1) WM Act	Normal circumstances	Priorities for the sharing of water
Section 49A(1) WM Act	Minister is satisfied that there is a severe water shortage Concurrence of the Minister for the Environment required	May suspend the operation of any management plan (including a WSP), either in whole or in part
Section 49B WM Act	Minister is satisfied there is an extreme event in relation to a particular Basin management area or part of the Basin water resources Concurrence of the Minister for the Environment required	May suspend the operation of any Basin management plan, either in whole or in part
Section 59(1)(b) WM Act	While an order under section 49A and/or 49B is in place	Allows available water determinations (AWDs) to be made for one or more individual access licences in relation to one or more water source or water management area
Section 60(3) WM Act	While an order under section 49A is in place	Provides the rules of distribution (priorities) for the making of an AWD
Section 60(3A) WM Act	While an order under section 49B is in place	Provides the rules of distribution (priorities) for the making of an AWD
Section 71(z) WM Act	May be considered as an appropriate tool from Stage 2 of an event	May regulate the types of dealings (or trades) that can be made in certain circumstances
Section 324(1) WM Act	Minister is satisfied that it is necessary to do so in the public interest (such as to cope with a water shortage or threat to public health or safety)	May direct that for a specified period the taking of water from a specified water source is prohibited, or is subject to specified restrictions, as the case requires

Legislation	Circumstance/trigger	Summary of powers/provisions
Section 324(2) WM Act	Minister is satisfied that it is necessary, in relation to aquifer, to do so to: <ul style="list-style-type: none"> <li>• maintain or protect groundwater levels</li> <li>• maintain, protect or improve water quality</li> <li>• prevent land subsidence or aquifer compaction,</li> <li>• protect groundwater dependent ecosystems, or</li> <li>• maintain pressure or ensure pressure recovery</li> </ul>	May direct that within a specified area and for a specified period the taking of water from that aquifer, or any other aquifer that is above, below or adjacent to that aquifer is prohibited, or is subject to specified restrictions, as the case requires
Section 331 WM Act	Relating to holders of domestic and stock rights and holders of harvestable rights	May direct a landholder or person to take specified measures to protect the environment, to preserve basic landholder rights or to overcome a threat to public health
Section 336B WM Act	Relating to water take and use for domestic and stock purposes under a domestic and stock right or a domestic and stock access licence	May establish mandatory guidelines with respect to the taking and use of water for domestic consumption and stock watering by landholders or other persons authorised to take and use water for either or both of those purposes under a domestic and stock right, or a domestic and stock access licence
Sections 110, 111 and 112 WM Act	For example, to prohibit new groundwater bores in specific areas where contamination poses a threat to public health and other uses	May place a temporary or permanent embargo on the making of applications for new approvals
Clause 141 Water Management (General) Regulation 2018	Necessary to do so in order to conserve supplies of water in time of drought or other emergency	Water supply authority may regulate or restrict the: <ul style="list-style-type: none"> <li>• purposes for which water may be used</li> <li>• times when water may be used</li> <li>• quantities of water that may be used</li> <li>• means or methods by which water may be used</li> </ul>
Clause 209 Water Management (General) Regulation 2018	In any of the prescribed circumstances and if necessary to do so in order to, amongst other things, conserve supplies in time of drought or other emergency	A water supply authority may cut off or restrict the supply of water to land in certain circumstances
Section 62 <i>Local Government Act 1993</i>	Form opinion that an emergency exists that constitutes a threat to public health or public safety or that is causing or likely to cause damage to property  Concurrence of the Minister for the Environment required	May direct a council to take measures with respect to water supply and sewerage works


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Legislation	Circumstance/trigger	Summary of powers/provisions
Clause 137 Local Government (General) Regulation 2005	If available stored water or available capacity is insufficient, or if there is a drought, or if available stored water or available capacity is so limited as to make extraordinary measures necessary	A council may restrict the: <ul style="list-style-type: none"><li>• purposes for which the water can be used, or</li><li>• times when the water can be used, or</li><li>• methods by which the water can be used, or</li><li>• quantities of the water that can be used</li></ul>


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## Appendix D—Toolkits and decision-makers

Table 5 Drought or water shortage extreme events measures toolkit and decision makers

Criticality	Evidence— surface water	Evidence— groundwater	Intent of responses	Example Management Response Toolkit Options and Responsibility	Applicability	Proposed Decision Maker
<b>Stage 1</b> <b>Normal</b> <b>management</b> 	Can deliver all account under normal river operations practices	Groundwater levels remain within acceptable ranges, with annual recovery as expected given rainfall/recharge events	Provide certainty for water use planning  Long term water security and emergency/drought contingency planning	NSW Department of Industry and WaterNSW: <ul style="list-style-type: none"> <li>• Maintain WSP rules for distribution of access</li> <li>• Planning under Regional Water Strategy</li> </ul>	Surface water and groundwater	Minister for Regional Water  Otherwise, delegated officers, Department of Industry
				LWUs: <ul style="list-style-type: none"> <li>• Long term water security and emergency/drought contingency planning as part of IWCM strategy</li> </ul>	Surface water and groundwater	LWUs (based on approved IWCM plans and in consultation with NSW Department of Industry's Director Water Utilities)



Criticality	Evidence— surface water	Evidence— groundwater	Intent of responses	Example Management Response Toolkit Options and Responsibility	Applicability	Proposed Decision Maker
<b>Stage 2</b> <b>Emerging drought/water shortage</b> 	Unable to deliver 100% of high priority account water and maximum expected use of general security under normal river operations practices	Unacceptable groundwater level and or pressure declines potentially or actually impacting on groundwater availability to high priority GDEs, BLRs and/or LWUs  Drawdown to levels that could lead to aquifer subsidence	Operational measures in the current water year to reduce transmission losses and prevent potential future failure to supply water in accounts (surface water).  Limit potential impacts in local areas via dealings restrictions and potential local area access restrictions (groundwater)  Drought response readiness (LWUs)	NSW Department of Industry and WaterNSW: <ul style="list-style-type: none"> <li>Maintain WSP rules for distribution of                access</li> </ul>	Surface water and groundwater	Delegated officers, Department of Industry
				<ul style="list-style-type: none"> <li>In consultation with water users and                CWAP, progressively introduce                measures to reduce transmission losses                (e.g. 'block' deliveries, 'piggybacking'                replenishment flows)</li> </ul>	Surface water regulated rivers	Delegated officers, WaterNSW in consultation with NSW Department of Industry
				<ul style="list-style-type: none"> <li>If required, limit or refuse trade                (allocation or share assignments) into                impacted areas to maintain or protect                water levels/water pressure, to prevent                potential subsidence or compaction in a                water source, or to protect high priority                groundwater-dependent ecosystems</li> </ul>	Groundwater	For WM Act orders, Minister for Regional Water  Otherwise, delegated officers, WaterNSW on advice from Department of Industry
				<ul style="list-style-type: none"> <li>Impose extraction restrictions (s.324 WM                Act) on works nominated by lower                priority aquifer access licences that are                within impacted areas to maintain or                protect water levels/water pressure, to                prevent potential subsidence or                compaction in a water source, or to                protect high priority groundwater-                dependent ecosystems</li> </ul>	Groundwater	Delegated officers, Department of Industry
LWUs: <ul style="list-style-type: none"> <li>Accelerate implementation of the IWCM                Strategy measures and commence                readiness planning of                Emergency/drought contingency                response plan measures</li> </ul>	Surface water and groundwater	LWUs (based on approved IWCM plans and in consultation with NSW Department of Industry's Director Water Utilities)				

Criticality	Evidence— surface water	Evidence— groundwater	Intent of responses	Example Management Response Toolkit Options and Responsibility	Applicability	Proposed Decision Maker
<b>Stage 3</b> <b>Severe drought/water shortage</b> 	Only able to deliver restricted high priority demands and restricted remaining general security account water	Continuing unacceptable groundwater level or pressure declines Unacceptable drawdown impacts on 'efficiently constructed' BLR bores (i.e. levels below the pump or deeper than the bore) Evidence of aquifer compaction	Restricting access to account water, restricting trade and suspending some WSP rules in addition to increased operational measures to prevent potential future failure to supply water in accounts (surface water). Restrict access from bores in all affected areas Drought management/restrictions (LWUs)	NSW Department of Industry and WaterNSW, in consultation with water users and CWAP: <ul style="list-style-type: none"> <li>Maintain and progressively increase system operation adjustments (e.g. restricted deliveries to extremities of the system)</li> </ul>	Surface water regulated rivers	Where suspension of a WSP rule is required, Minister for Regional Water with concurrence of Minister for Environment Otherwise, Executive Director Water, Department of Industry
				<ul style="list-style-type: none"> <li>S.324 WM Act order restricting/prohibiting take within unregulated rivers and cease announcing periods of access under supplementary water access licences.</li> </ul>	Surface water unregulated rivers	Minister for Regional Water Otherwise, delegated officers, Department of Industry
				<ul style="list-style-type: none"> <li>Explore use of alternative supplies with LWUs</li> </ul>	Surface water and groundwater	Delegated officers, Department of Industry LWUs (with advice from Director Water Utilities)
				<ul style="list-style-type: none"> <li>Suspend relevant WSP rules to enable restriction of delivery of planned environmental water to be explored with OEH</li> </ul>	Surface water regulated rivers	Where suspension of a WSP rule is required, Minister for Regional Water with concurrence of Minister for Environment Otherwise, Executive Director Water, Department of Industry
				<ul style="list-style-type: none"> <li>S.324 WM Act order restricting access to general security water in accounts</li> </ul>	Surface water regulated rivers	Minister for Environment Otherwise, Executive Director Water, Department of Industry
				<ul style="list-style-type: none"> <li>Suspend relevant WSP rules to enable delivery to, or reduce allocations to, high priority access licences to be limited</li> </ul>	Surface water regulated rivers	Minister for Environment Otherwise, Executive Director Water, Department of Industry
				LWUs: Continue accelerated implementation of the IWCM Strategy measures, commence implementation of demand-side emergency/drought contingency response plan measures, and continue readiness planning of supply-side emergency measures	Surface water and groundwater	LWUs (based on approved IWCM plans and in consultation with NSW Department of Industry's Director Water Utilities)








Criticality	Evidence— surface water	Evidence— groundwater	Intent of responses	Example Management Response Toolkit Options and Responsibility	Applicability	Proposed Decision Maker
<b>Stage 4</b> <b>Critical drought/water shortage</b> 	Only able to deliver restricted town water supply, stock and domestic and other restricted high priority demands	Water level declines pose a risk to long term availability of the groundwater resources - subsidence, and/or mobilisation and induced flow of poorer water quality  Access by 'efficiently constructed' BLR bores significantly impacted	Suspension of some WSP rules Severe restrictions required to prioritise remaining supplies for critical human water needs (surface water and groundwater) Avoidance of permanent damage to aquifers (compaction or salinization) Emergency drought management measures/restrictions (LWUs)	NSW Department of Industry and WaterNSW, in consultation with water users and CWAP, in addition to Stage 3 (orange) measures: <ul style="list-style-type: none"> <li>Progressively maintain and increase system operation adjustments</li> </ul>	Surface water regulated rivers	Executive Director Water, Department of Industry
				<ul style="list-style-type: none"> <li>Temporary structures (e.g. earth weirs/block banks to store water more efficiently in the deeper river channels)</li> </ul>	Surface water	Secretary, Department of Industry
				<ul style="list-style-type: none"> <li>Implement reasonable use restrictions on BLR diversions</li> </ul>	Surface water and groundwater	Minister for Regional Water
				<ul style="list-style-type: none"> <li>Suspension water sharing plan rules to enable access to water in accounts to be limited to prioritise critical human water needs</li> </ul>	Surface water and groundwater	Minister for Regional Water Concurrence of Minister for Environment required if suspension of WSP rules are needed
				LWUs: <ul style="list-style-type: none"> <li>Complete implementation of the IWCM Strategy, review and enhance implementation of demand-side emergency/drought contingency response plan and commence implementation of supply-side emergency measures.</li> </ul>	Surface water and groundwater	LWUs (based on approved IWCM plans and in consultation with NSW Department of Industry's Director Water Utilities)

Table 6 Water quality extreme events measures toolkit and decision-makers

Criticality	Evidence—surface water and groundwater	Intent of responses	Example management response toolkit options and responsibility	Applicability	Proposed decision-maker
<b>Stage 1</b> <b>Normal management</b> 	Raw water able to be treated with usual methods Water quality able to meet other established local values and uses	Long term water quality management planning Ongoing monitoring and reporting of water quality and pollution events Water quality risk assessments	 <b>Stage 1</b> and  <b>Stage 2</b>		
<b>Stage 2</b> <b>Emerging water quality issue</b> 	Raw water able to be treated with some adjustments (minor cost) to usual methods Water quality able to meet other established local values and uses	As for Stage 1, and Deployment of additional treatment processes (LWUs)	<p>NSW Department of Industry and WaterNSW:</p> <ul style="list-style-type: none"> <li>Maintain WSP rules for distribution of access</li> <li>Ongoing monitoring of water quality</li> <li>Mapping of risks to water quality by EPA and LWUs</li> </ul> <p>LWUs:</p> <ul style="list-style-type: none"> <li>Implementation of Quality Assurance Program—Drinking Water Management System (DWMS) under the <i>NSW Public Health Act 2010</i> and <i>Public Health Regulation 2012</i></li> <li>Report any pollution incidents to NSW Department of Industry and EPA</li> <li>Deploy additional treatment processes as required</li> <li>Cl. 136 WM Act regulation notices as required</li> </ul> <p>Others:</p> <ul style="list-style-type: none"> <li>EPA reporting to NSW Department of Industry of any:               <ul style="list-style-type: none"> <li>existing or new declarations of significantly contaminated land under Division 2, Part 3 of the <i>NSW Contaminated Land Management Act 1997</i></li> <li>pollution incidents reported under the <i>NSW Protection of the Environment Operations Act 1997</i></li> </ul> </li> </ul> <p>EPLs in the water sources</p>	Surface water and groundwater   Surface water and groundwater   Surface water and groundwater	Delegated officers, Department of Industry   LWUs (based on approved IWCM plans and in consultation with NSW Department of Industry's Director Water Utilities)   Delegated officers, Department of Industry

Criticality	Evidence—surface water and groundwater	Intent of responses	Example management response toolkit options and responsibility	Applicability	Proposed decision-maker
<b>Stage 3</b> <b>Severe local water quality event</b> 	Raw water able to be treated with major adjustments (major cost) to usual methods  Water quality unable to meet some established local values and uses	Restricting/prohibiting access and associated trade to protect public health and safety  Communication of water quality risks to water users  Deployment of major treatment processes (LWUs)  Preparedness/deployment of emergency response measures (LWUs)	As for Stage 1 & 2 criticality, and in addition: NSW Department of Industry and WaterNSW: <ul style="list-style-type: none"> <li>• Apply WM Act s.324 and/or s.331 orders restricting or prohibiting take if necessary in affected areas</li> <li>• Notify works approval holders in affected areas of potential water quality issues</li> <li>• Apply WM Act s.110 order placing an embargo on applications for new bores (water supply works) in specified areas</li> <li>• Broad public communications re: quality/contamination risks</li> </ul> NSW Department of Industry notification of groundwater quality contamination to EPA, NSW Health and LWU  LWUs: <ul style="list-style-type: none"> <li>• Major process adjustments if required, and in consultation with NSW Department of Industry and Department of Health</li> <li>• Commence implementation of demand-side emergency/drought contingency response plan measures and implement supply-side emergency measures</li> </ul>	Surface water and groundwater	If s324 order, Minister for Regional Water or delegated officers, Department of Industry   Otherwise, LWUs (based on approved IWCM plans and in consultation with NSW Department of Industry's Director Water Utilities)
			Others: <ul style="list-style-type: none"> <li>• EPA implementing and reporting to NSW Department of Industry of any incident or contaminated lands management actions triggered under the <i>Contaminated Land Management Act 2007</i> or the <i>Protection of the Environment Operations Act 1997</i></li> <li>• EPA notification of groundwater quality contamination to NSW Health, NSW Department of Industry and LWU</li> </ul>	Surface water and groundwater	Delegated officers, Department of Industry
			As for Stage 3 criticality, and in addition: NSW Department of Industry, WaterNSW and OEH: <ul style="list-style-type: none"> <li>• If required, activate provisions of the <i>Essential Services Act 1988</i> and the <i>State Emergency and Rescue Management Act 1989</i> as required therein.</li> <li>• Use of EWA to flush regulated river system if appropriate</li> </ul>	Surface water and groundwater	Executive Director Water, Department of Industry

Criticality	Evidence—surface water and groundwater	Intent of responses	Example management response toolkit options and responsibility	Applicability	Proposed decision-maker
<b>Stage 4</b> <b>Critical water quality event</b> 	Raw water: <ul style="list-style-type: none"> <li>Unable to be treated with current process train, to meet health-related values identified in the Australian Drinking Water Guidelines</li> <li>Likely to remain untreated over the longer term</li> </ul> Water quality unable to meet most established local values and uses	As above, and <ul style="list-style-type: none"> <li>Flush rivers if possible using stored water and uncontrolled (supplementary) flows</li> <li>Full implementation of supply side emergency measures (LWUs)</li> <li>Employ <i>Essential Services Act 1988</i> and the <i>State Emergency and Rescue Management Act 1989</i> if required</li> </ul>	LWUs and others: <ul style="list-style-type: none"> <li>Commence implementation of the water treatment measures in the IWCM Strategy and review and enhance implementation of demand-side emergency/drought contingency response plan, and full implementation of supply-side emergency measures.</li> </ul> If required, activate provisions of the <i>Essential Services Act 1988</i> and the <i>State Emergency and Rescue Management Act 1989</i> as required therein	Surface water and groundwater	LWUs (based on approved IWCM plans and in consultation with NSW Department of Industry's Director Water Utilities)