



Proposal for the pass-through of water supply augmentation costs

Submission to the Independent Competition and Regulatory
Commission

13 January 2006

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1 Introduction

In April 2004, the ACT Government released *“Think water, act water – a strategy for sustainable water resources management”*.¹ The strategy assessed all aspects of ACT water resources including water supply, demand management, institutional arrangements, regulation and innovation. As part of this strategy, ACTEW was charged with the responsibility of assessing the reliability of the existing water supply and recommending options for new sources to the ACT Government.

ACTEW launched the Future Water Options project on 30 April 2004, establishing a project team of specialists to investigate three main water sources for future supply identified in the *Think water, act water* strategy:

- Building a new dam near Mount Tennent, south of Tharwa;
- Enlarging the existing Cotter Dam; and
- Transferring water from Tantangara Dam in NSW into the ACT.

Given the substantial lead times involved in planning and building major infrastructure and to fill new storages, ACTEW was also required to examine options for “immediate measures”² to secure supply to maintain “acceptable levels for the duration, frequency and severity of water restrictions during period of drought”³ over the short to medium term.

After nine months of detailed study and analysis the Future Water Options team provided their crucial findings and recommendations to the ACTEW Board of Directors and ACT Government.

The final recommendations of the Future Water Options project were to:

- Implement a Cotter to Googong Bulk Transfer (CGBT) scheme where surplus water from the Cotter water supply catchment in the west would be transferred through the existing reticulation network into Googong Dam;
- Implement the Angle Crossing Option where water would be pumped from the Murrumbidgee River, near Angle Crossing, to Googong Dam via Burra Creek; and
- Undertake additional technical analysis for each of the dam options.

The CGBT scheme was identified during the FWO study as an augmentation option that would provide up to an additional 12GL of water per annum by optimising the use of existing infrastructure by allowing the transfer of water into Googong dam that would otherwise have overflowed Cotter river dams.⁴ This accelerated filling of Googong dam

¹ ACT Government 2004.

² ACTEW 2005, p 49.

³ “Factors set by Government” in ACTEW 2005, p v.

⁴ ACTEW research has shown that, on average over the past 40 years, some 29 GL has spilt from the Bendora and Cotter dams each year.

was to provide additional security against the continuation of the existing drought, and greater security against future droughts, and conforms with the objective of *Think water, act water* to achieve “more efficient use of the existing infrastructure, including the option to use Lower Cotter when the new water treatment facility is commissioned”.⁵ Work on this project has commenced.

In order to maximise the availability of water from the Cotter reservoir for the CGBT, ACTEW is undertaking a catchment remediation project to improve the quality of water in the Cotter reservoir, which has been adversely affected by the poor state of the Lower Cotter Catchment since the 2003 bushfires. This work represents an acceleration of catchment remediation work already planned by the ACT Government.

The original remediation program begun by the ACT Government following the 2003 bushfires was expected to take up to 10 years. ACTEW has been compelled to ‘fast track’ this process to reduce the frequency and magnitude of poor water quality events in the reservoir, which has become a critical component of the ACT water supply system as part of the CGBT scheme.

The CGBT scheme, in combination with the accelerated catchment remediation project, will secure water supply for at least 5 years. In order to secure water supply until at least 2023, the ACT water supply system would need to be supplemented by the transfer of water from the Murrumbidgee River as per the findings of the Future Water Options Implementation Plan.

As foreshadowed in ACTEW’s letter of 3 June 2005 and discussions with the Commission since then, this submission provides information and indicative costs, ahead of its tariff proposals for 2006/07 and 2007/08, in relation to the pass-through of efficient and prudent costs resulting from the Future Water Options, CGBT, and Cotter catchment remediation projects. This submission outlines the basis for ACTEW’s pass-through proposal and the costs likely to be borne by ACTEW as a result of the pass-through event. These costs exceed the Commission’s materiality threshold in each remaining year of the current regulatory period, and are prudent and efficient in accordance with the Commission’s requirements.

2 Project description

2.1 Future Water Options project

One of the objectives of the ACT Government’s 2004 *Think water, act water* strategy⁶ was to: provide a long-term reliable source of water for the ACT and region.

It was considered necessary to reassess the need for a new water source given climate change issues, the impact of the bushfires on existing catchments, ACT Government population projections and water consumption targets, proposed changes to environmental flow guidelines and the significant impact of ongoing water restrictions.

⁵ ACT Government 2004, p 53.

⁶ ACT Government 2004

ACTEW was charged with the responsibility of assessing the reliability of the existing water supply and recommending options for new sources for the ACT Government. Over 44 studies were undertaken to assess and evaluate environmental, social, economical and technical issues and prepare preliminary engineering designs for the various alternatives.

ACTEW's Future Water Options (FWO) project team consisted of highly skilled and qualified technical specialists from ACTEW and ActewAGL and other expert consultants. The Future Water Options process was totally separate to ACTEW core business. It was a specific project with all costs contained within a project management framework. Consultancies were commissioned after tender processes were followed to ensure appropriate skills and value for money.

ACTEW has incurred costs of around \$3.2 million on the FWO project to date, and proposes that these costs be passed through to customers as part of the capital expenditure on the CGBT scheme. Further details of the work involved in the Future Water Options project are included in Appendix 3.

2.2 Cotter-Googong Bulk Transfer scheme

The CGBT scheme involves transferring treated water through the ACT water reticulation network from the Stromlo Water Treatment Plant (WTP) into Googong Dam to increase overall system yield. Water would be dechlorinated at the Googong Pump Station before entering Googong Dam.

The transfer rate will depend largely on the weather and on the daily demand of the city. The project is particularly attractive at present when, because of the drought and use following the 2003 bushfire, the Googong dam level is low. Storage levels in the Cotter catchment dams have recovered from the drought, with all dams having been 100% full, while Googong remains around 40% full. This provides a great opportunity to transfer into Googong dam water that would otherwise have overflowed Cotter River dams. This filling of Googong dam provides additional security against the continuation of the existing drought, and greater security against future droughts.

The CGBT program includes four main components:

- Googong water treatment plant bypass pipeline, de-chlorination of water prior to discharge into Googong dam and reversal of Deakin and Hume water pumping stations (subprogram 1);
- Cotter Pump Station – re-commissioning of pumps 5 and 6 at the Cotter pump station, and automation of the operation of all four pumps 5, 6, 7 & 8 (subprogram 2);
- Stromlo upgrade – work at Stromlo WTP to more reliably treat Cotter water (subprogram 3); and

- Project Management, Co-ordination and Risk management – overall co-ordination of the above projects, plus development and implementation of a risk management plan for the project.⁷

Further detail regarding the CGBT project is included in Attachment 1.

ACTEW has already committed around \$14 million of capital investment to the CGBT scheme, and it is anticipated that the scheme would require further capital expenditure of around \$11 million over the next 12 months. Additional operating costs resulting from the scheme are expected to be around \$5 million per year.

2.3 Catchment remediation project

An essential component of the development of the FWO implementation plan and the CGBT scheme was that the water quality in the Cotter reservoir would be sufficient to maintain the planned supply rate at all times.

However, the lower Cotter catchment was severely damaged by the 2003 bushfires, and it has become increasingly evident that the poor state of the catchment is adversely affecting the quality of the water in the Cotter reservoir and the ability to utilise the CGBT at its optimum level. Currently, the Stromlo WTP is not able to treat the high turbidity levels present in water from the Cotter reservoir following moderate storm events. In the last 3 years, high turbidity levels have been experienced about 40% of the time.

This significantly reduces the opportunity to use Cotter Reservoir water directly for potable use and through the CGBT and hence impacts on the overall effectiveness of the water supply system in the short term. That is, water restrictions may need to be re-introduced sooner and be applied for longer periods if further low rainfall periods are experienced in the future. This would mean that the upper limit of time in water restrictions, as identified in the FWO implementation plan, would be exceeded. In the longer term, continued high turbidity events would result in the need to bring forward the timing of the next new water source.

The ACT Government's timetable for remediation of the lower Cotter catchment is up to 10 years. But as a result of the issues identified, ACTEW has undertaken to fast-track the remediation of the lower Cotter catchment in order to improve the quality of water in the Cotter reservoir and provide an immediate improvement to reliability of supply. This accelerated catchment remediation project is an essential adjunct to the CGBT scheme and is deemed necessary in order to meet FWO and *Think water, act water* objectives.

Work in the catchment has already commenced, including on road and drainage works, sediment basins, wetlands, vegetation planting, monitoring and scientific studies. The rehabilitation program is based on studies undertaken by Ecwise Environmental including a catchment and landscape analysis completed as part of the Future Water Options process and an analysis of the impact of the bushfires on vegetation and the resultant hydrological change on the Cotter River.

⁷ During the initial stage of the program, before any agreement was signed, all costs associated with the project were allocated to this component.

Further detail regarding the accelerated remediation of the Cotter catchment is included in Attachment 2.

It is anticipated that the minimum expenditure required to achieve significant water quality improvement in the catchment is \$11 million and the ACTEW Board has currently approved works to this value. A decision will be made in July 2006 on whether this expenditure needs to increase to \$17 million based on the extent of natural recovery of the catchment including regeneration of native vegetation up until that time.

3 Pass-through proposal

3.1 Basis of pass-through claim for augmentation costs

The Commission's March 2004 Price Direction states that

ACTEW may, when submitting proposed tariffs to the commission in accordance with clause 5.1, seek to incorporate in proposed tariffs the effects of pass-through events.

A pass-through event is an event that has occurred or is reasonably anticipated to occur that satisfies the materiality test in clause 6.7 and is either:

- ...
- an augmentation event.⁸

And

An augmentation event occurs where ACTEW is required to fund or contribute to the funding of a major augmentation to ACTEW's water supply that was not included in the costs reasonably foreseen by the commission and ACTEW and incorporated in this price direction.⁹

Capital and operating expenditures resulting from the CGBT and catchment remediation projects were not incorporated in the 2004 Price Direction. The Commission stated that:

The commission's allowances for ACTEW's capital expenditure program provide for what the commission considers to be an efficient level of investment over the regulatory period... (This investment) does not give consideration to the drivers of major infrastructure investment.¹⁰

At the time of the Price Direction the Commission acknowledged there was "considerable public debate about the need for some form of additional infrastructure."¹¹ However, the Commission noted that its consultant, Halcrow, had advised it that "it did not consider that

⁸ ICRC 2004, p182.

⁹ *ibid*, p185.

¹⁰ *ibid*, p159.

¹¹ *ibid*, p166.

there was a need for significant expenditure on major infrastructure projects in the period 2004-05 to 2008-09.”¹² Nevertheless, the Commission had discussed this in some detail with ACTEW and listed a series of possible options for augmenting supply, noting “it is possible that a decision will be made regarding funding of a new supply source during the next regulatory period.”¹³ For this reason, the Commission decided to include in the Price Direction a specific pass-through provision for an augmentation event as it was clearly possible in the term of the next price path, though the cost of such augmentation could not have reasonably been foreseen at the time.

ACTEW submits that FWO, CGBT and catchment remediation costs result directly from an ‘augmentation event’ as defined by the Commission in its Price Direction, and, as demonstrated below, meet the materiality test set out in the Price Direction. Therefore, it is proposed that these costs be passed through in tariffs within the current regulatory period.

3.2 Materiality

The Commission’s March 2004 Price Direction states:

The effect of the change in costs arising from an... augmentation event must be such that the annualised cost incurred by ACTEW or forecast to be incurred as a result of the event occurring is at least \$1.5 million (in 2002-03 dollar terms) in any one year above the costs reasonably foreseen by the commission and ACTEW and incorporated in this price direction.

The annualised cost in any one year is equal to the amount of additional operating expenditure incurred in that year plus 15 per cent of the additional capital expenditure incurred in that year.¹⁴

Current estimates of costs incurred as a result of this augmentation event substantially exceed the materiality threshold in each of the remaining years of this regulatory period, as demonstrated in Table 1 in section 3.3 below.

3.3 Cost estimates

The following table summarises the estimated costs¹⁵ for the projects outlined above.

¹² ICRC 2004, p159

¹³ ICRC 2003, p142.

¹⁴ ICRC 2004, p185.

¹⁵ These costs include only actual FWO costs incurred to date.

Table 1: Summary of estimated costs

		To 12/05 \$'000s	1/06-6/06 \$'000s	2006-07 \$'000s	2007-08 \$'000s
CGBT	Capex	\$11,100	\$8,250	\$5,650	\$0
	Opex	\$200	\$2,000	\$4,800	\$5,000
CR	Capex	\$1,245	\$3,515	\$2,100	\$200
	Opex	\$335	\$1,905	\$1,700	\$0
FWO	Capex	\$3,178	\$0	\$0	\$0
Total	Capex	\$15,523	\$11,765	\$7,750	\$200
	Opex	\$535	\$3,905	\$6,500	\$5,000
Annualised cost		\$8,533		\$7,663	\$5,030
Materiality threshold		\$1,578		\$1,578	\$1,578

* all figures are in 2005-06 dollar terms

3.4 Proposed pass-through approach

ACTEW proposes that costs be passed through to customers as actual costs become known and confirmed. This means revenue would be recovered only for expenses that have actually been incurred.

That is, 2006-07 prices would be set to recover additional operating costs, the return on assets arising from capital costs and depreciation on those assets incurred in the period 1 January to 31 December 2005.

2007-08 prices would recover such costs for the period 1 January to 31 December 2006.

Actual costs for the period 1 January to 31 December 2007 and estimated costs for the period 1 January 2008 to 30 June 2008 would be incorporated into the revenue requirement for the following regulatory period. The residual asset value (initial capital expenditure less depreciation to 30 June 2008) would be rolled into the opening regulatory asset base (RAB) as at 1 July 2008. All operating expenditure forecast to occur from 1 July 2008 would be similarly built into ACTEW's revenue requirement for the next regulatory period.

3.5 Indicative price impact

Under ACTEW's proposal, expenses are to be passed through to customers once the work has been undertaken and actual costs have been confirmed. The pass-through in 2006-07

prices (due to expenditure on the three projects during the 2005 calendar year) is likely to be around 3c/kL, or \$8 per annum for a customer using 280kL per annum.¹⁶

The pass-through is likely to increase to around 18c/kL in 2007-08 prices, as more works are completed and operating costs are confirmed, though this is likely to be offset by other factors at that time.¹⁷

In addition to this, under ACTEW's proposal, an estimated \$12 million would be included in the revenue requirement for the following regulatory period to recover expenses incurred in the period 1 January 2007 to 30 June 2008.¹⁸

A detailed price impact analysis will be provided in ACTEW's 2006-07 pricing proposal due 1 March 2006. Before this time, ACTEW would be pleased to discuss with the Commission options for managing the impact on customers of this pass-through proposal.

¹⁶ Assumes net capex of \$10m (based on allocation of capex deferrals proportionately with total CGBT, CR and FWO capex) and opex of \$535k in the 2005 calendar year. Assumes 2006-07 metered consumption equal to metered consumption amount used to set 2005-06 prices adjusted for one years' customer growth – to be updated in formal pricing proposal due 1 March 2006.

¹⁷ Assumes net capex of \$10m in each of the 2005 and 2006 calendar years (based on allocation of capex deferrals proportionately with total CGBT, CR and FWO capex) and opex of \$7.2m in 2006 calendar year. Assumes 2007-08 metered consumption equal to metered consumption amount used to set 2005-06 prices adjusted for two years customer growth – to be updated in formal pricing proposal due 1 March 2006.

¹⁸ All indicative price impact calculations are based on a WACC of 7% and an average asset life of 66 years for CGBT (and FWO) assets (per ICRC 2004, p48), and 11 years for notional 'catchment remediation assets'.

References

ACT Government 2004, *Think water, act water – Volume 1: strategy for sustainable water resource management in the ACT*, April.

ACTEW 2005, *Future Water Options for the ACT Region Implementation Plan: A summary of the recommended strategy to increase the ACT's water supply*, April.

Independent Competition and Regulatory Commission (ICRC) 2003, *Draft Report and Draft Price Direction – Investigation into prices for water and wastewater services in the ACT*, Report 16 of 2003, December.

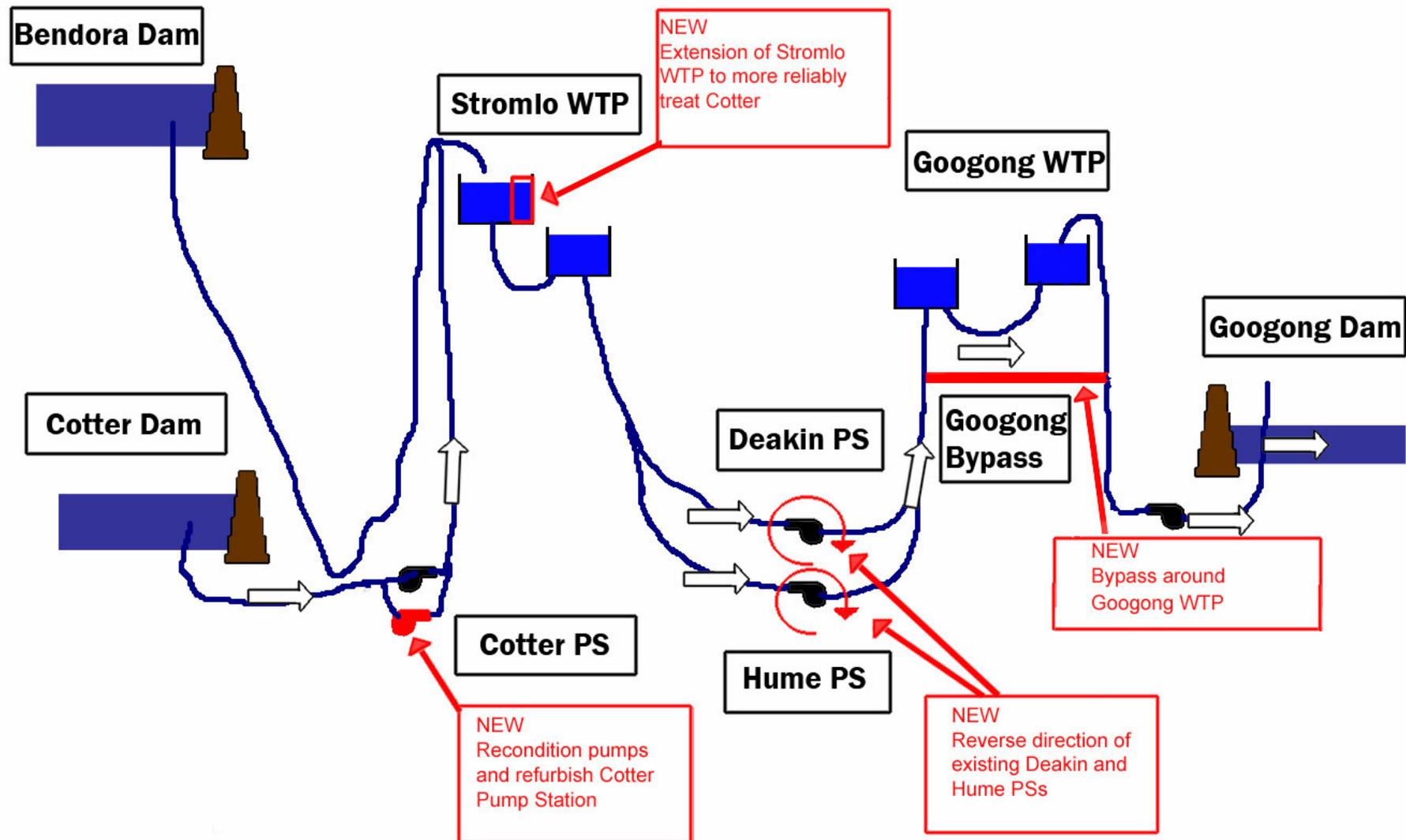
Independent Competition and Regulatory Commission (ICRC) 2004, *Final report and price direction – Investigation into prices for water and wastewater services in the ACT*, Report 8 of 2004, March.

Attachment 1 - CGBT Scheme

Operational strategy

The CGBT scheme, once fully operational will increase system yield by transferring water that would otherwise have spilled over Cotter River dams. At the time of this submission, all of these dams are close to maximum capacity.

The strategy for operating the system is heavily dependent on the weather and the relative storage in the Cotter and Googong systems. For instance, if it rains and Googong fills quickly, transferring water into Googong would not be required. If it is very dry, as in autumn 2005, there may not be enough water in the Cotter system to warrant transfer. Most likely, the weather will be somewhere between these extremes. ActewAGL has developed a detailed operating strategy (Summer operations plan) that sets the rules for the appropriate times to transfer.



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Work program

CGBT program management

Coordination and risk-management includes conducting options studies, undertaking planning, gaining approvals, developing concept designs and researching market pricing.

Subprogram 1: Googong, Deakin & Hume works

A pipeline has been constructed to enable the bypass of the Googong Water Treatment Plant. The plant itself has been modified to enable dechlorination of water being transferred into Googong Dam. Work at the Deakin and Hume reticulation pump stations has enabled the pumps to be reversed, which will increase the amount of water that can be transferred. This subprogram has recently been completed, which will enable up to 150 ML/day to be transferred to Googong Dam from Stromlo WTP depending on Canberra water demand.

Subprogram 2: Cotter Pumping Station works

Work at the Cotter Pumping Station is currently under investigation, and will involve refurbishing the pump station building and pumps 5 and 6 to enable more water to be pumped from Cotter Dam. The pumping station is a heritage-listed building, which means that the refurbishment will need to comply with a number of regulations. The work will also involve automation of pumps 5, 6, 7 and 8, pumps 7 and 8 having been re-commissioned as part of the Drought Contingency Plan.

Subprogram 3: Stromlo Treatment Plant

Work at the Stromlo WTP is currently in early stages of design, and will involve augmenting the sludge handling capability and the treatment process of Stromlo WTP. This will give the plant more reliability to treat water from the Cotter Dam. The net result is that the system yield will increase as Cotter water will be more available.

Attachment 2 - Catchment Remediation

Since the 2003 bushfires, ACT Forests has been rehabilitating the lower Cotter catchment. Activities include replanting of native plants and pine trees, reassessing the road network and felling and burning of dead pine trees. This work has, in part, been based upon the recommendations of Professor Wasson and other advisors. Professor Wasson was previously a member of the team that developed the recommendations for the Non-Urban Study, which have been brought into the document "Shaping our Territory - revitalising the Cotter". Prof. Wasson was also previously chair of the Chief Minister's Sustainability Expert Reference Group.

As a result of these recommendations, ACT Forests' practices now include:

- a reduction in roads, the accepted main source of sediment in established pine plantations;
- the establishment of riparian zone buffers in various areas, in particular Pierces Creek and its main tributary, Dry Creek; and
- the clearing of debris from steep slopes, which are not planned to be replanted with pines but with natives.

Other activities currently being carried out by ACT Forests include:

- contour ripping to enhance absorption of water for plants and reduction in erosion;
- debris management in preparation for planting or for fire management; and
- road construction and rehabilitation.

The timetable for ACT Forests to complete these remediation works was up to 10 years, which in terms of general catchment management, considering the extent of the fires was considered reasonable, but as discussed in the main report, would be too late to provide a significant improvement in water quality needed for ACTEW to be able to meet FWO and *Think water, act water* objectives and to ensure the CGBT scheme was fully effective. Hence the need for the accelerated program by ACTEW.

In a recent report commissioned by ACTEW (as an extension of investigations of the Cotter site for the Future Water Options project) the authors (Nagy and Starr) and peer reviewed by Prof Wasson, concluded that:

"The principal source of fine and coarse sediment will, almost certainly, be steep slopes either connected to the drainage system or immediately adjacent to the reservoir."

The following work program was therefore developed.

Work program

Sediment basins and wetlands

To reduce the amount of sediment entering the streams and moving to the reservoir, it is necessary to provide structures that reduce sediment movement. Construction of sediment basins has proved most effective while the vegetation is being re-established. Construction of wetlands in the catchment will improve water quality by reducing fine sediments that are suspended in flows and not able to settle out in sediment ponds.

Work undertaken to date has been within Pierces Creek catchment with more than 20 small structures in gullies and tributary stream beds as well as one large in-stream sediment basin in Pierces Creek and one wetland embankment in its main tributary, Dry Creek. One more large sediment basin is to be built in Pierces Creek, which will complete the major sediment basin work within Pierces Creek.

Discussions with Environment ACT and work plans for approval are currently being developed for projects in the Lees Creek and Condor Creek catchments on the western side of Cotter River.

Road drainage and culverts

Unsealed roads are known to continually contribute significantly to the sediment load. Therefore it is important that roads in the catchment be properly maintained to reduce scour of roadside drainage channels and the creation of gully erosion from flows concentrated by drains or culverts. For safety reasons, drainage along roads normally occurs on the inside of the road adjacent to the cut embankment. By draining roads to the inside edge, many culverts or drainage crossings are required. These tend to concentrate flow and increase downstream erosion potential in gullies. Therefore proper scour protection for both culvert inlets and outlets needs to be considered on all roadways.

Significant installation of drainage culverts has been undertaken in the Pierces Ck, Mt McDonald, and Blue Range compartment areas with intermittent works on connecting roads.

Roadworks

Erosion of unsealed road surfaces is a major source of sediment in streams and reservoirs. Within the lower Cotter Catchment, many roads require regrading and drainage improvement. Steeper high-use roads, in particular the Pipeline Road, will be surfaced with a coarse gravel to minimize damage and erosion, and improve durability. Other steep roads as well as roads immediately adjacent to major creeks will be closed and revegetated where possible.

Many existing roads are to be closed as a dense road network is no longer required. There are two reasons for this. Firstly, fewer pines are being planted, and secondly, fire-fighting services are moving from land-based to aerial approaches.

Grading of roads has occurred in the Pierces Ck catchment, Mt MacDonald and Blue Range areas as well as some connecting roads. Several roads within these compartments have also been closed.

Vegetation

There has been much discussion on the replanting of pine trees versus native plants, and even consideration of planting some flatter areas with grasses. The evidence appears in favour of native replanting to improve water quality. This is due to factors including the reduced road network required for natives compared to commercially harvested pines, the ability of natives to regenerate after fire, and reduced organic loads from natives (due to broken-down leaves and other organic material entering the water). However, areas planted with pines with appropriate riparian zones surrounding them are considered acceptable from a water quality perspective.

It is being recommended to the catchment managers that non-critical riparian zones where dead pine trees have been cleared and native regeneration has occurred be left to return to a native forest naturally. This would result in a much lower cost than replanting these areas.

At this stage only previously proposed pine and native vegetation plantings have been undertaken by ACT Forests as part of their original program. ACTEW understands there is no intention to commercially log any pine plantations occurring as part of the remediation of the catchment.

Monitoring and scientific studies

Monitoring and a series of studies are being undertaken as an integral part of this Work Plan, to ascertain the effectiveness of the works undertaken, both during the work period and afterward, as well as providing a better understanding of the catchment so that it can be managed more effectively in the future.

Since the January 2003 bushfires, ACTEW has initiated a number of studies to better understand what is happening in the catchment and how long it will take to recover in terms of both water quality and yield. It will be several more years until more reliable estimates can be made. The studies undertaken as part of this work plan will build on the knowledge gained from the post-bushfire studies undertaken in the catchment. The ACT Chief Minister's *ACT water supply catchment management group* is assisting ACTEW to develop these studies and a monitoring program.

Attachment 3 – Future Water Options project

The ACT Government released *Think water, act water: A Strategy for Sustainable Water Resources Management in the ACT* in April 2004. This strategy assessed all aspects of ACT water resources including water supply, demand management, institutional arrangements, regulation and innovation.

Through a comprehensive consultation process, *Think water, act water* identified a series of objectives to guide sustainable management of water resources in the ACT. One of these is to: *Provide a long-term reliable source of water for the ACT and Region*. Furthermore it states;

A range of water supply options for the future will continue to be considered in case water use efficiency measures are not able to save enough water to avoid the need to construct further water supply infrastructure. This planning process is being developed in a strategic manner to ensure there is no risk to the long-term security of water supplies in the ACT.¹⁹

Need for the Project

Previous analysis had indicated that the ACT would need a new water supply by 2017, to meet demand for a population of about 405,000. Several issues had emerged in recent years that motivated reassessment of this prediction:

- The current drought was developing into one of the worst on record with experts concerned it may be an indication of permanent climate change for the region.
- The Cotter River water supply catchment was completely burnt in 2003 and is expected to deliver reduced inflows to water storages as it recovers over time.
- The ACT Government announced a population policy in the Spatial Plan of 500,000 by 2032.
- The Government's strategy, *Think water, act water* had set water efficiency targets of a reduction in per capita mains water use of 12 per cent by 2013 and 25 per cent by 2023.
- Environmental Flow Guidelines were first introduced in 1999 requiring releases from water supply storages to sustain downstream environments. As part of their introduction a review of these guidelines is now being undertaken.
- As water restrictions continued, the impacts on the community were being realised as significant, bringing attention to determining what levels of water restrictions should be allowed for in planning for a long-term reliable water supply.

¹⁹ ACT Government 2004, p4.

Project Outline

ACTEW was charged with the responsibility of assessing the reliability of the existing water supply and recommending options for new sources for the ACT Government.

The Future Water Options Project was launched on 30 April 2004. As identified in *Think water, act water* the Future Water Options Project investigated three main water sources for future supply:

1. building a new dam near Mount Tennent, south of Tharwa;
2. enlarging the existing Cotter Dam; and
3. transferring water from Tantangara Dam in NSW into the ACT.

A triple bottom line approach was taken for the project to answer two key questions:

1. If the ACT needs a new water supply, when will it be needed? And;
2. What would be the best option?

These two answers had to be provided to Government by December 2004 and April 2005 respectively.

ACTEW established a project team of specialists in water resources management, hydrological modelling, environmental studies, planning analysis, engineering, economics and related areas to conduct this analysis. The project team comprised of more than 20 engineers, scientists and other professionals drawn from ACTEW, ActewAGL, other ACT agencies and specialist contractors and consultants. A thorough technical, environmental and planning analysis was undertaken for each option.

Over 44 studies were undertaken to assess and evaluate environmental, social, economical and technical issues and prepare preliminary engineering designs for the various alternatives.

After nine months of detailed study and analysis the Future Water Options team provided its crucial findings and recommendations to the ACTEW Board and ACT Government. The response by the media and community to the final recommendations has indicated that the community was well informed and that in general the outcomes were supported.

Two key reports were provided to the ACT Government:

1. *An assessment of the need to increase the ACT's water storage* in December 2004 predicting the future reliability of the existing supply; and
2. *Implementation Plan – A recommended strategy to increase the ACT's water supply* in April 2005 recommending implementing options to increase the reliability of the ACT's water supply.

3.6 Future Water Options Implementation Plan

The final recommendations of Future Water Options were to:

- Implement the Cotter Googong Bulk Transfer where surplus water from the Cotter water supply catchment in the west is transferred through the existing reticulation network into Googong Dam; and
- Implement the Angle Crossing Option where water is pumped from the Murrumbidgee River, near Angle Crossing, to Googong Dam via Burra Creek.

Additionally, it was recommended that:

- (i) The remaining options of an enlarged Cotter Dam to 78 GL, a small (43 GL) or a large (159 GL) Tennent Dam and transferring water from Tantangara Dam down the Murrumbidgee River into the ACT be retained as future viable options;
- (ii) ACTEW be ready to implement one of these options without delay, if required, through the development of a work program, implementation of formal processes for regularly reviewing the six assumptions, and completing analysis, design and other relevant technical studies for an approval process; and
- (iii) Additional technical analysis be undertaken for each of the dam options, including refining the dam design, further detailed examination of pipeline routes and additional examination of the benefits of building a new water treatment plant near the Tennent Dam versus transferring water from the Tennent Dam into the Mount Stromlo WTP.

Key achievements of the project include:

- Timely delivery of reports to ACT Government summarising the results and responding to key questions;
- Completion of 40 technical studies and evaluations providing supporting information for the main reports to Government;
- Engineering design and assessment of over 20 alternative supply options including new dams and water transfers;
- Development of a water resources model able to model more variables including climate change and water supply catchment recovery after bushfires than any water resources model in Australia;
- Triple bottom line assessment of over 20 alternatives based on three broad options;
- Undertaking a comprehensive, transparent and informative consultation process to assess community values;
- Presenting the outcomes of the studies in a major public exhibition, Palette of Possibilities, in February 2005, identifying 6 short-listed alternatives and seeking further comments prior to forming a final recommendation for Government;

- Implementation of an innovative efficiency measure to make better use of the existing infrastructure by transferring excess water from the Cotter water catchment in the west through the network and into Googong Dam; and
- Recommendation of a cost effective, minimal risk, maximum benefit solution to provide a reliable water supply out to 2023.

The main reports completed for FWO were:

<p>Future Water Options for the ACT Region-Implementation Plan: A Recommended Strategy to Increase the ACT's Water Supply</p>	<p>A report which summarises the technical, social, environmental and economic implications of the various options, restates the need for additional supply and describes the preferred path to provide a reliable water source for the ACT, for consideration by the ACT Government.</p>	
<p>Future Water Options for the ACT Region-Implementation Plan: A Summary of the Recommended Strategy to Increase the ACT's Water Supply</p>	<p>Summary of above</p>	
<p>The Cotter Dam Option</p>	<p>A report which assesses the environmental, social and economic implications of the Cotter Dam enlargement option.</p>	

<p>The Tennent Dam Option</p>	<p>A report which assesses the environmental, social and economic implications of the new Tennent Dam option.</p>	
<p>The Tantangara Dam Option</p>	<p>A report which assesses the environmental, social and economic implications of the Tantangara Dam option.</p>	
<p>An Assessment of the Need to Increase the ACT's Water Storage</p>	<p>A report which addresses the question of whether and if so when there is a need to provide additional storage for the ACT and region.</p>	
<p>Options for the next ACT water source</p>	<p>A report which identified nearly 30 options for a new water sources for the ACT and recommended three options for further assessment.</p>	

These summarised and assessed information and data from:

Author	Year	Report Title
GHD	2005	Cotter, Tennent, Coree Dams and Murrumbidgee Transfer Options (Engineering)
SMEC	2005	Water Supply Infrastructure Tantangara Options
ACTEW	2005	Cloud Seeding
Environment ACT	2005	Fish Impact Study
Marsden Jacob & Assoc. and Fluvial Systems	2005	Predictions of Transmission Losses in the Upper Murrumbidgee River and Cotter River
Marsden Jacob & Assoc. and Fluvial Systems	2005	Predictions of Transmission Losses in Burra Creek
CRC Freshwater Ecology	2004	Ecological Risk Assessment
CRC Freshwater Ecology	2005	Aquatic Ecology Study
Biosis	2005	Terrestrial Flora, Fauna and Vegetation Study
Navin Officer	2005	Cultural Heritage Assessment
KMR	2005	Land Ownership Study
Ecowise and Starr	2005	Catchment & Landscape Analysis of the Future Water Options for the ACT
ActewAGL	2005	ACT Future Water Options Water Resources Modelling
Atech	2005	Cotter Options Water Quality Report
Atech	2005	Tennent Options Water Quality Report
Atech	2005	Tantangara Options Water Quality Report
Atech	2005	Risk Assessment and Management Report for the Use of Cotter Reservoir Water in the Canberra Drinking Water Supply System
Atech	2005	Risk Assessment and Management Report for the Use of Murrumbidgee River Water in the Canberra Drinking Water Supply System
Tania Parkes Consulting and Ernst & Young	2005	Stage 1 Social Impact Assessment
CEE	2005	Value of Effluent Discharged to the Murrumbidgee River
Water Futures	2005	Technical Advice on ACT Reservoir Recreational Water Use Options
Atech	2005	Greenhouse Gas Emissions
ACTEW	2005	Consultation Report
Institute of Sustainable Futures and CEE	2005	Sustainability Framework and Assessment Plan
URS	2005	Future Water Options Risk Assessment

Centre for International Economics	2005	Economic Benefit-Cost Analysis of new water supply options for the ACT
ActewAGL	2004	System Operation Optimisation
ActewAGL	2004	Population Projections
ActewAGL	2004	Environmental Flows Scenarios
ActewAGL	2004	Yr. 2017 Timing Assessment
ActewAGL	2004	System Performance Criteria
ActewAGL	2004	Rainfall-Runoff Model Detailed Description
ActewAGL	2004	Demand Model Detailed Description
ActewAGL	2004	Description of REALM Model
Ecwise/DHI	2004	Bushfire Yield Reduction Curve
SKM	2004	Update of Water Resources Strategy for Canberra and Queanbeyan - Stochastic Generation of Climate Data
SKM	2004	ActewAGL Inflow Time Series
ActewAGL	2004	ACT Water Supply Augmentation Timing

Attachment 4 – Think water, act water

In April 2004, the ACT Government released “*Think water, act water – a strategy for sustainable water resources management*”. This strategy assessed all aspects of ACT water resources including water supply, demand management, institutional arrangements, regulation and innovation.

Through a comprehensive consultation process, *Think water, act water* identified a series of objectives to guide sustainable management of water resources in the ACT, including to:

- increase the efficiency of water usage; and
- provide a long term reliable source of water for the ACT and region.

Furthermore it states:

A range of water supply options for the future will continue to be considered in case water use efficiency measures are not able to save enough water to avoid the need to construct water supply infrastructure. This planning process is being developed in a strategic manner to ensure there is no risk to the long-term security of water supplies in the ACT.²⁰

Previous analysis had indicated that the ACT would need a new water supply by 2017, to meet demand for a population of about 405,000. Several issues had emerged in recent years that motivated reassessment of this prediction:

- The current drought was developing into one of the worst on record with experts concerned it may be an indication of permanent climate change for the region.
- The Cotter River water supply catchment was completely burnt in 2003 and is expected to deliver reduced inflows to water storages as it recovers over time.
- The ACT Government announced a population policy in the Spatial Plan²¹ of 500,000 by 2032.
- The Government’s strategy, *Think water, act water* had set water efficiency targets of a reduction in per capita mains water use of 12 per cent by 2013 and 25 per cent by 2023.
- Environmental Flow Guidelines were first introduced in 1999 and are currently under review.
- As water restrictions continued, the impacts on the community were being realised as significant, bringing attention to determining what levels of water restrictions should be allowed for in planning for a long-term reliable water supply.

²⁰ ACT Government 2004, p4

²¹ ACT Government 2004, *The Canberra Spatial Plan*, March.



Think water, act water charged ACTEW with the responsibility of assessing the reliability of the existing water supply and recommending options for new sources for the ACT Government, and set a target of March 2005 to achieve this.²²

²² *Think water, act water* 2004, p28