

**Submission to IPART's
Mid-Term Review of the
Sydney Catchment
Authority's
Operating Licence**

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1. Introduction

1.1 Background to the Sydney Catchment Authority

On 1 July 1999, the NSW Government established the Sydney Catchment Authority (SCA) to manage and protect Sydney's water catchments and to supply Sydney Water Corporation with clean, reliable bulk water.

The SCA was born out of the recommendations of the Sydney Water Inquiry, conducted by Mr Peter McClellan QC in December 1998. The Inquiry led to the establishment of the SCA as a statutory authority under the *Sydney Water Catchment Management Act 1998* (the Act). The SCA is also classified as a Public Trading Enterprise and funds its operations from the sale of water and related services.

Sydney Water Catchment Management Act 1998 defines the roles, functions and objectives of the SCA. It charges the SCA with:

1. ensuring that the catchment areas and the catchment infrastructure works are managed and protected so as to promote water quality, the protection of public health and public safety, and the protection of the environment
2. ensuring that water supplied by the SCA complies with appropriate standards of quality,
3. conducting activities in compliance with the principles of ecologically sustainable development where the SCA's activities affect the environment, and
4. managing the SCA's catchment infrastructure works efficiently and economically and in accordance with sound commercial principles.

The SCA is responsible for a catchment area covering more than 16,000 square kilometres. The area extends from north of Lithgow to the source of the Shoalhaven River near Cooma in the south, and from Woronora in the east to the source of the Wollondilly, west of Goulburn.

Included in the SCA's area of responsibility is the land within the hydrological catchments of:

- Prospect Reservoir
- Warragamba River and its tributaries, which drain to Lake Burragorang
- Shoalhaven River and its tributaries, which drain to Lake Yarrunga
- Greaves, Whipcord, Woodford and Cascade creeks, which drain to the Blue Mountains storages.
- Upper Nepean River draining to the Metropolitan storages.
- Woronora River upstream of Woronora Dam.

A particular focus of SCA responsibility is the range of special areas throughout the catchment, some of which extend downstream of dams within the water supply system. These special areas are generally in close proximity to stored waters or major water supply works.

A 'special area' is defined as a parcel of land that has been identified as being important either to the protection of the quality of stored waters or to the maintenance of the ecological integrity of the land.

Traditionally the SCA's predecessors have not only exercised regulatory control over special areas but have also been the owners of much of these lands. Over more recent decades land ownership has progressively transferred to the National Parks and Wildlife Service. The SCA is continuing this practice. As these transfers continue to take place, the land management role of the SCA will progressively diminish.

In addition to its role within the catchments, the SCA is authorised by its Act and Operating Licence to exercise its functions beyond its area of operations, where

appropriate. As an example, major transfer systems such as the Upper Canal and the Warragamba pipelines are outside the SCA's area of operations. However, the SCA is permitted to operate those facilities to enable it to fulfil its role.

The SCA's bulk water supply is derived from four major river systems. They are the Warragamba, Upper Nepean, Woronora and Shoalhaven river systems. The SCA also draws supplies from tributaries of the Grose River within the Blue Mountains and from the Fish and Duckmaloi rivers at Oberon.

Overall, water is retained in 15 bulk water storages, located within six individual catchments. With a combined operating capacity of 2,400,000 ML, the storages are managed by the SCA and are identified as:

- Warragamba Dam and Wingecarribee Reservoir in the Warragamba catchment
- Cordeaux Dam, Cataract Dam, Avon Dam and Nepean Dam in the Upper Nepean catchment
- Woronora Dam in the Woronora catchment
- Fitzroy Falls and Tallowa Dam in the Shoalhaven catchment
- Medlow Dam, Greaves Creek and the three Cascade dams in the Blue Mountains catchment
- Prospect Dam in the Prospect Reservoir catchment

1.2 Principles of Operating Licences

The SCA's Operating Licence grants powers to the SCA to conduct specified activities within defined geographical areas.

The Operating Licence also proscribes the powers of the SCA as well as ensuring that customers receive adequate levels of service¹.

¹ Independent Pricing and Regulatory Tribunal Issues paper page 1

The SCA feels that care needs to be taken to ensure regulation does not stifle innovation. The scope, extent and form of regulation need to be carefully balanced.

The SCA believes that the following principles should guide the review of the SCA's Operating Licence.

1. The Licence should generally confer powers or authorise an act or thing in a clear and unambiguous manner. Where the Licence seeks to fetter, attenuate or proscribe a power in a particular way, it should be described in a clear and concise manner.
2. The Licence should only prescribe actions and activities where there is evidence of market failure or abuse of monopoly position. This is particularly important where mechanisms exist for subsequent reviews of the licence instrument.
3. Regulation should be focussed on outputs and performance. Input or processes to be adopted should only be prescribed where outputs cannot be specified.
4. Regulated outputs, inputs or processes should be relevant, unambiguous, and verifiable (i.e. auditable).
5. A particular regulation should not seek to duplicate or contradict other lawful regulatory instruments.
6. Neither the Licence nor a regulation should seek to impose obligations on parties, other than on the regulated agency, unless the regulation also confers the means and the power to elicit compliance.
7. The Licence and associated instruments should be straightforward and accessible to those benefiting from the Licence or regulation.
8. The approach to monitoring different licence conditions should have regard to the consequences of a breach of those conditions and provide clear, measurable

criteria for compliance assessment (National Economic Research Associates, 2001, Page iii)

9. There is a need to provide a clear definition of the roles and responsibilities of all institutions involved in administering the licensing regime. There is also a need to identify the means of achieving effective coordination amongst those institutions. (National Economic Research Associates, 2001, Page iii)

1.3 Mid-term review and the end of term review of the Operating Licence

The SCA believes that the mid term review should prepare the way for identifying the issues that need to be addressed in preparation for the end of term review. More meaningful changes to the Licence can only be made when some complex issues such as demand management and bulk water quality regulation have been considered comprehensively.

Consequently, the SCA's submission does not attempt to solve all the questions posed by the IPART Issues Paper. Instead, where appropriate, it provides details of possible work programs designed to help parties make decisions about the content of the next Operating Licence.

Some of the work that will be undertaken includes:

- More comprehensive consideration of improving demand management strategies. This will be significantly aided by the work of a Taskforce of Water CEO's recently established by government.
- Review the pollution source Risk Management Plan to consider a more holistic view of pollution.
- Develop a more integrating risk management framework.

2. Report Card

2.1 Overall achievements of the SCA

The SCA has achieved some excellent results in its short existence. Outlined below are the key achievements of the SCA over the last two and a half years.

Supply of Quality Water

- Provided a reliable supply of bulk raw water, meeting 100 percent of quantity requirements in 2000-2001.
- Developed strategies to optimise the quality of water in storages.
- Developed the Bulk Raw Water Quality Management Plan, which brings together the SCA's strategies and tools for managing water quality in the catchment areas, storage dams, water supply and delivery networks.
- Commenced a structured, prioritised research program targeting sources and effects of water contaminants and activities that impact on water quality.
- Entered into a Bulk Water Supply Agreement with Sydney Water Corporation.
- For the supply of bulk water to Sydney Water Corporation, met 96 percent conformance with quality standards, specified for each water filtration plant in the Bulk Water Supply Agreement. Supply also met 99.7 percent conformance to the Australian Drinking Water Guidelines in relation to pesticides and heavy metals for 2000-2001.

Protecting the Health of the Catchments

- In managing activities in the catchments, developed and implemented two regulations to regulate activities that are likely to impact on water quality. In the special areas and controlled areas (tracts of land closest to the SCA's water storages), access, activities and conduct are regulated by means of the *Sydney Water Catchment Management (General Regulation) 2000*.

- With the assistance of the Environment Protection Authority (EPA), developed the second of its regulations - the *Sydney Water Catchment Management (Environment Protection) Regulation 2001*. The regulation enables the SCA to exercise certain regulatory functions under the *Protection of the Environment Operations Act 1997*, with regard to non-scheduled premises and activities. However, as identified by both IPART and the Catchment Auditor, there is a need for the SCA to effectively implement the regulation and work to that end is underway.
- Played a major role in reviewing development proposals under State Environmental Planning Policy (SEPP) 58 to ensure that quality of water in the catchment and storages was not compromised.
- Implemented major capital works programs, in conjunction with the EPA, DLWC and local councils, to reduce sewage effluent impacts on catchments.
- Instigated responsible land management through adopting the Special Areas Strategic Plans of Management (SASPoM) and the Wingecarribee Swamp and Special Area Plan of Management.
- Advanced catchment protection and enhancement and fostered community goals through the Healthy Catchments program.
- Established and maintained the Catchment Protection and Improvements Grants scheme to provide funds to community groups wishing to undertake improvement works in the catchment.

Community Consultation and Education

- Undertaken a comprehensive community awareness survey within the catchment areas. This study canvassed community attitudes about the SCA and its roles and responsibilities. It also sought to elicit perceptions about water quality, environmental, health and efficient water usage. Interestingly, three quarters of respondents felt that many people in Sydney were careless about water use.

- Incorporated key educational messages into presentation material, publications, and media stories. Messages included the importance of protecting the catchments and the role of the SCA.
- Continued the commitment to fostering student knowledge and understanding of the catchments. Some of these programs include SCA's catchment Education program, Warragamba Dam education services, the Streamwatch program, education enquiry service and the SCA Community Awareness Program.
- Extended links to the communities in the catchments by forming two regional consultative committees and the Local Government Reference Panel. Links to the community were also established through the provision of community grants.
- Established a central library as a community resource for catchment information.

Managing the Business

- Achieved excellent performance in successive operating licence audits.
- Achieved full compliance with NSW Dams Safety Committee requirements.
- Began operations under its first Water Management Licence.
- Received a Medium Term Price Path from IPART for the supply of water and services by the SCA. The term covers the period from 1 October 2000 to 30 June 2005.
- Developed action plans for sustainable energy and waste management throughout the SCA.
- Developed system management plans to provide accountable asset management for the SCA's seven catchment infrastructure systems.

- Enhanced preparedness to manage incidents through the development of systems, processes and resources.

2.2 Operating Licence

The SCA's Operating Licence enables the SCA to provide, construct, operate, manage and maintain systems or services so as to exercise its functions in accordance with the Act. The Operating Licence was granted to the SCA by the Governor on 30 June 1999 and amended on 19 April 2000. The Licence expires on 31 December 2004, but may be renewed by the Governor in accordance with the Act.

The Operating Licence permits the SCA to conduct a broad range of activities within and, where appropriate, beyond its area of operations. The activities described in the Licence are crucial to the SCA being able to fulfil the obligations imposed on it by the Act. The SCA's activities include supplying safe, reliable, bulk water. They also include maintaining adequate reserves of water. To this end, the SCA is charged with providing, constructing, operating, managing and maintaining systems and services that are efficient, coordinated and viable.

Section 36 of the Act and Clause 3.3 of the Operating Licence require the SCA to enter into Memoranda of Understanding (MOU) with certain regulatory agencies, those being New South Wales Health, the Water Administration and Ministerial Corporation and the Environment Protection Authority.

All three MOU were entered into in the SCA's first year of operations. Subsequent to this, all three have been reviewed or are in the process of being reviewed. The review of the Memoranda with NSW Health and the EPA were finalised in late 2001.

The Operating Licence obliges the SCA to undertake and report on a rigorous water-quality monitoring program to ensure that drinking water guidelines, relevant to the Act and Operating Licence, are adhered to. The program is implemented on an ongoing basis. The results are made available, free of charge, to the public via the

Annual Water Quality Monitoring Report, which is accessible in hard copy and via the SCA's website.

The Operating Licence also requires the SCA to develop a pollution source risk management plan in consultation with NSW Health, the Environment Protection Authority, the Department of Land and Water Conservation and the public. The pollution source Risk Management Plan was completed by 1 January 2001, as required by the Operating Licence. Copies of the final plan were forwarded to IPART, regulators and stakeholders on 20 December 2000. The document was loaded onto the SCA website on 21 December 2000.

As well as requiring the development of a pollution source Risk Management Plan, the Licence also obliged the SCA to develop an incident management plan to the satisfaction of NSW Health. In satisfying this provision, the SCA developed its Bulk Raw Water Quality Incident Response Plan. This plan was developed in consultation with the SCA's customers, stakeholders and regulators. The plan focuses on water quality incident management through a coordinated approach involving the media, stakeholders and NSW Health. It was completed, as required by the Operating Licence, by 1 July 2000.

It was also a condition of the Licence that the SCA administer the special areas within the catchment in accordance with the Special Areas Strategic Plan of Management (SASPoM). In doing so, the SCA must consult with and, where possible, collaborate with the National Parks and Wildlife Service. As required by the Operating Licence, annual reports on the implementation of both the SASPoM and the Wingecarribee Swamp Plan of Management have been completed.

Although Sydney Water Corporation is the SCA's largest customer by a substantial margin, the SCA also supplies water to several other customers. They include local and county councils, firms engaged in either primary or secondary industry and smaller users who use the water for domestic stock and irrigation purposes. These other customers collectively account for about 0.5 percent of the total water demand placed on the SCA.

In fulfilling its commercial undertakings, the SCA is obliged to enter into a separate agreement with each of its customers. Each agreement deals with the terms of the contract, including the price that the customer is to pay for water supplied, the potential use of the water and the need for water treatment if the water is to be used for human consumption.

The Operating Licence protects the rights of the SCA's customers and other stakeholders through a number of strategies. One strategy has been to direct the SCA to implement an internal complaints-handling procedure. The policy and procedures have been completed and have been passed on to the community in accordance with Operating Licence requirements.

It was a condition of the Operating Licence that the SCA establish one or more consultative committees to enable the community to become actively involved in assessing the SCA's performance. The SCA subsequently established four such committees and consults with them on a regular basis.

The SCA has now prepared the first of its five-year environmental plans in line with Licence requirements. Public consultation has been an important feature of the plan's development. The document sets targets and timetables and includes a policy dealing with energy management within the SCA. The plan has been made available to the community, free of charge, through the SCA's website.

The Operating Licence requires the SCA to develop Ecologically Sustainable Development (ESD) and Environmental Indicators. The SCA's list of indicators was finalised by 1 January 2001, as required. The indicators provide a basis for reporting on the SCA's environmental performance and the state of the water supply catchments. Monitoring and the compilation of data sets for the indicators commenced on 1 March 2001.

The Operating Licence requires the SCA to prepare an Annual Environment Report to report on performance against the Environment Plan and indicators. Two such reports have been prepared and have been widely distributed throughout the catchments.

2.3 Annual Operating Licence audits

Part 10 of the SCA's Operating Licence provides for an annual audit of compliance against licence conditions.

2.3.1 Operating Licence audit 1999 – 2000

Egis Consulting (under contract to the Licence Regulator – Ministry of Energy and Utilities) conducted the 1999-2000 audit between July and November 2000.

The initial Operating Licence audit found the SCA to be fully or highly compliant with more than 73 percent of the audited licence requirements.

The auditors identified one technical non-compliance. The technical non-compliance related to the non-delivery of a draft report on the EIS process for determining environmental flows for the Hawkesbury-Nepean, Woronora and Shoalhaven rivers (Clause 9.4.2). The auditors deemed the matter to be one of technical non-compliance as other government processes had overtaken the need to deliver the EIS. The report is a requirement of the Operating Licence.

The auditors recommended that the SCA regularly review the Operating Licence to amend requirements that become redundant or are no longer applicable. The SCA decided that the mid-term review of the Operating Licence was the most opportune time to amend the clause.

2.3.2 Operating Licence audit 2000 – 2001

Egis Consulting (under contract to the Licence Regulator – IPART) conducted the 2000–2001 audit between July and November 2001.

Overall, the audit found that the SCA's performance had improved since the previous audit. In 86 percent of the audited Operating Licence requirements, the level of compliance was found to be either full or high. This constituted a 13 percent increase (or 18 percent improvement) on the previous year's audit. More significant was the increase in full compliance from 57 percent to 71 percent of audited items. The increase in compliance becomes even more significant when compared with the

number of clauses audited each year. The 2000-2001 audit saw the number of clauses audited rise from 70 to 88 compared with the previous audit.

During the audit, the auditors identified two technical non-compliances. As with the previous audit, one was the technical non-compliance for the failure to deliver a draft report on the EIS process for environmental flows for the Hawkesbury-Nepean, Woronora and Shoalhaven rivers (Clause 9.4.2 of the Operating Licence).

The other technical non-compliance related to the SCA's failure to meet the system performance criteria for ensuring security of supply (Schedule 2 of the Operating Licence).

The criterion concerns the likelihood of the total useable water volume, held in the supply reservoirs, falling to below five percent useable capacity in any one month over 100,000 months. The criterion is assessed with the use of a hydrology model. On operating the model for the year, the criterion was shown to have been exceeded. The auditors qualified the non-compliance by saying that they believed '*adoption of such an extreme criterion has significant inherent uncertainty and should be critically reviewed*'. The SCA supports the qualification and is currently undertaking work to review all the system performance criteria in the Operating Licence.

3. IPART Issues Paper

The Independent Pricing and Regulatory Tribunal released an issues paper to aid consideration of matters relevant to the reviews of the operating licences of the SCA and Sydney Water.

The issues paper poses a number of questions directly relevant to the review of the SCA Licence. Issues include:

- Relevance of the current Licence
- MOUs with NSW Health, Environment Protection Authority (EPA) and Water Administration Ministerial Corporation (WAMC)
- Water quality obligations
- Pollution source risk management plan
- Water supply performance criteria

This section of the submission addresses each of the issues in turn.

3.1 Is the Operating Licence fulfilling its objectives?

3.1.1 Response to Issue

Does the Licence currently reflect the objectives and requirements of the Sydney Water Catchment Management Act 1998?

The SCA believes that the Operating Licence adequately reflects the requirements of the *Sydney Water Catchment Management Act 1998*. It further believes that the Operating Licence adequately enables the SCA to exercise its functions under the Act, as per Section 15 (1).

Is the Operating Licence fulfilling its objectives?

The SCA believes that the Operating Licence satisfactorily fulfills the objectives stipulated in the Act.

3.2 Memoranda of Understanding

3.2.1 Background

In its initial year of operations, the SCA entered into Memoranda of Understanding (MOU) with the EPA, WAMC, DLWC and NSW Health. The documents were placed on public exhibition and finalised late in 1999. The parties to each of the MOU believe that the MOU adequately reflected the needs of each agency and the requirements of the SCA's Operation Licence and Act.

During the first operating licence audit, the MOU with the EPA came under close scrutiny. The auditors concluded:

*'The Memoranda of Understanding itself however requires expansion to identify arrangements whereby the EPA could assist the SCA in protecting catchment health and water quality'*²

As a result, the SCA undertook a review of all the MOU in late 2000. During the second operating licence audit, the EPA and NSW Health MOU were on public exhibition. At that time, the MOU with DLWC was still being negotiated.

During the exhibition process, copies of the MOU were provided to the IPART Secretariat and the operating licence auditor for review.

No submissions were received regarding the EPA or NSW Health MOU. Consequently, they were finalised and entered into by the parties late in 2001.

² Egis Consulting, 2001, Page Vi

The EPA Memorandum came under scrutiny and criticism again during the second operating licence audit. The Auditor found that:

*'The MOU with the EPA should be enhanced to identify the full extent of potential cooperative relationships to further the objectives of the Licence and the Act.'*³

The SCA argued, however, that both parties to the Memorandum and the public were satisfied with the content. It was believed that the Memorandum, as it stood, would assist both agencies in performing their functions.

As a result of the findings of the second operating licence audit and the SCA's position on the content of the MOU, IPART indicated in its report to Minister Debus that it would seek the views of stakeholders on the role of the MOU during the mid-term review of the Operating Licence. Minister Debus acknowledged this request and forwarded the following requirement to the SCA:

'I accept the Tribunal's advice that the MOUs are required under the Licence to be considered as part of the upcoming mid-term review and that this provides an opportunity to consider their role and status.'

3.2.2 Response to Issues

What is the appropriate role of the MOU within the context of the SCA's Operating Licence and regulatory structure?

The SCA is firmly of the view that MOU are arrangements that facilitate cooperative relationships between the parties involved, by committing them to working together on issues of mutual interest and benefit to the community. MOU commit the parties to working together on issues that will see benefit from collaboration between the parties.

³ Egis Consulting, 2001, Page 20

Present examples of SCA collaboration include working with the EPA to draft the SCA's Environment Protection regulation and waste management audits. Others include working with NSW Health on the implementation of the McClellan Inquiry recommendations as well as on joint SCA and NSW Health research initiatives. Working with DWLC on the implementation of the Catchment Protection Scheme is another example of SCA collaboration, as is the early work of the Hawkesbury-Nepean Forum and Expert Panel.

As well as collaborating on specific projects, the SCA meets regularly with the Strategic Liaison Groups, established under each MOU, to discuss strategic issues common to the agencies.

The SCA believes that the MOUs' role of facilitator of cooperative relationships and joint projects is an effective one. It should be noted, however, that there is also effective cooperation between the agencies outside the scope of the MOU.

Do the MOU adequately define the roles and responsibilities of the relevant organisations?

All MOU to which the SCA is a party, define the roles and responsibilities of the parties and acknowledge the respective statutory obligations of each agency. It must be understood that the role of MOU is to establish cooperative relationships. They are not tools for the regulatory bodies to exercise their regulatory powers. This would be duplication of regulation, which would not be appropriate.

Most regulators, including the SCA, have the power to make or have made regulations that give them the authority to exercise certain powers. Regulations made in this way are generally subject to a regulatory impact statement and scrutiny by Parliament. Scrutiny includes the right to disallow.

In addition, the Act and Operating Licence enable the SCA to exercise certain functions vested in other agencies. The Sydney Water Catchment Management (Environment Protection) Regulation 2001 is a case in point. The regulation enables the SCA to exercise certain functions under the *Protection of the Environment*

Operations Act 1997 (POEO Act) with regard to non-scheduled premises and activities.

These mechanisms provide appropriate ways for regulatory powers to be confirmed.

Are there obligations in the MOU that should be incorporated into the Operating Licence?

As indicated previously, the current framework, under which the MOU exist, facilitates appropriate outcomes for the SCA and similar regulatory agencies.

The regulatory framework, within which the SCA operates, has assisted the SCA in its fair and diligent performance of its roles as the supplier of bulk water and regulator of specific activities in its operating area.

The stated purpose of each MOU indicates that the MOU will facilitate effective interaction and cooperative arrangements between the parties. This is not the function of the Operating Licence. The SCA believes that the Operating Licence acts, and should act to grant powers to act, proscribe or limit powers to act where necessary and to authorise the undertaking of activities consistent with the SCA's enabling legislation. The MOU serve a different purpose from the Operating Licence.

The SCA believes that it has had proven success in working with the MOU partners within the boundaries of the MOU and also on particular issues outside them.

The SCA believes that adding clauses from the MOU to the Operating Licence would blur the distinction between the role of an Operating Licence and the role of an MOU, and that to do so would serve no useful purpose.

The SCA therefore believes that no benefit would be gained from injecting obligations from the MOU into the Operating Licence.

In fact, the SCA believes that in the longer term such an approach could be counter productive by inhibiting innovation. It believes that agencies might be reluctant to adopt new strategies for fear of the strategies being subsequently incorporated in an Operating Licence. That would then open the way for the agency to be audited against those innovations.

It also needs to be recognized that whereas MOU are bilateral in nature, the Operating Licence is only binding on the SCA. Therefore, the inclusion of any obligations within the Operating Licence would only be binding on the SCA. The SCA is of the view that where an obligation is to be placed on another party, it must be accompanied by the granting of powers to the SCA to elicit compliance.

3.3 Water Quality Obligations

3.3.1 Background

There are numerous water quality obligations imposed on the SCA. They range from monitoring catchment streams to monitoring the inlets of water filtration plants.

Schedule 4 of the Operating Licence details the SCA's water quality monitoring obligations in relation to the supply of water for treatment. The obligations are NSW Health's interpretation of the relevant requirements from the Australian Drinking Water Guidelines. The guidelines identify a need for pesticides, chemicals and radiological compounds to be monitored. To provide an accurate reflection of the quality of water being supplied for treatment to the SCA's major customer, Sydney Water, samples are collected at the inlets to Sydney Water's water filtration plants.

The Bulk Water Supply Agreement with Sydney Water requires additional quality monitoring at the inlets. The parameters tested provide an indication of the quality of water coming into the water filtration plants. This allows Sydney Water to modify processes to ensure optimum treatment and the SCA to ensure that best quality water is delivered to its customers.

In addition, the SCA conducts extensive monitoring both of catchment streams that flow into the storages and of the storages themselves.

Information on the chemical and biological quality of the water in the catchment streams is collected through monthly routine sampling at 26 sites in the catchments. Information includes, but is not limited to, information on turbidity, pH, nutrients and coliform.

Information on the quality of the water in the storages is collected monthly at 12 sites and fortnightly at 7 sites. In addition, during summer, information on water quality is collected weekly at a number of locations that have the potential to suffer from algae blooms.

The SCA also has a comprehensive pathogen (*Cryptosporidium* and *Giardia*) monitoring program. The program includes monitoring of the pathogens six days a week at Warragamba Dam and Broughtons Pass Weir. *Cryptosporidium* and *Giardia* are also monitored twice weekly in Prospect Reservoir, weekly in Werri Berri Creek (the nearest inflow to Warragamba Dam) and Wingecarribee Dam, and monthly in the Wollondilly and Coxs rivers.

For more details about water quality monitoring undertaken by the SCA, please refer to the SCA's *Annual Water Quality Monitoring Report* available on the SCA web site or by contacting the SCA office.

3.3.2 Response to Issue

The Tribunal seeks comments on whether or not water quality obligations identified in the Operating Licence are adequate.

The SCA believes that the current water quality monitoring obligations are adequate. It believes that the SCA's various monitoring programs and risk management activities assist in a better understanding of how catchment activities impact on water. The research and development programs will further help inform the end of

term review of the Operating Licence of any need for modifications to the SCA's water quality monitoring obligations. Some examples are outlined below:

The SCA has recently awarded a \$2 million contract for a limnological⁴ study of Lake Burragorang and Prospect Reservoir to be undertaken. The limnological models to be developed will assist the SCA's understanding of the processes within the water body of the lakes. The models will simulate the movement and mixing of the water within the lakes and the biological and chemical processes that influence water quality.

The study will provide a better understanding of contaminant movement in the lake and assist the SCA as it makes decisions regarding appropriate levels at which water may be taken from the dam. Such decisions will help ensure supply of the best quality water possible.

The SCA's Bulk Raw Water Quality Management Plan demonstrates SCA initiatives in achieving best-practice water quality management across all areas of its responsibilities. Initiatives include a range of programs, actions and strategies for managing water quality in the catchment areas, storages, supply systems and delivery networks. The plan outlines aspects of water quality monitoring programs, research and risk management programs and protocols that deal with water quality incidents.

The SCA has allocated \$1.8 million to its research and development program for the current year. The program focuses on improving the management of water quality and the environment.

3.4 Risk Management Plan

3.4.1 Background

Under the interim Operating Licence, the SCA was required to produce a pollution source Control Implementation Plan. This requirement was expanded in the revised

⁴ Limnology is the study of inland waters. This includes rivers, creeks, billabongs, ponds, pools, swamps, lakes, salt-lakes and other wetlands.

Operating Licence, issued in April 2000, to include the preparation of a more extensive pollution source Risk Management Plan by 1 January 2001.

The plan was completed by 1 January 2001, as specified in the Operating Licence. Copies of the plan were forwarded to IPART, regulators and stakeholders on 20 December 2000. The document was loaded onto the SCA website on 21 December 2000.

The pollution source Risk Management Plan borrowed heavily on work commissioned to satisfy the interim Operating Licence requirements to develop a Pollution Source Control Implementation Plan.

IPART has indicated that the requirement for this plan was intended to be a first step toward managing the catchments, particularly while the Regional Environment Plan for the drinking water catchments of Sydney and adjacent regional centres was under development. IPART has acknowledged that the Operating Licence requirements for the pollution source Risk Management Plan had the potential to overlap with the Regional Environment Plan initiatives. IPART therefore inserted the following sub-note to clause 6.7.2(d) of the Operating Licence:

‘Ideally the Risk Management Plan should form part of a Government catchment planning process. The requirement to produce the Risk Management Plan may be satisfied by plans developed under the Regional Environmental Plan to the extent they incorporate the requirements in clauses 6.7.2 and 6.7.3.’

3.4.2 Response to Issue

The Tribunal seeks comments on the adequacy, scope and effectiveness of the Catchment Authority’s Risk Management Plan.

A general finding of the 2000-2001 Operating Licence audit was that:

*'The SCA has prepared a Risk Management Plan to identify and control risks to water quality. This Plan focuses on identifying and managing the risk associated with pollution sources in the catchments. This plan is yet to take a more holistic view of pollution and how it varies as it passes along rivers and through reservoirs and its significance with respect to the water supplied to customers. Separate risk assessment has been carried out for the major catchment infrastructure works (such as reservoirs) and overall, it can be concluded that the SCA is developing an excellent risk-based approach to its management of bulk water quality.'*⁵

The resulting Ministerial Requirements from the audit, in relation to the pollution source Risk Management Plan, were to:

'...further expand the Risk Management Plan by working with SCA customers and other regulators of the catchment to incorporate existing knowledge regarding sources of pollution and catchment infrastructure operation, bulk water and water supplied to customers.

The Plan must; clearly locate where the key controls lie (i.e. at the source, reservoir or water filtration plants); identify the important control requirements, the extent and overall effectiveness of the various controls; and determine whether additional controls are required.'

Clause 6.7.5 of the Operating Licence requires the SCA to conduct a review of the pollution source Risk Management Plan after each catchment audit. The 2000-2001 catchment audit is currently being finalised. An interim report was provided to Minister Debus in December 2001.

The SCA acknowledges that the pollution source Risk Management Plan as it currently stands does not fully address the requirements in the Operating Licence.

⁵ Egis Consulting, 2001, Page x

The SCA also recognises that the scope could be expanded to consider a more holistic view of pollution.

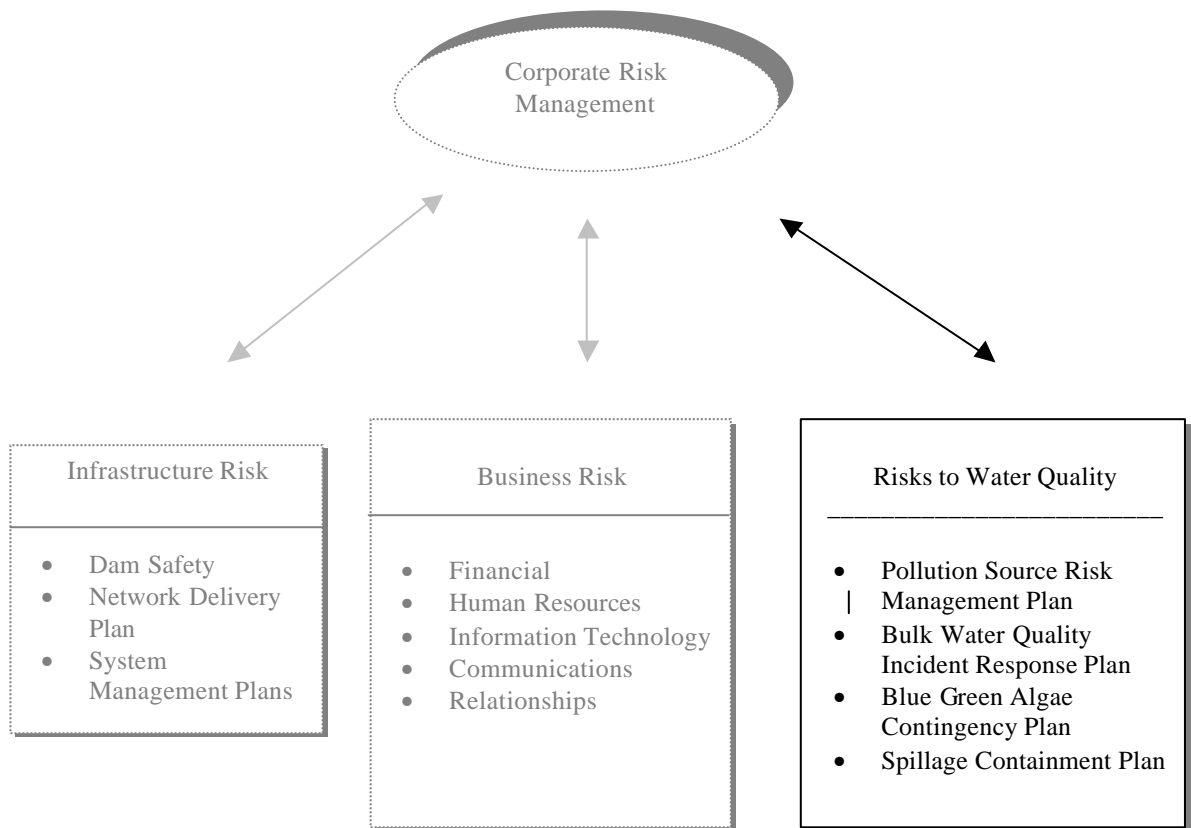
The SCA believes, however, that its current plan has addressed numerous pollution source issues. For example, the SCA actively comments on any licence issued by the EPA and relating to premises within the catchment. Another example is the assistance provided with on-site sewage system inspection training programs.

To address the inadequacies of the current plan, the SCA will embark on a review of the pollution source Risk Management Plan as prescribed under clause 6.7.5 of the Operating Licence.

This review will be conducted on two levels. First, the methodology to assess the risks to water quality will be reviewed. Second, the plan will take into account the appropriate findings from the current catchment audit. It will include risk actions associated with management of catchment infrastructure works to reduce pollution in raw water supplied. It will also include a stakeholder consultation process.

It is important to recognise that the pollution source Risk Management Plan is but one component, albeit an important one, of the SCA's overall suite of risk management instruments.

SCA Corporate Risk Framework



The diagram above shows how a revised pollution source Risk Management Plan will fit into the SCA's Corporate Risk Management Framework.

The SCA's review of the risk assessment methodology relates to the identification of pollution sources and contaminant behaviour throughout the system, from catchment to the inflows to the water filtration plants. The review will take into account identified improvement opportunities identified as a part of a more holistic view of water quality risks.

It is proposed that the review of the methodology will involve several stages. It will begin by identifying pollutants, their modes of travel and the subsequent risk and control actions at the conceptual level through to catchment. It will end with the work being repeated on a subcatchment level. The details and magnitude of the risk and control actions will be refined as knowledge of catchment processes, pollution sources and contaminant behaviour increases. This knowledge will become available

through the SCA's research program, as well as through catchment management and storage management projects.

Will there be a continuing need for the Risk Management Plan when the Regional Environmental Plan is finalised?

The Regional Environmental Plan (REP) currently requires the development of a Catchment Rectification Action Master plan (CRAM) and Rectification Action Plans (RAPs).

The purpose of the CRAM is to identify assets and problems requiring protection or rectification; setting priorities for a coordinated program of actions by all stakeholders; and establishing a timetable for the preparation of subcatchment RAPs. Future revisions of the CRAM will be a roll up of the RAPs.

The purpose of the RAPs will be to identify, on a sub catchment basis, priority rectification actions that need to be performed on existing development by all relevant parties operating within the catchment. This is to ensure that development meets the neutral or beneficial test in the REP. A cost benefit analysis of the actions will be included in the RAPs.

The Operating Licence contemplates the replacement of the pollution source Risk Management Plan with plans developed under the REP. This is conditional on the plans required under the REP incorporating the requirements of the Operating Licence in respect of the pollution source Risk Management Plan.

The Operating Licence requires a significant component of the pollution source Risk Management Plan to focus on the management of catchment infrastructure works (dams and storages). The aim is to ensure the selection of best quality water for customers. This will not be addressed in either the CRAM or the RAPs.

The current pollution source Risk Management Plan contains risk control actions in relation to catchment management. These risk control actions may form a portion of the RAPs.

At present, to meet the Operating Licence requirements for the pollution source Risk Management Plan, the SCA provides several plans to the operating licence auditor. As identified earlier, the SCA is working on developing one comprehensive plan that addresses Operating Licence risk management requirements.

In summary, while instruments to be developed as part of the REP process may provide scope for dealing with some pollution sources in the catchment, it is likely that the need for a pollution source Risk Management Plan, to document and manage threats to bulk raw water quality, will remain.

3.5 Review of Performance Criteria

3.5.1 Background

Sydney's potable water is obtained from a number of rain-fed streams in the water supply catchments. Whereas cities such as Brisbane and Melbourne receive clear seasonal patterns of rainfall, Sydney's water supply catchments have no regular rainfall season. Instead, rainfall is highly variable. This results in high variability of stream flows with low flows occurring for several years in succession. To compensate for the stream flow variability and to meet the relatively constant demand for water, nine major reservoirs have been built. Collectively, they store approximately 2,400,000ML of water. This excludes Prospect and the Blue Mountains, which contribute less than one percent of the total storage.

Schedule 2 of the SCA's Operating Licence specifies certain performance criteria for water storages and transportation systems. These criteria of Robustness, Reliability and Security are interpreted as follows:

- The SCA shall operate and maintain its storages such that, in nine years out of ten on average, it is able to supply to Sydney Water at least the amounts specified in the Schedule Two of the Operating Licence (*Robustness*);

- The SCA shall operate and maintain its storages such that, in ninety seven months out of a hundred on average, it is able to supply to Sydney Water, at least the amounts specified in Schedule Two of the Operating Licence (*Reliability*);
- The SCA shall maintain adequate reserves such that, 0.001 percent of all months, on average, it is able to keep the level of stored waters above five percent of total storage in (*Security*).

The 2000-2001 operating licence audit identified that the SCA had a technical non-compliance with the Security System Performance Criteria. It was determined by the auditors that the Security criteria, based on the information provided, was 0.0013 percent. This was higher than the Operating Licence requirement of 0.001 percent.⁶

Since the audit, the SCA has undertaken significant work on the hydrological models and the methodology for assessing compliance with the criteria.

At the time of the audit, the models were undergoing a review for possible ‘anomalies’. Consequently, the auditor found that the information being provided was interim. The auditor also highlighted the fact that new data plots were being developed at the time of the audit. Following completion of the audit, the review of the models continued. This involved them being refined and any ‘anomalies’ eradicated.

As well as refining the modelling process, the SCA has also reviewed its process for interrogating the model. Prior to the audit, and based on various forecast demands, it was usual practice to use the model to determine the system’s augmentation date. This process was subsequently found to be inadequate. The new methodology assesses the ‘safe yield’ from the system, based on System Performance Criteria in the Operating Licence.

⁶ The Auditor failed to take into account the 5-10% accuracy limitation estimated to exist for this computer generated model

Safe yield is defined as ‘...the amount of water that can be withdrawn from a reservoir on an ongoing basis with an acceptably small risk of reducing the reservoir storage to zero’⁷

In other words, it is the maximum quantity of water that can be guaranteed from a reservoir system.

The safe yield for a reservoir system depends on the storage capacity of the reservoir system and the amount of inflow into the storage. In its storage system safe yield calculations the SCA used the WATHNET software, developed by the University of Newcastle.

The safe yield calculations work as follows. An estimate is made of the safe yield, for a given set of operational conditions, (Table 1 below, System Performance Criteria). The storages are tested against this estimated yield using 2000 replicates of inflow data. If the conditions are fully complied with, a larger yield is selected and the process is repeated until the system criteria just fail. That yield is then identified as the safe yield for the conditions selected.

Table 1: Safe Yield & System Performance Criteria

Yield (ML/ annum +/- 5%)	Robustness (%)	Reliability (%)	Security (%)
570 000	4.87	2.23	0.0000
580 000	5.32	2.46	0.0001
600 000	6.28	2.95	0.0001
610 000	6.79	3.22	0.0003
620 000	7.32	3.5	0.0004
660 000	9.63	4.74	0.0011

(The numbers in bold are the actual System Performance Criteria reflected in the SCA’s Operating Licence)⁸

⁷ Nevada Division of Water Planning, US.

⁸ Operating licence criteria – Robustness 10.0, Reliability 3.0 & Security 0.001

The current thinking of the SCA suggests that the water supply system can safely supply around 600,000 ML per annum (+/- 5-10%) under the current operating rules and compliance criteria. The requirement for supply of water to Sydney Water, as set out in Schedule 2 of the Operating Licence, was 588,000 ML in the year 2000-2001. The SCA therefore continues to comply with the requirements of its Operating Licence.

It is important to note that the safe yield is a risk-based concept. The greater the risk that a water supplier is prepared to take, the larger the yield that can be extracted from a storage system. Urban water suppliers, such as the SCA, have to operate in a conservative fashion to ensure that supplies of water are always available to meet the demands of major cities. The degree of risk for the SCA is defined by the System Performance Criteria.

In 2000-2001, the SCA supplied Sydney Water with 627,000 ML of water. That quantity was above the safe yield of 600 000 ML. In the short term, the consequence of supplying a quantity of water greater than the safe yield is not particularly significant. In the period 1999 –2000, the net annual inflow averaged 725,000 ML, which safely exceeded the sum of the supply to customers and the environmental flow requirements placed on the SCA. There was therefore no deterioration in the supply position.

The maintenance of security of supply and adequate reserves of water to secure Sydney's future is linked inexorably with demands for water. Both the supply and demand elements are being considered within the SCA and as a part of a wider government policy agenda.

More particularly, the recommendations of the Hawkesbury-Nepean River Management Forum, its associated Expert Panel and the deliberations of the Water CEOs Taskforce, will bring focus to consideration of demands on the water supply system and how these might best be met and managed while also achieving positive environment outcomes.

The Hawkesbury-Nepean Forum is to make recommendations to Government on the appropriate level of environmental flows required from the SCA's storages. A decision on the level of flows is not anticipated until late 2003.

The Water CEOs Taskforce is overseeing the early determination and implementation of environmental flow releases from SCA storages. It is also developing the ways and means of improving demand management strategies to reduce water consumption.

3.5.2 Response to Issue

Are the performance standards clear, concise and unambiguous?

As mentioned earlier, The SCA's Operating Licence specifies System Performance Criteria of Robustness, Reliability and Security.

"Robustness" is defined in percentage terms, as the number of years in which the full demand can be supplied. It is set at 90 percent in the Operating Licence.

Consequently, the SCA is required to guarantee the supply of the quantities specified in Schedule Two of the Operating Licence, without interruption, in nine years out of ten.

This criterion, while providing a broad indication of the supply guarantee may not be adequate for all purposes. Assume, for example, that in a 50-year period there were four years of restrictions. The impact of those restrictions, particularly for industry, would be quite different if the restrictions in each of the years were applied for a single month or across most of the year. To provide customers with a more meaningful criterion, the concept of "Reliability" is introduced. Under this criterion, the SCA is required, not only to guarantee supply without interruption in nine years out of ten, but also in ninety-seven months out of every hundred (over the long term). Robustness therefore limits the frequency of restrictions while reliability limits their duration.

It should be noted that satisfying the Reliability criterion does not automatically satisfy the Robustness criterion. Nevertheless in a large supply system the Reliability criterion is more likely to be a limiting constraint than Robustness.

The operation of any dam requires a balance between the reliability of an uninterrupted supply and the security of maintaining adequate reserves against the likelihood of total storage depletion. More frequent supply interruptions enable a more secure, but less reliable supply to be provided. On the other hand less frequent interruptions provide a more reliable supply but with a greater risk of total failure. Having fixed Reliability and Robustness as criteria against supply interruption, the third criterion of “Security” is introduced. This provides protection against total system failure. It requires the SCA to maintain adequate reserves at all times to protect against storage volumes dropping to five percent in more than one month in a hundred thousand months.

The SCA is in the process of engaging a contractor to investigate the System Performance Criteria and models that support its calculation and assessment. It is anticipated that the results of the preliminary work will be available near the end of the mid-term review process.

Any decisions on the levels of the system performance criteria should await the findings of the Hawkesbury-Nepean Forum as well as those of the Water CEOs’ Taskforce. The findings of both forums should be available to be considered as a part of the end-term review of the Operating Licence.

Is the current security criterion applicable and appropriate?

Changes to the system performance criteria could result in increased safe yield. An increase in safe yield would decrease the risk level for supply system security. However, it should also be recognised that an increase in safe yield would increase the frequency of restrictions. This would result in additional costs and a greater likelihood of needing to introduce emergency measures. This, in turn, would activate the emergency phase and all its consequences. Increasing the frequency of

restrictions would also be likely to result in increased nuisance restrictions and possible lack of adherences to restriction requirements.

The following table shows the safe yield associated with changed compliance criteria and associated costs.⁹

Change in Criteria	Increase in Safe Yield (ML/a)	Approximate Annual Incremental Cost (\$)
Reliability 3% to 4%	25 000	1 200 000
Reliability 3% to 5%	60 000	2 500 000
Security 0.001% to 0.005%	60 000	4 500 000

Changes in the original compliance criteria are relatively easy to implement and offer immediate benefits. Relaxing the conservative assumptions relating to the security of Sydney's water supply must be weighed against Sydney's location, a relatively short data record and possible climate changes.

It is important to note that water supply utilities have different performance criteria. The Hunter Water Corporation, for instance, operates under a performance criterion, which simply requires that *'on average customers should not enter a period of restrictions more often than once in every 10 years'*. This is similar to the SCA robustness criterion.

It is important to recognize that the inherent conservative nature of the SCA supply performance criteria reflects the physical characteristics of the catchment and inflow patterns. It manages episodes of deficiency of flows by the capture and storage of water during times of abundance. It also assumes that the quantity of water with which a supply authority enters a drought, coupled with reduced drought stream flows and restrictions on users, must be sufficient to see out the drought.

⁹ The figures are based on the increased pumping costs, financial costs based on the cost to SWC and the construction of a de-salination plant.

Traditionally this is what has been required to manage urban water supply systems. However, technological developments, particularly in areas such as desalination, continue to make remarkable strides. These, while still costly, have the ability to change the risk profile for supply authorities.

Desalination, for instance, means that cities can be freed, in part, from reliance on stored waters to see them through drought periods. It is now possible to convert large quantities of seawater to potable water, suitable and safe for human consumption.

A study undertaken for Sydney Water has found that a desalination plant of an annual capacity of 500 ML could be built at a cost of \$778 million (excluding the cost of land). Such a plant would have operating costs of \$ 0.40 kL. The cost per kilolitre of water is equal to \$0.80kL.¹⁰

The potential to invoke desalination as a management strategy in extreme droughts may enable supply authorities to adopt less conservative supply criteria.

Comment on the effectiveness of the Catchment Authority in encouraging demand management.

Clause 8.3 of the SCA's Operating Licence places the following requirement on the SCA:

8.3.1. The Authority must manage demand management consistent with the requirements in the Water Management Licence issued to the Authority under Part 9 of the Water Act 1912.

8.3.2. To the extent, which the Authority is able, it must manage water conservation consistent with the demand management requirements in Sydney Water Corporation's operating licence.

¹⁰ Seawater Desalination Study carried out for Sydney Water Corporation by Montgomery Watson – June 2000

8.3.3. In considering any augmentation of the Catchment Infrastructure Works, the Authority must consider as a priority, whether there exists any additional scope for cost effective demand management strategies by Sydney Water Corporation.

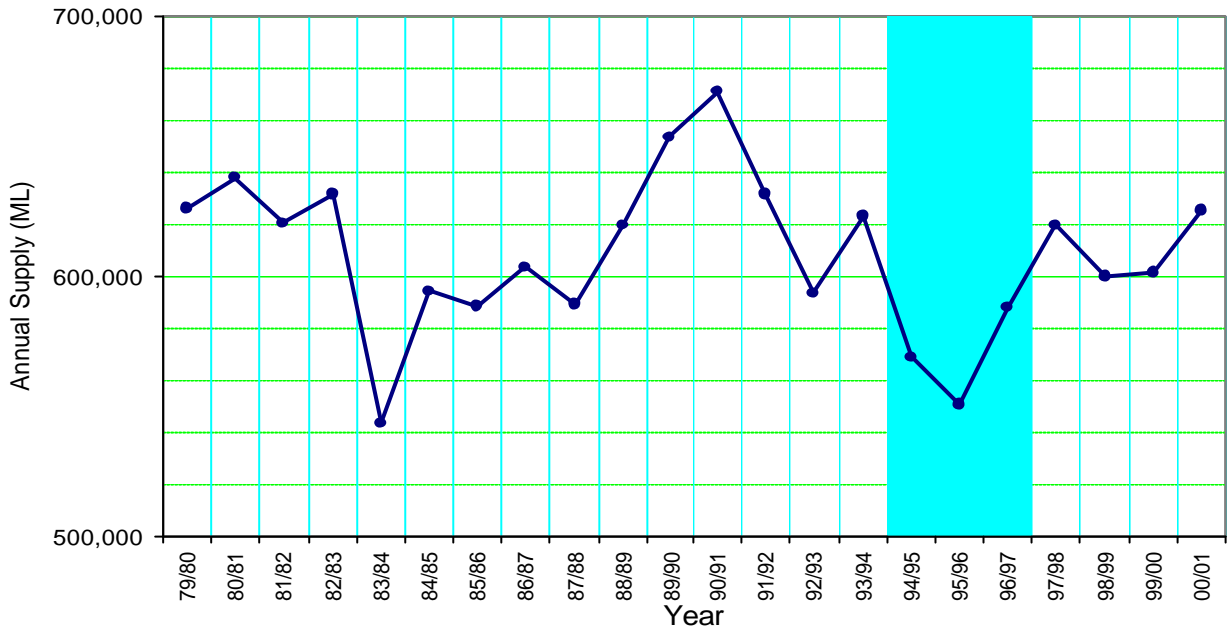
The SCA recognises that it shares with other agencies the role of implementing government policy directed towards reducing water demands in Sydney.

The CEO Taskforce recently established by government provides a vehicle for addressing and advancing the matter in a manner consistent with achieving integrated outcomes across government.

The SCA has also been supportive of Sydney Water in its endeavours to encourage demand management by providing Sydney Water with information on rainfall and weather, storage levels and inflows to the dams. The SCA also assists Sydney Water with the modelling of consumption trends.

Demand varies from day-to-day and year-to-year in response to a number of factors, which range from prevailing weather conditions to changes in customer behaviour. Figure 1 below shows Sydney Water's yearly demands since 1980. Yearly periods (ending 30 June) are normally used to allow each high consumption period (November to March) to be included in a single 12 month period. The shaded area from 1994 to 1996 represents the years when water restrictions were applied by Sydney Water on its customers.

Figure 1: SWC yearly consumption



Water supplied to Shoalhaven City Council & Wingecarribee Shire Council is as follows:

	1999/2000	2000/2001
Wingecarribee Shire Council	3,384ML	3,487ML
Shoalhaven City Council	71ML	79ML

The SCA recognises the need for it to model responsible water use behaviour. To this end the SCA during its start up phase is undertaking:

- A leakage assessment of the Warragamba pipelines, the upper canal and public picnic areas at dams.
- Recalibration of flow meters to more accurately measure water losses.
- Investigation into fitting water efficient appliances and water saving devices at SCA properties.

The SCA has also contributed to State Governments 'The Living Thing' community education campaign.

4. Conclusion and Summary

The mid-term review of the SCA's Operating Licence provides a unique opportunity for the SCA and IPART to reflect upon the SCA's operations to date and to prepare for the future.

Since its inception, the SCA has achieved some excellent results, both in the supply and management of its bulk water obligations and as steward of its catchment lands, waterways and infrastructure.

The SCA's focus on consultation, together with its whole of government approach to its responsibilities, has resulted in effective working relationships with other government agencies, local government, industry and the community.

In its submission to IPART, several recommendations have been made, which are pertinent to the Operating Licence and which should guide the mid-term review. Such an approach will maximise the benefits of the review and provide a pathway for a more efficient regulatory environment for future SCA Operating Licences.

In summary, the SCA believes that the Operating Licence is contemporary and reasonably reflects and authorises appropriate courses of action and activities necessary to exercise its functions.

As far as the principle issues raised in IPART's Mid Term Review discussion paper, the SCA is of the view that:

1. Memoranda of Understanding
 - a. The MOU serve a different purpose from the Operating Licence. The purpose of an MOU is to facilitate effective interaction and cooperative arrangements between parties.

- b. The SCA has proven success in working with MOU partners within the boundaries of the MOU and also on issues outside them.
- c. No benefit would be gained from injecting obligations from the MOU into the Operating Licence.

2. Water Quality Obligations

- a. The Bulk Raw Water Quality Management Plan demonstrates SCA initiatives in achieving best-practice water quality management across all areas of its responsibility.
- b. The current water quality monitoring obligations are adequate.

3. Risk Management Plan

- a. The current pollution source Risk Management Plan, even though it addresses numerous pollution source issues, does not fully address the requirements of the Operating Licence.
- b. The SCA will review the pollution source Risk Management Plan.
- c. It is likely that there will be a continued need for the pollution source Risk Management Plan once the Regional Environmental Plan has been finalised.

4. Review of Performance Criteria

- a. Any decisions relating to the systems performance criteria should await the finding of the Hawkesbury-Nepean Forum and the Water CEOs' taskforce.

- b. The potential to invoke desalination as a management strategy, in extreme droughts, would enable supply authorities to adopt less conservative supply criteria.

5. Environmental Impact Statement (EIS)

- a. Clause 9.4.2 should be amended as other government processes have taken over the need for the SCA to deliver the EIS.
- b. The Auditors have recommended that Operating Licence requirements such as this, which are redundant or no longer applicable, be amended.

5. Reference Listing

1. National Economic Research Associates, Review Of Energy Licensing Regimes In NSW: Most Effective Model, A Final Report For The Independent Pricing And Regulatory Tribunal, November 2001
2. Egis Consulting, 1999-2000 Operating Licence Audit Of The Sydney Catchment Authority.
3. Sydney Water Corporation, Seawater Desalination Study by Montgomery Watson, June 2000.