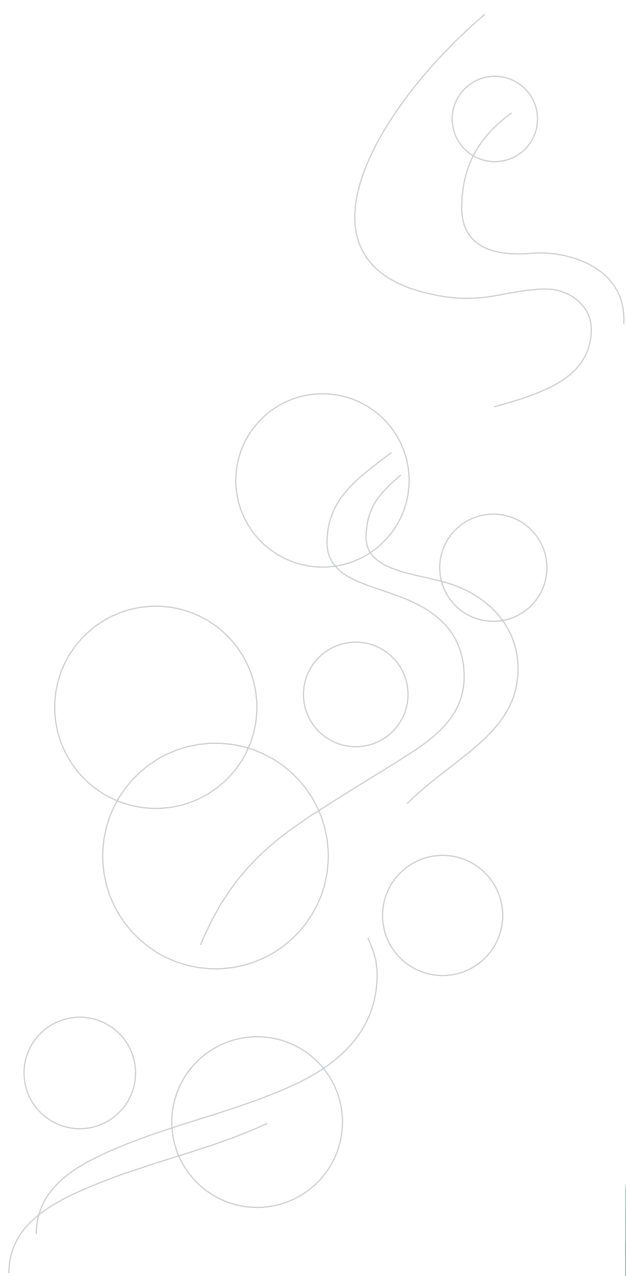


## 4. Strategy risk analysis





## Strategy risk analysis

Addressing water supply risks requires an ongoing monitoring and consultation process.

A key risk to the strategy is climate variability and change.

As part of the study, a risk management approach was utilised to identify any longer term implications for the proposed strategy responses and to determine appropriate actions or 'treatments' to mitigate them.

Three levels of risk were established, low, medium and high. The level of risk was determined based on the perceived likelihood of the risk event occurring, and the consequence of the risk event occurring.

The following categories of risk were identified:

- Climate risks
- Demand risks
- Availability of supply risks
- Environmental risks
- Social risks
- Economic and financial risks
- Stakeholder risks.

Generally, the means of mitigating or treating the risks requires processes for monitoring and reviewing the strategy input data and processes, and provision for consultation with affected stakeholders.

The most significant risks were identified as climate variability and climate change, which may have already had an impact on rainfall and therefore stream flows.

Consideration was also given to the possible implications for the strategy that might arise from issues under consideration outside the strategy area, for example, in adjacent catchments.

The outcomes of the risk analysis are provided in Table 3.

Table 3: Risk analysis

Identified risks	Risk consequences	Risk likelihood	Risk evaluation	Risk treatments
<b>Climate change/climate variability</b> <ul style="list-style-type: none"> <li>• Temperatures rise</li> <li>• Rainfall/runoff events become less frequent</li> <li>• Rainfall/runoff events become more intense</li> <li>• Rainfall/runoff events become more scattered</li> <li>• Severe drought occurs</li> </ul>	Reliability of supplies from existing sources reduced	Likely	High	Continue collection and analysis of meteorologic, hydrologic and environmental data
	Quality of supplies from existing sources reduced	Likely	High	Complete review of the water resource plans at 10-yearly intervals
	Demand for supply, particularly from rural users increases	Likely	High	Reassess ability of existing sources to meet existing demands at 10-yearly intervals
	Supply available from new source options less than currently estimated	Likely	High	Re-assess ability of new source options to meet demands at 10-yearly intervals
	Stress on some environmental systems increased	Likely	High	Development of drought management plans for water supply schemes
	Supply failure	Possible	High	Optimise supply scheme management, for example opportunities for conjunctive use of schemes  Consider benefits of developing alternative supply sources when considering future supply options
<b>Water demands</b> <ul style="list-style-type: none"> <li>• Forecast population trends change</li> <li>• Forecast industry trends change</li> <li>• Forecast mining trends change</li> <li>• Forecast agricultural trends change</li> <li>• New production technologies emerge</li> <li>• Water use practices change</li> </ul>	Water volume demands vary from predicted trends	Likely	Medium	Update industry and mining demand projections at 3-yearly intervals
	Water priority demands vary from predicted trends	Likely	Medium	Update urban and rural demand projections at 6-yearly intervals
	New supply sources not developed at optimum time	Possible	Medium	Re-assess ability of existing sources to meet industry and mining demands at 3-yearly intervals Re-assess ability of existing sources to meet urban and rural demands at 6-yearly intervals
	Increasing achievement of water conservation measures can make it more difficult to implement short-term water savings that may be required under significant drought conditions			Adequate planning for future growth needs to incorporate consideration of the effect of long term reductions in overall water usage

Identified risks	Risk consequences	Risk likelihood	Risk evaluation	Risk treatments
<b>Availability of supply</b> <ul style="list-style-type: none"> <li>Predicted savings from improved supply system management and water use practices not realised</li> <li>Community concerns restrict development of waste water re-use proposals</li> <li>Trading in allocations not effective in meeting priority needs</li> <li>New sources of supply not developed in time to meet demands</li> <li>Alternative sources of supply become available in adjacent catchments, for example, Bowen Broken</li> </ul>	Existing users not able to benefit	Possible	Low	Maintain and enhance incentives for water service providers to improve supply. Maintain and enhance incentives for water users to improve water use practices  Monitor water supply improvements and water use savings  Undertake sufficient assessments of new source options to establish appropriate certainty regarding development timeframes  Monitor effectiveness of trading regime in meeting priority needs  Amend ROP as necessary to address any restraints to trading  Initiate and manage process for the development of new sources of supply in a timely and effective way  Review any new major supply sources developed for their ability to meet the projected needs in the strategy area
	New users not able to access supply as needed	Possible	High	
	Preferred options in the strategy may no longer be the 'best' solution	Possible	Medium	

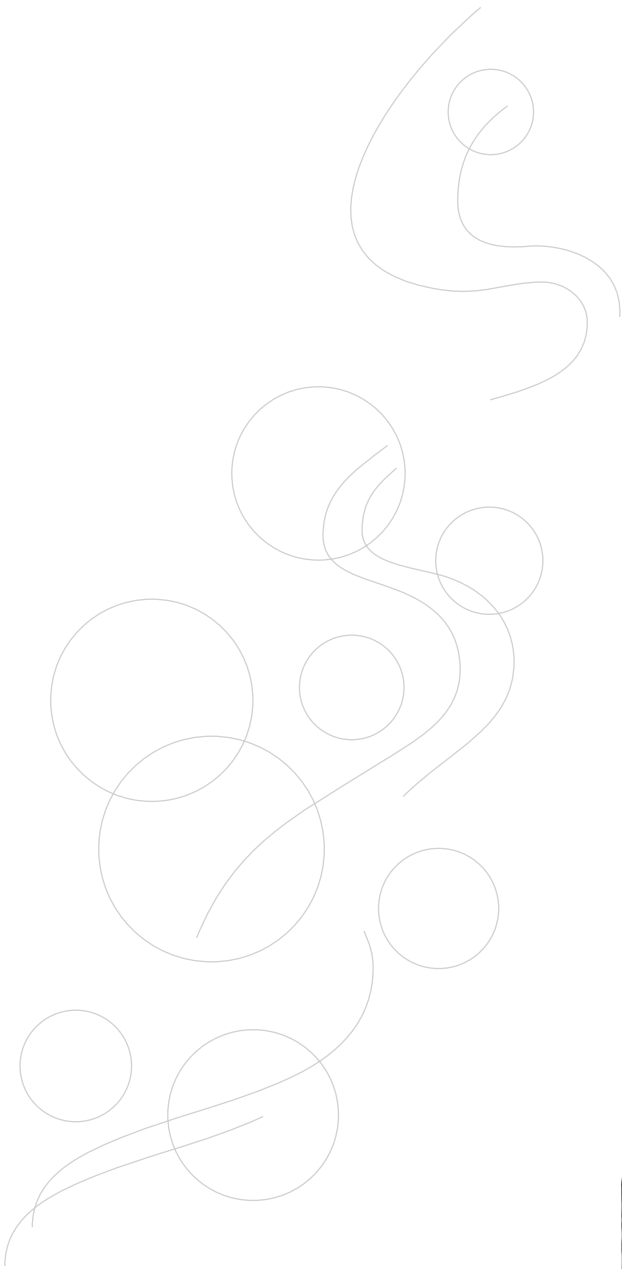
Identified risks	Risk consequences	Risk likelihood	Risk evaluation	Risk treatments
<b>Environmental issues</b> <ul style="list-style-type: none"> <li>Quality of supply from existing sources varies over time</li> <li>Environmental issues emerge which preclude development of preferred new source options</li> <li>Quality of supply from new source options less than anticipated</li> <li>Catchment impacts from existing and new water uses develop over time</li> </ul>	Supply from existing sources becomes unfit for purpose	Unlikely	Medium	Continue State water quality and ecosystem monitoring as per the ROP  Continue water quality and ecosystem monitoring at and downstream of existing storages as per the ROP  Commence water quality and ecosystem monitoring at proposed new source options  Evaluate state-of-the-environment reports to identify emerging issues as soon as practicable
	Supply from new source options unfit for all intended uses	Unlikely	Low	
	Alternative source options need to be identified and developed	Possible	Medium	
	Conditions of use of existing allocations need to be varied	Possible	Medium	
	Additional environmental management strategies need to be developed and implemented for new source options to address unforeseen issues	Likely	Medium	

Identified risks	Risk consequences	Risk likelihood	Risk evaluation	Risk treatments
<b>Social issues</b> <ul style="list-style-type: none"> <li>Landholders in new source areas are disadvantaged</li> <li>Quality of life is impacted upon by restricted availability of supply</li> <li>Employment opportunities are affected by restricted availability of supply</li> </ul>	Landholders in proposed new source areas suffer uncertainty for undue periods	Likely	Low	Fully inform landholders in proposed new source areas of possible impacts and their timing
	Property values in proposed new source areas affected because of uncertainty	Likely	Low	Monitor property values in areas of possible impact
	Lifestyle activities e.g. gardening and recreation are restricted	Possible	Low	Address landholder concerns in project development phase e.g. access issues
	Health issues arise because of inadequate quantity/quality of supplies	Unlikely	Low	Risk treatments as for water demands and availability of supply issues
	Costs of unemployment due to restricted economic development are higher than otherwise	Possible	Low	

Identified risks	Risk consequences	Risk likelihood	Risk evaluation	Risk treatments
<b>Economic and financial issues</b> <ul style="list-style-type: none"> <li>Economics of existing industries are impacted upon by restricted or more costly water supplies</li> <li>Expansions and new industry developments are delayed or abandoned</li> <li>Industry impacts have flow on effects to other industry sectors</li> </ul>	Production constraints impact on viability of existing and new industries	Possible	High	Maximise certainty (and minimise risks) for the development of necessary new water sources adequately in advance of needs
	Viability of other industry sectors is impacted upon	Possible	Medium	Consider all potential funding opportunities, develop business case in advance
	Increased production opportunities are delayed or lost	Possible	Medium	
	Water sales and charges do not cover the cost of new supply infrastructure	Possible	Low	
	Capacity to pay for water is impacted upon	Possible	Medium	

Identified risks	Risk consequences	Risk likelihood	Risk evaluation	Risk treatments
<b>Stakeholder issues</b> <ul style="list-style-type: none"> <li>Not all stakeholders understand or accept the strategy</li> <li>Some stakeholders resist implementation of the strategy options</li> </ul>	Some stakeholders require review and/or amendment of the strategy	Possible	Medium	Consult with all relevant stakeholders and consider all feedback
	Multi-stakeholder issues are difficult to resolve and impact on strategy implementation	Possible	High	Seek to resolve multi-stakeholder issues as soon as practicable
	New source options are delayed by stakeholder objections	Possible	High	Consult with landholders and interest groups and address concerns

## 5. Strategy implementation





## 5.1 Overview

Implementation will involve a number of actions including regular monitoring and review to ensure the strategy remains up to date and risks are minimised.

The implementation of a regional strategy to address the water supply issues in Central Queensland will require a range of activities. Some of the activities that will need to be undertaken as a part of the implementation process include:

- development of more effective water entitlement trading opportunities
- improved water supply system management and water efficiencies
- progression of water supply planning for small communities
- reservation and release of unallocated water
- further investigations of preferred infrastructure options.

These action items are to be progressed through the appropriate water resource management and planning processes and will assist the state and local governments in their future planning.

The initial actions requiring implementation are outlined below. A detailed implementation schedule for the strategy indicating priorities, lead agencies and expected timings for each of the strategy actions is given in Table 4.

Monitoring, review and consultation on the information contained in the strategy, including the main parameters upon which future water demand projections are based, will be undertaken at regular intervals ensuring the strategy is dynamic, up-to-date and flexible.

An investigation of potential institutional arrangements relevant to water supplies from the Lower Fitzroy and Boyne will also need to be undertaken. Appropriate institutional arrangements are required to enable:

- a regional approach to water supply so that potential efficiencies can be realised
- a reduction in risk and liability issues
- an improved certainty for future developments
- key actions required to implement the strategy.

## 5.2 Maximising the effectiveness of supplies through water trading

Provision will be made in the Fitzroy Basin ROP for the conversion of medium priority water allocations to high priority water allocations to facilitate trading in the Nogoia Mackenzie Water Supply Scheme. To provide for this, a review of the Fitzroy Basin ROP change rules for this scheme will occur through a consultative process to be completed in 2006.

## 5.3 Maximising the effectiveness of supplies through more efficient use of water

### *Water demand and efficiency management*

Existing urban, industry, and rural demand management and water use efficiency initiatives in the region will continue to be implemented, and new initiatives, at both regional and sub-regional scales, developed.

As part of the ongoing development of the regional water supply strategy for Central Queensland, regional and/or sub-regional water demand and efficiency management plans are to be developed over the next 1 to 2 years. These plans will outline key demand measures and water efficiency activities to be implemented over identified time periods for urban and industrial water use.

It is anticipated that each plan will describe:

- appropriate targets for residential water use for the localities within the plan area, and suitable time periods over which to implement them
- key opportunities and implications for source substitution
- likely successful demand management programs and possible sources of funding for these schemes
- potential integrated urban water management options to better manage existing water resources and reduce impediments to demand management and water efficiency initiatives
- categories of water users that should undertake water efficiency audits and water efficiency management plans to reduce potable water use
- where savings from pressure and leakage reduction programs would be most effective, and the approximate estimated savings from these programs
- an action plan to implement identified actions.

It is intended that development of the plan utilise and build on work done in association with existing and proposed programs rather than duplicating this work.

While the timeframe for development of these plans is 1 to 2 years, the targets for residential water use should be identified during 2006–07.

To assist in the development of the plan/s, a task group of interested local governments, water service providers and state government officers will be established. The task group would regularly review the development of the plan and provide feedback to relevant stakeholders on a regular basis.

The rural water use efficiency initiative will continue to be the vehicle for improving the efficiency of rural water use.

### ***Lower Fitzroy and Boyne River systems***

In conjunction with the relevant water service providers in the Lower Fitzroy and Boyne River systems, assessments will be undertaken, particularly economic and hydrologic, to maximise the effectiveness of existing and future supplies through innovative and coordinated management. Critical to these assessments will be the establishment of appropriate levels of service for these water supplies.

The above assessments will include evaluation of options for operating the Lower Fitzroy schemes in conjunction with the Awoonga Dam scheme.

In consultation with the relevant water service providers, appropriate institutional arrangements will be established to allow development and operation of additional water infrastructure in the Lower Fitzroy.

### ***Potential for a future Nathan Dam to provide water supplies to the Lower Fitzroy River area***

Hydrologic assessments will be undertaken to determine the effectiveness of a Nathan Dam in providing supplies to the Lower Fitzroy, particularly in critical water supply periods.

### ***Callide Valley groundwater***

Groundwater performance issues in the Callide Valley will be addressed as part of a future amendment process to include regulation of groundwater in the Fitzroy Basin Water Resource Plan, commencing in 2006.

## 5.4 Progression of supply planning for small communities

The Central Queensland Local Government Association will lead, with support from the Department of Natural Resources and Water, the development of solutions to address the water supply needs of small communities.

The study will be undertaken to provide an initial assessment of opportunities for local governments to work collaboratively on solutions such as:

- joint water supply options
- implementing consistent regulations
- encouraging voluntary community adoption of best practice water conservation.

The proposed study will coordinate a regional assessment of water demands in smaller communities and alternatives for meeting the demands. This study will investigate both specific solutions for individual small communities, and generic solutions that may be appropriate for a number of small communities within the study area.

## 5.5 Reservation or release of unallocated water

### *Reservation of unallocated water*

The strategy provides for the reservation of unallocated water to provide high priority supplies to meet urban, industrial and mining demands in the region.

Following completion of investigations associated with existing and proposed infrastructure in the Boyne and Lower Fitzroy systems, including the development of levels of service for these systems, the Fitzroy Basin ROP may be amended to reserve water in accordance with the following:

- reservation of up to 30 000 ML/a of reliable water from the Lower Fitzroy for urban and industrial purposes for the Gladstone Area Water Board, or other entity that may arise from a review of the institutional arrangements
- reservation of 4000 ML/a of reliable water from the Lower Fitzroy for urban needs on the Capricorn Coast
- reservation of the balance of available water from the Lower Fitzroy (currently estimated to be in the order of 42 000 ML/a of reliable water) for urban, industrial and agricultural purposes in the Lower Fitzroy

- reservation of water for urban and other purposes in other systems in the Fitzroy Basin where unallocated water is available.

The hydrologic investigations for the Boyne and Lower Fitzroy will include investigations of potential linkages:

- between the Awoonga Dam Water Supply Scheme and water supply schemes in the Lower Fitzroy
- between the proposed Nathan Dam and water supply schemes in the Lower Fitzroy.

The above reservations are to be in addition to existing reservations, and releases of unallocated water, currently provided for in the existing water resource and resource operations plans.

The Fitzroy Basin ROP may also be amended to reserve water in association with the proposed infrastructure (like Connors River Dam) following completion of the necessary hydrologic and levels of service investigations, as well as detailed design information and project evaluations including economic, environmental, social and cultural heritage assessments.

In implementing the reservation of unallocated water for urban community needs, it will be necessary to develop methods to calculate community reserves and principles for release of reserved water. As part of the development of the methodology, policy targets for reasonable per capita usage in the region will be required.

### ***Release of unsupplemented water for other water uses***

Releases of unsupplemented water will, over time, be made in the Isaac–Connors, Lower Mackenzie–Fitzroy and Upper Dawson sub catchments. The actual timing and process for these releases needs to be determined in consultation with existing and potential water users. In the Isaac–Connors and Lower Mackenzie–Fitzroy sub-regions, it is intended that these releases be made by no later than 2010. A release in the Isaac–Connors and tributaries of the Lower Mackenzie and Fitzroy (excluding Dawson) is planned for 2006. In the Upper Dawson sub catchment, it is intended that the release be made after the details of the Nathan Dam project are finalised.

## 5.6 Investigations of potential infrastructure developments

### ***Confirmation of the suitability of the Connors River Dam proposal***

Development of a dam at the Mt Bridget site on the Connors River is considered to be the preferred option to meet medium to long term high priority needs in the Isaac–Connors area.

Steps will now be taken to ensure there are no ‘fatal flaws’ with this dam site and to provide critical baseline information that will assist detailed impact assessments, specifically:

- geological assessment, including drilling core holes to establish the level and adequacy of foundations for the proposed dam
- assessment of adequate sources of construction materials
- assessment of areas suitable for revegetation
- further assessment of the likely impacts on the Fitzroy River turtle
- further assessment of the likely impacts on fish habitat and fish passage
- appropriate cultural heritage assessment.

Investigation of possible pipelines required to convey supply from the dam to users should be initiated when the location of potential future users is clearer.

### ***Impact assessment studies of the Fitzroy River Weir proposals***

For the Fitzroy River Weir proposals, necessary project evaluations will be undertaken including environmental, social, cultural, and economic assessment and evaluation. The outcomes of these investigations will assist the selection of the most appropriate arrangements of this infrastructure, including the size, and any staging of the infrastructure. It is intended that these studies will proceed in 2006–07.

### ***Progress construction of Nathan Dam***

The State government will develop a separate implementation plan for Nathan Dam to progress the development process for the dam, including amongst other things, addressing environmental issues and the outstanding approvals processes.

## 5.7 Monitoring and review

A comprehensive monitoring and review program has been developed to ensure that the strategy remains relevant over the coming years, and to identify if a significant review of the strategy might be necessary in the future.

Significant elements of the monitoring and review program include the following:

- review of the region's water resource plans at 10-yearly intervals, at which time, re-assess the ability of existing and proposed sources to meet demands
- as part of regular water resource plan reviews, re-assess the performance of schemes and improve the definition of performance of water allocation priority groups where practical
- update industry and mining demand projections at 3-yearly intervals, and if updates vary significantly from previous projections, re-assess ability of existing sources to meet the demands
- update urban and agricultural demands at 6-yearly intervals, and if updates vary significantly from previous projections, re-assess ability of existing sources to meet demands
- monitor effectiveness of trading regime in meeting priority needs
- monitor climatic, hydrologic, water quality and ecosystem variables in accordance with existing regulatory requirements
- evaluate state-of-the-environment reports to identify emerging issues.

## 5.8 Consultation

Whilst this strategy has been developed in consultation with agencies of government and with the assistance of a steering committee comprising representatives of local government, industry and interest groups across the Central Queensland region, a broader program of consultation is now necessary to establish awareness of and understanding of the strategy.

Consultation will need to continue with:

- relevant state government departments
- local governments in the Central Queensland region
- water service providers and water users in the region
- interest groups
- landholders potentially affected by proposed works, storages or pipelines
- the community generally.

## 5.9 Implementation schedule

A detailed implementation schedule for the strategy indicating priorities, lead agencies and expected timings for each of the strategy actions is given in Table 4 below.

**Figure 4:** Strategy Implementation

Strategy action	Priority	Lead agency/ agencies	Instrument	Current schedule or trigger
<b>Regional strategies</b>				
Establish a mechanism / process for ongoing monitoring of the implementation of the strategy, including formation of a strategy implementation group to meet on a formal and regular basis, with additional one-off meetings if emerging issues are identified	High	Department of Natural Resources and Water (NRW)	Central Queensland Regional Water Supply Strategy (CQRWSS)	Finalisation of the strategy. Annual report
Reservation of water in association with future proposed infrastructure	High	NRW	ROP amendment	Amendment of ROP follows completion of necessary investigations, including hydrologic, levels of service and detailed infrastructure assessment studies (2006–07)
Reservation of up to 30 000 ML/a of reliable water from the Lower Fitzroy for urban and industrial purposes for the Gladstone Area Water Board (or other entity as may arise from the review of institutional arrangements)	High	NRW	ROP amendment	Amendment of ROP follows completion of necessary investigations, including hydrologic, levels of service and detailed infrastructure assessment studies (2006–07)
Reservation of 4000 ML/a of reliable water from the Lower Fitzroy for urban needs on the Capricorn Coast	High	NRW	ROP amendment	Amendment of ROP follows completion of necessary investigations, including hydrologic, levels of service and detailed infrastructure assessment studies (2006–07)
Reservation of the balance of available water from the Lower Fitzroy for urban, industrial and agricultural purposes in the Lower Fitzroy	High	NRW	ROP amendment	Amendment of ROP follows completion of necessary investigations, including hydrologic, levels of service and detailed infrastructure assessment studies (2006–07)
Progress a review of institutional arrangements in the Lower Fitzroy (including Waterpark Creek) and Boyne rivers systems	High	NRW; The Coordinator-General; Existing water service providers in this area	Water Act	2006–07
Develop process to progress development of identified infrastructure and release of associated water allocation	High	The Coordinator-General; NRW	State policy	2006–07
Maximising the effectiveness of supplies through water trading e.g. <ul style="list-style-type: none"> <li>review of change rules in Nogoa–Mackenzie</li> </ul>	High	NRW	ROP amendment	Release draft ROP amendment mid 2006 Finalise ROP amendment late 2006

Strategy action	Priority	Lead agency/ agencies	Instrument	Current schedule or trigger
<b>Regional strategies</b>				
Maximising the effectiveness of supplies through water trading e.g. <ul style="list-style-type: none"> <li>review of change rules in other areas</li> </ul>	Low	NRW	ROP amendments	When significant interest from water users is evident
Maximising the effectiveness of supplies through continuing implementation of existing demand and water efficiency initiatives and exploring development of new initiatives for demand management at regional and sub-regional scale	High	Local governments, Fitzroy River Water, GAWB, and SunWater in consultation with NRW, EPA and Local Government Planning Sports and Recreation (LGPSR)	State-wide policy, Water Act	Water Demand and Efficiency Management Plans completed by end of 2007–08. Water use targets identified by end of 2006–07
Maximising the effectiveness of supplies through improved management	High	Water service providers, in consultation with NRW	ROP amendments	A number of studies are current or proposed
Maximising the effectiveness of supplies through drought management planning	High	Water service providers	Water Act	2006–07
Release of unsupplemented unallocated water	Medium- High	NRW	Market based release for tradable water allocations and water licences	As per sub-regional strategies
Increasing water supplies through additional water supply sources	High	The Coordinator-General	Formal appointment of developers, commitment to make water allocations	As per sub-regional strategies
Release of water reserved in association with infrastructure	High	NRW	ROP amendment	Once final project design has been confirmed and necessary approvals obtained for the infrastructure
<b>Urban communities strategy</b>				
Progress state-wide policy relating to targets for urban water use and reservation of water for community urban needs	High	NRW	State policy document	Ongoing during 2006–07
Progress state-wide policy development to address affordability of water for urban community needs	High	LGPSR; Treasury; NRW; Local Government Association of Queensland	State-wide policy	2006–07
Investigate potential for improvements in the allocation security and supply regime for towns supplied by mining companies in the Isaac–Connors, Upper Mackenzie and Comet areas	High	NRW; Local Governments; Relevant mining companies	Water Act; Local Government Act	2006–07
Coordinate small communities planning study	High	Water Directorate-Central Queensland Local Government Association (CQLGA), with support from NRW and LGPSR	Agreement between CQLGA and State Government	Commencing in 2006

Strategy action	Priority	Lead agency/ agencies	Instrument	Current schedule or trigger
<b>Sub-regional strategy</b>				
<i>Isaac–Connors</i>				
Construction of Burdekin–Moranbah Pipeline	High	SunWater	Commercial project by SunWater	2006–07
Release of between 6000 and 8000 ML of unsupplemented water (in the Isaac–Connors and tributaries of the Lower Mackenzie and of the Fitzroy River)	High	NRW	ROP and water licence	2006–07
Release of between 4000 and 6000 ML of unsupplemented water, including overland flow (in the Isaac–Connors and tributaries of the Lower Mackenzie and of the Fitzroy River)	Medium	NRW	ROP amendment and water licence	2007–08
Undertake studies to confirm no 'fatal flaws' associated with the Connors River Dam option	High	NRW; Coordinator-General	CQRWSS	2006–07
Detailed planning and approvals for Connors River Dam option	High	NRW; Coordinator-General	CQRWSS	If the above studies indicate no fatal flaws, the proposal should be progressed to a stage where, if required, it could be developed in the least possible timeframe
Construction of a dam at the Mt Bridget site on the Connors River	Medium-High	Proponent (facilitated by Coordinator-General)	State Development and Public Works Organisation Act and Water Act	Construction to commence with sufficient lead time to enable commercial operation of the infrastructure when anticipated demands approach available supplies
Construction of a pipeline/s from Connors River Dam	Medium-High	Proponent (facilitated by Coordinator-General)	State Development and Public Works Organisation Act and Water Act	Construction to commence with sufficient lead time to enable commercial operation of the infrastructure when anticipated demands approach available supplies
Develop management options for the groundwater systems, including Braeside Borefield	High	NRW	Water Act and/or WRP amendment/ ROP amendment	As part of the Department's ongoing water management role. Management options determined in 2006–07
<i>Lower Mackenzie–Fitzroy</i>				
Detailed assessment studies of Eden Bann Weir raising and of Rookwood Weir	High	NRW	CQRWSS	2006–07
Assess options to maximise effectiveness of supplies in the Lower Fitzroy and Awoonga Dam including addressing performance shortfalls during critical water supply periods	High	Fitzroy River Water; Gladstone Area Water Board; SunWater; NRW	CQRWSS	2006–07
Development of appropriate levels of service for water supplies associated with the Lower Fitzroy schemes and Awoonga Dam	High	Local Governments, Fitzroy River Water, GAWB, SunWater, NRW	Water Act	2006–07
Raising of Eden Bann Weir	High	Proponent (facilitated by Coordinator-General)	State Development and Public Works Organisation Act and Water Act	Complete 2011 (size and staging to be determined)

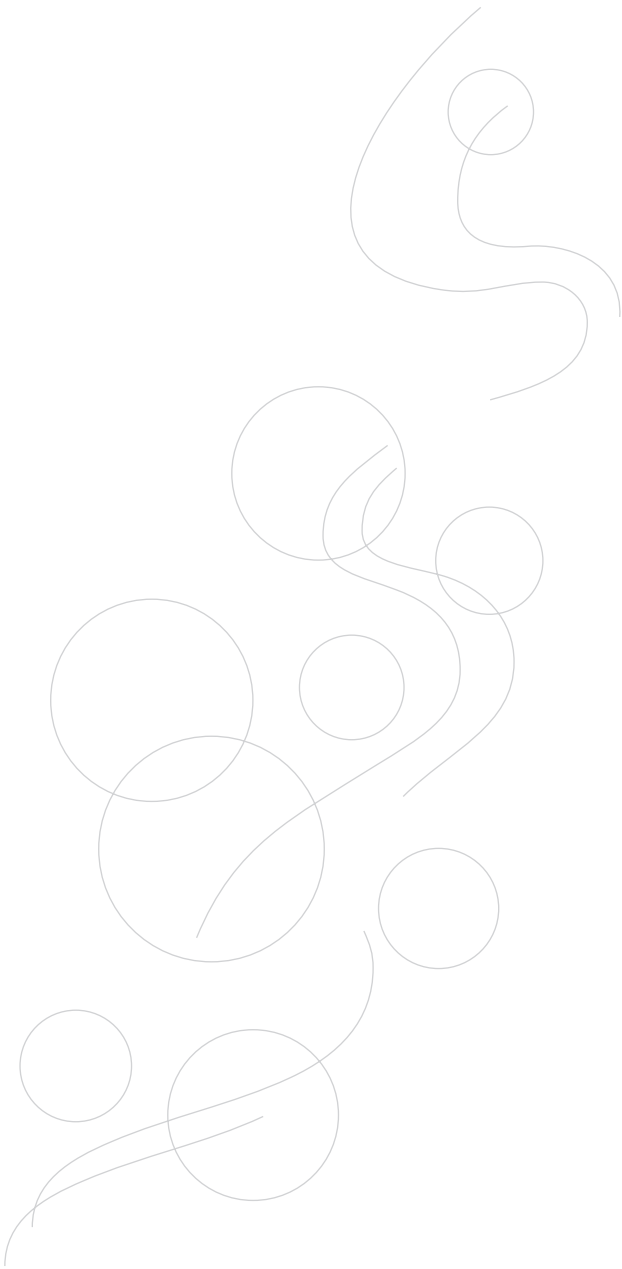
Strategy action	Priority	Lead agency/ agencies	Instrument	Current schedule or trigger
<b>Sub-regional strategy</b>				
<i>Lower Mackenzie–Fitzroy</i>				
Construction of Rookwood Weir	High	Proponent (facilitated by Coordinator- General)	State Development and Public Works Organisation Act and Water Act	Complete 2011 (size and staging to be determined)
Release of 8000 ML nominal volume of unsupplemented water allocation in the Lower Mackenzie	Low	NRW	ROP	When significant interest by potential water users is demonstrated
Construction of pipeline and associated infrastructure from Fitzroy River Barrage to the Capricorn Coast.	High	Livingstone Shire Council	State Development and Public Works Organisation Act/ Agreement between council and relevant water service provider	Commencement of project in 2006–07
<i>Dawson–Callide Valley</i>				
Investigate potential for Nathan Dam to supply Lower Fitzroy in critical water supply periods	High	NRW; Coordinator- General	CQRWSS	2006–07
Construction of Nathan Dam	High	Proponent (facilitated by Coordinator- General)	State Development and Public Works Act and Water Act	When impact assessment studies are completed, outstanding approvals have been obtained and the project is assessed as commercially viable
Address groundwater performance issues - Callide Valley	High	NRW	WRP amendment, ROP amendment	Commencing in 2006
Raising of Glebe Weir	Low	SunWater; Proponent	Water Act, WRP amendment, ROP amendment	When assessed as commercially viable and if Nathan Dam does not proceed
<i>Upper Dawson</i>				
Release of unsupplemented water	Medium	NRW	ROP amendment and water licence	When details of the Nathan Dam project has been finalised
<i>Gladstone</i>				
Construction of a pipeline from the Fitzroy River Barrage to Gladstone	High	GAWB (or other entity if agreed through review of institutional arrangements)	State Development and Public Works Organisation Act and Water Act	When assessed as commercially viable
<i>Comet–Nogoa–Mackenzie</i>				
Review of change rules for medium to high priority allocations to allow for conversion of water allocations if required and introduce a more flexible trading regime	High	NRW	ROP amendment	Release draft ROP amendment mid 2006  Finalise ROP amendment late 2006

Strategy action	Priority	Lead agency/ agencies	Instrument	Current schedule or trigger
<b>Strategy monitoring and review</b>				
<i>Climate</i>				
Continue collection and analysis of meteorologic, hydrologic and environmental data	High	Bureau of Meteorology (BOM), NRW and EPA	Monitoring and reporting requirements, ROP and others	Continuing
Complete review of region's water resource plans at 10-yearly intervals	High	NRW	Water Act	Commencing in 2007
Re-assess ability of existing sources to meet existing demands at 10-yearly intervals	Medium	NRW; water service providers	Review of WRP's, ROP's and CQRWSS	Commencing in 2010
Re-assess ability of new source options to meet demands in terms of adequacy of volume and performance at 10-yearly intervals	Medium	NRW	As above	Commencing in 2015 for Fitzroy region or dependent on significant new information
<i>Water demands</i>				
Update industry and mining demand projections at 3-yearly intervals, or more frequently if need arises	High	NRW	CQRWSS	Commencing in 2009
Update urban and rural demand projections at 6-yearly intervals, or more frequently if need arises	Medium	NRW, DPI&F	CQRWSS	Commencing in 2012
Re-assess ability of existing sources to meet industry and mining demands at 3-yearly intervals (in terms of supply volume and performance)	High	NRW; water service providers	CQRWSS	Commencing in 2009 if up-dates vary significantly from projections
Re-assess ability of existing sources to meet urban and rural demands in terms of supply volume and performance at 6-yearly intervals or more frequently if need arises	Medium	NRW; water service providers	CQRWSS	Commencing in 2012 if up-dates vary significantly from projections
<i>Availability of supply</i>				
Maintain incentives for water service providers to improve water supply	High	NRW; LGPSR; water service providers	Total Management Plans; State guidelines including performance targets	On-going
Maintain incentives for water users to improve water use practices including water re-use	High	State and local governments; water users	State and local government incentive initiatives; state guidelines	On-going
Monitor water supply improvements and water use savings	Medium	NRW; Local governments; water service providers	Incentive scheme obligations; Annual local government reporting	On-going
Undertake sufficient assessments of new source options to establish appropriate certainty regarding development timeframes	High-Medium	NRW	State Development and Public Works Organisation Act	As per Isaac–Connors and Lower Mackenzie–Fitzroy sub-regional strategies

Strategy action	Priority	Lead agency/ agencies	Instrument	Current schedule or trigger
<b>Strategy monitoring and review</b>				
<i>Availability of supply</i>				
Progress the streamlining of water reporting requirements for efficient collection, storing and reporting of water service provider data (Statewide Water Information Management – SWIM Project)	High	LGPSR	The appropriate state legislation – to be determined as part of the project	2006–07
Monitor effectiveness of trading regime in meeting priority needs	Medium	NRW	Water Act	Ongoing
Amend ROP as necessary to address significant restraints to trade	Medium	NRW	Water Act	As required to address identified significant restraints
Initiate and manage process for development of new sources of supply in a timely and effective way	High	The Coordinator-General	State Development and Public Works Organisation Act and Water Act	As per triggers in sub-regional strategies
<i>Environmental issues</i>				
Continue state water quality and ecosystem monitoring	High	NRW	ROP	Ongoing as per the ROPs
Continue water quality and ecosystem monitoring at and downstream of existing storages	High	Fitzroy and Boyne Basin Resource Operations Licence holders	ROP	Ongoing as per the ROPs
Commence water quality and ecosystem monitoring at proposed new source options	Medium	NRW	Water Act	Commencing 2006–07
Evaluate state of the environment reports to identify emerging issues as soon as practicable, and determine appropriate response	Medium	NRW, EPA	CQRWSS	Ongoing
<i>Cultural issues</i>				
Undertake indigenous cultural heritage assessments for proposed new infrastructure	High	NRW, The Coordinator General, Proponent, and indigenous stakeholders	Various State and Commonwealth Legislation	Appropriately in advance of each development
Undertake non indigenous cultural heritage assessments for proposed new infrastructure	High	NRW, The Coordinator General, Proponent and stakeholders	Various State and Commonwealth Legislation	Appropriately in advance of each development
<i>Social issues</i>				
Fully inform landholders in proposed new source areas of possible impacts and their timing	High	NRW	CQRWSS	2006 and as required
Monitor property values in areas of possible impact	Medium	NRW	CQRWSS	Ongoing
Address landholder concerns in project development phase e.g. access	Medium	The Coordinator-General	State Development and Public Works Organisation Act	Appropriately in advance of each development

Strategy action	Priority	Lead agency/ agencies	Instrument	Current schedule or trigger
<b>Strategy monitoring and review</b>				
<i>Economic and financial issues</i>				
Maximise certainty (and minimise risks) for the development of necessary new water sources adequately in advance of needs	High	The Coordinator-General	State Development and Public Works Organisation Act	Appropriately in advance of each development
Minimise risk of funding shortfalls; consider need for community service obligations	High	The Coordinator-General, Treasury	Treasury Guidelines, State Development and Public Works Organisation Act	Appropriately in advance of each development
<b>Strategy review</b>				
Comprehensive strategy review	Low	NRW in consultation with key stakeholders	CQRWSS	Commence when monitoring and assessment actions detailed above suggest that comprehensive review of the strategy is required or by 2018

## 6. Further reading





## Further reading

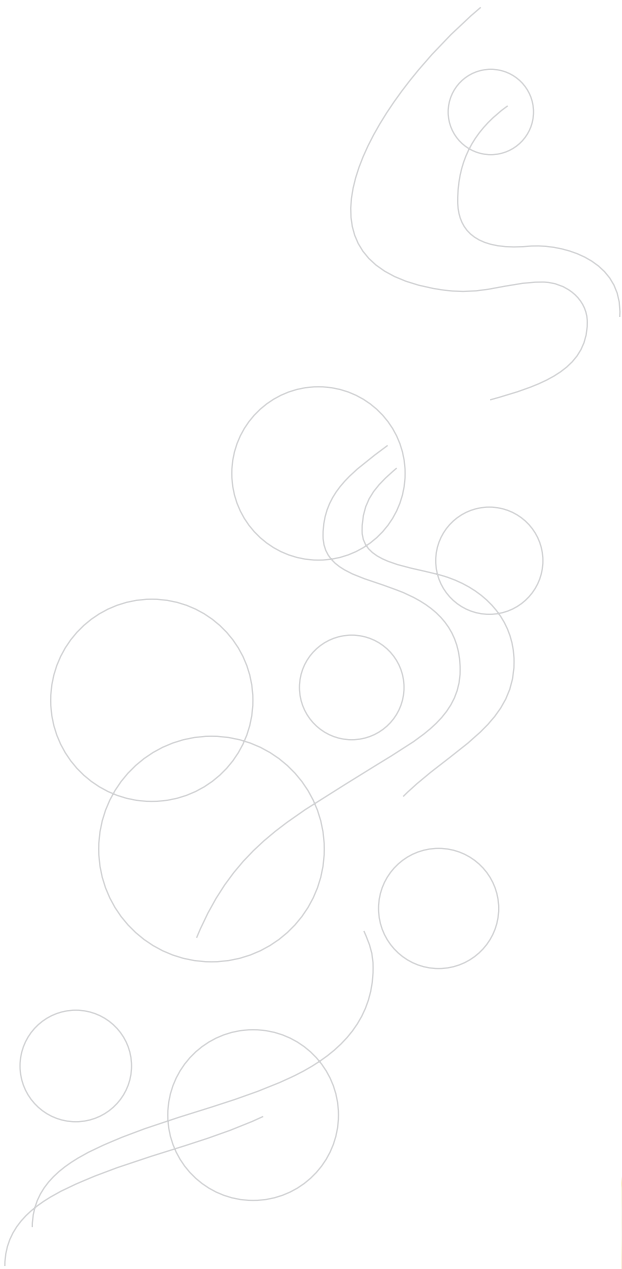
The following list of Department of Natural Resources and Water publications may be of interest to readers who wish to obtain further information about water reform and water planning, particularly as it relates to Central Queensland. The list includes documents which provide general background information about water reform in Queensland, as well as documents relating to water planning in Central Queensland.

The document titled Central Queensland Regional Water Supply Study Report 2005 formed the basis for the development of the strategy.

- Central Queensland Regional Water Supply Study Report, 2005  
[www.cqwaterstrategy.qld.gov.au/documentation](http://www.cqwaterstrategy.qld.gov.au/documentation)
- Fitzroy Basin Resource Operations Plan, 2004  
[www.nrm.qld.gov.au/wrp/fitzroy\\_rop.html](http://www.nrm.qld.gov.au/wrp/fitzroy_rop.html)
- Fitzroy Basin Water Resource Plan, 1999  
[www.nrm.qld.gov.au/wrp/fitzroy.html](http://www.nrm.qld.gov.au/wrp/fitzroy.html)
- Boyne River Basin Resource Operations Plan, 2003  
[www.nrm.qld.gov.au/wrp/pdf/boyne/boyne\\_rop.pdf](http://www.nrm.qld.gov.au/wrp/pdf/boyne/boyne_rop.pdf)
- Boyne River Basin Water Resource Plan, 2000  
[www.legislation.qld.gov.au/LEGISLTN/CURRENT/W/WatResBRPoo.pdf](http://www.legislation.qld.gov.au/LEGISLTN/CURRENT/W/WatResBRPoo.pdf)
- Queensland Water Plan 2005–10 – An action plan to meet our future water needs, August 2005  
[www.nrm.qld.gov.au/water/pdf/qld\\_water\\_plan\\_05\\_10.pdf](http://www.nrm.qld.gov.au/water/pdf/qld_water_plan_05_10.pdf)
- Climate Change: Climate Smart Adaptation  
[www.longpaddock.qld.gov.au/ClimateChanges/](http://www.longpaddock.qld.gov.au/ClimateChanges/)
- Fact sheets  
[www.nrm.qld.gov.au/factsheets/index.php](http://www.nrm.qld.gov.au/factsheets/index.php)
  - W75 Water reform: striking a balance
  - W76 Water trading
  - W74 Water resource planning



## 7. Key terms and concepts





## Key terms and concepts

### **Demand management:**

any program that decreases the level and / or delays the timing of demand for water to meet current and projected needs. Demand management programs may include:

#### *Increasing system efficiency:*

Examples: flow analysis and pressure monitoring; leak detection and leak repair; changes in system operation such as pressure reduction.

#### *Increasing end use efficiency:*

Examples: use of water efficient appliances, devices and processes.

#### *Improving the market in water use:*

Examples: universal metering and cost reflective pricing; education campaigns; water audits.

#### *Promoting distributed sources of supply:*

Examples: stormwater harvesting; encouraging water sensitive urban design; industrial, community and agricultural effluent reuse initiatives.

#### *Substitution of resource use:*

Examples: Air-cooling, saltwater cooling, desalination.

#### *Rural water use efficiency measures:*

Examples: Farm design, crop selection, on-farm storage and channel loss reduction, tailwater recycling.

### **Environmental flow objective:**

an objective for the protection of the health of natural ecosystems for the achievement of ecological outcomes. The environmental flow objectives are specified in water resource plans. For the Fitzroy Basin Water Resource Plan, these objectives relate to first post winter flows, seasonal base flows and medium to high flows.

### **High priority:**

a water allocation that has a relatively high level of performance when compared to medium priority water allocations. High priority water allocations are mostly used for urban and industrial purposes, although they are also sometimes used for irrigation, particularly for high value, long lived crops such as fruit trees.

### **Levels of service:**

the frequency, duration and severity of water restrictions that would be experienced by the community on average over the long term.

**Medium Priority:**

a water allocation having a relatively lower level of performance compared to high priority water allocations. Medium priority water allocations are generally used for irrigation purposes.

**Overland flow:**

water, including floodwater, flowing over land, other than in a watercourse or lake:

- a) after having fallen as rain or in any other way
- or
- b) after rising to the surface naturally from underground.

Overland flow water does not include:

- a) water that has naturally infiltrated the soil in normal farming operations, including infiltration that has occurred in farming activity such as clearing, replanting and broadacre ploughing
- or
- b) tailwater from irrigation if the tailwater recycling meets best practice requirements
- or
- c) water collected from roofs for rainwater tanks.

**Performance:**

The performance of a water supply in terms of its suitability for an intended use, considered in terms of a number of key attributes including, for example, the severity, frequency and duration of restrictions.

**Resource Operations Plan (ROP):**

is a plan that details the operating rules for water infrastructure and other management rules that will be applied in the day-to-day management of water supplies.

A ROP might address, among other things:

- the conversion of water entitlements to tradable water allocations
- the process and location in which water allocations will be traded
- the process for release or reservation of unallocated water that is identified in the corresponding water resource plan
- the detailed operating rules for infrastructure operators so management of dams and weirs complies with the water resource plan’s objectives for water users and the environment
- the detailed practices needed to meet the monitoring and reporting requirements specified in the water resource plan.

**Supplemented water:**

water supplied from a major water supply scheme, for example, the Fitzroy Barrage, Lower Fitzroy (Eden Bann Weir) and Nogo Mackenzie (Fairbairn Dam) water supply schemes. The supply of this water is managed by a water service provider, such as, for example, SunWater or Fitzroy River Water.

**Unallocated water:**

water that it is possible to make available for future consumptive use by urban, rural or industrial sectors without compromising the environment or the security of supply to existing water users.

**Unsupplemented water:**

water not supplied from a major water supply scheme. The Department of Natural Resources and Water manages unsupplemented water. Unsupplemented water includes water taken under high flow conditions (traditionally known as waterharvesting).

**Water allocation:**

a water allocation is an entitlement established through a resource operations plan. Water allocations are tradable separate to land according to limits and rules defined in a resource operations plan. In a trading market, water allocations can be bought, sold or leased, in part or full, permanently or temporarily.

The water allocation holder's details and specifications for water allocations are recorded on a water allocation register, similar to the existing system for registering land titles.

**Waterharvesting:**

the taking of unsupplemented water during specified high flow events, and generally involves storing the water off-stream for later use.

**Water entitlement:**

is a general term for a range of different types of authorisations to take water, including water allocations and water licences.

**Water licence:**

a water licence is for the taking of water or interfering with the flow of water. Unlike water allocations, water licences are not tradable separate to land.

**Water Resource Plan (WRP):**

is subordinate legislation under the Water Act and details the plan area, water to which the plan applies and what the plan aims to achieve.

The water resource plan identifies:

- water allocation security objectives (WASOs)
- environmental flow objectives (EFOs).

**Water trading:**

prior to recent reforms, water licences were tied to the land. Now water allocations, which are established through a resource operations plan, can be bought and sold separately from land. Water trading promotes higher efficiency because water users can sell any surpluses they create through a market process to others who place a higher value on it. Water licences cannot be traded separately from land.