

Hunter Water Corporation
Operational Audit 2002/2003

INDEPENDENT PRICING AND REGULATORY TRIBUNAL
OF NEW SOUTH WALES

Hunter Water Corporation
Operational Audit 2002/2003

Compliance No 11

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INDEPENDENT PRICING AND REGULATORY TRIBUNAL
OF NEW SOUTH WALES

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27 November 2003

The Hon. Frank Sartor MP
Minister for Energy and Utilities
Level 31
Governor Macquarie Tower
1 Farrer Place
SYDNEY NSW 2000

Dear Minister

Hunter Water Corporation 2002/2003 Operating Licence Compliance Audit

I am pleased to present you with the independent Operational Audit Report for Hunter Water Corporation for the period from 1 July 2002 to 30 June 2003.

In assessing overall compliance the Auditor found that:

"Hunter Water has performed well against its Operating Licence for 2002/03 with full compliance being achieved except in one area. The non-compliance was of a technical nature and related to the omission of reporting in the Catchment Report on chlorophyll-a trend levels in the Williams River. The non-compliance has no significant impact on the overall performance of Hunter Water."

The Tribunal believes that this is a particularly sound result given that this is the first Audit of Hunter Water's new five year Operating Licence.

Drinking water quality

In particular, the Auditor reported that Hunter Water achieved the best drinking water results since 1992. Although this good result is partially attributable to the recent dry weather conditions, it also reflects the significant investment made by Hunter Water over a number of years in roofing all service reservoirs and upgrading water treatment facilities to improve the integrity of its water supply system.

In relation to drinking water quality, the Audit reports that NSW Health has recommended that Hunter Water undertake a number of actions with respect to its incident management procedures. The Tribunal supports these recommendations to further safeguard water quality in the Hunter region.

Although achieving very high levels of compliance against the health parameters of the Australian Drinking Water Guidelines, Hunter Water received an increased number of customer complaints relating to the aesthetic qualities of the drinking water supplied, relating to taste and odour. The Auditor found that these issues arose from the occasional presence of non-toxic algal compounds at Grahamstown and Chichester Dams. These naturally occurring compounds have no adverse health impacts, but can impart an earthy taste and odour to the water. Hunter Water is planning to upgrade its water treatment facilities to address this issue.

The Auditor has also made a number of recommendations to assist Hunter Water in responding more quickly to these problems when they occur. These recommendations are supported by the Tribunal.

Water continuity standard

The Operating Licence specifies basic standards of service with respect to water continuity (interruptions), water pressure and sewer overflows. For water continuity, Hunter Water is required to ensure that no more than 14,000 properties in any financial year are impacted by water supply interruptions with a cumulative duration of more than five hours.

In 2002/2003, 13,966 properties were affected by interruptions in excess of five hours, representing around 6.7% of all properties served by Hunter Water. Whilst remaining in compliance with the standard, this is the worst result in terms of water continuity performance for the past seven years. The Auditor has indicated that the result was influenced by significant increases in planned interruptions as a result of the need to connect new subdivisions to Hunter Water's system.

The Tribunal notes that the water continuity standard is intended to provide a challenging target for Hunter Water, as the Corporation's performance in any one year can be influenced by climate and one-off events, such as large trunk main failures. However, an adequate supply of water is a basic service obligation for all water utilities and as such, the Tribunal expects Hunter Water to manage and maintain its assets in order to meet the continuity standard.

Hunter Water in consultation with the Auditor has identified a number of areas in which improvements can be made which will assist Hunter Water in achieving on-going compliance against the continuity standard. This includes reviewing the way in which Hunter Water records water interruptions to ensure that vacant lots without a connection are not counted towards the standard.

To this end, the Tribunal endorses the Auditors' recommendation that Hunter Water report to you on what actions are being taken by the Corporation to ensure that it can meet the continuity standard over the remainder of the Licence term under normal operating conditions.

Accuracy of reporting systems

During the course of the Audit, the Auditor identified a number of minor accuracy errors associated with the reporting of water quality results, system performance indicators, rebates and demand management calculations. The Auditor reported that these errors were minor and did not result in a materially incorrect portrayal of Hunter Water's performance.

Despite this, the Auditor has suggested that Hunter Water conduct an internal review to identify and correct any deficiencies in the Corporation's monitoring and reporting systems. The Tribunal endorses this recommendation.

Demand/supply balance

The Tribunal notes the Audit findings that current levels of water consumption in Hunter Water's area of operations exceed the estimated sustainable yield from the Corporation's existing water sources. This demand/supply imbalance highlights the need for Hunter Water to carry out the various demand management and supply options identified in the Corporation's Integrated Water Resources Plan (IWRP).

The Tribunal recommends that Hunter Water's annual report on achievements under the IWRP (as required under clause 8.3.8 of the Licence) clearly set out progress against the individual actions set out in the Plan. To facilitate this, Hunter Water should report this information in a similar format to Sydney Water Corporation's *Demand Management Reporting Schedule*.

Other issues going forward

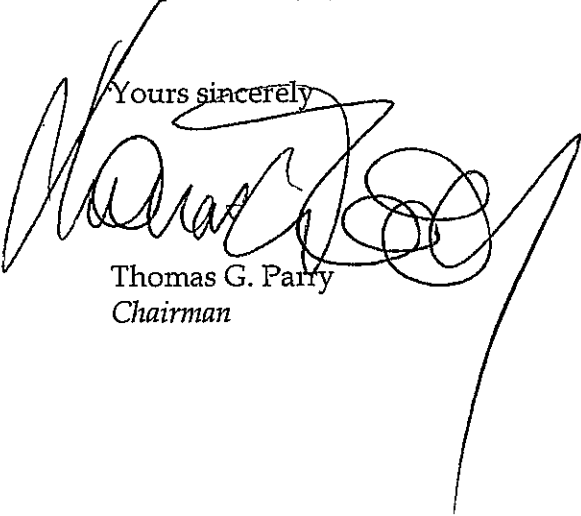
The Auditor has identified a number of other issues which have the potential to impact on future compliance with the Licence. These include:

- Implementation and compliance against Hunter Water's new Customer Contract (which took effect on 1 September 2003)
- Customer management and complaint handling procedures
- The implementation of a new electronic Customer Information System (expected to be operational by July 2005).

Hunter Water is aware of these issues and in most cases has initiated action to address any potential problems. The Tribunal believes that specific recommendations addressing these issues are not appropriate at this time, but may seek to have these issues investigated further as part of subsequent Audits of the Licence.

Should have any queries about the matters raised, please do not hesitate to contact me by telephone on (02) 9290 8444.

Yours sincerely



Thomas G. Parry
Chairman

Hunter Water Corporation

Operational Audit 2002/03 Final Report

November 2003

Independent Pricing and Regulatory Tribunal



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Date: 24 November 2003
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Abbreviations

Abbreviation	Description
AOMS	Assets and Operations Management System
ARMCANZ	Agricultural and Resource Management Council of Australia and New Zealand
CFU	Colony Forming Units
CIS	Customer Information System
CMS	Customer Management System
DEC	Department of Environment and Conservation
DFT	Department of Fair Trading
DIPNR	Department of Infrastructure, Planning and Natural Resources
EMP	Environmental Management Plan
EMS	Environmental Management System
EPA	Environmental Protection Authority (now the Department of Environment and Conservation)
ESD	Ecological Sustainable Development
EWON	Energy and Water Ombudsman of NSW
GIS	Geographical Information System
GL	Giga litres
IWRP	Integrated Water Resource Plan
LIMS	Laboratory Information Management Systems
LPR	Linear Polarisation Resistance
ML	Mega litres
MoU	Memorandum of Understanding
MWh	Mega watt hours
NHMRC	National Health and Medical Research Council
PAC	Powdered Activated Carbon
PAS	Payment Assistance Scheme
SCADA	Supervisory Control and Data Acquisition
SEDA	Sustainable Energy Development Authority
TCM	Total Catchment Management Committee
The Tribunal	Independent Pricing and Regulatory Tribunal of NSW
WSAA	Water Services Association of Australia
WSP	Water Sharing Plan
WWPS	Waste Water Pumping Station
WWTW	Waste Water Treatment Works

Executive Summary

Overview

This is the first year in which Hunter Water has operated under its new Operating Licence. This Licence is more prescriptive, requires detailed reporting and seeks greater transparency in Hunter Water's operational capabilities and performance.

Hunter Water has performed well against its Operating Licence for 2002/03 with full compliance being achieved except in one area. The non-compliance was of a technical nature and related to the omission of reporting in the Catchment Report on chlorophyll-a trend levels in the Williams River. The non-compliance had no significant impact on the overall performance of Hunter Water.

Hunter Water continues to provide drinking water of a high quality that more than meets public health guidelines. Water quality results achieved this year were the best since Corporatisation. Although full compliance was achieved in relation to drinking water quality there were an elevated number of taste and odour complaints arising from two incidents where the compounds Geosmin and MIB were found in Chichester and Grahamstown Dams (Geosmin and MIB are non-toxic metabolites of naturally occurring blue-green algae). Hunter Water dealt with the two incidents appropriately. Close monitoring of the situation is continuing and steps are being taken through the implementation of automated mechanisms to allow immediate treatment of any further outbreaks at Grahamstown. A review of potential treatment options has also commenced for the Chichester source.

Hunter Water achieved operational compliance for system performance standards in relation to water supply discontinuity, low pressure and sewer overflows. Performance in these areas is highly influenced by climatic or extreme conditions such as extended periods of no rainfall or extreme rainfall, growth in demand and the infiltration of tree roots into pipes. Long periods of dry weather can also increase the number of system breaks due to movement occurring in reactive clay soils. Upgrade and replacement programs are underway to rectify problem areas and alleviate potential concerns leading into summer. The number of water supply interruptions experienced this year was close to the standard of 14,000 properties being impacted. This was the result of several large unplanned incidents as well as greater than expected planned outages related to new developments in the region. Hunter Water has undertaken a number of initiatives since yearend to alleviate impacts to customers from planned and unplanned outages. With the inherent volatility of water supply interruptions however, Hunter Water must continually improve system performance in line with growth in connected properties.

The Integrated Water Resource Plan (IWRP) was finalised during the year. This Plan quantifies the maximum reliable quantity of water that can be derived from storages and makes projections in relation to the total demand for water. The IWRP examines the strategic options available for Hunter Water to meet projected demand at the lowest cost base considering social, environmental and economic factors. The options adopted, including augmentation of Grahamstown Spillway and a combination of demand management and water conservation initiatives are reasonable and reflect the lowest cost options to Hunter Water. The IWRP is however, a working document and ongoing regular review will be necessary to ensure these options remain the most viable and cost effective.

NSW is currently experiencing its worst drought for 100 years with more than 99% of the State being drought declared at sometime during 2002/03. While Hunter Water's storage systems are currently at levels greater than 80%, storage levels can fall quickly over a dry summer. Hunter Water has continued to improve security of supply through a number of capital works programs and improvements to Chichester Dam. Demand management programs underway, targeted at both the community and industry are also likely to assist in reducing demand from customers. The success of these programs in terms of expected water savings however, is likely to be small compared to the current supply and future demands forecast. Water demand and supply options identified in the IWRP need to be carried out as a priority.

Hunter Water's proactive strategy of continuous improvement in relation to customer service continued throughout the year with further streamlining of processes, improvements in data collection, ongoing staff training, better information being made available for trend analysis, and continued feedback being sought from customers via surveys. The proposed replacement of the current Customer Service System with a new Customer Information System by 2005 will provide further efficiencies in customer service in the future.

Hunter Water has adopted a proactive approach to managing complaints from consumers through improvements to internal systems and procedures and through the introduction of the Energy Water Ombudsman of NSW (EWON) for external dispute resolution. These improvements have been well received by customers. A number of initiatives were undertaken during the year to improve operational efficiency at the Contact Centre, which manages complaints with respect to call waiting times. While improvements have been small, these will grow in time as staff become more familiar with systems and management initiatives are bedded down.

Hunter Water adopts a multiple barrier approach to ensure the delivery of safe water to its customers. Catchment management is a critical and fundamental component of this approach and Hunter Water undertakes a number of initiatives in this area, particularly with respect to the Williams River Catchment in conjunction with other agencies and organisations. Catchment management for the Williams River and the Tomago and Anna Bay Sandbeds is not the sole responsibility of Hunter Water. However, Hunter Water has strong working relationships in place with the key stakeholders involved to ensure effective outcomes are achieved for each catchment.

Hunter Water breached the requirements of its Water Management Licence during the year due to greater than permitted extractions of water from the Anna Bay Sandbeds. This matter was investigated by the Department of Infrastructure, Planning and Natural Resources and is unlikely to occur again as Hunter Water has since supplemented water extracted from the Anna Bay Sandbeds with the Tomago source via the completion of a pipeline between the two systems.

Hunter Water's corporate policy in relation to the environment, its Environmental Management System, the many programs in place, and actions undertaken under the Environmental Management Plan (EMP) demonstrate Hunter Water's commitment to continual improvement in environmental stewardship. Within the EMP there are a number of internally set 'stretch' targets adopted by Hunter Water to encourage continual improvement in environmental management. The comprehensive set of environmental and Ecological Sustainable Development (ESD) indicators adopted by Hunter Water also demonstrates a high level of commitment towards sustainable business practices. This is the first year of adoption of ESD indicators and although these indicators have only been in place for a few months, Hunter Water appears to be working effectively towards improving environmental, social and financial performance in the areas being measured.

During the audit, a small number of minor accuracy errors related to reporting were detected across all areas of the business reviewed. Although these errors did not result in a materially incorrect portrayal of Hunter Water’s performance against the Operating Licence, they do reflect possible underlying problematic trends in the processes, procedures and systems used for reporting under the Licence. Quality assurance with respect to accuracy and completeness of reporting could be improved. Although projects are underway within various departments of Hunter Water to automate reporting systems and improve or replace legacy systems with more robust systems that have the ability to provide more useful information, interim measures are necessary to ensure management controls over reporting are effective.

In all, Hunter Water has shown a high degree of compliance with the requirements of its new Operating Licence, achieving a successful transition to the more rigorous performance obligations set out in the Licence. Year to year climatic conditions and continued population growth exert a significant influence on Hunter Water’s operational performance, as evidenced by the relatively high number of water supply interruptions over 2002/03. Meeting these ongoing challenges and maintaining compliance with the Operating Licence will necessitate continual improvement by Hunter Water and prudent management of its assets.

Summary of overall compliance performance

Hunter Water achieved full compliance against its Operating Licence in all areas except catchment management reporting. While Hunter Water implemented all required catchment management initiatives to ensure safe drinking water for its customers, reporting on chlorophyll-a trend results, as required under Clause 10.1 of the Operating Licence, was omitted from the Catchment Report.

Hunter Water adequately addressed all of the Ministerial Directives and audit recommendations arising out of last year’s audit. These are summarised in the sections to which they relate.

Overall performance against core areas within the Operating Licence is as follows:

Core Area	Clause	Description	Compliance
Customer and Consumer Rights	5.1	Customer contract	
	5.2	Complaint handling, complaint resolution and debt and disconnection procedures relating to consumers	
	5.3	Code of Practice and Procedures on Debt and Disconnection	
	5.4	Consultative forum	
Water Quality	6.2	Drinking water quality – standards	
	6.3	Drinking water quality – monitoring	
	6.4	Drinking water quality – reporting	
	6.5	Drinking water quality – planning	

Core Area	Clause	Description	Compliance
	6.6	Drinking water quality – other grades of water	
	6.7	Drinking water quality – environmental water quality	
System Performance Standards	7.3.1	Operate the system such that no more than 14,000 properties in a financial year experience one or more interruptions with a cumulative duration of more than 5 hours.	
	Customer Charter ¹	Rebate the water service charge to customers if over the course of a year, as a result of failure to Hunter Water’s systems they experience total confirmed interruptions to the water service exceeding 24 hours.	
	7.3.2	Operate the system such that no more than 4,800 properties experience a pressure incident where pressure falls below 20 metres head in a financial year.	
	Customer Charter ¹	Rebate a customer account, if over the course of a year, confirmed low water pressure events are experienced on more than 5 separate occasions.	
	7.3.3	Operate the system such that the number of uncontrolled sewage overflows does not exceed 6,500 in a financial year (other than on public land).	
	Customer Charter ¹	Rebate a customer account, if over the course of a year as a result of a failure of Hunter Water’s systems, a customer experiences more than three confirmed sewer surcharge events on their property.	
Water Demand and Supply	8.3	Develop an Integrated Water Resources Plan that details how Hunter Water will manage demand for water for the next 10 years and report performance against the plan.	
	8.4	Comply with the water conservation target where the five-year rolling average annual residential water consumption is less than 215 kilolitres.	
	8.5 and 8.6	Report on security of supply, losses from the water system, recycled water, demand management, and water demand and supply indicators.	
Environment – Indicators and Plan	9.1	Produce a five-year Environmental Management Plan containing details of environmental improvement strategies and endorsing ESD principles.	
	9.2	Develop a list of environmental and ESD indicators and report performance against these indicators in the Annual Environmental Report.	
	9.3	Participate in the Energy Smart Business Program and report activities undertaken.	

Core Area	Clause	Description	Compliance
Catchment Management	10.1	Report performance against catchment management activities, bulk water quality results, the Water Management Licence and the Dams Safety Act.	
Complaint and Dispute Handling	12.1	Report on complaints made against Hunter Water which are handled by internal complaints handling procedures.	
	12.2	Report on complaints received by the external disputes resolution body, EWON.	
	12.3	Report on complaints made against Hunter Water to a court of tribunal.	

Note: 1. The Customer Charter is a voluntary management commitment. Compliance under the Operating Licence is not applicable.

Key

Full compliance achieved



Partial compliance achieved



Non-compliance



Summary of key recommendations

Recommendations arising from the 2002/03 Operational Audit can be divided into two categories, namely recommendations relating to operational compliance and recommendations relating to continuous improvement. These recommendations should be read in conjunction with the relevant section of the report as indicated. Priorities have been established in accordance with the following criteria:

Priority 1: Key risk area requiring attention by senior management to ensure ongoing Operating Licence compliance.

Priority 2: Minor/technical non-compliance requiring action or recommendation to ensure continuous improvement to operations and business practices.

Priority 3: Suggestion to achieve best practice.

Each recommendation has an associated timeframe to be actioned which has been agreed to by Hunter Water.

Operational Compliance Recommendation

Area	Finding	Recommendation	Priority	Action By	Report Reference
Catchment reporting (Operating Licence cl10.1.1)	The Catchment Report for 2003 did not report on Chlorophyll-a trends in the Williams River as required under clause 10.1 of the Operating Licence.	Hunter Water should ensure that results for Chlorophyll-a trends are reported within the Catchment Report for 2003/04.	2	1 September 2004	9.5

Note: There were no Priority 1 operational compliance recommendations.

Continuous Improvement Recommendations

Area	Finding	Recommendation	Priority	Action By	Report Reference
Water quality reporting/ system performance/w ater supply and demand	During the audit a small number of minor accuracy errors (transposition errors from source systems to reporting systems and within calculations) were detected associated with reporting of water quality results, system performance indicators, rebates and demand management calculations within the IWRP. Although these errors did not result in a materially incorrect portrayal of Hunter Water’s performance against its Operating Licence, they do reflect possible underlying problematic trends in processes, procedures and systems used for reporting, particularly in relation to the quality assurance of information provided. It is understood that a project is underway to automate interfaces between LIMS (used for water quality testing at the laboratory), AOMS and SCADA source systems to provide automatic generation of excel spreadsheets for reporting. This process is currently undertaken manually.	An internal audit should be conducted to assess the accuracy and completeness of reporting across Hunter Water in relation to water quality, systems performance, rebates and the IWRP. As an interim measure until automated report generation is available, additional management controls should be implemented to ensure the accuracy of the numbers being reported. When automated reporting is available, the existing system and new system should be run in parallel for a suitable period of time to ensure reporting accuracy and completeness. Additional quality controls should be employed in further updates to the IWRP.	1	31 March 2004	5.5.3
					6.2
					7.5.1
Water continuity standard	Hunter Water reported that 13,966 properties (approximately 6.7% of properties compared with 6.3% in 2001/02 or 12,347) experienced one or more water supply interruptions which taken together, had a cumulative duration exceeding five hours during the 2002/03 audit year. This result is very close to the standard set in the Licence of 14,000 properties being impacted.	Hunter Water should report to IPART and the Minister for Energy and Utilities on the causes of the near breach of its water continuity standard over 2002/2003. This report should detail actions being taken by Hunter Water to ensure that it can meet the standard over the remainder of the Licence term under normal operating conditions.	1	31 March 2004	6.4.2

Area	Finding	Recommendation	Priority	Action By	Report Reference
Taste and odour	<p>To date, research undertaken in Australia by water authorities and other organisations has failed to identify the triggers for algal blooms that produce taste and odour compounds. Trends indicate that the frequency of problems may be increasing in the Hunter region. Investigations and close monitoring of the situation is being undertaken by Hunter Water. Problems experienced over 2002/03 with taste and odour compounds appear to be parochial, with surrounding water authorities including Sydney Water not experiencing these problems.</p>	<p>Laboratory testing for Geosmin and MIB occurs on a weekly basis. As a result there is potential for a delay of several days to occur between the onset of a taste and odour problem, and the receipt of results from laboratory testing. It is recommended that taste testing continually occur at Chichester and Grahamstown on a daily basis so that taste and odour problems can be identified as soon as they occur.</p>	1	31 March 2004	5.5.1
	<p>Hunter Water are proactive in preventing taste and odour problems before they occur however are limited by the capability of the system regarding the speed at which the problems can be alleviated and also by impacts on large customers when water sources are substituted.</p>	<p>It is recognised that identifying a trigger for taste and odour problems is the subject of significant research across Australia. Continued investment by Hunter Water in research is recommended with specific emphasis on their water supply system.</p>	2	Ongoing	
		<p>While it is recognised that a majority of taste and odour complaints are received in the first few days of the problem occurring, and measures are being undertaken to address the problem, Hunter Water should investigate methods for reducing the time taken to address the problem. Methods investigated could include PAC (powdered activated carbon) dosing when taste and odour problems occur while a substitute source is brought online or investigation of other technologies to remove taste and odour compounds.</p>	2	30 June 2004	

Area	Finding	Recommendation	Priority	Action By	Report Reference
Incident response	NSW Health has recommended that Hunter Water undertake a number of actions related to incident management.	Hunter Water should undertake security measures as per NSW Health recommendations. The incident response plan should be tested during 2004 using relevant scenarios to ensure that management are well trained.	1	In accordance with the timetable agreed with NSW Health	5.5.4
Contact Centre operational efficiency	<p>Considerable effort is given by Contact Centre management to resource planning on both a day-to-day and longer term basis. However, the random nature of unplanned operational events often causes problems relating to adequate resourcing. Given the relatively small size of the Contact Centre, a number of core staff are available each day with contingency arrangements in place if required to increase capacity such as using a casual panel, or bringing other staff from outside the Call Centre online etc.</p> <p>In some instances results achieved by Hunter Water in relation to call waiting times indicate poor communication between other departments and the Contact Centre, relating to factors such as large mailouts or billing issues that are likely to trigger a large number of customer calls into the Contact Centre.</p>	<p>Hunter Water should review its Contact Centre planning initiatives. Effort should be directed at improving communication and coordination between departments in relation to customer service actions that impact on calls received by the Contact Centre, particularly during peak times.</p> <p>A review of staffing levels against call centres operated by like sized water companies within Australia should be undertaken to determine any shortfalls.</p> <p>Appropriate strategies should be developed to address these shortfalls.</p>	2	30 June 2004	4.5.5

Area	Finding	Recommendation	Priority	Action By	Report Reference
After hours emergency calls	<p>The abandonment rate target of 4% for emergency calls was set by Hunter Water with actual call rates averaging 5.2% for 2002/03. This result is comparable with other water authorities. This result was impacted by a higher abandonment rate after business hours when only one staff member is available to answer calls. Hunter Water has identified that the higher after hours abandonment rate was the result of high call traffic during unplanned peak times or customers hanging up after hearing a recorded message. It is not possible within the current constraints of the Meridian telephone system to take these factors into account when determining indicator results. Effort was taken during the year to address these issues within the Contact Centre by changing operating processes and staffing levels with slight improvements being seen towards the end of the year.</p>	<p>To further assist Hunter Water in achieving its abandoned call rate target of 4%, a review of options available to address after hours emergency calls should be undertaken to determine whether, based on a cost benefit analysis, staffing levels should be increased or shifts staggered to provide greater coverage through, for example, extended business hours. A trend analysis of calls received on weekends should occur to determine if increasing staff levels on weekends is justified.</p>	2	30 June 2004	4.5.5

Area	Finding	Recommendation	Priority	Action By	Report Reference
Calculation of compliance against water continuity standard	<p>Clause 7.3 of the Operating Licence refers to establishing the number of "properties" in a financial year which experience water supply interruptions with a cumulative interruption exceeding 5 hours. In accordance with the definition of property in the Operating Licence this could be interpreted to mean that if a property is not connected to Hunter Water's network, that is, it is a vacant lot without a meter, then it cannot incur a water supply interruption. Hunter Water has however included all vacant lots into the count of effected properties for the water continuity standard. These properties should not have been incorporated as an interruption to supply cannot occur to properties that do not have a connection.</p> <p>Historically vacant lots were included in the count primarily because it was not possible within Hunter Water's systems at the time to identify them and therefore exclude them. The computer systems now in place however have this capability. By including vacant lots in the water continuity standard calculations for 2002/03 the number of properties effected has been overstated by 459 properties.</p>	<p>Hunter Water should review its method for calculating properties effected by water supply interruptions in accordance with the Licence standard and ensure that vacant lots are excluded from calculations.</p>	2	30 June 2004	6.4.2

Area	Finding	Recommendation	Priority	Action By	Report Reference
Asset management watermain replacement model	<p>Reticulation watermains are managed in what Hunter Water call a “controlled reactive manner”. This means that Hunter Water operates the mains to failure but routinely records all performance data to allow continual assessment as to whether ongoing repair of these failures is an acceptable approach or whether the point has been reached where replacement is required. Hunter Water uses a watermain replacement model to determine when reticulation watermains should be replaced. The model broadly makes a “whole of community” cost assessment as to whether repair or replacement is the cheapest option. The inputs into the model are:</p> <ul style="list-style-type: none"> ▪ the ongoing cost of a watermain repair based on maintenance contract rates; ▪ an estimate of overall replacement cost based on the most recent watermain laying contract rates; ▪ a social cost allowance on a per property basis to value the impact of an interruption; and ▪ a cost allowance for water lost through a break or leaks. 	<p>An internal review of the inputs into Hunter Water’s asset management watermain replacement model should be conducted in the context of the current drought conditions being experienced and additional demand being placed on the system from population growth, to assess the adequacy of these inputs in addressing Licence requirements. If, for example, inputs relating to social costs or lost water costs are higher than currently assumed, then a greater level of watermain replacement will be required.</p>	2	31 March 2004	6.4.2
Environmental incident reporting	<p>From a sample of five randomly selected environmental incident reports reviewed as part of the audit, four of these showed transposition errors between laboratory results and the incident report for faecal coliform counts, or had information missing.</p>	<p>Review the management review controls in place for environmental incident reporting to ensure errors are identified and rectified appropriately.</p>	2	30 June 2004	6.6.3

Area	Finding	Recommendation	Priority	Action By	Report Reference
Water supply and demand	The IWRP suggests that Hunter Water can provide a sustainable or safe yield (which is the supply of water from water sources without breaching internal restriction standards or running the risk of storages reaching critical levels) of 73,000 megalitres of water per annum from current sources. Demand for 2001, 2002 and 2003 has marginally exceeded this volume. Demand management initiatives proposed in the IWRP will provide limited savings of around 1,000 megalitres per year.	It is imperative that the proposed actions identified in the IWRP be undertaken and completed in accordance with the timetable outlined in the IWRP to maintain the current security of supply, and provide an extra 5,500 megalitres per annum.	2	In accordance with timetable in the IWRP	7.5.1
Code of Practice and Procedure on Debt and Disconnection	The information provided within the Code of Practice and Procedure on Debt and Disconnection does not provide as much detail on Hunter Water's debt collection procedure as the new Customer Contract effective from 1 September 2003. For example, the Contract states that customers will be sent particular notices before disconnection occurs, while the Code states that "Hunter Water will endeavour to notify you".	Information in the Code of Practice and Procedures on Debt and Disconnection should be consistent with the information in the Customer Contract, and the Code should more fully inform customers of their rights in regard to debt collection.	2	30 June 2004	4.5.3
Payment Assistance Scheme	In July 2003, Hunter Water extended the Payment Assistance Scheme (PAS) to customers who have difficulty in paying bills. The PAS operates under a similar framework to other established schemes within NSW for gas/electricity companies and Sydney Water. The scheme is designed to assist Hunter Water customers experiencing financial hardship and is facilitated by local welfare agencies. If eligible, customers may receive \$25 vouchers to assist in paying their Hunter Water account.	The Code of Practice and Procedure on Debt and Disconnection should contain more practical information regarding the PAS and the ways in which customers can access PAS vouchers. Sydney Water's code, for example, provides customers with information regarding the nature of the scheme. Given the newness of the PAS, Hunter Water should provide information on this scheme in the Code of Practice and Procedure on Debt and Disconnection.	2	30 June 2004	4.5.3

Area	Finding	Recommendation	Priority	Action By	Report Reference
Review of the IWRP	<p>The options identified as most viable within the IWRP were selected based on meeting a forecast conservative growth in consumption from Hunter Water's customer base of around 0.6GL/yr against predicted population growth in the region. Growth forecasts were developed on the assumption that there would be a continuation of recent climatic conditions, that existing demand management and water conservation measures would continue and that no new significant industries would be moving into the area. Any significant change to one or more of these assumptions however, could change demand forecasts, which could mean that the selected supply options are no longer the most suitable to meet security of supply requirements.</p>	<p>Provision is made within the Operating Licence for the IWRP to be reviewed regularly. A formal review of the Plan is not scheduled until 2006. As the IWRP is a working document, internal reviews should be conducted on a regular basis to ensure strategies being implemented to monitor and improve demand management initiatives and maintain the security of supply remain viable.</p>	2	30 June 2004	7.5.1
IWRP development	<p>Although compliance with the requirements of the Operating Licence has been achieved in relation to the IWRP and a detailed analysis of options was undertaken by Hunter Water in the development of the Plan, the analysis undertaken and options reviewed are not clearly reflected in the Plan with only limited discussion of options presented. In addition the Plan is not logically structured and simple to understand.</p>	<p>Further versions of the IWRP should include more detailed assessment of all reasonable options and consideration should be given to restructuring the layout of the Plan to provide a more user-friendly document.</p>	2	When the IWRP is re-published as per section 8.3 of the Operating Licence	7.5.1

Area	Finding	Recommendation	Priority	Action By	Report Reference
Demand management	In preparing the IWRP, Hunter Water has met the specific requirements of the Operating Licence. There is however little flexibility built into targets set within the IWRP and there is no contingency plan to deal with a large increase in demand that may require the development of a new water source.	Although the possibilities associated with meeting industrial demands using recycled water are adequately addressed in the IWRP, further potable (and non-potable supplies not able to be serviced by recycled water) have not been outlined in the IWRP. Some preliminary planning for future augmentation options (for example, Stockton groundwater etc) should be included in the terms of the current IWRP to address these supply uncertainties.	2	30 June 2004	7.6
Williams River water quality trends	The Catchment Report provides Williams River water quality trends for the full extent of available data (15 years) which is greater than the requirements specified in the Operating Licence. A long-term assessment of trends limiting the interference of climatic variability is also provided in the report.	Five year water quality trends for the Williams River, as required by the Licence, and suitable trend descriptions for recent catchment initiatives should be included in the Catchment Report, as well as trends for the complete record period (being 15 years). This will highlight any water quality trends that may be occurring in the medium-term as a result of land use changes and catchment management activities that may differ from long-term trends.	2	1 September 2004	9.5.1
Groundwater status reporting	There are risks to the Tomago and Anna Bay aquifer system (and associated dependent ecosystems) from land uses on these water sources and also land use practices. A combined management approach is evolving based on respective land ownership and occupations. Hunter Water has a primary role in maintaining the natural attributes of these resources. At present, the catchment report has no information on water level trends or groundwater dependent ecosystems for the Tomago and Anna Bay water sources.	Future Catchment Reports should have an expanded section on groundwater sources and address the quantity, quality and dependant ecosystems attributes of the resource. This should be aligned with the new requirements for the Water Sharing Plan and Hunter Water major utility access licences.	2	1 September 2004	9.5.2

Area	Finding	Recommendation	Priority	Action By	Report Reference
Complaint resolution times	<p>Approximately 60% of EWON matters were completed within 20 days. Those that took more than 20 days related to more complex issues such as water pressure developer issues and compensation.</p> <p>There were, however, a small number of examples whereby cases referred to EWON took an extended period of time for EWON and HWC to resolve, in addition to the time already spent by HWC, for example three to five months. The cases being reviewed by EWON emphasise the importance of early intervention and response to customers. Hunter Water has expressed a commitment to “ongoing coaching and development of Hunter Water’s staff in complaints management”.</p>	<p>Hunter Water should work with EWON to identify and develop ways to improve customer service, particularly in relation to the handling of complaint response times.</p>	2	30 June 2004	10.5.2

Area	Finding	Recommendation	Priority	Action By	Report Reference
Water quality planning	<p>A qualitative drinking water risk assessment was undertaken by Hunter Water in December 2002 in accordance with <i>AS/NZS 4360:1999 Risk Management</i>. The assessment identified and assessed the risks of failing to comply with the drinking water health guidelines (including <i>Cryptosporidium</i> and <i>Giardia</i>) and the drinking water guidelines values for pH, true colour, turbidity, aluminium, iron and zinc. The method utilised a risk assessment procedure based on identification of potential hazards or causes, events or incidents which could lead to contamination, then determined the level of risk for each by estimation of likelihood and consequence using pre-defined qualitative measures or categories. This process was undertaken via individual discussions with key personnel within Hunter Water rather than through the use of workshops.</p>	<p>As a means of further improving the risk assessment process, Hunter Water should consider adopting a workshop based methodology for the review and updating of its drinking water risk assessment to ensure risk scores allocated and the risk profile adopted for each particular area reviewed are consistent and incorporate all aspects of Hunter Water's business appropriately. Workshops provide a more effective means of cross communication between departments in risk analysis and determination of rankings.</p>	3	30 June 2005	5.5.4

1. Introduction

1.1 Hunter Water Corporation

Hunter Water Corporation (Hunter Water) is a State Owned Corporation, being wholly owned by the NSW Government, which provides water and wastewater services to approximately 495,000 people in Newcastle, Lake Macquarie, Maitland, Cessnock and Port Stephens. A total of 208,000 properties are connected to the water network and 195,000 to the wastewater network. Hunter Water generates total annual revenues of \$132 million (2002/03) and is responsible for the maintenance of assets with a total value of approximately \$2 billion. The area of operations for which Hunter Water is responsible is set out in *Figure 1.1*.

Hunter Water supplies more than 200 million litres of water a day sourced from Chichester Dam, Grahamstown Dam, the Tomago Sandbeds and the Anna Bay Sandbeds. The water supply system consists of 4,400 kilometres of pipes, 73 reservoirs and 77 pumping stations. Requirements in relation to water quality, water supply and pressure are set out in the Operating Licence. The water supply network is set out in *Figure 1.1*.

Hunter Water maintains a wastewater transportation system comprising 17 treatment works, 4,870 kilometres of sewer main pipes and 366 pumping stations. Requirements in relation to wastewater are also set out in the Operating Licence and sewerage system licences. The wastewater network is set out in *Figure 1.2*.

Hunter Water is regulated by the following State government agencies:

- the Independent Pricing and Regulatory Tribunal (the Tribunal), which determines the prices charged by Hunter Water and administers Hunter Water's Operating Licence;
- the NSW Department of Infrastructure Planning and Natural Resources (DIPNR) previously the Department of Land and Water (DLWC), which administers Hunter Water's Water Management Licence;
- the NSW Department of Environment and Conservation (DEC), previously the NSW Environment Protection Authority, which issues sewerage system licences, covering mainly effluent discharges;
- NSW Health, through a Memorandum of Understanding (MoU) that establishes procedures for communicating the results of Hunter Water's water quality monitoring programs; and
- the NSW Dam Safety Committee, which regulates the safety aspects of dam management.



Figure 1.1: Hunter Water's Water Supply Network

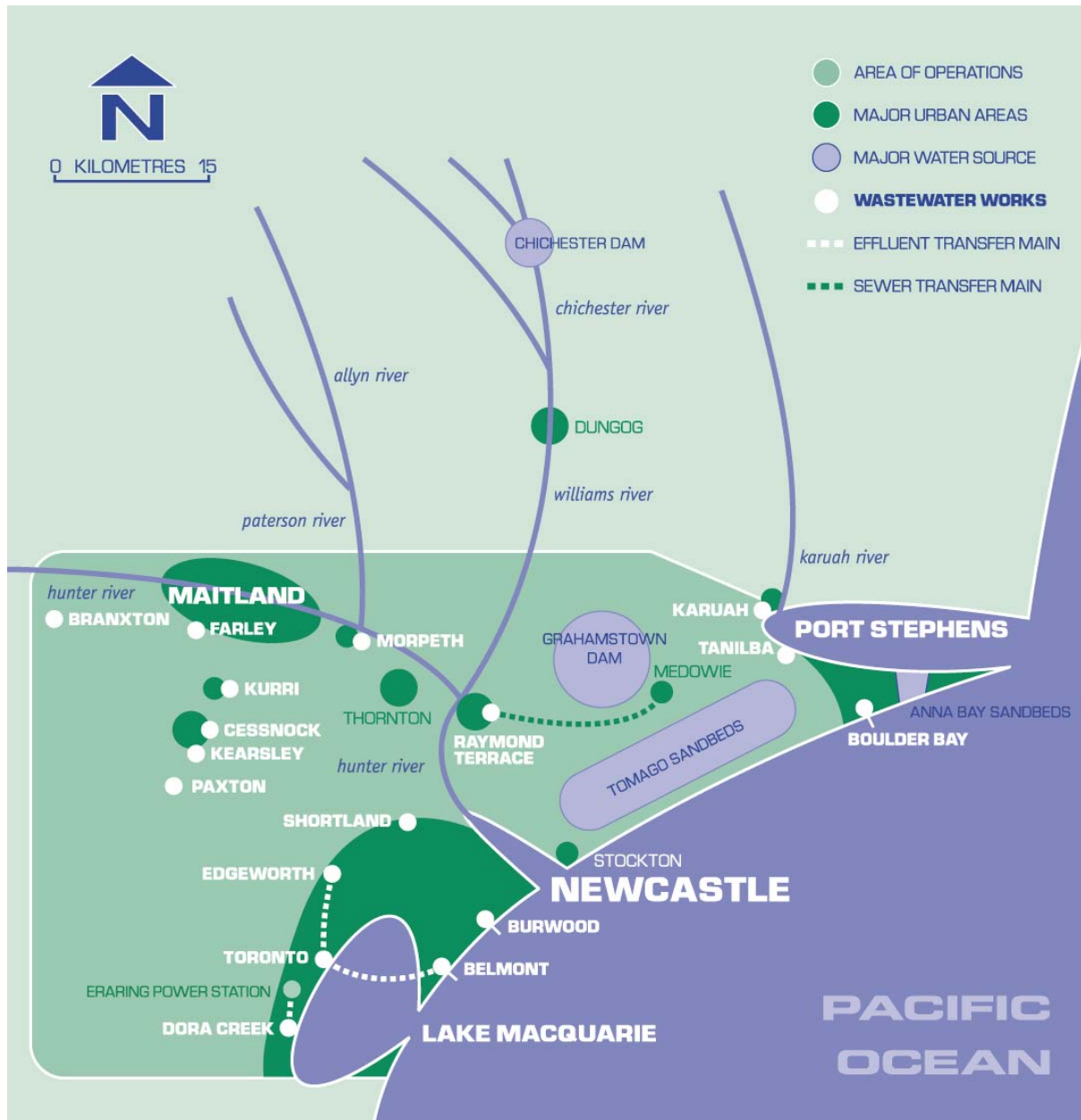


Figure 1.2: Hunter Water's Wastewater Network

2. Scope of Operational Audit

The objective of this audit is to advise and report to the Tribunal on Hunter Water's performance against its Operating Licence for the period 1 July 2002 to 30 June 2003. The scope of the audit is outlined in Part 11 of the Operating Licence, and requires an assessment of compliance against the areas of the Operating Licence outlined in *Table 2.1*.

Table 2.1: Scope of the 2002/03 Audit

Licence Part	Key Area	General Requirements for Hunter Water	Reference in this Report
5	Customer and consumer rights	Fulfil obligations under the Customer Contract, the Code of Practice and Procedure on Debt and Disconnection, and the Consultative Forum.	4
6	Water quality	Comply with 1996 NHMRC/ARMCANZ Australian Drinking Water Guidelines in relation to planning, monitoring and reporting on water quality. Comply with the relevant guidelines and requirements relating to other grades of water and environmental water quality.	5
7	System performance	Comply with and report on system performance standards and indicators as set out in Schedule 4 of the Operating Licence relating to water continuity, water pressure, and sewage overflow. Maintain records on water interruptions, low pressure and sewage overflows and report on low pressure areas.	6
8	Water demand and supply	Develop and report on performance against the Integrated Water Resources Plan. Hunter Water must also comply with and report on performance against water conservation targets, water demand and supply indicators including security of supply, losses from the water system, recycled water and demand management.	7
9	Environment – indicators and plan	Prepare a five-year Environmental Management Plan, develop and comply with environmental and Ecological Sustainable Development (ESD) indicators, and participate and report on involvement in the Energy Smart Business Program administered by SEDA.	8
10	Catchment Management	Report on performance against catchment management activities.	9
12	Complaint and dispute handling	Develop internal complaints handling procedures and report on performance against customer complaint handling indicators. Hunter Water must also establish and report on the performance of an external Dispute Resolution Scheme and report on complaints made against Hunter Water to a court of tribunal.	10

The scope of the audit also includes an assessment of compliance and the progress of Hunter Water in addressing Ministerial Directives from the NSW Minister for Energy arising from the 2001/02 Operational Audit, the identification of factors that may influence Hunter Water’s compliance performance in the future, and how its performance could be improved.

2.1 Structure of the Audit Report

This report has been prepared to specifically meet the audit brief and Part 11 of the Operating Licence. The report follows the structure of the Operating Licence. Each section of the report is structured as follows:

- a **summary of findings** at the beginning of each section addressing the key findings in relation to compliance for each audit area;
- **recommendations** for each auditable area;
- a **summary of the requirements** for each auditable area providing context to, and summarising the requirements of the Operating Licence against which the performance of Hunter Water is being assessed;
- a **summary of compliance** against the Operating Licence, Ministerial Directives, and previous year audit recommendations. Each auditable requirement is broken down into sub-clauses and includes an assessment of the level of compliance using a traffic light approach with green indicating full compliance, amber indicating partial compliance and red indicating non-compliance;
- a discussion of each auditable area whereby substantive evidence and **findings** that support the assessment of compliance are presented; and
- **factors likely to affect compliance** for each key auditable area in the future.

A detailed description of compliance against specific clauses within the Operating Licence related to each auditable area is available in *Appendix A*.

2.1.1 Ministerial Directives

Table 2.2 provides guidance on where Ministerial Directives are addressed in this report.

Table 2.2: Ministerial Directives

Reference	Requirement	Report Reference
Water quality management and improvement programs	<p>i) <i>I require that Hunter Water modify the notification form it uses to inform NSW Health of an exceedance or water quality incident. Hunter Water should base this modification on similar forms currently used by Sydney Water, which require a signature from both parties on actions taken and agreed to.</i></p> <p><i>The use of online systems, such as email, should be investigated as the medium for this type of communication. I require that this be reported on</i></p>	Section 5.5.7

Reference	Requirement	Report Reference
	<i>in the 2002/03 Operational Audit.</i>	
	2) <i>In order to address varied microbiological results in the Southern Region for total coliforms over the past seven years, ongoing monitoring is necessary to ensure that these good results do not decline, as it may become a compliance issue.</i>	Section 5.5.7
Customer Management	3) <i>Hunter Water should consider establishing a shorter target waiting time and lower abandoned call rate for emergency calls, as opposed to customer service calls, prior to the 2002/2003 Operational Audit. This may be achieved through the dedication of a separate telephone number for emergency calls.</i>	Section 4.5.5

2.2 Audit Methodology

The approach to this audit was based on Australian/New Zealand Standard AS/NZS ISO 14011:1996 *Guidelines for environmental auditing - Audit procedures - Auditing Environmental Management Systems*. ISO 14011 provides a systematic approach to defining the requirements of the audit, planning, collecting and objectively assessing audit evidence, and reporting on the findings.

2.3 Audit Approach

To ensure that the audit requirements outlined in Part 11 of the Operating Licence and the audit brief provided by the Tribunal were addressed, the scope of the audit was confirmed with the Tribunal and a draft audit plan prepared.

Inception meetings were held with the Tribunal and Hunter Water on 13 August 2003 and 18 August 2003 respectively. The purpose of these meetings was to confirm the approach and timetable for the audit, establish working principles and obtain an overview of the performance of Hunter Water during the year in relation to the Operating Licence.

A detailed audit test plan was developed to address all requirements within the scope of the audit. These tests provided a means to review substantive compliance with Operating Licence requirements and identify factors that may impact on compliance performance in the future. The audit tests were performed through a combination of:

- reviewing key documentation provided by Hunter Water;
- conducting a number of detailed discussions with relevant Hunter Water personnel in relation to each area being audited;
- reviewing relevant management procedures, system processes and reporting mechanisms within Hunter Water in relation to the auditable areas;
- observation of a number of wastewater treatment plants, a water treatment plant, and construction upgrade works; and
- substantive sampling to ensure an adequate audit trail of evidence.



To ensure a positive relationship during the audit, protocols were established at the inception meeting to ensure a transparent flow of information and open communication lines between Hunter Water and Parsons Brinckerhoff (PB). The audit team comprised specialist auditors from PB for each of the auditable areas under the Operation Licence.

3. Regulatory Regime

3.1 Introduction

Hunter Water has the primary role of managing the potable water supply and providing sewerage treatment to protect public health and the environment for the benefit of the Hunter region. These roles and responsibilities are derived from the *Hunter Water Act 1991* (the Act) and the Operating Licence issued under Section 12 of that Act.

As specified in the Act, Hunter Water delivers services under an Operating Licence granted by the NSW Government. A new Operating Licence came into effect on 1 July 2002 and will remain current until 30 June 2007. This is the first audit conducted under the new Operating Licence.

A brief description of the statutory and regulatory framework within which Hunter Water operates is provided below.

3.2 Hunter Water Act 1991

Under Section 13 of the Act, Hunter Water is required to provide, construct, operate, manage and maintain efficient, co-ordinated and commercially viable systems and services for supplying water, providing sewerage services and disposing of waste water and drainage services within the capacity of the drainage service transferred to Hunter Water.

Hunter Water is also required to ensure that the systems and services meet the quality and performance standards specified in the Operating Licence in relation to water quality, service interruptions, price levels and other matters determined by the Governor of NSW and set out in the Operating Licence.

The Operating Licence must also include terms or conditions that require Hunter Water to maintain procedures under which Hunter Water is to consult with its customers at regular intervals in relation to the provision of these systems and services.

The Act also establishes provisions for Hunter Water in relation to the following:

- ownership of works and assets;
- entry on to private land;
- compensation;
- power to open roads;
- altering the position of conduits;
- interference with works;
- compensation to Hunter Water for damage;

- interference to works by trees; and
- liability with respect to paying an annual charge on pipes etc.

3.3 Operating Licence

Hunter Water is required to conduct its activities in accordance with the Operating Licence issued under Section 12 of the *Hunter Water Act 1991*. The Operating Licence is valid for five years from 1 July 2002 to 30 June 2007. The objective of the Licence is to enable and require of Hunter Water to lawfully provide the services within its area of operation. This requires Hunter Water to:

- meet the objectives and other requirements imposed on it in the Act;
- comply with the quality and performance standards in the Licence;
- recognise the rights given to customers and consumers by the Act and Licence; and
- be subject to annual audits of compliance against the Licence.

PB has reviewed the requirements of Part 11 of the Operating Licence (summarised in *Section 2* of this report) and conducted this audit against these requirements.

3.4 Customer Contract

The Customer Contract sets out the rights and obligations of each person defined as a Hunter Water customer and the minimum standards of customer service Hunter Water will provide. The key areas of the Customer Contract have been identified and reviewed in *Section 4.5.1* of this report.

A new Customer Contract came into effect on 1 September 2003 replacing the existing contract included within the scope of the audit for this year. It provides greater clarity to the rights and obligations of customers and Hunter Water, and incorporates other instruments relating to customer service including the Customer Charter thereby reducing inconsistencies and duplication.

3.5 Memoranda of Understanding

MoU with NSW Health

Under the Operating Licence, Hunter Water is required to maintain a Memorandum of Understanding (MoU) with NSW Health for the duration of the Licence. This MoU has the primary purpose of recognising the role of NSW Health in providing advice to the NSW Government in relation to drinking water quality standards and the supply of water which is safe to drink.

The MoU between NSW Health and Hunter Water dated April 2002 is designed to outline the roles and responsibilities and to facilitate effective interaction between the two

organisations. A Joint Operational Group regularly discusses the broad principals, directions and policies underlying the roles of Hunter Water and NSW Health. Hunter Water is required to prepare and submit to NSW Health for review and comment a strategy for the comprehensive management of water quality issues outlining its current and long term intentions for water supply, catchment management and public health aspects of wastewater disposal and reuse. Hunter Water is also required to submit to NSW Health an Annual Water Quality Report, monthly monitoring results and event based results, including all water quality testing exceptions found.

As part of the audit process NSW Health were requested to comment on Hunter Water's performance against the Operating Licence. NSW Health indicated that Hunter Water has performed satisfactorily against the Operating Licence.

MoUs with DEC and DIPNR

Although not a requirement of the *Hunter Water Act 1991*, or the provisions of the Operating Licence, MoUs are in place between Hunter Water and the NSW Department of Environment and Conservation (DEC), previously the NSW Environment Protection Authority and the Water Administration Ministerial Corporation (Department of Infrastructure, Planning and Natural Resources, or DIPNR) respectively. The objectives of these MoUs are to assist in the formation and development of cooperative relationships between the agencies with a view to furthering the objectives of the Operating Licence and the Act.

The MoU between Hunter Water and the DEC, agreed in January 2000, extends through to 2005 and sets out the framework and ongoing process for interaction between the two organisations. The MoU contains a framework for regular communication, dispute resolution and data sharing. The MoU notes the process of preparing the five-year Environmental Management Plan by Hunter Water and the Annual Environmental Report.

A MoU is currently not in place with DIPNR, previously DLWC. The previous MoU with DLWC expired June 2002. Both parties have been working on a replacement however this has not been finalised. The replacement MoU with DIPNR is likely to be more detailed and incorporate Water Sharing Plan arrangements. The previous MoU was responsible for allocating and overseeing the management of all freshwater resources, including groundwater within Hunter Water's area of operation.

As part of the audit process DEC and DIPNR were requested to comment on Hunter Water's performance against the Operating Licence. A response was not received from the DEC. DIPNR indicated that Hunter Water have performed adequately against the Operating Licence, however they highlighted a breach against the Water Management Licence. This is discussed further in *Section 9.5.3*.

3.6 Water Management Licence

DLWC issued a Water Management Licence (WML) to Hunter Water for a period of 20 years from 1998 that authorised the use of water for the general purpose of urban water supply. The WML is issued to Hunter Water under the *Water Act 1912* and is administered by DIPNR. The WML authorises Hunter Water to take and use water and places rules on extractions from the Chichester River, the Williams River and the groundwater extractions from the Tomago Sandbeds and Anna Bay Sandbeds. The WML also contains requirements detailing the management of water resources consistent with the principles of ESD and the prevention of contamination or degradation of the resources. Under the WML Hunter Water is required to provide data, reports and information to DIPNR including an Annual Demand Management Strategy that analyses consumption trends and unaccounted for water.

The WML is currently being reviewed and is due for completion in December 2003.

3.7 Other Legislation

Hunter Water must comply with all applicable NSW legislative instruments. Those most relevant include:

- *State Owned Corporations Act 1989;*
- *Hunter Water (Special Areas) Regulation 2003;*
- *Protection of the Environment Operations Act 1997;*
- *Public Health Act 1991;*
- *Water Legislation Amendment (Drinking Water and Corporate Structure) Act 1998;*
- *Water Act 1912;*
- *Water Management Act 2000;*
- *Environmental Planning and Assessment Act 1979;*
- *Independent Pricing and Regulatory Tribunal Act 1992; and*
- *Dam Safety Act 1978.*

4. Customer and Consumer Rights

4.1 Summary of Findings

Hunter Water has achieved compliance with the requirements of the Operating Licence in relation to customer and consumer rights for 2002/03 and has adequately addressed the Ministerial Directives provided in 2001/02. In addition, adequate systems, procedures and processes are in place to effectively manage customers and obtain feedback on performance. Hunter Water's proactive strategy of continuous improvement in relation to customer service continued throughout the year with further streamlining of processes, improvements in data collection, having better information available for trend analysis, ongoing staff training and continued upgrading of systems. Hunter Water has continued to receive positive feedback from customers relating to overall performance, customer service, customer service operators and customer satisfaction.

The total number of rebates paid to customers during the year was less than previous years as a result of generally good system performance.

4.2 Recommendations

While achieving compliance with the Operating Licence, a number of recommendations are made in relation to Customer and Consumer Rights to provide further opportunities for Hunter Water to continue to improve in these areas. These are described in *Table 4.1*.

Table 4.1: Customer and consumer rights recommendations

Area	Finding	Recommendation	Priority
Contact Centre operational efficiency	Considerable effort is given by Contact Centre management to resource planning on both a day-to-day and longer term basis. However, the random nature of unplanned operational events often causes problems relating to adequate resourcing. Given the relatively small size of the Contact Centre, a number of core staff are available each day with contingency arrangements in place if required to increase capacity such as using a casual panel, bringing other staff from outside the Call Centre online etc.	Hunter Water should review its Contact Centre planning initiatives. Effort should be directed at improving communication and coordination between departments in relation to customer service actions that impact on calls received by the Contact Centre, particularly during peak times. A review of staffing levels against call centres operated by like sized water companies within Australia should be undertaken to determine any shortfalls. Appropriate strategies should be developed to address these shortfalls.	2

Area	Finding	Recommendation	Priority
	<p>In some instances results achieved by Hunter Water in relation to call waiting times indicate poor communication between other departments and the Contact Centre, relating to factors such as large mailouts or billing issues that are likely to trigger a large number of customer calls into the Contact Centre.</p>		
<p>After hours emergency calls</p>	<p>The abandonment rate target of 4% for emergency calls was set by Hunter Water with actual call rates averaging 5.2% for 2002/03. This result is comparable with other water authorities. This result was impacted by a higher abandonment rate after business hours when only one staff member is available to answer calls. Hunter Water has identified that the higher after hours abandonment rate was the result of high call traffic during unplanned peak times or customers hanging up after hearing a recorded message. It is not possible within the current constraints of the Meridian telephone system to take these factors into account when determining indicator results. Effort was taken during the year to address these issues within the Contact Centre by changing operating processes and staffing levels with slight improvements being seen towards the end of the year.</p>	<p>To further assist Hunter Water in achieving its abandoned call rate target of 4%, a review of options available to address after hours emergency calls should be undertaken to determine whether, based on a cost benefit analysis, staffing levels should be increased or shifts staggered to provide greater coverage through, for example, extended business hours. A trend analysis of calls received on weekends should occur to determine if increasing staff levels on weekends is justified.</p>	<p>2</p>

Area	Finding	Recommendation	Priority
Payment Assistance Scheme	In July 2003, Hunter Water extended the Payment Assistance Scheme (PAS) to customers who have difficulty in paying bills. The PAS operates under a similar framework to other established schemes within NSW for gas/electricity companies and Sydney Water. The scheme is designed to assist Hunter Water customers experiencing financial hardship and is facilitated by local welfare agencies. If eligible, customers may receive \$25 vouchers to assist in paying their Hunter Water account.	The Code of Practice and Procedure on Debt and Disconnection should contain more practical information regarding the PAS and the ways in which customers can access PAS vouchers. Sydney Water's code, for example, provides customers with information regarding the nature of the scheme. Given the newness of the PAS, Hunter Water should provide information on this scheme in the Code of Practice and Procedure on Debt and Disconnection.	2
Code of Practice and Procedure on Debt and Disconnection	The information provided within the Code of Practice and Procedure on Debt and Disconnection does not provide as much detail on Hunter Water's debt collection procedure as the new Customer Contract effective from 1 September 2003. For example, the Contract states that customers will be sent particular notices before disconnection occurs, while the Code states that "Hunter Water will endeavour to notify you".	Information in the Code of Practice and Procedures on Debt and Disconnection should be consistent with the information in the Customer Contract, and the Code should more fully inform customers of their rights in regard to debt collection.	2

4.3 Summary of Requirements

Hunter Water

Hunter Water must comply with the requirements set out in Part 5 of the Operating Licence relating to:

- the Customer Contract (Clause 5.1);
- customer complaints handling and resolution (Clause 5.2);
- the Code of Practice and Procedure on Debt and Disconnection (Clause 5.3); and
- a Consultative Forum to enable community involvement in issues relevant to the performance of Hunter Water against its obligations under the Operating Licence (Clause 5.4).

Auditor

Clause 11.2 requires that the audit investigate and prepare a report on:

- compliance by Hunter Water under Part 5 of the Licence;
- ongoing compliance by Hunter Water with its Customer Contract and specific areas of non-compliance; and
- Hunter Water’s compliance with its Code of Practice and Procedure on Debt and Disconnection under Clause 5.3.

4.4 Compliance

A detailed description of Hunter Water’s performance against the relevant clauses of the Operating Licence relating to customer and consumer rights is provided in *Appendix A*. A summary of compliance is provided in *Table 4.2*.

Table 4.2: Summary of customer and consumer rights compliance

Clause	Area of Operating Licence	Compliance
5.1	Customer contract	
5.2	Complaint handling, complaint resolution and debt and disconnection procedures relating to consumers	
5.3	Code of practice on debt and disconnection	
5.4	Consultative forum	

4.5 Findings

4.5.1 Customer Contract

The Customer Contract as outlined in Schedule 2 of the previous Operating Licence (since replaced from 1 July 2002), applied for the current audit year as a transitional measure until a new contract was developed. The new Customer Contract took effect on 1 September 2003 and Hunter Water’s performance against the new Contract will be assessed as part of the 2003/04 audit. The Contract applicable for the current year sets out the rights and obligations of customers and Hunter Water in relation to the water, sewerage and other services provided. The key areas addressed within the Contract are:

- the obligations of Hunter Water in relation to the provision of water, sewer and other services in accordance with the Operating Licence;
- the setting and varying of fees, charges, rates and other amounts payable to the customer in accordance with the Act, Tribunal and Operating Licence;

- the delivery and binding nature of notices to customers in relation to the services provided and the charges incurred;
- the obligations of customers to pay for services received and Hunter Water's rights in relation to the collection of overdue amounts;
- the rights of the customer to the use of services provided by Hunter Water and any limitations imposed;
- restrictions on prohibited substances such as trade waste and stormwater being discharged into Hunter Water's systems without prior written permission;
- the measurement of services supplied through a meter approved by Hunter Water, and the installation, maintenance, reading or removal of meters;
- the ownership of Hunter Water assets installed in or on customer property and the obligations of the customer in relation to those assets;
- access to private land by Hunter Water to rectify problems; and
- the obligations and powers of Hunter Water in relation to varying the terms and conditions of the Customer Contract and the termination of arrangements under the Customer Contract.

From an assessment of the quarterly Customer Satisfaction Surveys and the Biannual Perceptions Survey, and other relevant internal management reports provided, Hunter Water has consistently met its obligations with respect to the Customer Contract throughout the year for each of the above areas. Since the inception of the quarterly Customer Satisfaction Surveys in January 2002, Hunter Water has consistently improved against Key Performance Indicator targets set relating to overall performance, customer service, customer service operators and customer satisfaction.

Customer Charter

Hunter Water introduced the Customer Charter in 1995 to complement the Operating Licence and Customer Contract framework. The Charter is Hunter Water Management's voluntary commitment to individual customers whose properties are effected by service interruptions, as distinct from the global service standards contained in the Operating Licence. The Charter focuses on two key areas:

- Hunter Water's service delivery obligations and objectives for responding to service interruptions, which affect individual properties. This includes assessment of the problem within 30 minutes of notification, reinstatement of water or sewer services within six hours or alternatively the provision of water or toilet facilities where practical until the problem is resolved, and two days notice of planned outages.
- Where service standards are not met over the course of a year, Hunter Water will provide a rebate of charges to the customers impacted. A systematic process is in place to investigate service interruptions or problems, determine the effected area and the customers therefore entitled to a rebate, if required.

The Customer Charter currently sits outside the regulatory framework, however it is an important part of Hunter Water's operating framework. It is not possible, within an acceptable cost to create an infrastructure that is fault free or does not result from time to time, in a diminution of services due to peak congestions. Without the Charter, under the previous Operating Licence, there was no provision to compensate for such events. Therefore the Charter provides an adequate means to ensure those customers impacted are compensated accordingly.

There is a range of recording and system investigations and remediation processes that underpin the Charter to minimise the risk of problems occurring that would trigger a "Charter event". This ensures that Hunter Water can attend to a problem in a timely manner and that expenditure is directed towards problems that are causing customers inconvenience.

The Customer Charter has been replaced by the new Customer Contract effective 1 September 2003 however, for the purposes of the current audit year, rebates policies set out within the Charter are applicable.

Rebates to Customers

The processes employed by Hunter Water to respond to "Charter events" and determine rebates payable were found to be adequate.

Rebates are calculated and paid automatically through the Asset Operation Management System (AOMS). Rebates are not necessarily paid in the year in which the event occurred. This is the result of a lag between the determination and processing of the rebate, as often lengthy investigations are required to ensure all customers entitled to a rebate are identified. Rebates are credited to customers' accounts in the next billing cycle, which occurs three times per year. For water, the customer receives an amount equivalent to:

- the standard residential annual water service charge if the property experiences total confirmed water supply interruptions exceeding 24 hours within the year as a result of a Hunter Water systems failure; and
- \$50 if their property experiences confirmed low pressure (defined as less than 12 metres head at the property boundary) on more than five separate occasions within the year as a result of a Hunter Water systems failure.

For sewer, the customer receives an amount equivalent to the standard residential sewerage service charge if the property experiences more than 3 confirmed overflows within the year as a result of a Hunter Water systems failure.

Table 4.3 shows the rebates paid in relation to the Customer Charter for water interruptions, low pressure and sewer surcharges against total expenditure for rectification works over and above normal maintenance activities for 2002/03. Where a break or surcharge or similar breakdown event occurs in the network, the immediate repair costs are flagged as "maintenance". If a subsequent decision is taken to undertake further work to replace parts of the network or in some other way reduce the risk of future breakdowns, the associated costs are classed as "rectification". System failures account for a substantial number of rebates paid.

Table 4.3: Rebates under the Customer Charter

Incident Type	2002/03¹	Total rectification expenditure (above normal maintenance activities)	2001/02	Total rectification expenditure (above normal maintenance activities)
Interruptions	\$4,586		\$34,816 ²	
Low pressure	\$4,700		\$900	
Sewer overflow	\$937		\$1,290	
Total	\$10,223	\$9,395,839 ⁴	\$37,006 ³	\$1,662,000

Notes

1. For 2002/03 a total of 297 properties received rebates. There were no large incidents occurring during the year. The following events resulted in rebates to more than 50 properties:
 - Water Discontinuity: 159 rebates were processed in early 2002/03 for properties in Mulbring. The event occurred in 2001/02; and
 - Low Pressure: 61 rebates were processed in 2002/03 for properties in Mulbring. Again this related to an event that occurred in 2001/02. While it was in the same suburb as the water discontinuity, the incidents were unrelated.
2. Discontinuity rebates in 2001/02 were due to an event at Gateshead where several breaks to the trunkmain occurred. Approximately 1,000 properties were impacted.
3. A total of 1,417 properties received rebates during 2001/02.
4. Rectification expenditure was significantly larger than previous years as a result of \$5.7 million spent on water amplification projects at Tomago and Nelson Bay. A further \$2.8 million was spent on wastewater rectification.

4.5.2 Consumers

Complaint handling and resolution

There is no differentiation provided by Hunter Water in addressing complaints received relating to Hunter Water’s performance or to report a problem regardless of whether the complaint is received from a property owner or other consumers. All complaints are recorded within the Complaints Management System and actioned accordingly based on the priority assigned. As detailed in *Section 10* of this report, Hunter Water has fulfilled its obligations under the Customer Contract relating to complaint handling and complaint resolution procedures where those obligations extended to consumers.

Debt and disconnection

Only property owners are charged for water usage. However these charges may then be separately passed onto tenants by the property owner. The responsibility for the charges still rests with the property owner, not the tenant. Where other customers such as tenants become involved in disputes, Hunter Water extends its debt and disconnection policy to these consumers as discussed in *Section 4.5.3* of this report. Hunter Water has fulfilled its obligations under the Customer Contract relating to debt and disconnection procedures for consumers.

4.5.3 Code of Practice and Procedure on Debt and Disconnection

In accordance with Clause 5.3 of the Operating Licence, Hunter Water has developed a Code of Practice and Procedure on Debt and Disconnection (the Code). The Code is sent to customers at least once a year and is also available on the website. It

complements and summarises the key provisions of the new Customer Contract effective 1 September 2003.

The Code sets out:

- The options available to customers if they are having difficulty paying their bills, and the approach to debt recovery. The actions that may be undertaken by Hunter Water regarding restriction of disconnection of supply and provides contact information for complaints handling and customers who believe their bill is incorrect; and
- The option for customers to refer complaints to the Energy and Water Ombudsman of NSW (EWON).

The information provided within the Code does not provide as much detail on Hunter Water's debt collection procedure as the new Customer Contract effective from 1 September 2003. For example, the Contract states that customers will be sent particular notices before disconnection occurs, while the Code states "Hunter Water will endeavour to notify you".

Recommendation: *Information in the Code of Practice and Procedure on Debt and Disconnection should be consistent with the information in the Customer Contract, and customers should be more fully informed in the Code of their rights in regard to debt collection.*

Hunter Water as policy actively encourages customers who are having difficulty in payment to make early contact with Hunter Water to arrange appropriate assistance. Sometimes however tenants can become embroiled in landlord disputes regarding billing or landlords can use restrictions or disconnection as a means of effectively evicting a tenant over non-water related charges.

In July 2003 Hunter Water extended the Payment Assistance Scheme (PAS) to customers who have difficulty in paying bills. The PAS operates under a similar framework to other established schemes within NSW for gas/electricity companies and Sydney Water. The scheme is designed to assist Hunter Water customers experiencing financial hardship and is facilitated by local welfare agencies. If eligible customers may receive \$25 vouchers to assist in paying their Hunter Water account.

Recommendation: *The Code of Practice and Procedure on Debt and Disconnection should contain more practical information regarding the PAS and ways in which customers can access PAS vouchers. Sydney Water's Code, for example, provides customers with information regarding the nature of the scheme. Given the newness of the PAS, Hunter Water should provide information on this scheme in the Code of Practice and Procedure on Debt and Disconnection.*

4.5.4 Consultative Forum

Hunter Water has chaired a Consultative Forum for a number of years. During the year the Consultative Forum met on a quarterly basis with the primary objective of enabling community involvement in issues relevant to the performance of Hunter Water's

obligations under the Operating Licence. Formal agendas and report papers were provided for all meetings on key operating, environmental and community matters.

The Consultative Forum operates under a Charter, that establishes the role of the Forum, membership, protocols by which Hunter Water and external members must adhere to, the nature of matters to be considered by the Forum, confidentiality, communication of outcomes from Forum meetings and administrative matters. The Forum's role in addressing matters discussed is advisory. It does not have a formal decision making role or management responsibility.

Membership to the Forum is at an organisation level rather than as an individual. In accordance with the Operating Licence, the following members participated in the Forum during the year:

- Cessnock City Council;
- Ecoedge Network Inc - Environmental Education;
- Employers First (formerly Employers' Association);
- Hunter Business Chamber;
- Hunter Catchment Management Trust;
- Lake Macquarie City Council;
- Maitland City Council;
- Migrant Resource Centre;
- Newcastle City Council;
- Newcastle Combined Pensioners Area Council;
- Port Stephens Council;
- Small Business and Consumer Affairs;
- Throsby Landcare;
- Waterwatch;
- Wetlands Environmental Education Centre – Schools; and
- Williams River Total Catchment Management Committee.

Throughout the year key matters for discussion included the Integrated Water Resource Plan developed by Hunter Water, water and wastewater performance, regional development proposals and issues, environmental management, water conservation campaigns and key infrastructure projects, such as the Lake Macquarie and Newcastle sewer system upgrades. In addition, the external members raised a number of concerns that were investigated by Hunter Water and reported on in subsequent meetings such as the use of rainwater tanks, complaints and sewerage projects.

Hunter Water reported to the Tribunal on the establishment and operations of the Consultative Forum and the Charter.

Hunter Water has met all conditions of the Operating Licence relating to the Consultative Forum.

4.5.5 Ministerial Compliance

Hunter Water has adequately addressed the Ministerial requirements related to customer service however, a number of recommendations for further improvements have been identified as discussed below.

1) Customer service indicators

"I expect the Corporation to implement the indicators detailed ...from 1 July 2002"

This Ministerial Directive was in addition to, and raised separately with Hunter Water from Ministerial Directives arising from the 2001/02 Operational Audit.

At the direction of the Minister of Energy in April 2002, Hunter Water implemented a number of customer service indicators in relation to:

- Affordability - specifically the number of disconnections, flow restrictions, debt recovery actions, customers assisted through payment support options;
- Complaints and account contacts – specifically the time to provide substantive responses to complaints by time band;
- Telephone calls – specifically the percentage of telephone calls received by a permanent primary advertised number; and
- Metered accounts where meters were not read.

These indicators were measured from July 2002 by Hunter Water. *Table 4.4* lists the results achieved against the customer service indicators as at year end.

Table 4.4: Year end performance against customer service indicators

Service	Indicator	Performance^a
Affordability	No of disconnections for non-payment.	Residential 5 ^b Non-residential 0
	Number of flow restrictions for non-payment.	Total 703
	Number of debt recovery actions.	Total 22
	Number of customers assisted through payment support and / or installment options.	Total 10,331
	<i>(Note: Hunter Water did not provide payment assistance vouchers until 1 July 2003).</i>	
Complaints and Account Contacts		
a) Complaints	Time to provide a substantive response to complaints by time band:	
	▪ Percentage less than two days	43%
	▪ Percentage less than five days, and	55%
	▪ Percentage less than ten days	68%
b) Account Contact	Time to provide a substantive response to account contacts by time band:	
	▪ Percentage less than two days	99.1%
	▪ Percentage less than five days, and	99.4%
	▪ Percentage less than ten days	99.6%
Telephone Calls	Percentage of telephone calls received by a permanent primary advertised number that are answered:	
	▪ within 15 seconds	45.6%
	▪ within 30 seconds	59.3%
	▪ Total time when all incoming lines are busy and callers receive the busy tone.	0
	▪ Total number of calls abandoned	8,138 or 5.1%
Metered Accounts Where Meters Not Read	Percentage of metered accounts receiving a bill not based on an actual meter read during the report year.	0.5%

a. Performance reporting commenced January 2003.

b. The properties were disconnected in accordance with Hunter Water's Code of Practice for Debt and Disconnection.

As these indicators were only implemented in July 2002, comparison data from 2001/02 is not available. Data captured in the indicators is extracted manually from daily field reports, or via the Complaints Management System, the Customer Service System and the Meridian telephone system. Hunter Water only commenced the collection of account contact data from April 2003 therefore the results provided are an extrapolation of yearly figures from that time.

Complaint and account contacts are discussed in *Section 10* of this report.

2) Customer service and emergency calls

“Hunter Water should consider establishing a shorter target waiting time and lower abandoned call rate for emergency calls, as opposed to customer service calls, prior to the 2002/2003 Operational Audit. This may be achieved through the dedication of a separate telephone number for emergency calls.”

Hunter Water has had a separate Emergency Call number available 24 hours, seven days a week for a number of years. A 2002 Call Centre Industry Benchmarking Study within Australia¹ identified that nationally, the average speed of answer for calls was within 27 seconds and the abandoned call rate was 5%. The Water Services Association of Australia (WSAA) industry average placed call response times at 31 seconds in 2002. Hunter Water reported that only 59.3% of calls received were answered within 30 seconds throughout the year. The average response time for Hunter Water was 35 seconds during June 2003, slightly over the WSAA average. For the majority of the year however, Hunter Water was far from achieving the WSAA industry average due to Contact Centre staffing issues, greater than expected disconnection notices being sent to customers that triggered high volumes of calls, billing system errors, unplanned events and a number of other factors.

Considerable effort is given by Contact Centre management to resource planning on both a day-to-day and longer term basis. However, the random nature of unplanned operational events often causes problems relating to adequate resourcing. Given the relatively small size of the Contact Centre, a number of core staff are available each day with contingency arrangements in place if required to increase capacity such as using a casual panel, or bringing other staff from outside the Call Centre online etc.

In some instances the results achieved by Hunter Water in relation to call waiting times indicate poor communication between other departments and the Contact Centre, relating to factors such as large mailouts or billing issues that are likely to trigger a large number of customer calls into the Contact Centre.

Recommendation: *Hunter Water should review its Contact Centre planning initiatives. Effort should be directed at improving communication and coordination between departments in relation to customer service actions that impact on calls received by the Contact Centre, particularly during peak times. A review of staffing levels against other calls centres operated by like sized water companies within Australia should be undertaken to determine any shortfalls. Appropriate strategies should be developed to address these shortfalls.*

Hunter Water set an aggressive internal target abandoned call rate of 4% for customer service calls with actual rates averaging at 5.1% during the year, which was in line with industry averages. The internal target for abandonment of emergency calls was also set at 4% with actual rates averaging 5.2% again inline with industry averages. This result was impacted by a higher abandonment rate for after business hours when only one staff member is available to answer calls. Hunter Water has identified that the higher after hours abandonment rate was the result of high call traffic during unplanned peak times, or customers hanging up following listening to a recorded message. It is not

¹ ACA Research 2002 Australian Call Centre Industry Benchmarking Study

possible within the current constraints of the Meridian telephone system to take these factors into account when determining indicator results.

Hunter Water has undertaken a range of initiatives in the Contact Centre aimed at achieving shorter waiting time and lower abandoned call rates on the Emergency Services line during business hours. These have included:

- changes to staffing rosters and queuing so that more operators have the emergency services line as their first priority in the call queue (that is, an emergency call will go to the front of the call queue ahead of a customer service call);
- adjustments to information presented on customers' bills to minimise customers using the emergency services line for customer service enquiries;
- appointment of an additional resource to assist with calls during busy periods; and
- the trialing of call overflow to an external company during high call periods.

While these initiatives are recent, call management data for wait times and abandonment rates on the emergency service line during business hours towards the last few months of the year showed an improved trend.

In regard to outside normal business hours, sharp peaks in emergency call numbers (for example, due to water supply interruptions that may affect a large number of properties) can have short-duration impacts on wait times and abandonment rates because there is only one operator on duty. To assist in managing call peaks out of normal business hours, an emergency call-in roster has been established. In addition, the transfer of the out-of-hours Control Centre to the Head Office Contact Centre in January 2003 has enhanced the monitoring and reporting information available on this service. The Contact Centre call management system provides the on-duty operator with real time information on call traffic and wait times, which assists in making decisions on whether extra resources may be required.

Recommendation *To further assist Hunter Water in achieving its abandoned call rate of 4%, a review of options available to address after hours emergency calls should be undertaken by Hunter Water to determine whether, based on a cost benefit analysis, staffing levels should be increased or Contact Centre shifts staggered to provide greater coverage through for example, extended business hours. A trend analysis of calls received on weekends should occur to determine if increasing staff levels on weekends is justified.*

4.5.6 Prior Year Audit Recommendations

Hunter Water adequately addressed the recommendations made in the 2001/02 Operational Audit in relation to customer and consumer rights. Details of action taken have been outlined in *Table 4.5*.

Table 4.5: Actions arising from 2001/02 customer and consumer rights recommendations

Area	Prior year recommendation	Priority assigned	Action taken	Adequately addressed
Contact Centre targets for call waiting and abandonment	Hunter Water should consider establishing a shorter target wait time and lower abandonment rate for emergency calls (compared to customer service calls) given that the majority of these relate to emergency situations such as pipe breaks and overflows and may require a faster response.	1	Targets for wait times and abandonment calls set during the year were consistent with those targets set for normal customer service calls. Effort has been taken, as discussed in <i>Section 4.5.1</i> of this report to respond to emergency calls in a more timely manner.	Partially
Customer Contract	In light of the efforts being taken by Hunter Water to reduce water usage and introduce tighter demand management strategies through climatic modelling etc, clause 6.2 should be reworded to incorporate other conditions related to these initiatives.	2	Recommendations made during the previous audit year relating to the Customer Contract have now been incorporated into the new Customer Contract.	Yes
Consistency between the Customer Charter, Customer Contract and Operating Licence.	We concur with the approach suggested by Hunter Water to the Tribunal in August 2001 for the Customer Charter to be merged with the Customer Contract. The Tribunal is scheduled to undertake a review of the Customer Contract in 2002/03. As part of this review, steps should be taken to eliminate duplications and inconsistencies in the measures used. Discussions with Hunter Water management indicate that this will occur within the next 12 months.	2	Recommendations made during the previous audit year relating to the Customer Charter have now been incorporated into the new Customer Contract.	Yes

4.6 Factors Affecting Future Performance

A new Customer Contract, brought into effect on 1 September 2003, applicable for the 2003/04 audit year, will replace the Customer Contract applicable for the current audit year. It is a comprehensive document, incorporating elements from the Customer Charter (for example, rebates) and the Code of Practice on Debt and Disconnection (discussed in *Section 4.5.2*) and provides a means by which issues relating to customer management will now be assessable under the Operating Licence. The new Customer Contract has replaced the Customer Charter. The new Customer Contract is very similar in content to the Contract adopted by Sydney Water.

A copy of the Customer Contract is available on the Hunter Water website and throughout Hunter Water premises. Pamphlets summarising the Contract will be posted on the website by the end of October and will be included in customer bills in the November 2003 - February 2004 billing cycle.

The new Customer Contract effective from 1 September 2003 incorporates rebates to customers. Under the new Customer Contract the triggers for providing a rebate to customers have been expanded and the amount of rebate payable increased (refer *Table 4.6*). In addition to rebates provided for service interruptions, low water pressure and sewage overflows, refunds may also be provided to customers for damage caused by dirty water for the cost of water used to flush the system and for a NSW Health 'boil water alert' where there is contamination of drinking water. It is expected, as a result of these changes and with continued dry weather that rebates may increase next year.

Hunter Water has investigated the use of Integrated Voice Activation (IVA), which could increase operational efficiency. The current phone system does not support this functionality. The IVA system will be implemented when Hunter Water relocates to the new head office building and is likely to further reduce call waiting times and improve customer service.

Table 4.6: Comparison of rebateable occurrences between Customer Charter and Customer Contract.

Type	Customer Contract		Customer Charter	
	Rebate	Trigger	Rebate	Trigger
Service Interruptions	Automatic rebate of 10% of annual water service charge subject to minimum of \$50.	Confirmed water and/or sewerage interruptions exceeding 24 hours within a 12 month period; or five unplanned water interruptions each in excess of 30 minutes.	Standard annual water service for a residential property that has a 20 millimetre water service.	Confirmed water service interruptions exceeding 24 hours within a full financial year.
Low Water Pressure	Rebate of 10% of annual water service charge subject to minimum of \$50.	Water pressure is below 15 metres head on more than five occasions within a 12 month period.	\$50	Water pressure is below 12 metres head on more than five occasions over the course of a full financial year.
Sewage overflows	Automatic rebate of 10% of annual sewerage service charge subject to minimum of \$150.	Two or more sewage overflows on the customer's property within a 12month period.	Standard annual sewerage service charge for a residential property that has a 20mm water service.	More than three sewage overflows over the course of a full financial year.
Dirty Water	At the discretion of Hunter Water, a refund of the cost of water used to flush the customer's water system.	Damage caused by dirty water as a result of Hunter Water activities or failure to comply with the Contract.	N/A	N/A
Boil Water Alert	Rebate of \$15 where the customer property is within the alert area.	If NSW Health issues a "boil water alert" due to contamination of drinking water caused by Hunter Water.	N/A	N/A

The continued implementation of programs to improve customer management are likely to result in further long term positive impacts on customer service. A project is underway to replace the current Customer Service System with a new Customer Information System (CIS) and to proceed to a selected tender process during the second half of 2003. The project timeframe provides for a new CIS to be fully implemented by July 2005.

The scope of this project appears to be clearly defined and extensive work is being taken upfront by Hunter Water to determine business requirements. Major objectives of the CIS project include:

- improving customer service, including provisions for customer self service;
- providing a solid foundation for customer service and billing operations that will efficiently and effectively support future regulatory and operational initiatives;
- accessing modern technological capabilities including e-commerce; and
- mitigating the risks inherent in operating a two-decade-old financial and operational asset that is based on obsolete operational and development platforms.

Significant efficiencies in customer service and complaints handling in the future will be driven by:

- e-commerce capabilities, such as direct interaction by customers with Hunter Water over the internet for receipt and payment of bills, registration of complaints, personalised information on accounts;
- the flexibility of the CIS to cope with new regulatory and operational requirements, such as complex pricing arrangements, multi-utility operation, capability to value-add through targeted marketing of products and services to customers; and
- the ability to integrate seamlessly and on-line with existing systems, such as AOMs and SWIMs.

This project is being tightly managed internally by Hunter Water with a detailed project management methodology being adopted. Regular monitoring and progress reporting to the Hunter Water Board is occurring.

5. Water Quality

5.1 Summary of Findings

Hunter Water has complied with all requirements of the Operating Licence in relation to water quality for 2002/03 in and has adequately addressed Ministerial Directives raised in 2001/02. During the year Hunter Water achieved the best water quality results since Corporatisation in 1991. A number of water quality improvement programs and asset management projects initiated during the year have continued to protect and improve the quality of water provided by Hunter Water to its customers.

During the year a number of incidents occurred where aesthetic quality was reduced relating to taste and odour problems in Grahamstown and Chichester Dams. The problems were well managed, close monitoring of the situation is continuing and steps are being taken through the implementation of automated mechanisms to treat further outbreaks. The water industry generally are not clear as to the trigger for algal blooms. As a result further research is required. Hunter Water are monitoring this risk closely as it could potentially cause problems in the future if the rate of algal bloom outbreaks increase.

5.2 Recommendations

While achieving compliance with the Operating Licence, a number of recommendations are made in relation to water quality to provide further opportunities for Hunter Water to continue to improve in these areas. These are outlined in *Table 5.1*.

Table 5.1: Water quality recommendations

Area	Finding	Recommendation	Priority
Water quality reporting	During the audit a small number of minor accuracy errors (transposition errors from source systems to reporting systems and graphical representations of results) were detected associated with reporting of water quality results. Although these results did not result in a materially incorrect portrayal of Hunter Water's performance against its Operating Licence, they do reflect possible underlying problematic trends in the reporting processes, procedures and systems used for reporting, particularly in relation to quality assurance of information provided with respect to accuracy and completeness. It is understood that a project is underway to automate interfaces between LIMS (used for	An internal audit should be conducted to access the accuracy and completeness of reporting across Hunter Water in relation to water quality. As an interim measure until automated report generation is available, additional management controls should be implemented to ensure the accuracy of numbers being reported. When automated reporting is available, the existing system and new system should be run in parallel for a suitable period of time to ensure reporting accuracy and completeness.	1

Area	Finding	Recommendation	Priority
	<p>water quality testing at the laboratory), AOMS and SCADA source systems to provide automatic generation of excel spreadsheets for reporting. This process is currently undertaken manually.</p>		
<p>Taste and odour</p>	<p>To date, research undertaken in Australia by water authorities and other organisations has failed to identify the triggers for algal blooms that produce taste and odour compounds. Trends indicate that the frequency of problems may be increasing in the Hunter region. Investigations and close monitoring of the situation is being undertaken by Hunter Water. Problems experienced over 2002/03 with taste and odour compounds appear to be parochial, with surrounding water authorities including Sydney Water not experiencing these problems.</p>	<p>Laboratory testing for Geosmin and MIB occurs on a weekly basis. As a result there is potential for a delay of several days to occur between the onset of a taste and odour problem, and the receipt of results from laboratory testing. It is recommended that taste testing continually occur at Chichester and Grahamstown on a daily basis so that taste and odour problems can be identified as soon as they occur.</p>	1
	<p>Hunter Water are proactive in preventing taste and odour problems before they occur however are limited by the capability of the system regarding the speed at which the problems can be alleviated and also by impacts on large customers when water sources are substituted.</p>	<p>It is recognised that identifying a trigger for taste and odour problems is the subject of significant research across Australia. Continued investment by Hunter Water in research is recommended with specific emphasis on their water supply system.</p>	2
		<p>While it is recognised that a majority of taste and odour complaints are received in the first few days of the problem occurring, and measures are being undertaken to address the problem, Hunter Water should investigate methods for reducing the time taken to address the problem. Methods investigated could include PAC (powdered activated carbon) dosing when taste and odour problems occur while a substitute source is brought online or investigation of other technologies to remove taste and odour compounds.</p>	2

Area	Finding	Recommendation	Priority
Incident response	NSW Health has recommended that Hunter Water undertakes a number of actions related to incident management.	Hunter Water should undertake security measures as per Department of Health recommendations The incident response plan should be well tested during 2004 using relevant scenarios to ensure that management are well trained.	1
Water quality planning	A qualitative drinking water risk assessment was undertaken by Hunter Water in December 2002 in accordance with <i>AS/NZS 4360:1999 Risk Management</i> . The assessment identified and assessed the risks of failing to comply with the drinking water health guidelines (including <i>Cryptosporidium</i> and <i>Giardia</i>) and the drinking water guidelines values for pH, true colour, turbidity, aluminium, iron and zinc. The method utilised a risk assessment procedure based on identification of potential hazards or causes, events or incidents which could lead to contamination, then determined the level of risk for each by estimation of likelihood and consequence using pre-defined qualitative measures or categories. This process was undertaken via individual discussions with key personnel within Hunter Water rather than through the use of workshops.	As a means of further improving the risk assessment process, Hunter Water should consider adopting a workshop based methodology for the review and updating of its drinking water risk assessment to ensure risk scores allocated and the risk profile adopted for each particular area reviewed are consistent and incorporate all aspects of Hunter Water's business appropriately. Workshops provide a more effective means of cross communication between departments in risk analysis and determination of rankings.	3

5.3 Summary of Requirements

Hunter Water

Water quality performance is the most critical performance standard for any water authority as it can have a direct impact on public health. Most water authorities within Australia, including Hunter Water, measure water quality performance against the Australian Drinking Water Guidelines (the Guidelines) published by the National Health and Medical Research Council (NHMRC) and Agricultural and Resource Management Council of Australia and New Zealand (ARMCANZ).

Hunter Water is required, under Clause 6.2 and Schedule 3 of the Operating Licence, to comply with the NHMRC/ARMCANZ Australian Drinking Water Guidelines updated in September 2001 as specified for health and aesthetic values. Compliance in relation to water quality must be achieved at a "whole of area of operation level."

Drinking water should be safe to use and aesthetically pleasing. Ideally, it should be clear, colourless, and well aerated, with no unpalatable taste or odour, and it should contain no suspended matter, harmful chemical substances or pathogenic micro-organisms. Appearance, taste and odour are generally the characteristics by which the public judges water quality, and are therefore useful indicators of the quality of water. However, water that is turbid or coloured, or has an objectionable taste or odour may still be safe to drink. Conversely, the absence of any unpleasant qualities does not guarantee the water's safety. The safety of water in public health terms is determined by its microbiological, physical, chemical and radiological quality of these. Microbiological quality is usually the most important.

The Guidelines are intended to meet the needs of consumers and apply at the point of use, for example at the customer's property boundary. They provide the Australian community and the water supply industry with guidance on what constitutes good quality drinking water (as distinct from water which is acceptable). They are concerned with the safety of water from a health point of view and with its aesthetic quality. The Guidelines are applicable to any water intended for drinking (except bottled or packaged water) irrespective of its source (municipal supplies, rainwater tanks, bores, point-of-use treatment devices etc.) or where it is used (the home, restaurants, camping areas, shops etc.).

The Guidelines provide:

- an authoritative Australian reference on good quality drinking water and a framework for identifying acceptable quality of water through community consultation;
- information on the significance of a range of water-borne micro-organisms which can cause disease;
- guideline values for a wide range of chemical and radiological substances and physical properties which affect water quality, to ensure that drinking water does not pose any significant health risk to the consumer and is aesthetically of good quality;
- advice to operators of water supply systems on the significance of water quality;
- characteristics for the operation of the system;
- guidance on developing monitoring programs; and
- procedures for assessing performance of a water supply system, and advice on reporting performance to the public and to health authorities.

The Guidelines also provide a reference for use within the Australian administrative and legislative framework to ensure the accountability both of water authorities, as managers, and of State health authorities, as auditors of the safety of water supplies. The Guidelines should not, however, be construed as legally enforceable standards.

Under Clause 6.3 of the Operating Licence, Hunter Water is required, to the satisfaction of NSW Health, to prepare an Annual Comprehensive Water Quality Monitoring Plan for the water supply system by 30 April each year. This Plan must provide for performance monitoring and regular sampling of health and aesthetic parameters for both treated and

bulk water, laboratory testing and processes to ensure quality control. The sampling frequency and locations chosen for monitoring must ensure that the results are representative of the quality of water supplied to consumers. The distribution of sample points throughout the system, including the extremities, must reflect the number of people supplied by the different parts of the system, especially for systems drawing on surface water.

Under Clause 6.4 of the Operating Licence, Hunter Water is required to make available monthly monitoring results on its website or at its offices. On an annual basis a Water Quality Report must also be provided showing Hunter Water's performance against health and aesthetic guideline values for which compliance is required.

Under Clause 6.5 of the Operating Licence and the MoU with NSW Health, Hunter Water is required to develop a strategy for the comprehensive management of water quality issues. To do this Hunter Water must, again to the satisfaction of NSW Health, develop a five year Water Quality Management Plan that includes strategies for the management of all aspects of the water supply cycle necessary to ensure that drinking water supplied to customers complies with the requirements of the Guidelines and the Operating Licence. Hunter Water is also required to develop an Annual Water Quality Improvement Plan that incorporates system and operational changes needed to address problems identified through monitoring data and periodic system inspections and evaluations. The aim is to reduce risks to public health and meet aesthetic guideline values.

Under Clause 6.6 of the Operating Licence other grades of water supplied by Hunter Water must be supplied in accordance to relevant guidelines and requirements prescribed by NSW Health, the NSW DEC, DIPNR, and the NSW Department of Agriculture.

Under Clause 6.7 of the Operating Licence Hunter Water is required to report performance against any environmental water quality requirements for any discharges or water releases required under the Water Management Licence issued by DIPNR or allowed under the NSW DEC Wastewater Licences.

Auditor

Clause 11.2 requires that the audit investigate and prepare a report on compliance by Hunter Water with its obligations under Part 6 of the Licence.

5.4 Compliance

A detailed description of Hunter Water’s performance against the relevant clauses of the Operating Licence relating to water quality is provided in *Appendix A*. A summary of compliance is provided in *Table 5.2*.

Table 5.2: Summary of water quality compliance

Clause	Area of Operating Licence	Compliance
6.2	Drinking Water Quality – Standards	
6.3	Drinking Water Quality – Monitoring	
6.4	Drinking Water Quality – Reporting	
6.5	Drinking Water Quality – Planning	
6.6	Drinking Water Quality – Other grades of water	
6.7	Drinking Water Quality – Environmental water quality	

5.5 Findings

During the year Hunter Water achieved the best water quality results since Corporatisation in 1991. In delivering its water services throughout the year, Hunter Water adopted a risk based approach to catchment and system management of its water supply relating to water quality to minimise the risk of contamination to water supplies, including for *Cryptosporidium* and *Giardia*. This risk based approach was in accordance with *AS/NZS 4360:1999 Risk Management* and as recommended in the current draft revision to the Australian Drinking Water Guidelines (June 2002). It should be noted, however, that no suitable guidelines have been set for *Cryptosporidium* and *Giardia* in drinking water to date.

Monitoring results indicate that the water supplied by Hunter Water to its customers is of a high quality throughout its area of operation and complies with the NHMRC/ARMCANZ Australian Drinking Water Guidelines. The standards imposed by these Guidelines are based on a percentage compliance regime rather than absolute figures. Hunter Water undertakes monitoring for a significantly greater range of parameters than required by these Guidelines.

There are adequate processes, procedures and systems in place within Hunter Water to ensure water quality is maintained at a standard within the requirements of the Operating Licence and the MoU with NSW Health.

5.5.1 Water Quality Standards

In accordance with the requirements of Clause 6.2 of the Operating Licence and Schedule 1 of the MoU with NSW Health, Hunter Water has complied with the health and aesthetic value guidelines specified.

Microbiological indicators - health values

Water is tested for the presence of indicator bacteria, that is bacteria which are not normally harmful in themselves, but may indicate the presence of pathogenic (disease causing) micro-organisms. The presence of indicator bacteria is used as a trigger to take further action to identify and rectify any potential sources of contamination. Total coliform bacteria are used as a scientific indicator of the cleanliness of drinking water and of the possible presence of disease causing micro-organisms. Faecal (or thermotolerant) coliforms are a more specific indicator of faecal contamination than total coliforms.

The Guidelines recommend that more than 98% of samples tested should contain zero thermotolerant (that is faecal) coliforms per 100 millilitres and that 95% of samples tested should contain zero total coliforms per 100 millilitres. Hunter Water tested water in accordance with the Guidelines at the property boundary of customers at 54 sample points distributed throughout its area of operation. Testing was carried out fortnightly, collecting around 1,400 samples to assess water quality over the course of the year.

Full compliance with respect to microbiological water quality indicators was achieved for the whole area of operation. These results are listed in *Table 5.3*.

Table 5.3: Microbiological water quality indicator compliance

Standard	Licence Target	Performance 2002/03
Total Coliform	>95% of samples contain 0 colony forming units(CFU) per 100 ml	99.3% pf samples contained 0 CFU per 100ml
Faecal Coliform	>98% of samples contain 0 CFU per 100 ml	99.9% of samples contained 0 CFU per 100ml

Microbiological results reported for each region are listed in *Table 5.4*.

Table 5.4: Microbiological results for each region

Region	Total coliforms	Faecal coliforms
Central	99.2%	99.7%
Southern	99.2%	100%
Northern	99.4%	100%

Compliance with microbiological indicators was achieved within each region throughout the year. Levels of total coliforms are generally higher than faecal coliforms as total coliforms are often environmentally derived and can be present in a water source without there being an obvious public health issue evident. It is for this reason that the NHMRC is currently considering the recommendation that total coliforms not be used as an indicator of drinking water quality.

Monitoring for *Cryptosporidium* and *Giardia* is undertaken fortnightly for Dungog and Grahamstown raw water and quarterly for Tomago, Lemon Tree Passage, Anna Bay, and Nelson Bay raw water. The corresponding treated water is analysed if *Cryptosporidium* or *Giardia* are detected at any level in the raw water. No detection of *Cryptosporidium* or *Giardia* was found during the year.

Physical and chemical characteristics - Health and aesthetic values

Guideline values for key physical/chemical health parameters identified as having the potential to be present in the Hunter region's drinking water, and against which compliance has been assessed were:

- Chlorine;
- Copper;
- Lead;
- Manganese;
- Trihalomethanes (THM's); and
- Fluoride.

In addition, the following physical/chemical parameters were monitored for aesthetic value:

- Physical – turbidity, pH and colour; and
- Chemical – iron, aluminium, and zinc.

Assessing performance for compliance purposes was carried out by Hunter Water on a whole area of operation and regional basis for all compliance parameters using the assessment methods specified in the Guidelines for physical/chemical parameters respectively. Hunter Water tested water in accordance with the Guidelines at the property boundary of customers at 54 sample points distributed throughout its area of operation. Sampling frequencies for each parameter were at least equal to the frequency recommended in the Guidelines. Sample points were chosen to include representative points from each zone. Testing was carried out fortnightly, collecting around 1,400 samples to assess water quality over the course of the year.

The Operating Licence requires that key physical/chemical health parameters results fall within the Guidelines greater than 95% of the time within a 12 month period while for water quality characteristics that are not health related, the mean (or average) value of results over the preceding 12 month period must be less than the Guideline value.

Full compliance with the Operating Licence requirements was achieved in relation to key physical/chemical health and aesthetic parameters. These results have been listed in *Table 5.5* and *5.6*.

Table 5.5: Physical/chemical health and aesthetic parameter compliance

Standard	Licence Target	Performance 2002/03
Key indicators	Within specified guidelines >95% of the time	Within the specified guidelines 99.9% of the time

Table 5.6: Performance against key physical and chemical parameters July 2002 to June 2003 (Annual Water Quality Report 2002/03)

Category	Parameter	Health/Aesthetic	Units	NHMRC Guideline	Licence Performance ¹	12 Months Mean
Physical	Turbidity	Aesthetic	NTU	< 5	0.3	0.3
	pH	Aesthetic		6.5 to 8.5	7.8	7.8
	Colour	Aesthetic	HU	< 25	5.6	5.4
Chemical	Iron	Aesthetic	mg/L	< 0.3	0.03	0.03
	Manganese	Health	mg/L	< 0.1	0.04	0.01
	Aluminium	Aesthetic	mg/L	< 0.2	0.059	0.056
	Copper	Health	mg/L	< 1	0.08	0.05
	Lead	Health	mg/L	< 0.01	0.0018	0.0011
	Zinc	Aesthetic	mg/L	< 3	0.024	0.023
	Fluoride	Health	mg/L	< 1.5	1.11	0.91
	Chlorine	Health	mg/L	< 5	0.9	0.3
	Trihalomethanes	Health	mg/L	< 0.25	0.131	0.077

Notes:

¹ Licence Requirements for Physical and Chemical Parameters

- For health related characteristics, the objective is to be confident that the 95th percentile of results over the preceding 12 months is less than the Guideline value. This means that the upper bound of the 95% confidence interval for the 95% percentile should be less than the Guideline value.
- For water quality characteristics which are not health related, the objective is to be confident that the mean value (or average) of results over the preceding 12 months is less than the Guideline value. This means that the upper bound of the 95% confidence interval for the mean should be less than the Guideline value.

All chemical parameters, with the exception of chlorine are naturally occurring in the environment. The level of occurrence is driven by environmental factors and varies throughout the year. Treatment methods for their removal are expensive. The current Licence performance is derived from a statistical calculation using actual results to provide confidence that even when allowing for variability in results, the Licence requirement is still being achieved. The Guideline values of chemical parameters are “life time” consumption values being the amount of each parameter that could be consumed every day of a person’s life without adverse affects.

The pH level in cement mortar lined pipes was within the Guideline values for all samples tested during the year. A total of 1,231 samples were tested for (amongst other things) pH levels. No samples were found to have a pH less than 6.5 or greater than 9.2 as required by Clause 6.2.4 of the Operating Licence.

Hunter Water also monitored other parameters at sampling points across the distribution network to examine the performance of the water delivery system and test for possible contaminants. The parameters monitored were dissolved oxygen, ammonia, hydrogen sulphide, nitrates, nitrites, temperature, cadmium, chromium, nickel, antimony, cyanide, xylene, toluene, DEHP and DEHA. For all parameters the maximum values recorded were within water quality health and aesthetic limits except for dissolved oxygen, however as the mean value was greater than the limit, compliance was achieved.

Schedule 3 of the Operating Licence specifies the bulk water quality monitoring parameters. At the request of NSW Health, Hunter Water changed testing laboratories during 2002/03. The laboratory nominated by NSW Health does not test for all the parameters in the Operating Licence, however, those pesticides not covered are not used in the Hunter region. Although Hunter Water advised that NSW Health actioned the change the letter form NSW Health confirming this was not available.

For all sources except Nelson Bay, pesticides were not detected in bulk water supplies. One sample at Nelson Bay recorded a low level of PCP (pentachlorophenol) although this was well within the Guideline limits. PCP is an insecticide/fungicide that is used as a wood preservative. It was suspected following investigations by Hunter Water, to have come from the timber of an old power pole, although subsequent retesting in the following month found no contaminants.

Audit tests performed to assess Hunter Water's performance in meeting water quality standards included a comparison of selected water quality data reported by Hunter Water Australia (the laboratory) against monthly corresponding Water Quality Performance Reports produced by Hunter Water; an analysis of a sample of exceptions to ensure they had been adequately addressed and reported on; and a review of the adequacy of the frequency of monitoring performed by Hunter Water against the Guideline requirements.

Problem Areas

Taste and odour

Although drinking water supplied by Hunter Water achieved full compliance with the Operating Licence, variations in aesthetic qualities occurred on several occasions throughout the year relating to odour and taste that resulted in an increase in related customer complaints. *Figure 5.1* shows the number of taste and odour service calls for the last five years as recorded in AOMS (note that the definition of 'service calls' is different to that for 'complaints' and refers to all queries received by the Contact Centre relating to taste and odour. This is further explained in *Section 10.5.1*). Many natural substances can impart taste and odour to water. Two compounds usually associated with earthy-musty odour in water are the metabolites of certain blue-green algae and acclinomycetes – Geosmin and MIB. Both are non-toxic compounds.

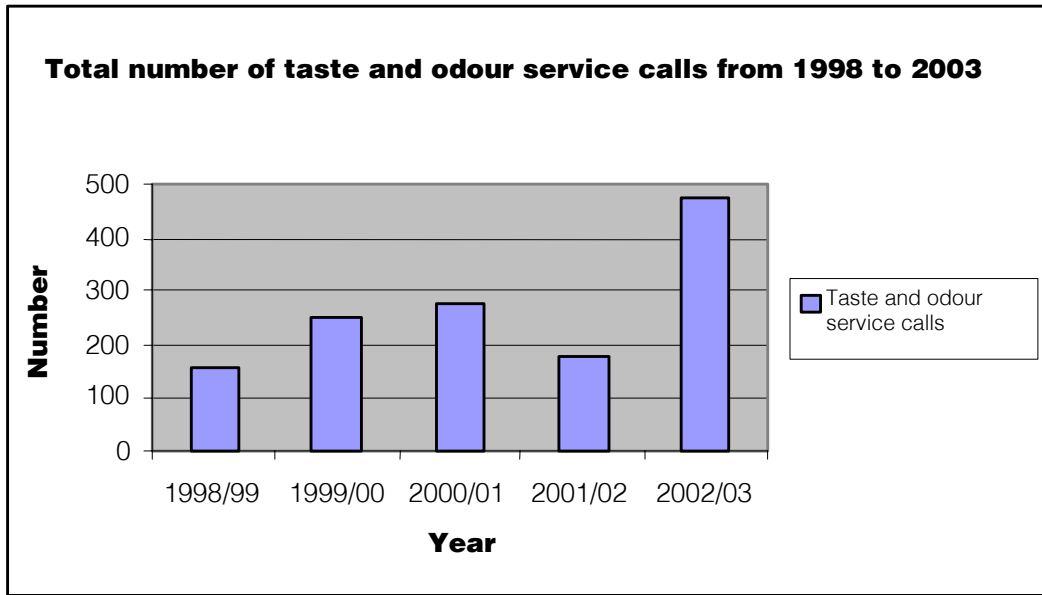


Figure 5.1: Total number of taste and odour service calls per year for the last five years as recorded in AOMS.

The taste and odour compound MIB was detected in Grahamstown Dam in April and May 2003. Hunter Water minimised the extent to which customers were effected by substituting Grahamstown water with Tomago water until the aesthetic quality levels were restored in both cases. The taste and odour compound Geosmin was detected in Chichester Dam during July, August, December and February. During these months the flow of water from Chichester was restricted and substituted with Grahamstown water.

Hunter Water conducts laboratory testing for Geosmin and MIB on a weekly basis (more frequently when levels are elevated) and conducts taste testing from water sources on a regular basis when laboratory results indicate that blue-green algae levels are increasing. When taste and odour compounds are found above threshold levels, Hunter Water either dilutes the water with another source or substitutes with another source completely. Powdered Activated Carbon (PAC) dosing is used to absorb the taste and odour compounds when source substitution is not practical. PAC dosing is a particularly expensive process costing approximately \$10,000 per day. Temporary PAC dosing occurred in Grahamstown treated water during the year for a period of approximately six weeks. Pre-construction work was also undertaken during the year to implement an automated PAC dosing plant at Grahamstown. This project is expected to be completed in early 2004. This facility will have the capacity to remove toxins and/or taste and odour compounds in the event of further blue-green algae blooms on a fully automated basis, rather than the current manual process.

To date, research undertaken in Australia by water authorities and other organisations has failed to identify the triggers for algal blooms that produce taste and odour compounds. Trends indicate that the frequency of problems may be increasing in the Hunter region. Investigations and close monitoring of the situation is being undertaken by Hunter Water. Problems experienced over 2002/03 with taste and odour compounds appear to be parochial, with surrounding water authorities including Sydney Water not experiencing these problems.

Hunter Water are proactive in preventing taste and odour problems before they occur however are limited by the capability of the system regarding the speed at which the problems can be alleviated and also by impacts on large customers when water sources are substituted.

Recommendation: *Laboratory testing for Geosmin and MIB occurs on a weekly basis. As a result there is potential for a delay of several days to occur between the onset of a taste and odour problem, and the receipt of results from laboratory testing. It is recommended that taste testing continually occur at Chichester and Grahamstown on a daily basis so that taste and odour problems can be identified as soon as they occur.*

It is recognised that identifying a trigger for taste and odour problems is the subject of significant research across Australia. Continued investment by Hunter Water in research is recommended with specific emphasis on their water supply system.

While it is recognised that a majority of taste and odour complaints are received in the first few days of the problem occurring, and measures are being undertaken to address the problem, Hunter Water should investigate methods for reducing the time taken to address the problem. Methods investigated could include PAC (powdered activated carbon) dosing when taste and odour problems occur while a substitute source is brought online or investigation of other technologies to remove taste and odour compounds.

5.5.2 Water Quality Monitoring

Hunter Water undertakes all water quality monitoring in accordance with an Annual Water Quality Monitoring Plan for the water supply system. This Plan was submitted to NSW Health on 28 April 2003. The Plan provides an outline of the routine planned monitoring to be undertaken by Hunter Water during 2002/03 to ensure compliance with the requirements of the Guidelines. In addition to planned samples, Hunter Water responds to specific water quality incidents with additional sampling targeted to identify the level and the extent of specific water quality parameters, as well as collecting data to identify trends.

Ongoing monitoring of all water quality results was undertaken on a monthly basis through the Hunter Water Quality Committee. This Committee reviewed any exceedances at any location across Hunter Water's area of operation as a matter of routine. Water quality monitoring undertaken by Hunter Water occurs at two levels in the water supply system:

- **system performance monitoring** in the water distribution system at the customer's property boundary to assess the quality of water received by customers relating to health and aesthetic parameters; and
- **operational monitoring** at the bulk water storages and at water treatment plants for the bulk water parameters specified in Schedule 3 of the Operating Licence.

The Guidelines provide recommended sampling frequencies for microbiological and key chemical and physical parameters. The sampling frequency is determined based on the population served. Hunter Water does not look at the total population served but

breaks the water supply system into zones as recommended in the Guidelines and divides its area of operation into three distinct regions, namely northern, central and southern. This effectively means that more samples are collected and analysed than would be collected if the number of samples was based on the total population.

A total of 54 system performance sampling points were monitored during the year, as identified in the Water Quality Monitoring Plan across these regions. The water sampling points selected were representative of the system with an adequate number of sample points in each region based on population, as recommended in the Guidelines. Sampling points selected adequately reflected the number of people supplied by different parts of the system. No samples were taken from trunkmains as the number of people connected to trunkmains is negligible. The majority of samples were taken from distribution mains, with some samples also taken from dead end mains proportionate to the number of people connected.

Operational water quality monitoring of treated water is undertaken at each drinking water treatment plant for nine parameters, including hardness, total dissolved solids, chlorine, sulphate and arsenic. Water quality monitoring at the six raw water sources also occurs for 10 chemicals, four radiological levels, 60 pesticides and 24 organic contaminants. This is well above the parameters required for monitoring under Schedule 3 of the Operating Licence and that recommended in the Guidelines.

The Guidelines recommend sampling once every five years for organic contaminants, if at all. The Tomago and Grahamstown supplies are more susceptible to organic contamination due to the location of the RAAF Base at Williamstown and weed management strategies around Grahamstown. Hunter Water samples Grahamstown and Tomago water sources on an annual basis for organic contaminants. No organic contaminants were detected at Tomago however DEPA (di(2-ethylhexyl)phthalate) was identified at the lowest possible levels that can be detected at Grahamstown on one occasion. DEPA is a chemical plasticiser used in flexible PVC products and may be present in drinking water that has been in contact with these products for a long time or from industrial spills. Additional testing for DEPA was carried out at nine sample points throughout the distribution system for Grahamstown and the compound was not detected. Hunter Water believes the initial detection may have been an abnormality.

5.5.3 Water Quality Reporting

During the year Hunter Water produced monthly Water Performance Reports summarising water quality results that were presented at monthly Open Board meetings and displayed on the website. These reports provided details of water quality results, any exceptions to performance throughout the month, issues or trends identified and actions taken.

An annual Water Quality Report was also produced and provided to NSW Health that compared drinking water quality against requirements of the Guidelines, summarised monitoring results for drinking and bulk water, and discussed system failures, water quality trends, issues and actions taken. Hunter Water reported correctly that they had complied with the Guidelines throughout the year, however there were several variations to aesthetic quality that resulted in customer complaints in some areas. This report is available on the website.

During the audit a small number of minor accuracy errors were detected associated with reporting of water quality results. These errors included transpositional errors from source data to reporting systems and graphical representations of results. Although these errors did not result in a materially incorrect portrayal of Hunter Water's performance against its Operating Licence, they do reflect possible underlying problematic trends in the processes, procedures and systems used for reporting, particularly in relation to quality assurance of information provided with respect to accuracy and completeness. It is understood that a project is underway to automate interfaces between LIMS (used for water quality testing at the laboratory), AOMS and SCADA source systems to provide automatic generation of excel spreadsheets for reporting. This process is currently undertaken manually.

Recommendation: *An internal audit should be conducted to assess the accuracy and completeness of reporting across Hunter Water in relation to water quality. As an interim measure until automated report generation is available, additional management controls should be implemented to ensure the accuracy of numbers being reported. When automated reporting is available, the existing system and new system should be run in parallel for a suitable period of time to ensure reporting accuracy and completeness.*

5.5.4 Water Quality Planning

While the Guidelines place emphasis on regular testing for a variety of water quality characteristics, these tests should be regarded as only one step in a broader monitoring and surveillance program to ensure that water is safe to drink. Testing does not effectively guarantee the safety of water supplies, as it is quite possible that contamination could occur between the sampling events and may be missed by the testing program. As such, the Guidelines discuss, and Hunter Water's strategy is to implement a multiple barrier approach to safeguarding water supplies. The philosophy of the Guidelines is that if these steps are taken to improve the safety of water supplies, it will be possible to have a high degree of confidence in the safety of the water supply. Testing can then be used as a final check that the steps taken are working and to determine natural variations in water quality.

Water quality management

A five year Water Quality Management Plan was developed by Hunter Water and provided to NSW Health in 2000. This Plan outlines the multi-barrier strategies adopted by Hunter Water in relation to comprehensive management of all aspects of the water supply cycle necessary to maintain quality to the level required by the Operating Licence and NSW Health. Hunter Water's multiple barrier approach to protecting water quality is through:

- protecting water within catchments;
- testing water using coagulation and filtration to remove impurities;
- disinfection to protect against microbiological contaminants;
- transportation and storage within a closed, well maintained distribution system; and
- routine sampling and analysis for compliance.

In addition, three Rangers are employed by Hunter Water to inspect and report on activities within catchment areas that could potentially impact on water quality.

Annual Water Quality Improvement Plan

An Annual Water Quality Improvement Plan developed during the year by Hunter Water, provides details on programs being undertaken by Hunter Water that aim to reduce risks to public health and meet aesthetic guideline values. This Plan, submitted to NSW Health on 28 April 2003, is largely retrospective, providing activities that have been undertaken by Hunter Water as programs are initiated as soon as the need arises. While no specific risks to water quality and public health were identified from drinking water quality monitoring data from 2001/02, actions initiated during 2002/03 to further improve drinking water quality at Hunter Water going forward included:

- upgrading the Powdered Activated Carbon (PAC) dosing plant at Grahamstown to remove toxins and/or taste and odour compounds in the event of an algal bloom occurring;
- investigation into the removal efficiency of currently available PAC;
- investigation into the organic removal options of seasonal algal blooms resulting in deteriorating taste and odour at Dungog Water Treatment Plant;
- the installation of a coated filter media process for the removal of manganese at Dungog and Grahamstown;
- the installation of a new mechanical destratification system at Chichester Dam to maintain chemical water quality and reduce the risk of blue-green algal problems; and
- an upgrade of the Chichester Dam chlorinator.

Drinking water risk management

A qualitative drinking water risk assessment was undertaken by Hunter Water in December 2002 in accordance with *AS/NZS 4360:1999 Risk Management*. The assessment identified and assessed the risks of failing to comply with the Guidelines relating to health values specified by NSW Health (including *Cryptosporidium* and *Giardia*) and the Guideline values for pH, true colour, turbidity, aluminium, iron and zinc. This process was undertaken via individual discussions with personnel within Hunter Water rather than through the use of workshops.

Recommendation: *As a means of further improving the risk assessment process, Hunter Water should consider adopting a workshop based methodology for the review and updating of its drinking water risk assessment to ensure risk scores allocated and the risk profile adopted for each particular area reviewed are consistent and incorporate all aspects of Hunter Water's business appropriately. Workshops provide a more effective means of cross communication between departments in risk analysis and determination of rankings.*

For each of the targeted water quality parameters an analysis of potential sources, 'hazardous incidents' and qualitative measures of likelihood, consequence and risk was undertaken. Based on this process, the vast majority of resultant 'level of risk' ratings (impacting the targeted water quality measures) fell into the low to moderate range. The resulting risk of failing in these indicators was therefore also considered low to moderate. For those ratings falling in the high or very high risk levels, a set of common causes was broadly determined.

Utilising the qualitative risk assessment process advocated in the Guidelines and incorporating Hunter Water's long history of compliance, the risk of failing to comply was assessed by Hunter Water to be low. Consequently, the risk of any significant public health issues was also assessed by Hunter Water as low.

Incident management

Hunter Water maintains an Incident Management Plan that has been in place since 1998. The Plan was last updated on 28 November 2002 following testing. The Plan aims to minimise impacts of any drinking water incident on Hunter Water's customers and consumers. It specifically addresses water quality incidents such as major chemical spills, wastewater treatment plant malfunction and Cryptosporidium and Giardia outbreaks.

Additional steps are being taken by Hunter Water to address security concerns at reservoirs and high-level tanks as per Department of Health requirements. NSW Health has recommended that Hunter Water undertakes a number of actions related to incident management.

Recommendation: *Hunter Water should undertake security measures as per Department of Health recommendations. The incident response plan should be well tested during 2004 using relevant scenarios to ensure that management are well trained.*

5.5.5 Other grades of water

Hunter Water supplies recycled water, referred to in the Operating Licence as "other grades of water" to a number of customers including industries, golf courses and educational institutions. Hunter Water supplies recycled water to customers under a Deed of Supply of Effluent. The Deed and the supply of water comply with the conditions of the Operating Licence. An internal Hunter Water working party is currently developing/resolving policies and procedures for recycled water and a new "Conditions of Use" will be attached to all supply. Customers will be issued with new Contracts in January 2004 in accordance with requirements of the Operating Licence.

5.5.6 Environmental water quality

Hunter Water has two types of environmental releases. The first are releases from waste water treatment works (WWTW) that are assessed under annual load based licences issued by the DEC to control discharges. Hunter Water achieved 97% compliance for discharges from WWTW. The second type of release relates to environmental flows from Chichester Dam. Hunter Water complied with its Water Licence in relation to environmental flows. Water is released from Chichester Dam to maintain environmental

flows in the Williams River. Water released must have a differential of less than four degrees Celsius and have sufficient dissolved oxygen levels to not kill fish in the river.

5.5.7 Ministerial Compliance

Hunter Water adequately addressed Ministerial requirements related to water quality during the year as follows.

1) "Modification of the content and delivery of the form used to notify of water quality problems to NSW Health – the form should require a signature from both parties on action taken and agreed to and employing the use of online systems for delivery."

Hunter Water undertook a review of the notification form used by Sydney Water to notify NSW Health of any water quality problems during the year. Some aspects of this form along with the recommendations made in last year's audit were adopted and the Hunter Water notification modified accordingly. NSW Health has acknowledged that the revised notification form is acceptable to them. Acknowledgement and sign off that NSW Health agree with actions taken by Hunter Water now occurs via email.

2) "Microbiological monitoring in Southern Region - Ongoing monitoring is required to ensure these results do not trend downwards."

Hunter Water undertook a review of secondary chlorination units in the Southern Region in response to this Ministerial requirement to ensure reliable operation. Some modifications and upgrades were undertaken. Ongoing monitoring of all water quality results continued on a monthly basis through the Hunter Water Quality Committee.

Microbial results improved within the Southern Region and across all other regions, to record 99.2% of samples containing no CFU (colony forming units) per 100 millilitres for total coliforms and 100% of samples containing no CFU per 100 millilitres for faecal coliforms.

5.5.8 Prior Year Audit Recommendations

Hunter Water adequately addressed the recommendations made in the 2001/02 Operational Audit in relation to water quality as follows:

Table 5.7: Actions arising from 2001/02 water quality recommendations

Area	Recommendation	Action taken	Adequately addressed
Microbiological monitoring in the Southern Region	Ongoing monitoring is required to ensure these results do not trend downward, as it may then become a compliance issue.	On going monitoring continued and results have improved.	Yes
Notification of problems to NSW Health	Steps should be taken to modify the notification form to follow a similar layout to that used by Sydney Water (whereby signoff is received from both parties on the actions taken and agreed and these are recorded). The use of online systems such as email should be investigated as the medium for this type of communication.	The form is transmitted via email and now requires sign off from both parties.	Yes
Public Reporting	Steps should be taken to include within the monthly reports provided to the Open Board, greater explanation of the causes of problems and trends that are occurring.	Greater explanations of the causes of problems and trends occurring was observed within Open Board Reports during the year	Yes
Reporting on water quality to the community	The provision of summary explanations in relation to water quality performance in newspaper advertisements should be investigated. These explanations should also be provided on the website. This will work towards increasing the understanding of customers in relation to actions taken by Hunter Water to ensure drinking water quality meets the Guidelines.	Results are provided on the website and the format of the advertisement showing Williams River water quality results has been simplified. The results published show the overall health of the river which aims to inform the public about the effectiveness of total catchment management activities.	Yes
Reporting on water quality to the community	Steps should be taken to ensure that marketing material and other information provided on the website is generally kept up to date.	Information on the website appears to be current.	Yes

Area	Recommendation	Action taken	Adequately addressed
Duplication of requirements between the NSW Health MoU and Operating Licence.	Should an opportunity arise to update the MoU, Licence, or EMP, steps should be taken to minimise duplication through cross-referencing.	The new Operating Licence effectively reduces duplication.	Yes

5.6 Factors Affecting Future Performance

Very little is known generally about the causes and triggers for outbreaks of algae that produce taste and odour compounds. While Hunter Water can deal with the problem when it arises through treatment or source substitution (full or partial), there is a lag time of several days as alternative water sources are brought online. With the completion of the automated PAC dosing facility at Grahamstown, a faster response time can be achieved, and a lowering of complaints being received should be experienced.

If taste and odour problems become more prevalent, Hunter Water should give consideration to the installation of biologically activated carbon ozone treatment plants. The approximate cost of this facility at Grahamstown has been estimated by Hunter Water to be \$25 million and would only be justified on a cost benefit analysis against PAC dosing if taste and odour problems occurred for six months of the year.

6. System Performance Standards

6.1 Summary of Findings

Hunter Water has achieved compliance with the Operating Licence for its performance in relation to each of the system performance standards. Performance in relation to water supply pressure and sewer overflow standards were similar to previous years and well within the requirements of the Operating Licence.

The number of water supply interruptions that occurred this year were only marginally below the Operating Licence standard of 14,000 properties being impacted. Hunter Water has recognised this as a potential compliance risk going forward and has implemented a number of initiatives since year end to manage and reduce both planned and unplanned water supply interruptions.

System performance is influenced greatly by climatic or extreme conditions such as extended periods without rainfall or extreme rainfall, growth in demand and the infiltration of tree roots into pipes. Long periods of dry weather can also increase the number of system breaks due to movement occurring in reactive clay soils.

6.2 Recommendations

While achieving compliance with the Operating Licence, a number of recommendations are made in relation to system performance standards to provide further opportunities for Hunter Water to continue to improve in these areas. These are outlined in *Table 6.1*.

Table 6.1: System performance recommendations

Area	Finding	Recommendation	Priority
Water continuity standard	Hunter Water reported that 13,966 properties (approximately 6.7% of properties compared with 6.3% in 2001/02 or 12,347) experienced one or more water supply interruptions which taken together, had a cumulative duration exceeding five hours during the 2002/03 audit year. This result is very close to the standard set in the Licence of 14,000 properties being impacted.	Hunter Water should report to IPART and the Minister for Energy and Utilities on the causes of the near breach of its water continuity standard over 2002/2003. This report should detail actions being taken by Hunter Water to ensure that it can meet the standard over the remainder of the Licence term under normal operating conditions.	1

Area	Finding	Recommendation	Priority
System performance	<p>During the audit a small number of minor accuracy errors (transposition errors from source systems to reporting systems and within calculations) were detected associated with reporting of system performance indicators and rebates. Although these errors did not result in a materially incorrect portrayal of Hunter Water's performance against its Operating Licence, they do reflect possible underlying problematic trends in processes, procedures and systems used for reporting, particularly in relation to the quality assurance of information provided. It is understood that a project is underway to automate interfaces between LIMS (used for water quality testing at the laboratory), AOMS and SCADA source systems to provide automatic generation of excel spreadsheets for reporting. This process is currently undertaken manually.</p>	<p>An internal audit should be conducted to access the accuracy and completeness of reporting across Hunter Water in relation to systems performance. As an interim measure, until automated report generation is available, additional management controls should be implemented to ensure the accuracy of the numbers being reported. When automated reporting is available, the existing system and new system should be run in parallel for a suitable period of time to ensure reporting accuracy and completeness.</p>	1
Asset management watermain replacement model	<p>Reticulation watermains are managed in what Hunter Water call a "controlled reactive manner". This means that Hunter Water operates the mains to failure but routinely records all performance data to allow continual assessment as to whether ongoing repair of these failures is an acceptable approach or whether the point has been reached where replacement is required. Hunter Water uses a watermain replacement model to determine when reticulation watermains should be replaced. The model broadly makes a "whole of community" cost assessment as to whether repair or replacement is the cheapest option. The inputs into the model are:</p> <ul style="list-style-type: none"> ▪ the ongoing cost of a watermain repair based on maintenance contract 	<p>An internal review of the inputs into Hunter Water's asset management watermain replacement model should be conducted in the context of the current drought conditions being experienced and additional demand being placed on the system from population growth, to assess the adequacy of these inputs in addressing Licence requirements. If, for example, inputs relating to social costs or lost water costs are higher than currently assumed, then a greater level of watermain replacement will be required.</p>	2

Area	Finding	Recommendation	Priority
	<p>rates;</p> <ul style="list-style-type: none"> ▪ an estimate of overall replacement cost based on the most recent watermain laying contract rates; ▪ a social cost allowance on a per property basis to value the impact of an interruption; and ▪ a cost allowance for water lost through a break or leaks. 		
<p>Calculation of compliance against water continuity standard</p>	<p>Within Clause 7.3 of the Operating Licence reference is made to establishing the number of 'properties' in a financial year which experience 'water interruptions' with a cumulative interruption exceeding 5 hours. In accordance with the definition of property and logically, this would mean that if a property is not connected to Hunter Water's network, that is, it is a vacant lot without a meter, then it cannot incur a supply interruption. Hunter Water has included however all vacant properties which do not have a connection into the water continuity standard. These properties should not be incorporated into a water continuity count as an interruption to supply cannot occur to properties that do not have a connection.</p> <p>Historically vacant lands were included in the count primarily because it was not possible within Hunter Water's systems at the time to identify them and therefore exclude them. The computer systems now in place have this capability. By including vacant lands in the water continuity standard calculations for 2002/03 the number of properties impacted has been overstated by an additional 459 properties.</p>	<p>Hunter Water should review its method for calculating properties effected by water supply interruptions in accordance with the Licence standard and ensure that vacant lots are excluded from calculations.</p>	<p>2</p>

Area	Finding	Recommendation	Priority
Environmental incident reporting	From a sample of five randomly selected environmental incident reports reviewed as part of the audit, four of these showed transposition errors between laboratory results and the incident report for faecal coliform counts, or had information missing.	Review the management review controls in place for environmental incident reporting to ensure errors are identified and rectified appropriately.	2

6.3 Summary of Requirements

Hunter Water

Hunter Water, under Clause 7.3 of the Operating Licence, must ensure that system performance standards are met during the audit year in relation to:

- water supply continuity;
- water pressure; and
- sewage overflows.

Hunter Water is required under Clause 7.4 of the Operating Licence, to report on the number of properties that experienced a planned or unplanned water supply interruption, one or more pressure loss incidents and on the number of uncontrolled sewage overflows.

In accordance with Clause 7.5 of the Operating Licence, Hunter Water is required to adopt, measure and report on performance against system performance indicators as set out in Schedule 4 of the Operating Licence.

In accordance with Clause 7.6 of the Operating Licence, Hunter Water is required to maintain the necessary records on water supply interruptions, low pressure occurrences and sewage overflows for it to meet its obligations.

Under Clause 7.7 of the Operating Licence, Hunter Water is required to report to the Tribunal on low pressure areas (locations where the customers are supplied water at a pressure less than 20 metre head).

The Customer Charter requires that rebates be paid where standards related to water interruptions, low pressure and sewage overflows as outlined in the Customer Charter have not been met.

Auditor

Clause 11.2 requires that the audit investigate and prepare a report on compliance by Hunter Water with its obligations under Part 7 of the Licence.

6.4 Water Continuity Standard

6.4.1 Compliance

A detailed description of Hunter Water’s performance against the relevant clauses in the Operating Licence relating to water supply continuity is provided in *Appendix A*. Compliance against system performance indicators as set out in Schedule 4 is provided in *Appendix C*. A summary of compliance is provided in *Table 6.2*.

Table 6.2: Summary of system performance standards compliance

Clause	Requirement	Compliance
Operating License Clause 7.3.1	No more than 14,000 properties in a financial year experience one or more water supply interruptions with a cumulative duration of more than five hours.	
Schedule 4	System performance indicators	
Customer Charter	Rebate the water service charge to customers if over the course of a year, as a result of the failure of Hunter Water’s systems, they experience total confirmed interruptions to the water service exceeding 24 hours.	

6.4.2 Findings

Hunter Water reported that 13,966 properties (approximately 6.7% of properties compared with 6.3% in 2001/02 or 12,347) experienced one or more water supply interruptions which taken together, had a cumulative duration exceeding five hours during the 2002/03 audit year. This result is very close to the standard set in the Licence of 14,000 properties being impacted. It should be noted that under the previous operating licence the standard was that 92% of properties (for 2002/03 this is equivalent to 16,600 properties) would not experience interruptions for more than five hours. Hunter Water have previously met this standard, even during years in which major water supply interruptions had occurred. Hunter Water is aware of the potential future risk of breaching the Operating Licence for water supply interruption and has initiated a number of programs to manage planned outages and reduce impacts. These are discussed in *Section 6.4.4*.

Recommendation: *Hunter Water should report to IPART and the Minister for Energy and Utilities on the causes of the near breach of its water continuity standard over 2002/2003. This report should detail actions being taken by Hunter Water to ensure that it can meet the standard over the remainder of the Licence term under normal operating conditions.*

Figure 6.1 shows the number of properties effected during the year by water supply interruptions. Reporting on performance against water continuity standard in accordance with Schedule 4 is available on Hunter Water’s website and found in Appendix C.

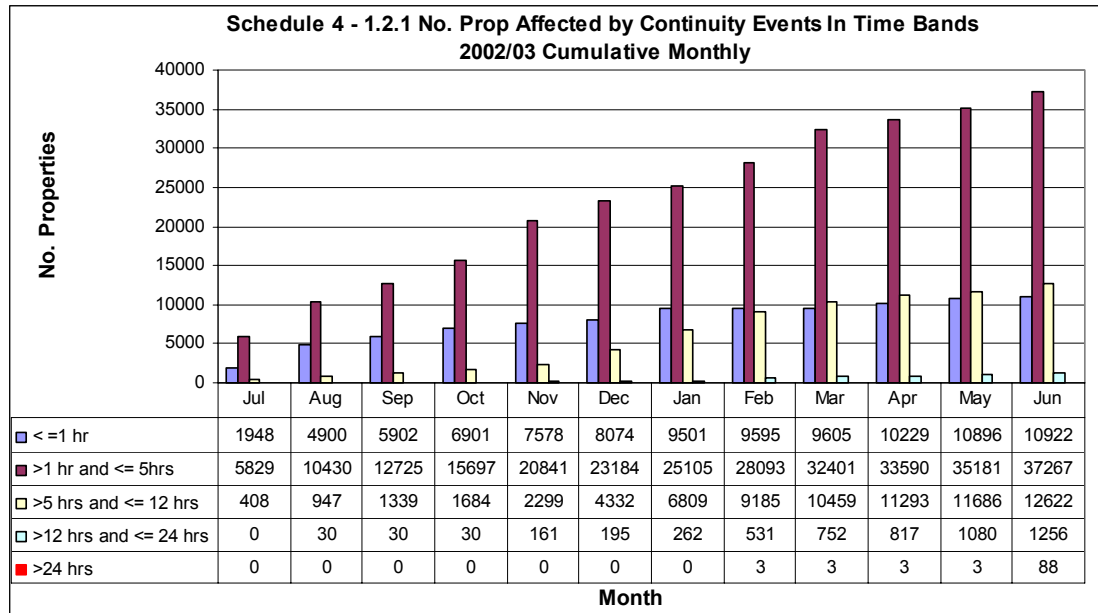


Figure 6.1: Number of properties effected by water supply interruptions (System Performance Indicators Report 2002/03).

The average age of watermains in the Hunter Water water network is approximately 42 years. On average, Hunter Water replaces approximately five kilometres of watermains each year. This represents 0.1% of the water delivery infrastructure. This year 3.5 kilometres of pipes were replaced at a cost of approximately \$1.3 million and approximately \$700,000 was spent replacing or repairing water services between the watermain and the customer’s meter. A comparison of the number of breaks and leaks per 100 kilometres of main for Hunter Water with the Water Association of Australia (WSAA) weighted average shows that Hunter Water has been above the average for the last five years (with similar levels to Sydney Water). In 2001 for example, Hunter Water incurred 43.02 breaks and leaks, while Sydney Water incurred 37.74 breaks and leaks per 100 kilometres of main. The industry average was 31.7 (WSAA facts 2001). It must be noted that there are inherent problems comparing water supply interruptions between water providers because of different age profiles, different soil and climatic conditions and different licence conditions.

Analysis of water supply interruptions

One of the key issues associated with water supply interruptions is the monitoring of the underlying causes to provide a targeted response. Water supply interruptions can be analysed according to:

- unplanned reticulation breaks;
- unplanned major trunkmain breaks; and

- planned shutdowns for maintenance and new connections.

Hunter Water is continuing to monitor and examine the underlying causes of water supply interruptions, conduct condition assessment programs and investigate new technologies to reduce planned shutdowns. *Table 6.3* provides a breakdown of water supply interruptions for 2002/03.

Table 6.3 Breakdown of water supply interruptions having a cumulative effect of more than five hours

Cause	Number of properties impacted
Unplanned Reticulation only >5 hours	5,525
Unplanned Trunk only >5 hours	3,055
Unplanned Trunk <=5 hrs and Reticulation <=5 hours but total >5 hours	839
Interruptions – Planned >5 hours	3,240
Interruptions – Planned <=5 hours & Unplanned <=5 hours but total >5 hours	1,307
Total Properties Effected by Planned and Unplanned Interruptions >5 hours	13,966

It should be noted that each property that is determined to have experienced a water supply interruption that exceeds the five hour Operating Licence threshold for water supply continuity may do so as a result of one major outage or a collection of events. For example, a combination of a reticulation break, a trunkmain break and planned works, may be recorded by Hunter Water as having caused one property to experience a total of six hours of water supply interruptions during the year even though individually each event may not have exceeded the five hour threshold.

The number properties impacted by water supply interruptions caused by trunkmain events is highly variable from year to year and can range from a very small number to several thousand properties. The level of interruptions from trunkmain events, while within the normal range, was at the higher end for 2002/03. The number of properties effected by reticulation breaks was marginally higher than in previous years which was influenced by dry weather conditions and resultant soil movement in reactive clay soils. The number of planned interruptions was high in 2002/03 largely due to elevated levels of construction activity across the region relating to the connecting of new housing estates into Hunter Water’s network. The level of planned works for construction jobs relating to new housing estates was 25-30% higher than in the previous 3 years. Hunter Water also undertook a high level of maintenance work this year, particularly on hydrant repairs in response to water conservation initiatives.

Five large unplanned events during the year accounted for approximately 4,000 properties included in the unplanned reticulation count. At Kurri Kurri, almost 1,900 properties experienced cumulative water supply interruptions of more than five hours from a series of breaks. Other large single event water supply interruptions are shown in *Table 6.4*.

Hunter Water has structured systems, processes and procedures in place to measure water supply interruptions accurately and completely, and accordingly report on this standard. Appendix B provides a summary of the confidence that can be placed in the accuracy and completeness of the numbers reported.

Clause 7.3 of the Operating Licence refers to establishing the number of “properties” in a financial year which experience water supply interruptions with a cumulative interruption exceeding 5 hours. In accordance with the definition of property in the Operating Licence this could be interpreted to mean that if a property is not connected to Hunter Water’s network, that is, it is a vacant lot without a meter, then it cannot incur a water supply interruption. Hunter Water has however included all vacant lots into the count of effected properties for the water continuity standard. These properties should not have been incorporated as an interruption to supply cannot occur to properties that do not have a connection.

Historically vacant lots were included in the count primarily because it was not possible within Hunter Water’s systems at the time to identify them and therefore exclude them. The computer systems now in place however have this capability. By including vacant lots in the water continuity standard calculations for 2002/03 the number of properties effected has been overstated by 459 properties.

Recommendation: *Hunter Water should review its method for calculating properties effected by water supply interruptions in accordance with the Licence standard and ensure that vacant lots are excluded from calculations.*

Asset management

Asset management within Hunter Water is driven by the Operating Licence standards, and is the primary means by which unplanned interruptions are managed.

There are three main areas where asset management effort is focussed:

- Reticulation watermains;
- Suburban trunk watermains; and
- Regional scale trunkmains.

Reticulation watermains

Reticulation watermains are managed in what Hunter Water call a “controlled reactive manner”. This means that Hunter Water operates the mains to failure but routinely records all performance data to allow continual assessment as to whether ongoing repair of these failures is an acceptable approach or whether the point has been reached where replacement is required. Hunter Water uses a watermain replacement model to determine when reticulation watermains should be replaced. The model

broadly makes a “whole of community” cost assessment as to whether repair or replacement is the cheapest option. The inputs into the model are:

- the ongoing cost of a watermain repair based on maintenance contract rates;
- an estimate of overall replacement cost based on the most recent watermain laying contract rates;
- a social cost allowance on a per property basis to value the impact of an interruption; and
- a cost allowance for water lost through a break or leaks.

Recommendation: *An internal review of the inputs into Hunter Water's asset management watermain replacement model should be conducted in the context of the current drought conditions being experienced and additional demand being placed on the system from population growth, to assess the adequacy of these inputs in addressing Licence requirements. If, for example, inputs relating to social costs or lost water costs are higher than currently assumed, then a greater level of watermain replacement will be required.*

Suburban trunk watermain

Hunter Water has several hundred kilometres of suburban trunk watermains which deliver water from bulk reservoirs into more localised storages. Failures in some of these assets can result in loss of capacity particularly during the high demand periods, and this can impact on continuity to many properties. At times, the extent of the impact could be as high as up to several thousand properties in an event although a more typical number would be between 500 to 1,000 properties (note this contrasts with a reticulation main failure where the typical shutdown size would be around 40 properties).

These particular assets will not generally fail on a regular basis and the asset management approach taken by Hunter Water with this particular category is to implement a program of trunkmain condition assessments. This work commenced several years ago with a condition assessment tool colloquially known as 'intelligent pig'. This tool is effectively pulled through a watermain and provides a profile of wall thickness which can be used to assess corrosion levels and hence risk of failure. This technique is quite expensive and Hunter Water has now moved to a new technology, linear polarisation resistance (LPR) condition assessment, which effectively gives the same outcome (that is, a probability of failure) at a much lower cost. As the condition assessments of trunkmains are undertaken, Hunter Water can compile the information collected on the probability of failures of various assets, assess the consequences of failure of these assets in terms of properties impacted and ultimately determine potential risk of non compliance against the licence continuity criteria.

Regional scale trunkmains

Regional scale trunkmains tend to be assets which are delivering bulk water from major sources and include assets such as the trunkmain from Chichester down into the operational area as well as the major watermains from the Grahamstown/Tomago complex into the Newcastle area. failures in these assets can potentially put whole local government areas out of water if repairs cannot be completed within 24 to 48 hours.

Examples such as failures in the Chichester line or the trunkmains crossing the Hunter River can potentially put between 90,000 to 150,000 people out of water for extended periods. This could also have significant impact on commercial and industrial properties and hence capacity for significant interruptions to employment in the region for the duration of the failure.

These assets are treated on a case by case risk assessment basis. Potential failure mechanisms are assessed and potential repair times for such failure mechanisms and ultimately the consequences of the failures are considered. Where there is a reasonable probability that an event can lead to a failure and the consequences are high in terms of impacts on customers, mitigation works such as protection of the assets or duplication of the assets are undertaken. The second crossing of the South Arm of the Hunter River, which is currently under design and soon due for construction, is an example of this.

6.4.3 Problem Areas

The largest three single water supply interruptions with a duration greater than five hours are shown in *Table 6.4*.

Table 6.4: Water supply interruptions where more than 250 properties were effected for a duration of more than five hours (System Performance Indicators Report 2002/03)

Date of Interruption	Location	No. Properties impacted	Duration (hrs)
10 Jan 2003	Tyrrell St, Wallsend ¹	1004	7.0
1 Feb 2003	Violet Town Rd, Tingira Heights ²	458	6.0
10 Feb 2003	Floraville Rd, Floraville ³	502	9.8

Notes:

1. The Wallsend interruption occurred as a result of corrosion causing a break in a 300 millimetre cast iron watermain. This main is the sole feed to the properties in Wallsend and Maryland which were out of water until the break was repaired.
2. The Tingira Heights interruption was the result of two concurrent breaks, possibly due to a water pressure spike, in the 150 millimetre cast iron watermain supplying this area. The majority of the properties impacted were supplied from the section of main that was isolated by the two shutdowns required. Both breaks were longitudinal fractures requiring removal and replacement of the broken pipe.
3. The interruption to Floraville was caused by a break, caused by corrosion in a 300 millimetre cast iron pipe in the Pacific Highway, Jewells. The pipe is the main feed to the elevated areas of Floraville and the back-up main does not have sufficient capacity to supply this area in periods of elevated demands. The main was repaired by removing and replacing the section of pipe.

6.4.3.1 Charter rebates

Hunter Water interprets the requirements in relation to water supply interruptions in the Customer Charter as follows:

- a year is defined as the financial year, that is, 1 July to 30 June;
- both planned and unplanned interruptions are included;
- the number of total confirmed interruptions to the water service is the cumulative duration of all incidents experienced by a customer throughout the year; and

- interruptions to water supply as a result of failures in water services (that is, the pipe from the main to the customer's meter) are not included in the licence figure as these pipes are owned by the customer.

Properties subject to water supply interruptions during an event are estimated through an analysis of complaint calls received at the Contact Centre, a review of SCADA records, and through the geographical information system (GIS). The location of the system failures and complaint calls received are marked on the GIS, and properties likely to have experienced an interruption to supply are identified. This number is used in the interruption calculations. The commencement of the interruption occurs either when the first complaint is received in which the caller identifies that they have no water, or when the maintenance crew turns off the valves so that the break can be fixed. The time when the discontinuity ends is recorded as the time when the valves are re-opened by the maintenance crew.

Rebates have been assessed in *Section 4* of this report.

6.4.4 Factors Affecting Future Performance

The number of water supply interruptions that occur in any given year is highly variable and influenced by climatic conditions and one-off breaks.

Hunter Water has control over the number and duration of planned interruptions, which this year represented 31% of the total number of interruptions experienced. Approximately 13% of all planned events this year were the result of connections for new housing developments where mains required shutting down while new areas were connected to the network. This number of events was significantly higher than in previous years. With the current housing trend it is likely that the number of planned interruptions caused as a result of the connection of new estates will increase. Hunter Water is currently adopting a changed design criteria for new estates so that shut downs that occur for the connection of sequential stages are eliminated using valves. This will minimise the impacts occurring to existing customers.

Hunter Water addresses unplanned water supply interruptions through its asset management program. Hunter Water is currently undertaking a condition assessment on trunkmains using linear polarisation resistance (LPR) at a cost of approximately \$700,000 and this assessment aims to reduce the likelihood of large one-off events occurring in the future. This method measures soil properties to calculate the rate of corrosion of pipes and predict the probable frequency of breaks. This technique has proven to be accurate and is being applied across the water supply system to help determine watermains most in need of replacing. The number and duration of planned discontinuities is also likely to improve with the progressive introduction of new technologies by Hunter Water. These technologies include the direct tapping of mains under pressure without the need to shut down the main, and cryogenic technologies that freeze the main instead of using shutdown valves, thus reducing the number of properties effected and the duration of the shutdown.

Hunter Water also expects to reduce the time between the identification of resources that require replacement through the adoption of improved procurement techniques

relating to pipe replacement. The current tender process and batching of jobs will be replaced and more efficient design processes implemented.

Going forward, Hunter Water expects to meet the water continuity standard under normal climatic conditions.

6.5 Water Pressure Standard

6.5.1 Compliance

A detailed description of Hunter Water’s performance against the relevant clauses in the Operating Licence relating to water pressure is provided in *Appendix A*. A summary of compliance is provided in *Table 6.5*.

Table 6.5: Summary of water pressure standards compliance

Clause	Requirement	Compliance
Operating Licence Clause 7.3.2	No more than 4,800 properties experience an incident where pressure to the property falls below 20 metres head in a financial year.	
Customer Charter	Rebate a customer account, if over the course of a year, confirmed low water supply pressure events are experienced on more than five separate occasions.	

6.5.2 Findings

Hunter Water reported that 2,461 properties (approximately 1.2% compared with 1.1% in 2001/02) experienced a low-pressure incident. This falls well within the requirements of the Operating Licence.

Generally water supply pressure problems occur during peak demand events, caused by exceptional weather conditions. During 2002/03 the peak demand was not as great as previous years and media coverage of the drought across NSW is likely to have increased people’s awareness of water conservation. As a result, a more even distribution of water pressure problems occurred throughout the year.

Hunter Water has a structured system in place to measure and report on this standard. *Appendix B* provides a summary of the confidence that can be placed in the accuracy and completeness of the numbers reported.

6.5.3 Problem Areas

Several areas within Hunter Water’s area of operation are known to consistently receive low pressure supply. From system modelling, Hunter Water has determined and reported that 689 properties receive less than 20 metres head on a consistent and systemic basis. This represents approximately 0.5% of the customer base. Many of these properties are in regions with infrastructure based on a previous design criteria of 16 metres head. Key low pressure areas include Caves Beach, Wyee Point and parts of Nelson Bay. No areas consistently receive less than 12 metres head of pressure.

Potential rectification options (including new booster stations, tanks and upgrades to watermains and reservoirs) have been identified for all areas experiencing less than 20 metres head however, these projects are subject to other factors such as new housing developments and asset management priorities.

Since the 2001/02 Audit, Hunter Water has addressed problem areas through upgrade and augmentation projects at Bolwarra, some parts of Nelson Bay, Lemon Tree Passage, Swansea Heads and East Braxton and an upgrade strategy at Medowie.

A total of 218 low pressure complaints (compared with 1,000 in the previous year) were received from consumers, of which 36 were confirmed through field inspections. Field inspection occurs during a similar demand condition to when the complaint is made. Results of the annual customer survey show that 89% of customers are happy with the level of water pressure they receive.

6.5.4 Charter rebates

The measurement of water pressure is taken at the connection of the property to Hunter Water's main. Hunter Water interprets the requirements in relation to water pressure in the Customer Charter as follows:

- low water supply pressure (as referred to in the Customer Charter) is defined as less than 12 metres head; and
- a verified complaint is one that has been confirmed by a field operator, who measures the pressure at the meter. The measurement is done at the same time of day as indicated by the customer, as soon as possible after the complaint is received.

Rebates have been assessed in *Section 4* of this report.

6.5.5 Factors Affecting Future Performance

Water pressure performance is highly dependent on climatic conditions. A particularly dry period will place increased pressure on the system whereas a relatively mild period will result in decreased stress. Current modelling predicts that demands on a peak day (364ML/day), which occur every two years on average, would result in 4,265 properties being effected. This year's highest demand days were lower than peak day demand. The number of days on which peak day demand is experienced may increase given the current climatic conditions being experienced, which result in a greater number of properties being impacted on these days. From modelling undertaken by Hunter Water the suburbs most likely to be impacted during these times would include Nords Wharf, Raymond Terrace, Wallalong and East Branxton.

The new Customer Contract, which came into effect on 1 September 2003, now incorporates rebates from the Customer Charter. Rebates for low water pressure are provided if water pressure drops below 15 metres head on more than five occasions during the financial year.

6.6 Sewage Overflow Standard

6.6.1 Compliance

A detailed description of Hunter Water’s performance against the relevant clauses in the Operating Licence relating to sewage overflows is provided in Appendix A. A summary of compliance is provided in *Table 6.6*.

Table 6.6: Summary of sewage overflow standards compliance

Clause	Requirement	Compliance
Operating Licence Clause 7.3.3	The number of uncontrolled sewage overflows does not exceed 6,500 in a financial year (other than on Public land)	
Customer Charter	Rebate a customer account, if over the course of a year as a result of a failure of Hunter Water’s systems, a customer experiences more than three confirmed sewer surcharge events on their property.	

6.6.2 Findings

Hunter Water reported that 2,969 properties (approximately 1.5% compared with 1.6% in 2001/02) experienced a sewer overflow. This falls well within the requirements of the Operating Licence.

It is estimated that 85% of sewage overflows are caused by pipe blockages from tree roots. The 2002/03 year was characterised by dry conditions which are known to cause tree root problems at least six to 12 months in the future as trees extend their roots in search of water.

Climatic variability is also seen as a major contributor to breakages in clay sewer pipes. Extreme variations in weather lead to expansion and contraction of reactive clay soils that can lead to breakages in clay pipes. Excessive rainfall can also overload sewer systems.

Hunter Water has a structured system in place to measure and report on this standard. Appendix B provides a summary of the confidence that can be placed in the accuracy and completeness of the numbers reported.

6.6.3 Problem Areas

Sewage overflows often occur in various locations with no specific areas experiencing recurring problems. It is therefore difficult to identify problem areas in advance. Overflows are usually one off events that are managed on a case by case basis.

A sewer overflow is classed as an environmental incident by Hunter Water. Environmental incident assessment occurs in two stages within Hunter Water. Initially, immediately following the incident, a simple assessment is made to determine whether notification to the DEC is warranted. The DEC is generally notified for medium to large overflows based on a judgement call by the field staff. A particularly conservative

approach is taken by Hunter Water, often resulting in a large number of incidents being reported. Following the incident, more detailed assessment procedures are carried out to determine the severity and impact of the incident for internal reporting purposes. Environmental incidents are ranked using a severity scoring matrix referred to as a 'green sheet'. The incident is ranked using a scoring system that assesses a number of factors including volume of discharge, type of waterway and effect on receiving waters. For example, high faecal coliform readings in a sensitive recreational waterway would receive a higher score than the same reading in a degraded stormwater channel. The incident is then classified as very minor, minor, moderate or major. These rankings allow trends in performance to be tracked and identify actions required for ongoing asset management.

Hunter Water, in conjunction with the DEC, is currently undertaking a review of environmental incident assessment and reporting to improve the consistency of reporting and the type of incidents that require reporting to the DEC. The review is also examining the incident classification matrix currently used.

A total of 180 environmental incidents were recorded internally by Hunter Water, compared with 114 in the previous year. The incidents were ranked as follows:

- very minor - 77;
- minor - 84;
- moderate - 19; and
- major - nil.

In all cases appropriate actions were taken by Hunter Water to rectify these problems. Of these incidents, those reported to the DEC included:

- a 500 millimetre rising main from Belmont No. 3 wastewater pumping station (WWPS) burst and sewage ran into Lake Macquarie via Cold Tea Creek (February 2003);
- due to extensive bushfires in November 2002, long term power outages to the western and north eastern sides of Lake Macquarie were experienced causing four pump stations to overflow; and
- in March 2003, an overflow occurred from Swansea No. 3 WWPS to Black Neds Bay as a result of a pump failure.

From a sample of five randomly selected environmental incident reports reviewed as part of the audit, four of these showed transposition errors between laboratory results and the incident report for faecal coliform counts, or had information missing

Recommendation: *Review the management review controls in place for environmental incident reporting to ensure errors are identified and rectified appropriately.*

6.6.4 Charter rebates

Uncontrolled sewage overflow events, as defined in the Operating Licence, refer to sewage overflows on private land and are counted per event rather than per the number of properties effected. Hunter Water interprets the sewer overflow onto customer property standard in the Customer Charter as follows:

- each overflow onto a customer’s property is counted towards a rebate;
- one event can affect more than one property;
- there is no rebate to properties that are not customers of Hunter Water but may be effected by a Hunter Water sewer; and
- there is no rebate to customers or members of the public who may be effected by surcharges onto public property such as a footpath or park.

Rebates have been assessed in *Section 4* of this report.

6.6.5 Prior Year Audit Recommendations

Hunter Water adequately addressed the recommendations made in the 2001/02 Operational Audit in relation to sewage overflows. These actions are described in *Table 6.7*.

Table 6.7: Actions arising from 2001/02 sewage overflow recommendations

Area	Recommendation	Action taken	Adequately addressed
Environmental incident severity assessment	<p>A review should be performed by the Hunter Water Compliance and Review Group to determine whether adequate procedures are in place for the monitoring and reporting of environmental incidents. This review should also include procedures to determine trends in monitoring, with a view to assessing the confidence of the severity criteria being used.</p> <p>The results of this review should be reported to the Board in sufficient time to be available for the 2002/03 Operational Auditors.</p>	<p>An internal audit review of monitoring and reporting of environmental incidents was conducted during the year.</p> <p>Findings from the Draft Review indicate that the controls in place are working effectively.</p>	Yes

Area	Recommendation	Action taken	Adequately addressed
Long term trend monitoring for sewer surcharges	Hunter Water needs to ensure that adequate processes are in place to monitor and report long term trends in relation to environmental incidents.	<p>An access data base is now used to record incident details including the cause, time, location, asset type, remedial actions, follow up, reporting information, severity and specific issues associated with the incident. This database allows analysis of trends and detection of abnormalities in reporting data over time and to highlight specific problem areas.</p> <p>Monthly reporting is provided to the Executive on all environmental incidents including trends for all types of incidents and for asset types. Six monthly reporting is provided to the Board Environmental Committee on environmental incidents including short term and long term trends.</p>	Yes

6.6.6 Factors Affecting Future Performance

The performance of Hunter Water in relation to sewer overflows is highly influenced by yearly climatic conditions, especially if short heavy storm rainfall is the only form of rain received. Climatic conditions are also influential in the risk of pipe failure. When a dry period is experienced, tree root systems will enter pipes in search of moisture. This can sometimes result in sewer pipe failure. Hunter Water proposes further improvements in relation to sewer surcharges with upgrades concentrating on the Newcastle and Lake Macquarie systems that account for around 70% of the total system.

7. Water Demand and Supply

7.1 Summary of Findings

Hunter Water has complied with the requirements of the Operating Licence in relation to the Integrated Water Resources Plan (IWRP), water conservation targets and water demand and supply reporting. Capital works programs undertaken throughout the year have continued to improve the security of supply, in particular augmentation works related to Grahamstown Spillway and upgrades to Chichester Dam. Contingency measures are in place should water restrictions be required under the current drought condition being experienced, however at this point in time modelling predicts that this will be unlikely in the upcoming year. No water restrictions were necessary during 2002/03. At the end of October 2003, supply levels were just under 80% in Hunter Water water supply sources.

Hunter Water customer consumption has exceeded the estimated sustainable yield from the Hunter Water supply sources over the past five years, and as such it is vital that Hunter Water fulfil the actions set in the IWRP.

NSW is experiencing its worst drought for 100 years with more than 99% of the State being drought declared at sometime during 2002/03. While Hunter Water's storage systems in October 2003 are slightly under 80%, storage levels can fall quickly over a dry summer. A number of demand management programs commenced during the year targeted at both community and industry water conservation. The success of these programs will be seen over the coming years with changes in population growth, and therefore water consumption across the region.

7.2 Recommendations

While achieving compliance with the Operating Licence, recommendations are made in relation to water demand and supply to provide further opportunities for Hunter Water to continue to improve in this area. These are outlined in *Table 7.1*.

Table 7.1: Water supply and demand recommendations

Area	Finding	Recommendation	Priority
Water supply and demand	The IWRP suggests that Hunter Water can provide a sustainable or safe yield (which is the supply of water from water sources without breaching internal restriction standards or running the risk of storages reaching critical levels) of 73,000 megalitres of water per annum from current sources. Demand for 2001, 2002 and 2003 has	It is imperative that actions identified in the IWRP be undertaken and completed as in accordance with the timetable outlined in the IWRP to maintain the current security of supply, and provide an extra 5,500 megalitres per annum.	2

Area	Finding	Recommendation	Priority
	marginally exceeded this volume. Demand management initiatives proposed in the IWRP will provide limited savings of around 1,000 megalitres per year.		
Review of the IWRP	The options identified as most viable within the IWRP were selected based on an assessment of meeting a forecast conservative growth in consumption from Hunter Water's customer base of around 0.6 GL/year against predicted population growth in the region. Growth forecasts were developed on the assumption there would be a continuation of recent climatic conditions, that existing demand management and water conservation measures would continue, and that no new significant water-using industries would be moving into the area. Any significant changes to one or more of these assumptions could change demand forecasts, which could mean that the selected supply options are no longer the most viable in meeting security of supply requirements.	Provision is made within the Operating Licence for the IWRP to be reviewed regularly. A formal review of the Plan is not scheduled until 2006. As the IWRP is a working document, internal reviews should be conducted on a regular basis to ensure strategies being implemented to monitor and improve demand management initiatives and maintain the security of supply remain viable.	2
IWRP accuracy	During the audit a small number of minor accuracy errors were detected associated with the development and reporting of the IWRP.	Additional quality controls should be employed in IWRP updates.	2

Area	Finding	Recommendation	Priority
IWRP development	Although compliance with the requirements of the Operating Licence has been achieved in relation to the IWRP and a detailed analysis of options was undertaken by Hunter Water in the development of the Plan, the analysis undertaken and options reviewed are not clearly reflected in the Plan with only limited discussion of options presented. In addition the Plan is not logically structured and simple to understand.	Further versions of the IWRP should include more detailed assessment of all reasonable options and consideration should be given to restructuring the layout of the Plan to provide a more user-friendly document.	2
Demand management	In preparing the IWRP, Hunter Water has met the specific requirements of the Operating Licence. There is however, little flexibility built into targets set within the IWRP and there is no contingency plan to deal with a large increase in demand that may require the development of a new water source.	Although the possibilities associated with meeting industrial demands using recycled water are adequately addressed in the IWRP, further potable (and non-potable supplies not able to be serviced by recycled water) have not been outlined in the IWRP. Some preliminary planning for future augmentation options (for example, Stockton groundwater etc) should be included in the terms of the current IWRP to address these supply uncertainties.	2

7.3 Summary of Requirements

Hunter Water

Hunter Water, under Clause 8.3 of the Operating Licence, is required to develop an Integrated Water Resources Plan (IWRP) through a process of public consultation. The IWRP must indicate:

- how Hunter Water will manage supply augmentation, real losses of water from its systems, and demand for water within its area of operations over the next 10 years, and include present value calculations for the next 20 years;
- the planning assumptions, including drought management assumptions employed;
- the operational strategy in relation to water resource management; and
- all other relevant matters employed.

The IWRP must quantify the maximum reliable quantity of water that can be derived from water storages and make projections of total demand for water. The IWRP must enable Hunter Water to respond to the water needs in its area of operation having regard to the financial, social and environmental costs of all reasonable available options to manage the demand and supply of water.

In accordance with Clause 8.4 and 8.5 of the Operating Licence, Hunter Water must also report on it's performance with respect to:

- water conservation targets; and
- water demand and supply indicators including security of supply, losses from the system, recycled water and demand management.

In accordance with Clause 6 of the Operating Licence, Hunter Water must report on its performance against the targets, standards, indicators included in the Plan.

Auditor

Clause 11.2 requires that the audit investigate and prepare a report on compliance by Hunter Water with its obligations under Part 8 of the Licence.

7.4 Compliance

A detailed description of Hunter Water's performance against the relevant clauses in the Operating Licence relating to water demand and supply is provided in *Appendix A*. A summary of compliance is provided in *Table 7.2*.

Table 7.2: Summary of water demand and supply compliance

Clause	Requirement	Compliance
8.3	Development of an Integrated Water Resources Plan that details how Hunter Water will manage demand for water for the next 10 years and report performance against the plan.	
8.4	Comply with the water conservation target where the five-year rolling average annual residential water consumption is less than 215 kilolitres.	
8.5 and 8.6	Report on security of supply, losses from the water system, recycled water, demand management, and water demand and supply indicators.	

7.5 Findings

7.5.1 Integrated Water Resource Plan

The IWRP is the culmination of a process that has examined the strategic options available to provide water to Hunter Water customers at the lowest cost based on social, environmental and economic factors. The approach taken recognises that reductions in water use through demand management initiatives could have the equivalent effect as increasing the supply by the same amount. The objective of the IWRP is therefore to

avoid “boom and bust” type cycles in an to attempt to sustain over time, a balanced community consideration of how to manage water resources. It sets the direction for Hunter Water in relation to water supply and demand over the next 10 years.

The IWRP was developed with input from relevant key personnel within Hunter Water. The development process involved a period of public consultation including a stakeholder forum attended by approximately 30 people. Three submissions were received and amendments incorporated into the final Plan, including the tightening of drought security levels and amendments regarding leakage and water recycling. Although compliance with the requirements of the Operating Licence has been achieved in relation to the IWRP and a detailed analysis of options was undertaken by Hunter Water in the development of the Plan, the analysis undertaken and options reviewed are not clearly reflected in the Plan with only limited discussion of options presented. In addition the Plan is not logically structured and simple to understand.

Recommendation: *Further versions of the IWRP should include a more detailed assessment of all reasonable options and consideration should be given to restructuring the layout of the Plan to provide a more user friendly document.*

During the audit a small number of minor accuracy errors were detected associated with the development and reporting of the IWRP.

Recommendation: *Additional quality controls should be employed in further updates to the IWRP.*

The options adopted to meet demand growth (as identified in an Action Plan developed by Hunter Water for implementing the IWRP) include a combination of demand management initiatives and water conservation programs, such as targeted residential retrofit programs, showerhead programs, community awareness strategies, and improvements to the efficiency of the water supply through leakage reduction, combined with the augmentation of Grahamstown Spillway to increase overall storage capacity.

The options identified as most viable within the IWRP were selected based on an assessment of meeting a forecast conservative growth in consumption from Hunter Water’s customer base of around 0.6 GL/year against predicted population growth in the region. Growth forecasts were developed on the assumption there would be a continuation of recent climatic conditions, that existing demand management and water conservation measures would continue, and that no new significant water-using industries would be moving into the area. Any significant changes to one or more of these assumptions could change demand forecasts, which could mean that the selected supply options are no longer the most viable in meeting security of supply requirements.

Recommendation: *Provision is made within the Operating Licence for the IWRP to be reviewed regularly. A formal review of the Plan is not scheduled until 2006. As the IWRP is a working document, internal reviews should be conducted on a regular basis to ensure strategies being implemented to monitor and improve demand management initiatives and maintain the security of supply remain viable.*

The IWRP suggests that Hunter Water can provide a sustainable or safe yield (which is the supply of water from water sources without breaching internal restriction standards or running the risk of storages reaching critical levels) of 73,000 megalitres of water per annum from current sources. Demand for 2001, 2002 and 2003 has marginally exceeded this volume. Demand management initiatives proposed in the IWRP will provide limited savings of around 1,000 megalitres per year.

Recommendation: *It is imperative that actions identified in the IWRP be undertaken and completed in accordance with the timetable outlined in the IWRP to maintain the current security of supply, and provide an extra 5,500 megalitres per annum.*

7.5.2 Water Conservation Target

The average annual residential water consumption level reported by Hunter Water was higher during the current audit year as a result of the continued hot and dry weather conditions experienced across eastern Australia in 2002/03. Aggressive community and industry based demand management programs underway during the year helped to offset water consumption during the extreme hot weather encountered during the 2002/03 summer.

Hunter Water has continued to meet its water conservation target of 215 kilolitres for annual residential water consumption as a five-year rolling average, with actual water usage of 205.5 kilolitres per residential customer per annum achieved as shown in Table 7.3.

Table 7.3: Water conservation results for Hunter Water (Community and Environment Report 2002/03)

Water Conservation Target	1999	2000	2001	2002	2003
Ave Residential Use	192.1	193.3	211.0	209.0	222.0
Rolling five year average					205.5

7.5.3 Water Demand and Supply Indicators

Security of supply

Security of supply is a measure of the reliability of source water supply, particularly in drought sequences. It is deemed to be adequate provided that demand does not exceed the supply, where demand is defined as the quantity of potable water supplied on an annual basis to the residential, commercial and industrial customer base. Hunter Water measures security of supply by modelling the frequency and duration of water usage restrictions and by assessing the risk of reaching critical storage levels to determine a safe yield for the maximum supply rate that can be maintained without exceeding acceptability limits. The security of supply standards adopted for the Hunter region are:

- in relation to robustness, restrictions should not be entered into more often than once every 10 years; and
- in relation to reliability, the average duration of restrictions should be in place for only 5% of the time, that is only five months out of every 100 months on average.

Modelling of security of supply is difficult as environmental variables can be uncertain with respect to climate data, climatic change and future population growth. An independent review of Hunter Water's water resource model was undertaken during the year by the CSIRO concluding that the model provided an appropriate representation of the supply system for the purposes of assessing performance against security of supply criteria specified in the IWRP. The model and its method of application for estimating system yield by Hunter Water were considered to be fit and appropriate for purpose.

Despite the continued dry and hot weather conditions within the Hunter region, rain fell at opportune times within water storage catchments and as a result, no water restrictions were imposed during the year. *Table 7.4* shows the reported quantity of water supplied from each storage. The increase in residential consumption from 2002 to 2003 occurred as a result of growth and the hot/dry summer. Changes in consumption for industry and other sectors were not considered to be significant.

Table 7.4: Annual supply from Hunter Water storages in megalitres (Community and Environment Report 2002/03)

Annual Supply from the Storages/ Sources	1999	2000	2001	2002	2003	Five year average
Chichester Dam	30,658	31,821	31,957	30,123	27,532	30,418
Tomago Sandbeds	17,409	9,979	15,958	14,749	14,845	14,588
Grahamstown Dam	24,375	31,252	24,208	24,170	31,142	27,029
Anna Bay Sandbeds	2,992	3,028	3,517	3,703	3,224	3,293
Lemon Tree Passage	774	754	823	821	884	811
Total Supply	76,208	76,834	76,463	73,566	77,627	76,140

Losses from the water system

Hunter Water reported water losses from the water supply system in accordance with the Water Services Association of Australia (WSAA) benchmarking guidelines. There was a reduction in real water loss from 8,466 ML in 2002 to 7,919 ML in 2003, as shown in *Table 7.5*. This reduction is a direct result of leakage control actions taken by Hunter Water.

An active leakage control project is being undertaken by Hunter Water involving the trialing of various leakage detection and pressure reduction techniques. During the year leakage detection using electronic sensors and night flow analysis (where flow rates are analysed from low demand times to find abnormally high flow areas) was undertaken across the network. To date no significant leaks have been detected. Water loss reduction was achieved during the year through the replacement of automatic inlet

valves at reservoirs and repairs to two or three specific trunkmain leaks for a total cost of approximately \$500,000.

Table 7.5: Water losses from Hunter Water water systems (Community and Environment Report 2002/03)

WSAA Water Loss Benchmarking	2001	2002	2003
Water supplied (ML)	74,054 ²	73,566	77,627
Authorised consumption (ML)	62,148	62,014	66,407
Water losses (ML)	11,906	11,552	11,220
Apparent losses (ML) ¹	3,092	3,086	3,301
Real losses (ML) ¹	8,814	8,466	7,919
Real losses litres/connection/day	122	115	106
Real losses litres/connection/average metre of pressure	2.44	2.30	2.11

1. The term apparent losses refers to the difference between metered supply at the bulk sources and metered consumption. This can be misleading as it does not take into account known non-metered usage such as flushing, reservoir cleaning and fire fighting. The term real losses refers to values that are adjusted to take the non-metered usage into account.
2. The difference in the water supplied number for 2001 from Table 7.4 and 7.5 occurs as a result of an error in a supply meter at Tomago. The figures in Table 7.4 reflect the gross meter readings (ie they include the error). In Table 7.5 the water supplied number has been reduced for the error. Were it to be shown as a gross number, the water loss numbers would need to be increased correspondingly, which would not be an accurate reflection of the actual losses.

Recycled water

Recycled water is sewage that has been biologically treated and disinfected and can be used for irrigation, industrial uses or process washing at Hunter Water's wastewater treatment plants. Hunter Water reported that 6,150 million litres were recycled in 2002/03. This represents 8% of the supplied water and around 10% of the dry weather flows to wastewater treatment plants. Future options for recycling are limited to new industrial applications entering into the Hunter Region. While no new industries are confirmed as entering at present, Hunter Water is well placed to supply recycled waters in the medium to long term from various plants. Given present trends, it is unlikely that reuse opportunities will grow by the 2,000 megalitres required per annum required to meet the 13% reuse target in 2007.

Demand management

Water consumption by sector is monitored by Hunter Water to examine changes from year to year. In 2003 residential consumption increased as a result of the hot and dry conditions and increases in population growth to the region. Changes from 2001/02 for all other sectors were not considered significant. *Table 7.6* shows consumption by sector.

**Table 7.6: Metered consumption by sector in megalitres
(Community and Environment Report 2002/03)**

Sector	1999	2000	2001	2002	2003	Five year average
Residential	33,891	34,753	38,609	38,886	41,953	37,618
Commercial	10,914	10,158	10,974	10,563	11,249	10,772
Industrial	14,332	11,418	8,518	8,634	8,927	10,366
Other	3,237	3,180	3,685	3,586	3,838	3,505
Total Consumption	62,374	59,509	61,786 ^a	61,669 ^a	65,967 ^a	62,261

a. The differences between Authorised consumption (Table 7.5) & Total Consumption (Table 7.6) occur as a result of different definitions for each term. Authorised Consumption is utilised when measuring / benchmarking water loss and includes water for operational uses such as flushing, reservoir cleaning and fire fighting.

The Water Management Licence requires Hunter Water to produce an Annual Demand Management Strategy that provides information on demand management programs including water use and unaccounted-for water trends. The requirements of the current Water Management Licence and the Operating Licence overlap on a number of demand management reporting requirements. The new Water Management Licence due in December 2003 will incorporate a number of changes to reduce the overlap in reporting requirements.

7.5.4 Annual reporting on water demand and supply indicators

The first annual report on performance against the IWRP was submitted to IPART on 1 September 2003. The IWRP has been in place since March 2003 and it is therefore too early to assess performance against the Plan, however initiatives taken to date by Hunter Water to meet targets established in the Plan relating to meeting demand and reducing water usage have included the use of focus groups to explore and better understand the current attitudes and behaviour of domestic customers regarding water conservation and saving water, and the development of a Marketing Plan that focuses on demand management, leakage reduction and recycled water. Water savings of 1,000 megalitres per year are projected. A community water conservation campaign is being launched in November 2003. In addition, a \$16 million project to increase the supply of water is being undertaken at Grahamstown Dam. A new low-level spillway to more effectively manage storm runoff during floods and to provide additional storage in the dam is planned for completion in 2005/06.

7.5.5 Prior Year Audit Recommendations

Hunter Water adequately addressed the recommendations made in the 2001/02 Operational Audit in relation to water demand and supply. These actions are listed in *Table 7.7*.

Table 7.7: Actions arising from 2001/02 water demand and supply recommendations

Area	Recommendation	Action taken	Adequately addressed
Security against Drought	The respective models should be peer reviewed after each major upgrade to ensure that they remain effective management approaches and tools for these sources.	An independent review of Hunter Water’s water resource model was undertaken during the year. The review assessed the model as fit and appropriate for purpose and identified areas for potential improvement.	Yes
Demand management	Progress made towards the development of a robust climatic model and against the revised water consumption target should be reviewed as part of the 2002/03 audit.	The CSIRO review of the Hunter Water climate model showed that the model is suitable and that it could potentially be used for climate correction of residential sector water production.	Yes
Climate modelling	Detailed peer review of the current model and output is required. This should include critical assessment with recommendations as to where the model can be substantially improved including the potential to develop a residential sector climate-connected trend analysis.	An independent review of the climate model was undertaken by CSIRO. The review concluded that the model was suitable, however concerns existed over the calibration procedure. A number of recommendations arising from the review are currently being incorporated into the model. CSIRO are satisfied with the improvements being made. The review also concluded that the model was suitable to track residential sector water production.	Yes

7.6 Factors Affecting Future Performance

NSW is experiencing its worst drought for 100 years with more than 99% of the State being drought declared at sometime during 2002/03. The Hunter region has been declared a drought area. While Hunter Water's water storages are currently at greater than 80%, storage levels can fall quickly over a dry summer.

In preparing the IWRP, Hunter Water has met the specific requirements of the Operating Licence. There is however, little flexibility built into targets set within the IWRP and there is no contingency plan to deal with a large increase in demand that may require the development of a new water source.

Recommendation: *Although the possibilities associated with meeting industrial demands using recycled water are adequately addressed in the IWRP, further potable (and non-potable supplies not able to be serviced by recycled water) have not been outlined in the IWRP. Some preliminary planning for future augmentation options (for example, Stockton groundwater etc) should be included in the terms of the current IWRP to address these supply uncertainties.*

8. Environment – Indicators and Plan

8.1 Summary of Findings

Hunter Water has complied with the requirements of the Operating Licence with respect to the development of the Environmental Management Plan and establishment of environmental and ESD indicators. The EMP contains a comprehensive list of environmental activities to be undertaken. The environmental and ESD indicators developed by Hunter Water are well targeted to suit environmental aspects and risks identified.

Hunter Water achieved considerable energy savings through participation in the SEDA Energy Smart Business Program and through the implementation of a number of energy saving initiatives.

8.2 Recommendations

No recommendations are made in relation to the EMP or the environmental and ESD indicators.

8.3 Summary of Requirements

Hunter Water

Hunter Water is required under Clause 9.1 of the Operating Licence to produce a five year Environmental Management Plan (EMP). The EMP must be developed in consultation with the community and contain details of Hunter Water's environmental improvement strategies for its water storages, catchments, water supply system, sewerage system, drainage system and environmental aspects of its other activities such as energy management, waste minimisation and heritage. The EMP must set targets and timetables for environmental activities to be undertaken utilising Ecological Sustainable Development (ESD) indicators. The EMP must be made available to the public and amendments can only be made after public consultation.

Under Clause 9.2 of the Operating Licence Hunter Water must produce, monitor and report on a set of environmental and ESD indicators. Performance against these indicators is to be reported in the Annual Community and Environment Report. Hunter Water must also participate in the Energy Smart Business Program and report on any actions or activities undertaken as part of this, or other green power programs in accordance with Clause 9.3 of the Operating Licence.

Auditor

Clause 11.2 requires that the audit investigate and prepare a report on compliance by Hunter Water with its obligations under Part 9 of the Licence.

8.4 Compliance

A detailed description of Hunter Water’s performance against the relevant clauses in the Operating Licence relating to environment management is provided in *Appendix A*. A summary of compliance is provided in *Table 8.1*.

Table 8.1: Summary of environmental management compliance

Clause	Requirement	Compliance
9.1	Produce a five year EMP containing details of environmental improvement strategies and endorsing ESD principles.	
9.2	Develop a list of environmental and ESD indicators and report performance against these indicators in the Annual Environmental Report.	
9.3	Participate in the Energy Smart Business Program and report activities undertaken.	

8.5 Findings

8.5.1 Environmental Management Plan

The EMP is a critical component of Hunter Water’s Environment Management System (EMS) developed in accordance with the ISO 14001 series of standards. The EMP helps Hunter Water achieve its corporate environmental objectives and meet environmental regulatory commitments. It contains details of environmental objectives for catchments, water storages, water supply, sewerage and drainage systems, endorses ESD principles and sets targets and timetables for actions to be undertaken over a five year period. The new EMP came into effect in September 2002.

The EMP is recognised in Hunter Water’s business plans and plays a significant role in the regulatory framework under which Hunter Water operates. The MoU with the DEC and the Water Management Licence with DIPNR both refer to the EMP as an important tool in environmental management and make reference to a commitment by Hunter Water to include specific factors such as demand management strategies within the EMP.

This EMP incorporates ESD principles as a key objective of environmental protection. ESD refers to development that meets the needs of the present without compromising the ability of future generations to meet their own needs using, conserving and enhancing the community’s resources so that ecological processes are maintained, and the total quality of life, now and in the future, can be increased.

The EMP contains regulatory commitments from the Operating Licence, the Water Management Licence issued by DIPNR and Wastewater System Licences issued by the DEC. Hunter Water has complied with the conditions of the relevant licences in the preparation of the EMP.

The EMP outlines environmental activities to be undertaken by Hunter Water over the term of the Plan. These targets utilise the environmental and ESD indicators discussed in *Section 8.5.2*.

8.5.2 Environmental and ESD Indicators

Hunter Water developed a list of environmental and ESD indicators during the year. The Consultative Forum had early input into indicator development and indicators underwent public consultation, with nine formal submissions received, before being approved by the Minister for Energy on 20 March 2003.

The indicators were developed with regard for the Commonwealth State of the Environment reporting system and the Australian State of the Environment environmental indicator reporting series produced by Environment Australia. The indicators address issues such as catchment management, recycled water, customer survey perceptions, energy consumption and price of water per litre.

As approved by the Minister, performance against a priority set of indicators rather than all indicators was reported in the Annual Community and Environmental Report 2002/03, with performance against the full set of indicators reported separately and provided on the website. The priority indicators reported on in the Community and Environment Report cover the areas of water collection, treatment, delivery and consumption, and wastewater collection and treatment, water recycling, stormwater, community involvement, and corporate responsibilities. The Annual Report has considerable focus on ESD, and clearly demonstrates Hunter Water's commitment to ESD through 15 sustainability case studies (called 'sustainability snapshots') provided in the report. Systems and processes are in place for Hunter Water to assess performance against the indicators however given the short time since approval (less than three months) it is difficult to assess performance in great detail. Preliminary performance appears to be adequate for the priority indicators. Hunter Water's environmental indicator report is provided in *Appendix D*.

8.5.3 Energy Management

Hunter Water used 69,746 MWh of energy across all systems and buildings in 2002/03 compared with 66,999 MWh in 2001/02.

Hunter Water participated in the SEDA Energy Smart Business Program during the year, achieving a bronze level saving. Initiatives for the 2002/03 year generated savings in energy of 1,876 MWh per annum, equivalent to a reduction of 1,820 tonnes per annum of carbon dioxide (CO₂). Initiatives included the implementation of:

- base flow 'jockey pumps' in wastewater pumping stations;
- high efficiency bore pumps;

- new controls at George Schroder Pumping Station;
- pump mechanical seals;
- mechanical stirring of Chichester Dam; and
- variable speed drives on water supply pumps.

8.5.4 Prior Year Audit Recommendations

Hunter Water adequately addressed the recommendations made in the 2001/02 Operational Audit in relation to environmental management as outlined in *Table 8.2*.

Table 8.2: Actions arising from 2001/02 environmental management recommendations

Clause	Requirement	Action	Compliance
Specific environmental training needs	The EMP needs to be modified to include an action to allow Hunter Water to conduct issues specific training determined on a priority basis.	The EMP has been modified to provide greater flexibility in providing staff training. Specific training needs have been identified and courses are being undertaken as required.	Yes
Incorporation of ESD indicators into the revised Environmental Management Plan	In the event of a revision to the Operating Licence, consideration should be given to providing flexibility in the submission date for the EMP. The outcomes from the public consultation process may result in changes to the ESD indicators that need to be incorporated into the EMP.	A revision to the Operating Licence did not occur during this year and therefore this recommendation was unattainable.	N/A

8.6 Factors Affecting Future Performance

The introduction of ESD indicators during 2003 and the actions being undertaken by Hunter Water to improve in these areas will work towards Hunter Water achieving a more sustainable business and reduce the negative impacts it may have on the environment.

9. Catchment Management

9.1 Summary of Findings

Hunter Water has achieved compliance with the requirements of the Operating Licence relating to catchment management except in one area. The non-compliance was of a technical nature and related to the omission of reporting in the Catchment Report on chlorophyll-a trends in the Williams River.

Hunter Water breached the requirements of the Water Management Licence during the year following greater than permitted extractions of water from the Anna Bay Sandbeds under the Licence. This matter was investigated by DIPNR and is unlikely to occur again as Hunter Water has since supplemented water extracted from the Anna Bay Sandbeds with a recently constructed pipeline from Tomago.

9.2 Recommendations

While achieving compliance with the Operating Licence, a number of recommendations are made in relation to catchment management to provide further opportunities for Hunter Water to continue to improve in this area. These are outlined in *Table 9.1*.

Table 9.1: Catchment management recommendations

Area	Finding	Recommendation	Priority
Groundwater Status Reporting	<p>There are risks to the Tomago and Anna Bay aquifer system (and associated dependent ecosystems) from land uses on these water sources and also land use practices. A combined management approach is evolving based on respective land ownership and occupations. Hunter Water has a primary role in maintaining the natural attributes of these resources.</p> <p>At present, the catchment report has no information on water level trends or groundwater dependent ecosystems for the Tomago and Anna Bay water sources.</p>	Future Catchment Reports should have an expanded section on groundwater sources and address the quantity, quality and dependant ecosystems attributes of the resource. This should be aligned with the new requirements for the Water Sharing Plan and Hunter Water major utility access licences.	2

Area	Finding	Recommendation	Priority
Williams River Water Quality Trends	The Catchment Report provides Williams River water quality trends for the full extent of available data (15 years) which is greater than the requirements specified in the Operating Licence. A long-term assessment of trends limiting the interference of climatic variability is also provided in the report.	Five year water quality trends for the Williams River, as required by the Licence, and suitable trend descriptions for recent catchment initiatives should be included in the Catchment Report, as well as trends for the complete record period (being 15 years). This will highlight any water quality trends that may be occurring in the medium-term as a result of land use changes and catchment management activities that may differ from long-term trends.	2
Catchment Management Reporting	The Catchment Report for 2003 did not report on Chlorophyll-a trends in the Williams River as required under clause 10.1 of the Operating Licence.	Hunter Water should ensure that results for Chlorophyll-a trends are reported within the Catchment Report for 2003/04.	2

9.3 Summary of Requirements

Hunter Water

Under *Clause 10.1* of the Operating Licence, Hunter Water is required to report its performance against catchment management activities in a Catchment Report that is made available to the public. The report must include:

- bulk water quality monitoring results in relation to pesticides, inorganics and radiological parameters;
- detailed activities undertaken by Hunter Water for the Williams River Catchment Regional Environment Plan, Regional Planning Strategy and Seaham Weir Operations Plan;
- details of Hunter Water’s performance against the Water Management Licence and the *Dam Safety Act 1978*;
- other catchment, land care and other supporting activities; and
- five year water quality trends in the Williams River.

Auditor

Clause 11.2 requires that the audit investigate and prepare a report on compliance by Hunter Water with its obligations under Part 10 of the Licence.

9.4 Compliance

A detailed description of Hunter Water’s performance against the relevant clauses in the Operating Licence relating to catchment management is provided in *Appendix A*. A summary of compliance is provided in *Table 9.2*.

Table 9.2: Summary of catchment management compliance

Clause	Requirement	Compliance
10.1	Report performance against catchment management activities, bulk water quality results, the Water Management Licence and Dams Safety Act.	

9.5 Findings

As part of Hunter Water’s multiple barrier approach to ensuring safe water for its customers, Hunter Water aims to ensure maximum protection for the source catchments and their local environments. Hunter Water produced during the year an Annual Catchment Report that outlined water quality results and catchment management activities occurring across its area of operation. The report also detailed performance against the Water Management Licence, the *Dams Safety Act 1978* and had a special focus on water quality trends in the Williams River.

Protection of local environments and drinking water quality is primarily through management of land use through:

- ownership of the land in the catchment;
- public education;
- incentive programs such as “Farming for the Future” plans that promote sustainable farming practices; and
- statutory regulation such as the *Hunter Water (Special Areas) Regulation 2003* which imposes controls on intensive agriculture and sewage disposal, water activities in the surface water catchments and the Seaham Weir pool, and extractive industries in groundwater catchments.

The Catchment Report for 2003 did not report on Chlorophyll-a trends in the Williams River as required under clause 10.1 of the Operating Licence.

Recommendation: *Hunter Water should ensure that results for Chlorophyll-a trends are reported within the Catchment Report for 2003/04.*

There are four main water sources in two large catchments within Hunter Water’s area of operation from which water supply is extracted, namely the Williams River, Grahamstown Dam, Tomago Sandbeds and Anna Bay Sandbeds.

9.5.1 Williams River and Grahamstown Dam Source

Chichester Dam is located in the upper catchment of the Chichester River sub catchment, which is a part of the Williams River catchment that covers an area of 197 square kilometres. The majority of this catchment is incorporated in the Barrington Tops National Park. It is one of the most pristine catchments in Australia. Land use is predominately rural with dairying and grazing.

Hunter Water draws water from the Williams River, via the Balickera Canal, to top up reserves in the Grahamstown Dam. The water quality of the Williams River is constantly monitored and a selective extraction protocol exists to ensure that only suitable quality water is pumped from the river.

While Hunter Water is not directly responsible for the condition of the Williams River catchment the organisation supports and participates in catchment improvement projects involving a number of local organisations. Hunter Water is an active member of the Williams River Total Catchment Management (TCM) Committee. The TCM is a sub-committee of the Hunter Catchment Management Trust and has implemented programs such as:

- the rehabilitation of the Williams River tributaries project – restricting stock access and revegetating stream banks;
- the Williams River vegetation management strategy, Balickera Canal – involving the planting of 2,240 trees out of a target of 4,000, and fencing remnant and sensitive vegetation;
- the large woody debris project and pin ramp trials – research projects designed to reduce stream bank erosion and improve aquatic habitat; and
- rivercare plans – which involved 21 landholders covering 280 kilometres of riverbank.

Hunter Water also conducted inspections and treatment of weeds at Balickera Canal during the year and is in the course of developing an Integrated Weed Management Plan.

The inherent variability in water quality of the Williams River is linked to climate, which in turn impacts on flow conditions. When assessing water quality trends it is necessary to consider the long-term water quality monitoring results. Water quality results for the Williams River for manganese, aluminium, ammonia and nitrogen have been improving over the last 15 years. There has however been a marginal increase in total phosphorus and turbidity levels, neither of which can be explained by Hunter Water.

The Catchment Report provides Williams River trends in water quality for the full extent of available data (15 years) which is greater than the requirements specified in the Operating Licence. A long-term assessment of trends limiting the interference of climatic variability is also provided in the report.

Recommendations: *Five year water quality trends for the Williams River, as required by the Licence, and suitable trend descriptions for recent catchment initiatives should be included in the Catchment Report, as well as trends for the complete record period (being 15 years). This will highlight any water quality trends that may be occurring in the medium-term as a result of land use changes and catchment management activities that may differ from long-term trends.*

9.5.2 Tomago Sandbeds and Anna Bay Sandbeds

These groundwater sources are located in shallow aquifers and supply the whole of the Tilligarry Peninsula and the Tomaree Peninsula (Nelson Bay) north of the Hunter River. Catchment and groundwater sustainability are major issues due to the vulnerability of these shallow aquifers.

Consequently a Water Management Committee (Tomago Tomaree Groundwater Management Committee) was formed in 1999 and a new Water Sharing Plan (WSP) for these water sources (and the Stockton reserve) was gazetted in 2002/03. Hunter Water is a key member of this Committee.

The WSP aims to protect the sustainability of groundwater resources and associated ecosystems from a quantity perspective, with 76,000 megalitres allocated to Hunter Water in any three water accounting years from the Tomago Special Area and 11,000 megalitres in any three water accounting years from the Anna Bay Special Area. The WSP provides for detailed monitoring and reporting of water levels and salinity trends in each of these water sources.

Under the current Water Management Licence the same level of reporting is not required and only limited information is provided in the Catchment Report for 2002/03. Other environmental programs underway within these groundwater source catchments include feral animal management and fire management.

There are risks to the Tomago and Anna Bay aquifer system (and associated dependent ecosystems) from land uses on these water sources and also land use practices. A combined management approach is evolving based on respective land ownership and occupations. Hunter Water has a primary role in maintaining the natural attributes of these resources.

At present the catchment report has no information on water level trends or groundwater dependant ecosystems for the Tomago and Anna Bay water sources.

Recommendation: *Future Catchment Reports should have an expanded section on the groundwater sources and address the quantity, quality and dependant ecosystem attributes of the resource. This should be aligned with the new requirements for the Water Sharing Plan and Hunter Water major utility access licences.*

9.5.3 Water Management Licence

In 2002/03 Hunter Water complied with the requirements of the Water Management Licence with respect to water extractions from Chichester, the Williams River and the Tomago Sandbeds. In August 2002 however, extraction of water from the Anna Bay Sandbeds exceeded the volumes permitted in the Licence. The Anna Bay aquifer was the sole source of water for local communities and faster than expected growth in demand for water led to this exception. A 38 kilometre pipeline was under construction at the time to supplement supply with Tomago water and was commissioned in December 2002. DIPNR has investigated the incident and identified that the method of calculating the three-year rolling average referred to in the Licence needs to be better defined. The major utility access licences to be issued in December 2003 for these two water sources will incorporate these refinements.

9.5.4 Dams Safety Act

Dam operation and maintenance in NSW is regulated by the *Dams Safety Act 1978*. Dams that are prescribed under the Act need to meet the requirements of the Act. Hunter Water had four structures prescribed under the Act being Chichester Dam, Grahamstown Dam, Winding Creek Detention Basin and Dora Creek Effluent Pond (which was de-prescribed during the year). Hunter Water continued to satisfy all requirements of the Act during the year. In 2002/03 Hunter Water commenced remedial works at Chichester Dam to improve the dam's ability to pass revised design floods.

9.5.5 Prior Year Audit Recommendations

Hunter Water adequately addressed the recommendations made in the 2001/02 Operational Audit in relation to catchment management. These actions are listed in *Table 9.3*.

Table 9.3: Actions arising from 2001/02 catchment management recommendations

Area	Recommendation	Action taken	Adequately addressed
Water Management Licence	The operational and management requirements for any relevant Water Sharing Plans should be addressed as soon as possible once the plans are gazetted. In addition, discussions should commence early in 2003 with DLWC to ensure that the requirements of the WML review by December 2003 are completed satisfactorily.	A Water Sharing Plan for Tomago has been gazetted for commencement in January 2004. A joint HWC/DIPNR working group is currently reviewing the Water Management Licence, scheduled for completion in December 2003. The impacts of the Tomago Water Sharing Plan have been considered and are unlikely to effect current practices. A Water-Sharing Plan for the Williams River has not yet been developed.	Yes

9.6 Factors Affecting Future Performance

Increased development, recent heavy mineral sand mining and the presence of the Williamstown RAAF airbase and airport and other industrial/commercial activities within part of the Tomago sandbeds catchment heighten the risks of contamination to water quality and the degradation of dependent ecosystems. Continued close monitoring and management will be paramount to ensure these risks are mitigated.

The sandbeds are a highly vulnerable water source that needs to be closely monitored and managed. As most of the resource area is either Special Area Water Reserves or National Park, the quality of the reserve should be maintained for all beneficial users.

The Williams River catchment should continue to provide suitable quality water for the region's requirements for the foreseeable future and is likely to improve with further catchment management work being undertaken.

10. Complaint and Dispute Handling

10.1 Summary of Findings

Hunter Water has achieved full compliance with the requirements in the Operating Licence relating to complaint and dispute handling. Hunter Water is committed to improving its customer service with respect to complaint and dispute handling and has in place an effective internal policy and procedures. A number of initiatives were undertaken during the year to improve Contact Centre operational efficiency with regard to call waiting times. While improvements have been small, these will grow in time as staff become more familiar with systems and management initiatives become bedded down.

The external dispute resolution scheme with EWON has been well received by customers with a number using the service. The majority of these complaints have been successfully resolved.

10.2 Recommendations

While achieving compliance with the Operating Licence, one recommendation is made (refer *Table 10.1*) in relation to complaints and dispute handling to provide further opportunities for Hunter Water to continue to improve in this area. This is outlined in *Table 10.1*.

Table 10.1: Complaint and dispute handling recommendations

Area	Finding	Recommendation	Priority
Complaint resolution times	<p>Approximately 60% of EWON matters were completed within 20 days. Those that took more than 20 days related to more complex issues such as water pressure developer issues and compensation.</p> <p>There were, however, a small number of examples whereby cases referred to EWON took an extended period of time for EWON and HWC to resolve, in addition to the time already spent by HWC, for example three to five months. The cases being reviewed by EWON emphasise the importance of early intervention and response to customers. Hunter Water has expressed a commitment to “ongoing coaching and development of Hunter Water’s staff in complaints management”.</p>	Hunter Water should work with EWON to identify and develop ways to improve customer service, particularly in relation to the handling of complaint response times.	2

10.3 Summary of Requirements

Hunter Water

Hunter Water is required to comply with the requirements set out under Part 12 of the Operating Licence in relation to:

- internal complaint handling procedures (Clause 12.1), including reporting on the number, types and resolution of complaints received on a month-by-month basis, classified by suburb, into a number of categories (water quality, water continuity, water pressure, sewage overflow, sewage odour, drainage services, and customer billings);
- the external dispute resolution scheme (Clause 12.2), including an outline of how the scheme works, the number of type of complaints, classified by suburb into the categories as required for internal complaints, and a summary of the outcomes, resolution times and procedures for resolution; and
- complaints made against Hunter Water to a court or the Tribunal (Clause 12.3).

Auditor

The audit must investigate and report on the effectiveness of Hunter Water’s internal complaint handling process under Clause 12.1 and external dispute resolution scheme under Clause 12.2. The audit must also investigate and report on complaints made against Hunter Water in a court of tribunal under Clause 12.3.

10.4 Compliance

A detailed description of Hunter Water’s performance against the relevant clauses in the Operating Licence relating to complaint and dispute handling is provided in *Appendix A*. A summary of compliance is provided in *Table 10.2*.

Table 10.2: Summary of complaint and dispute handling compliance

Clause	Requirement	Compliance
12.1	Report on complaints made against Hunter Water which are handled by the internal complaints handling procedures.	
12.2	Report on complaints received by the external disputes resolution body, EWON.	
12.3	Report on complaints made against Hunter Water to a court of tribunal.	

10.5 Findings

10.5.1 Internal complaints handling procedures

In accordance with Clause 12.1 of the Operating Licence, Hunter Water has in place an effective internal complaints handling policy and documented procedures for receiving, responding to and resolving complaints by customers and consumers. These complaint handling procedures are based on Australian Standard AS4268-1995. This standard outlines the need for an appropriate system to record complaints and their outcomes.

The two primary systems operating within Hunter Water for logging service difficulties and customer complaints are:

- the Asset and Operations Management System (AOMS) – service calls relating to water, sewerage and drainage systems; and
- the Complaints Management System (CMS) – all complaints received from customers.

The CMS was implemented in May 2002 and provides more advanced and flexible management reporting and analysis of complaints than the previous Customer Information System (CIS). As a result Hunter Water have been able to more effectively assess trends and issues on an ongoing basis and provide better responses as required. Training of customer service staff in complaints handling, conflict resolution and handling difficult customer interactions continued throughout the year. In addition performance feedback mechanisms for customer service staff were implemented including the feedback of results of quarterly customer service surveys conducted and staff reviews.

Hunter Water adequately reported to the Tribunal complaints handled by its internal complaints handling procedure in accordance with the requirements of the Operating Licence.

Analysis of complaints

When a call from a customer reporting a fault is received in the Contact Centre it will initially be logged as a service call in AOMS. Hunter Water do not treat all calls being received into the Contact Centre as complaints. The service call will be escalated and recorded in CMS as a complaint if the customer specifically requests the call be logged as a complaint, if it relates to a systemic problem with Hunter Water's systems or the customer is not happy with the outcome undertaken by Hunter Water to rectify the service fault. Hunter Water report to the Tribunal service calls and complaints received both in AOMS and CMS to ensure full transparency in reporting. The results reported this year to the Tribunal are provided in *Table 10.3*.

Table 10.3: Total service calls and complaints received as reported to the Tribunal

Category	Total complaints and service calls received 2002/03*
Water quality	2,562
Continuity of water supply	443
Water pressure	1,079
Sewage overflow	5,468
Sewage odour	533
Drainage services	30
Customer billing	2,037

* Combines both AOMs and CMS calls logged.

A total of 2,983 complaints were escalated from AOMS and logged in CMS during 2002/03 (1,744 in 2001/02), of which 86.6% (87% in 2001/02) related to the ten priority categories as defined internally by Hunter Water. These are listed in *Table 10.4*.

Table 10.4: Top priority complaints logged in CMS

Category	2002/03	2001/02	2000/01
Billing enquiry	912	287	161
Operations Maintenance	317	106	78
Metering	248	195	135
Water Quality	228	119	97
Water Pressure	218	28	39
Capital Works Contracts	150	232	202
Compensation/ Insurance	148	89	65
Asset Enquiry	129	321	156
Miscellaneous	121	42	45
Sewer odour	113	N/A	N/A

Table 10.4 shows that there was a significant increase in the number of complaints compared with last year. Hunter Water believes the increase in the number of complaints measured occurred as a result of significant process improvements in the handling and recording of complaints. There was a process of constant internal reinforcement to Contact Centre staff of the need to capture all complaints. In previous years water quality complaints referred only to complaints regarding the Customer Charter and broadening the definition has allowed more complaints to be recorded. Another factor increasing the number of complaints is believed to be increased customer awareness of complaint handling procedures and promotion of the EWON scheme.

10.5.2 External dispute resolution scheme

Hunter Water became a member of the EWON (Energy and Water Ombudsman of NSW) scheme on 1 July 2002. This scheme provides Hunter Water customers with an external and independent review of complaints they may have made or disputes they have against Hunter Water. EWON does not replace Hunter Water’s own customer complaint process but rather provides another option to customers who may not be satisfied with the solution offered by Hunter Water.

During the year, Hunter Water customers made 94 contacts with EWON. This represented 3.2% of all complaints logged by Hunter Water in CMS. These contacts comprised of:

- 32 enquires;
- 58 contacts requiring investigations that have been finalised; and
- 4 contacts for which investigations are yet to be finalised.

Figure 10.1 provides a summary of the categories of complaints, as specified under the Operating Licence, received by EWON. The majority of contacts made to EWON related to customer billings. The billing category covers issues such as disputed high bills, errors in bills, restrictions, difficulty in payment and complaints about fees and charges. Most other contacts within the categories required under the Operating Licence related to customer service, including complaints about a failure to respond to a customer’s query or complaint and complaints regarding the quality of the response received by a customer.

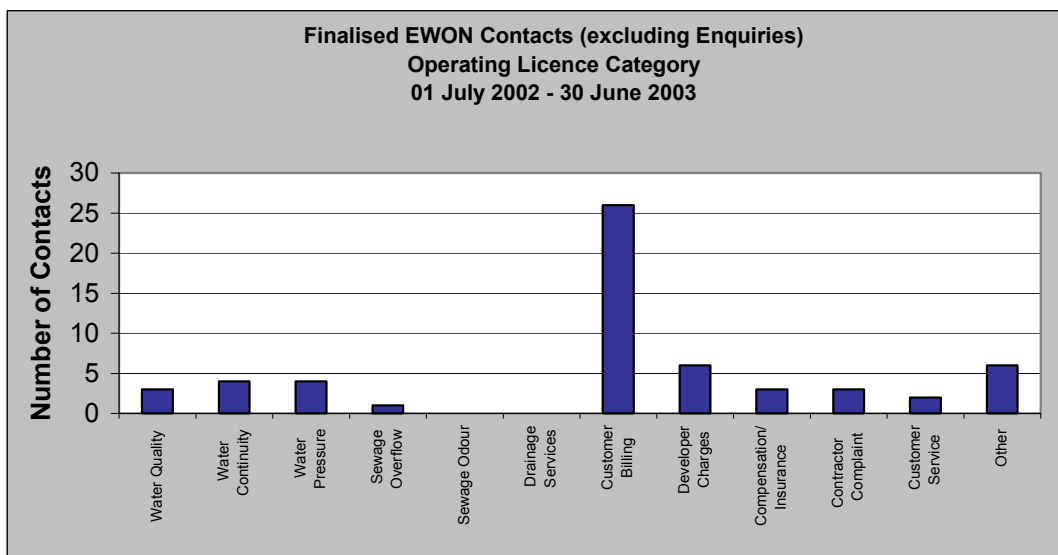


Figure 10.1: Categories of complaints

Information regarding the EWON scheme has been provided to customers as part of the billing cycle and is also available on the website. In accordance with the Operating Licence, Hunter Water prepared a report to EWON summarising the customer contacts made to EWON during the audit year. This is also available to the public via the website.

Approximately 60% of EWON matters were completed within 20 days. Those that took more than 20 days related to more complex issues such as water pressure developer issues and compensation. There were, however, a small number of examples whereby cases referred to EWON took an extended period of time for EWON and HWC to resolve, in addition to the time already spent by HWC, for example three to five months. The cases being reviewed by EWON emphasise the importance of early intervention and response to customers. Hunter Water has expressed a commitment to “ongoing coaching and development of Hunter Water’s staff in complaints management”.

Recommendation: *Hunter Water should work with EWON in identifying and developing ways to improve customer service particularly in relation to the handling of complaint response times.*

10.5.3 Complaints made to a court or tribunal

During the year Hunter Water customers referred two matters to the Independent Pricing and Regulatory Tribunal and one matter to the NSW Department of Fair Trading.

Matters reported to the Tribunal

- A water seepage complaint logged in August 2002 – Hunter Water acknowledged that they had provided unsatisfactory service to this customer and apologised for the delays.
- A complaint related to billing discharge factors in March 2003 – information was subsequently provided directly to the customer by Hunter Water.

Matters reported to the Department of Fair Trading (DFT)

- A complaint regarding metering standpipes in December 2002 – Hunter Water’s position in relation to changes to its policy in this area was upheld by the DFT.

10.5.4 Public submissions

Prior to the commencement of the Operational Audit, the Tribunal placed advertisements in the Newcastle Herald and the Sydney Morning Herald inviting public comments on the performance of Hunter Water. Two written comments were received and have been summarised below.

Submission received relating to taste and odour issues

Key areas of concern:

- Taste and odour problems have been experienced for six weeks or more each year for the last five years and Hunter Water are slow to take action when taste and odour issues arise.
- Hunter Water do not use a defined methodology or criteria for water taste testing.
- Management actions to address taste and odour issues may be reactive and ad hoc.
- All complaints concerning taste and odour issues may not be being recorded.

Hunter Water's response to the complaint included:

- Taste and odour testing is undertaken in response to increasing algal counts which can be a trigger for taste and odour compounds.
- The substitution of Grahamstown water with Tomago water takes several days for a full changeover and complaints occur in this period, however during the transition there is immediate benefit from having to shandy (that is, blend) the waters.
- The complaint is being independently reviewed by EWON.

Submission regarding definition of customer and consumer

Key areas of concern:

- Water authorities have customers however their customers are not customers as per the common definition.
- The electricity, gas, phone, pay TV, bus passengers, tollway operators and parking meters and all other suppliers to households consider the consumer to be their customer.
- It is the consumer who uses the water not the customer as the customer excludes about 40% of the community. Any pricing structure, tariff arrangement or incentive, rebate or penalty must be based on the consumer.

Hunter Water's response to these issues:

- The objection essentially relates to the fundamental legal basis that defines a Hunter Water "customer" as the owner of a property connected to their water supply and/or sewerage system. Note this relationship is not established through the Operating Licence, but rather through the *Hunter Water Act 1991* and subsequently the Customer Contract.
- The release of the Customer Contract by the Government followed a review by the Tribunal. This review included calling for public submissions. Hunter Water customers were all advised of the review through a message on their bills from October 2002 to January 2003. The opportunity was therefore provided to make a submission prior to finalisation of the new Contract.
- It is not Hunter Water's role to determine the content of its Customer Contract. This is a matter for the State Government and the Tribunal. Hunter Water's role is to operate in accordance with the Contract.

10.5.5 Prior Year Audit Recommendations

Hunter Water adequately addressed the recommendation made in the 2001/02 Operational Audit in relation to complaints and dispute handling shown in *Table 10.5*.

Table 10.5: Actions arising from 2001/02 complaints and dispute handling recommendations

Area	Recommendation	Action taken	Adequately addressed
Integration of AOMS and Complaints Management System.	As an interim measure before the implementation of the new Customer Information System, the suitability of interfacing the new Complaints Management System with AOMS should be explored. This may facilitate further improvements to information analysis in relation to the timeliness of identifying trends, and potential problem areas.	<p>Integration has been considered by Hunter Water and rejected on grounds of cost and efficiency.</p> <p>The complaints system was updated to collect contacts (April 2003).</p> <p>A new CIS was approved by the Board in March 2003. This will either incorporate field maintenance complaints or will integrate seamlessly to the existing AOMS system. Tender process is to proceed over 2003/04.</p>	Yes

10.6 Factors Effecting Future Performance

In the interim until the implementation of the new CIS system, the current arrangement to use the Complaints Management System and AOMS to manage complaints and disputes should continue to provide a satisfactory means to ensure compliance with the Operating Licence requirements.

The initiatives being implemented by Hunter Water to improve Contact Centre operational efficiencies as discussed in *Section 4.5.5* should continue to show improved results during 2003/04 as these processes become bedded down.

Appendix A

Compliance Against Specific
Clauses within Operating Licence

Appendix A: Compliance Against Specific Clauses Within Operating Licence

The following tables outline the key clauses within the Operating Licence that are auditable, and against which Hunter Water's performance has been assessed.

Note: NA means no action is required to be taken by Hunter Water.

5. Customer and Consumer Rights (Refer to Section 4)

Clause	Area of Operating Licence	Compliance	Comments
5.1	Customer Contract		
5.1.1	The Customer Contract sets out the rights and obligations of Customers and Hunter Water in relation to the Services provided through Systems required under this Licence.	NA	
5.1.2	The Customer Contract automatically applies to the persons to whom under the Act or any applicable law, it is expressed to apply.	NA	
5.1.3	Customer Contract to be posted on the website.	✓	
5.1.4	Any variations to the Customer Contract to be published in daily newspaper at least six months before it becomes effective.	✓	The Minister approved a 28-day advertising period for the new contract. Advertisement from Newcastle Herald 2 August 2003
5.1.5	Unless otherwise required by the Minister, IPART must initiate a review of the Customer Contract. The review must be completed within 12 months of the Commencement date.	NA	
5.1.6	The review must have regard to the system performance standards in Part 7 of this Licence.	NA	
5.1.7	By the date of completion of the review, the person undertaking the review must produce a report setting out its findings and recommendations. A copy of the report must be provided to the Minister upon its completion.	NA	

Clause	Area of Operating Licence	Compliance	Comments
5.1.8	Within 3 months of the completion of the review of the Customer Contract under clause 5.1.5, Hunter Water must, if directed by the Minister, take all steps necessary to issue a new Customer Contract that addresses the recommendations of the review report.	NA	
5.1.9	Within 3 months of completion of the review of the Customer Contract under clause 5.1.5, Hunter Water must prepare a pamphlet that: (a) provides a brief explanatory introduction to the Customer Contract; (b) summarises the key rights and obligations of customers under the Customer Contract; and (c) lists Hunter Water's local offices and emergency contact numbers in its Area of Operations.	✓	Pamphlet to be completed November 2003
5.1.10	The pamphlet prepared under clause 5.1.9 must be updated when changes are made to the Customer Contract and must be made available to the public.	NA	
5.1.11	Subject to the Act, Hunter Water may enter into other contracts or arrangements for the supply of Services. The terms of any such contract or arrangement are such as may be negotiated between Hunter Water and any such person.	NA	
5.2	Consumers		
5.2.1	Hunter Water must fulfil its obligations under the Customer Contract relating to complaint handling and resolution.	✓	
5.2.2	Hunter Water must fulfil its obligations under the Customer Contract relating to debt and disconnection.	✓	
5.3	Code of practice on debt and disconnection		
5.3.1	Developed within 6 months	✓	

Clause	Area of Operating Licence	Compliance	Comments
5.3.2	Content of the code; a) provide for deferred payment or payment by instalment and b) payment options are to be advised in bills.	✓	
5.3.3	The code must be incorporated into the Customer Contract.	✓	Incorporated into new Customer Contract.
5.3.4	Provide the code free of charge.	✓	Distributed in cycle 3 2002/2003 billing of rate notices.
5.4	Consultative Forum		
5.4.1	Hunter Water must regularly consult with Forum	✓	The Forum met in October, December, April and June.
5.4.2	The Consultative Forum may be utilised by Hunter Water, among other things, to provide it with high quality advice on the interests of Customers and Consumers of Hunter Water, on the Customer Contract and on such other key issues related to Hunter Water's planning and operations as Hunter Water may determine, consistent with the Consultative Forum Charter developed under clause 5.4.7.	NA	
5.4.3	Must be established within 6 months.	✓	
5.4.4	If prior to the Commencement date Hunter Water appointed persons to a forum similar to a Consultative Forum, that forum will expire no later than six months after the Commencement date. After that the membership of the Consultative Forum must be determined in accordance with the Consultative Forum Charter established under clause 5.4.7. Members appointed to that forum prior to the commencement date are eligible to be re-appointed to a Consultative Forum unless the Consultative Forum Charter otherwise provides.	NA	
5.4.5	Hunter Water must appoint the members of the Forum	✓	

Clause	Area of Operating Licence	Compliance	Comments
5.4.6	Membership to the Forum must include members from the following groups; business and consumer groups, low income households, rural areas, residential customers, environmental groups, local government, and people from non-English speaking backgrounds.	✓	The community is well represented, with members from six environmental groups.
5.4.7	A Forum Charter must be developed within 3 months and address the following issues; the role of the Forum, the selection criteria on how members will be drawn from the community, information on how the Forum will operate, a description of the type of matters referred to the Forum, communication of the outcome of the Forum to Hunter Water, procedures for tracking issues raised and ensuring follow-up of those issues and funding and resourcing of the Forum by Hunter Water.	✓	
5.4.8	Hunter Water must provide the Consultative Forum with information within its possession to enable the Consultative Forum to discharge the tasks assigned to it, other than information or documents over which Hunter Water or another person claims confidentiality or privilege.	NA	
5.4.9	Forum Charter posted on website.	✓	No date on the Forum Charter
5.4.10	Report on the establishment and operations of the Forum and the Forum Charter.	✓	
5.4.11	As part of the Licence review referred to in clause 2.3.1, IPART must evaluate and report on the effectiveness of the Consultative Forum and compliance with the Consultative Forum Charter.	NA	

6. Water Quality *(Refer to Section 5)*

Clause	Area of Operating Licence	Compliance	Comments
6.2	Drinking Water Quality – Standards		
6.2.1	Comply with the NHMRC and ARMCANZ drinking water guideline values	✓	
6.2.2	If there is an inconsistency between the Health guideline values in clause 6.2.1 (a) and the Aesthetic guideline value in clause 6.2.1 (b), the Health guideline value is to prevail. [Note: A significant aim of the drinking water quality standards is to ensure that Hunter Water achieves appropriate public health outcomes. The drinking water guidelines include catchment and system management practices to minimise the risk of contamination to water supplies, for example, the catchment management practices required to minimise the risk of contamination by Cryptosporidium and Giardia.]	NA	
6.2.3	Regards for the concepts of risk minimisation.	✓	
6.2.4	pH levels in cement mortar lined pipes must be in the range 6.5 to 9.2.	✓	
6.3	Drinking Water Quality – Monitoring		
6.3.1	Prepare an Annual Comprehensive Water Quality Monitoring Plan by 30 April	✓	
6.3.2	The Monitoring Plan must include monitoring drinking water health and aesthetic parameters and bulk water parameters.	✓	The requirement for monitoring of specific pesticides was changed with approval from the Department of Health as discussed in <i>Section 5.5</i> .
6.3.3	Sampling frequency and locations chosen should be representative.	✓	
6.3.4	Hunter Water must undertake Drinking water quality monitoring during this Licence as required by NSW Health.	✓	

Clause	Area of Operating Licence	Compliance	Comments
6.3.5	Where the Drinking water guidelines recommend monitoring at a Customer's or Consumer's tap, Hunter Water must monitor at the Property boundary from a Water service pipeline directly off a water main which is representative of the quality of water supplied to Customer or Consumer.	NA	
6.4	Drinking Water Quality – Reporting		
6.4.1	Monthly summary of water quality monitoring test results must be made available to the public.	✓	
6.4.2	Produce an Annual Water Quality Report that compares actual drinking water quality against the requirements of the guidelines.	✓	
6.4.3	The Annual Water Quality Report must include a summary of monitoring information, including information relating to bulk water parameters and include information about trends, problem areas, a summary of system failures and actions taken.	✓	
6.4.4	The Annual Water Quality Report must be prepared by 30 November and be available to the public	✓	The 2001/02 Annual Report is available on the internet
6.5	Drinking Water Quality – Planning		
6.5.1	Must maintain a five-year management plan to the satisfaction of NSW Health.	✓	Plan produced in 2000, not due again until 2005.
6.5.2	The Five-Year Water Quality Management Plan must include strategies for the comprehensive management of all aspects of the water supply cycle necessary to ensure that the quality of Drinking water supplied to Customers and Consumers complies with clause 6.2.1. The Plan should adopt the multi-barrier approach to protection of drinking water outlined in the drinking water guidelines covering catchment management and bulk water, treatment disinfection and water supply system management.	✓	

Clause	Area of Operating Licence	Compliance	Comments
6.5.3	Must prepare an Annual Water Quality Improvement Plan to the satisfaction of NSW Health by 31 March.	✓	The Plan is currently called "Water Quality Management and Improvement Programs 2003/2004" but could be renamed to "Annual Water Quality Improvement Plan 2003/2004" to avoid confusion with the five year "Water Quality Management Plan."
6.5.4	The Annual Water Quality Improvement Plan must incorporate system and operational changes needed to address problems identified through water quality monitoring data.	✓	Hunter Water initiates water quality improvement actions as they are required. The plan is consequently mainly retrospective relating programs that have been initiated already.
6.5.5	The Annual Water Quality Improvement Plan must be reviewed as part of any review of the Licence.	NA	
6.5.6	Must assess the risks of failing to comply with clause 6.2, in relation to drinking water and conduct a risk assessment within 6 months of commencement of the Licence.	✓	
6.5.7	Must maintain an Incident Management Plan to the satisfaction of NSW Health	✓	
6.5.8	The Incident Management Plan must incorporate procedures and protocols for the coordinated management of drinking water incidents.	✓	
6.6	Drinking Water Quality – Other grades of water		
6.6.1	Other grades of water supplied by Hunter Water must be supplied in accordance with relevant guidelines.	✓	
6.6.2	Where there is a conflict between any of the guidelines, requirements or standards applying to Hunter Water under clause 6.6.1 the Minister's	NA	

Clause	Area of Operating Licence	Compliance	Comments
	decision will prevail.		
6.6.3	Hunter Water must use its best endeavours to reach agreement with persons to whom Other Grades of water is supplied, as to the water quality standards that are to apply to that water for use other than as Drinking water.	✓	Customer agreements will be updated by January 2004.
6.6.4	Must advise persons to whom other grades of water is supplied the potential uses of the water and the requirement that for treatment if it is to be used as drinking water.	✓	
6.7	Environmental water quality		
6.7.1	Must report performance against environmental water quality requirements for any discharges of water.	✓	

7. System Performance *(Refer to Section 6)*

Clause	Area of Operating Licence	Compliance	Comments
7.3	System performance standards		
	Water Continuity Standard		
7.3.1	Must ensure the no more than 14,000 properties in a financial year experience one or more interruptions with a cumulative duration exceeding 5 hours	✓	
	Water Pressure Standard		
7.3.2	Must ensure that no more than 4,800 properties in a financial year	✓	
	Sewage Overflows Standard		
7.3.3	Must ensure that the number of uncontrolled sewage overflows (other than public land) in a financial year does not exceed 6,500.	✓	
7.4	Reporting on system performance standards		
	Reporting on water interruptions		
7.4.1	Must report on the number of properties that experience a planned or unplanned water interruption.	✓	

Clause	Area of Operating Licence	Compliance	Comments
Reporting on sewage overflows			
7.4.2	Must report on the number of uncontrolled sewage overflows (other than public land) and if it was wet or dry weather.	✓	
7.4.3	Must report on the number of uncontrolled sewage overflows (other than on public land) and weather the overflow occurred in wet or dry weather.	✓	
7.4.4	The reports must be available on Hunter Water's website and at Hunter Water offices free of charge.	✓	
7.5 System performance indicators			
7.5.1	Schedule 4 – System performance indicators (see below)	✓	
7.5.2	Must report performance against the indicators in Schedule 4 (see below) and make the information available to the public.	✓	
7.6 Keeping records on water interruptions, low pressure and sewage overflows			
7.6.1	Must keep records to meet obligations under clauses 7.3, 7.4 and Schedule 4.	✓	
7.6.2	Must maintain records of water interruptions, pressure incidents and sewage overflows classified by reference to the suburb where incidents occur.	✓	
7.7 Report on low pressure areas			
7.7.1	Must report on low pressure areas with less than 20 metres head; by suburb, the number of properties effected, the range of pressure and average pressure received by properties in the low pressure area and an analysis of the reasons for the low pressure and options for rectification of low pressure.	✓	

Schedule 4 – System performance indicators (Refer to Section 6)

Clause	Area of Operating Licence	Compliance	Comments
1.2	Reporting on Water interruptions		
1.2.1	Must report on the number of properties effected by planned or unplanned water interruptions where the duration is less than 1 hour, between 1 to 5 hours, between 5 and 12 hours, between 12 and 24 hours and more than 24 hours.	✓	
1.2.2	Must also report on the number of properties effected by water interruptions on 2 occasions, 3 occasions, four or more occasions.	✓	
1.2.3	Must report on the number of properties where planned water interruptions did not commence at the time specified in the notice	✓	
1.2.4	Report on single events where more than 250 properties were effected for a duration exceeding five hours and the cause of the event.	✓	
1.3	Reporting on water pressure		
1.3.1	Must report on the number of properties, not in a low pressure area, that experience one or more pressure incidents.	✓	
1.4	Reporting on sewage overflows		
1.4.1	Must report on the number of uncontrolled sewage overflows (other than on public land) in dry weather resulting from; a blockage in the main pipe, a blockage in a branch pipe, third party damage, or other event.	✓	
1.4.2	Must report on the number of priority 1 sewage overflows responded to in less than or more than one hour and the number of priority 2 overflows responded to in less than or more than three hours.	✓	
1.4.3	Must report on the number of uncontrolled sewage overflows on public land that occurred in dry and wet weather.	✓	

Clause	Area of Operating Licence	Compliance	Comments
1.4.4	Must report on the number of properties effected by an uncontrolled sewage overflow in dry weather where the period since the last uncontrolled overflow in dry weather is less than 12 months.	✓	
1.4.5	Must report on the number of public land locations effected by more than one sewage overflow, where the period since the last overflow is less than 12 months.	✓	

8. **Water Demand and Supply** (Refer to Section 7)

Clause	Area of Operating Licence	Compliance	Comments
8.3	Integrated water resources plan		
	Development of the Plan		
8.3.1	Hunter Water must develop a plan that complies with this part, which in its final form will be known as the integrated Water Resources Plan ("Plan").	✓	
8.3.2	Must develop a draft plan by 30 September and post the draft plan on the website for no less than 28 days.	✓	
8.3.3	Must engage in public consultation and produce the final plan by 1 March 2003.	✓	The public consultation involved a forum attended by about 30 people and 3 submissions were received.
8.3.4	The plan must be made available to the public.	✓	
8.3.5	Must review the plan regularly.	✓	The plan is a dynamic document that will be reviewed as necessary.
8.3.6	Hunter Water must report on any material amendments made in accordance with clause 8.3.5.	✓	No amendments made to date.

Clause	Area of Operating Licence	Compliance	Comments
8.3.7	So far as reasonably practicable Hunter Water must, when developing or reviewing the Plan rely on and apply relevant best practice research available in the public domain and endeavour to continually refine and renew its methodologies to reflect current best practice.	NA	No amendments made to date.
8.3.8	As part of the Licence review referred to in clause 2.3.1, IPART must evaluate and report on the outcomes achieved by the Plan.	NA	
Content and methodology of the plan			
8.3.9	The plan must enable Hunter Water to respond to water needs while having regard for the financial, social and environmental costs of available options to manage demand and supply of water.	✓	
8.3.10	The plan must indicate: how Hunter Water will manage supply augmentation, real losses of water and demand over the next 10 years, and include present value calculations for 20 years; the planning assumptions, including drought management assumptions employed; the operational strategy in relation to water resource management; and all other relevant matters.	✓	
8.3.11	The plan must quantify the maximum reliable quantity of water that can be derived from one year to the next, from existing storages.	✓	
8.3.12	The plan must make projections of the total demand for water.	✓	
8.3.13	In developing the plan present value calculations must be utilised, providing justifications for the discount rate and other inputs in the calculations.	✓	

Clause	Area of Operating Licence	Compliance	Comments
Identifying the options and associated costs			
8.3.14	The plan must identify and evaluate all reasonable practicable options to manage demand and supply of water and must list the non-financial advantages and disadvantages of each option.	✓	Although all options are identified and costed, more details about calculations, assumptions and advantages/disadvantages could be included.
8.3.15	In evaluating options all steps necessary steps must be taken to ensure that the plan; quantify and compare the estimated costs of each option – financial, social and environmental costs for each year of the plan.	✓	
8.3.16	If unable to reasonably quantify social and environmental costs of options Hunter Water must quantify those that it can and provide a description of those it can not.	✓	
8.3.17	The least cost option must be adopted, unless there are substantive reasons for adopting a different option.	✓	
Results of the plan			
8.3.18	Must outline targets, standards, indicators for applying the plan for consideration as part of the Licence review.	✓	
Annual reporting on the plan			
8.3.19	Must report performance against the plan.	✓	
8.4 Water conservation target			
8.4.1	Must ensure a five year rolling average for residential water consumption is less than 215 kilolitres.	✓	
8.4.2	Must report on compliance with the water conservation target.	✓	
8.4.3	Hunter Water must comply with the Water conservation target until replaced (if at all) by some or all of the proposals in clause 8.3.18 that are approved as part of the review of the License Review under clause 2.3.1.	✓	

Clause	Area of Operating Licence	Compliance	Comments
8.5	Water demand and supply indicators		
	Security of supply		
8.5.1	Hunter Water may impose Water restrictions only as approved by the Minister.	✓	There were no water restrictions during this period
8.5.2	Hunter Water must report on the nature and length of each Water restriction imposed in a Reporting period and whether it is likely to impose a Water restriction in the ensuing Reporting period or at any other time during this Licence.	NA	
8.5.3	Hunter Water must report on the criteria it applies in determining whether to request that the Minister authorise a Water restriction.	NA	
8.5.4	Must report on the quantity of water supplied from each storage.	✓	
	Losses from the water system		
8.5.5	Must report each of the components in the water balance table.	✓	
8.5.6	Must report on the outcomes of the water balance table with the preceding year.	✓	
	Recycled water		
8.5.7	Must report on recycled water supplied in a reporting period for; industrial or commercial use, irrigation or other uses.	✓	
	Demand management		
8.5.8	Must report on the total quantity of water supplied for; residential properties, industrial and commercial uses and large customers.	✓	
8.5.9	Must compare each application of water with the preceding period and indicate what factors contributed to a change. The factors to consider are; a growth in the customer base, climate, the nature or extent of recycled water consumption or demand management initiatives.	✓	

Clause	Area of Operating Licence	Compliance	Comments
8.6	Annual reporting on water demand and supply indicators		
8.6.1	Must report on performance against water demand and supply indicators.	✓	Included in the Community and Environmental Annual Report
8.6.2	Must publicly display the report on demand and supply indicators.	✓	

9. Environment – Indicators and Plan *(Refer to Section 8)*

Clause	Area of Operating Licence	Compliance	Comments
9.1	Environmental Management Plan		
9.1.1	Must produce a five year environmental management plan (EMP) within three months.	✓	
9.1.2	Must engage in public consultation in developing the EMP.	✓	The EMP went on public exhibition in August/September 2002 and nine submissions were received. A number of suggestions made in submissions were incorporated into the final version of the EMP. The Consultative Forum also assisted in development of the EMP.
9.1.3	The EMP must: contain details about environmental improvement strategies and objectives for catchments, water storages, water supply system, sewerage system, drainage system and environmental aspects of other activities such as energy management, waste minimisation and heritage; endorse ESD principles; and be recognised in business plans.	✓	
9.1.4	The EMP must set targets and timetables for environmental activities to be undertaken over the term of the EMP.	✓	

Clause	Area of Operating Licence	Compliance	Comments
9.1.5	Any material amendments may only be made to the Environmental Management Plan following Public consultation.	NA	No amendments made to date.
9.1.6	Hunter Water must report on any material amendments made in accordance with 9.1.5.	NA	No amendments made to date.
9.1.7	The EMP must be provided to IPART and made available to the public.	✓	
9.2	Environmental and ESD indicators		
9.2.1	Must monitor and compile data on indicators of the direct impact of its activities on the environment and the extent to which its services comply with the principles of ESD.	✓	
9.2.2	Must develop a draft list of environmental and ESD indicators within three months.	✓	
9.2.3	In developing the environmental and ESD indicators, Hunter Water must have regard for the Commonwealth State of the Environment Reporting System and the Australia: State of the Environment Environmental Indicator Report.	✓	After public consultation the indicators most relevant to Hunter Waters area of operation from these documents were adopted.
9.2.4	The environmental and ESD indicators developed must be consistent with the scope and objectives of the EMP.	✓	
9.2.5	The draft list of environmental and ESD indicators must undergo public consultation.	✓	
9.2.6	A final list must be presented to the Minister for approval within three months.	✓	These indicators were approved by the NSW Minister for Energy and Utilities.
9.2.7	Must commence monitoring and compiling data from the date of approval by the Minister.	✓	
9.2.8	Must report performance against environmental and ESD indicators in the annual environmental report.	✓	
9.2.9	The environmental and ESD indicators in clause 9.2.6 must be reviewed as part of the Licence review referred to in clause 2.3.1.	NA	

Clause	Area of Operating Licence	Compliance	Comments
9.3	Energy management		
9.3.1	Must participate in the Energy Smart Business Program, or similar.	✓	Achieved bronze award target.
9.3.2	Must report on any actions undertaken as part of the Energy Smart Business Program and any other energy management or green power initiatives.	✓	

10. **Catchment Management** (Refer to *Section 9*)

Clause	Area of Operating Licence	Compliance	Comments
10.1	Catchment report		
10.1.1	Must report performance against catchment management activities in the Catchment Management Report. The report must include: bulk water monitoring results; details of activities conducted by Hunter Water in the Williams River Catchment Regional Environmental Plan, Regional Planning Strategy and Seaham Weir Operations Plan; performance against the Water Management Licence and the Dam safety Act; other catchment or landcare activities conducted; and five year water quality trends in the Williams River.	✓	The water quality monitoring trends for the Williams River are calculated from all data available. This means that 16 years of data is analysed instead of the required 5 years. The Catchment Report contained information required by the Operating Licence, however graphical representation of Chlorophyll-a trends in the Williams River were omitted from the report.
10.1.2	Must make the report available to the public.	✓	

12. **Complaint and Dispute Handling** (Refer to *Section 10*)

Clause	Area of Operating Licence	Compliance	Comments
12.1	Internal complaint handling procedures		
12.1.1	Must establish internal complaints procedures for receiving, responding to and resolving complaints	✓	

Clause	Area of Operating Licence	Compliance	Comments
12.1.2	Internal complaints handling procedure must be based on Australian Standard AS4269-1995 Complaint Handling.	✓	
12.1.3	Must make available to consumers information about the internal complaint handling system and how to make a complaint.	✓	
12.1.4	Must provide the information in 12.1.3 to consumers at least once a year.	✓	
12.1.5	The customer complaint handling process must be reviewed and amended to ensure that it complies with AS4269-1995 Complaint Handling.	✓	Reviewed in February 2003.
12.1.6	Must report on the: number of complaints received on a monthly basis classified by suburb into water quality parameters, continuity of supply, water pressure, sewage overflow, sewage odour, drainage services, and customer billing; the number of complaints resolved or not resolved on a monthly basis; and any problems of a systemic nature arising from the complaints.	✓	
12.2	External dispute resolution scheme		
12.2.1	Within one month of commencement must establish an external dispute resolution scheme.	✓	Joined EWON (Energy and Water Ombudsman) Scheme from 1 July 2002
12.2.2	The Dispute Resolution Scheme so established by Hunter Water is subject to Minister's approval.	✓	
12.2.3	The dispute resolution body is to hear disputes relating to water quality parameters, continuity of supply, water pressure, sewage overflow, sewage odour, drainage services, and customer billing.	✓	

Clause	Area of Operating Licence	Compliance	Comments
12.2.4	The dispute resolution scheme must comply with the minimum standards specified in the benchmark for industry dispute resolution schemes released by the Commonwealth Minister for Customs and Consumer Affairs in 1997.	✓	
12.2.5	The dispute resolution scheme must have the following features: decision making process of the body to be independent of Hunter Water; Hunter Water agrees to abide by the decisions of the body; the scheme must adopt informal proceedings that discourage a legalistic adversarial approach; the body should be fair; the scheme is to keep track of disputes and regularly review the operation of the scheme; and the scheme is to be free of cost to the consumer and is to be funded by Hunter Water.	✓	
12.2.6	Must prepare a pamphlet explaining how the scheme works and how it can be accessed and should cover both the external and internal dispute resolution schemes.	✓	
12.2.7	The pamphlet must be provided to consumers through their bills at least once a year.	✓	
12.2.8	Must provide written reports to IPART on the determinations made by the dispute resolution body.	✓	

Clause	Area of Operating Licence	Compliance	Comments
12.2.9	Must report on: how the scheme works; the number of complaints received by the dispute resolution body on quality parameters, continuity of supply, water pressure, sewage overflow, sewage odour, drainage services, and customer billing; the outcomes of the complaints, time taken to resolve the complaints, the procedure for resolving the complaints, any problems of a systemic nature arising from the complaints; and any other relevant information required by IPART to be included in the report.	✓	
12.2.10	Must make the report in 12.2.9 publicly available.	✓	
12.3	Complaints to other bodies		
12.3.1	Must report on complaints made against Hunter Water to a court or tribunal.	✓	

Appendix B

Accuracy and Confidence Limits for
the System Performance Standards

Appendix B: Accuracy and Confidence Limits for the System Performance Standards

This section presents a brief examination of the accuracy and confidence of methods used for measuring and reporting against the System Performance Standards specified in the Operating Licence. For each Standard there are several components that combine to give the overall number. This has been reviewed by the auditors and found to be reasonable in terms of the underlying method and processes used to ensure accuracy. While each of the components has a relatively high degree of accuracy and Hunter Water attempts to take all reasonable and necessary measures to ensure accurate data is recorded, there is the potential for inaccuracies to have a cumulative impact.

B.1 Water Continuity Standard Confidence

In recording a water interruption event there are several measurements within which errors may occur, namely the recording of the shut off time and counting the number of properties effected.

The start time of a break is recorded, in most cases, as the time of the first call received from a customer, however if the caller reports that there is “no water” the discontinuity is measured from when maintenance crews shutoff the valves. The shutdown and reinstatement times are automatically determined in SWIMS (Sewer Water Management Information System) and are called in by operations and checked off in AOMS by dispatch operators. The AOMS system provides an error message if the times are inconsistent, which is then investigated.

The number of properties effected can be determined using two methods. The most common method uses SWIMS to automatically count the properties effected. The other method involves greater manual intervention and is employed for trunkmain discontinuities where the properties effected are modelled creating pressure contours that are verified by the location of complaints and plotted into a GIS. This method is relatively conservative as areas where no complaint calls have been received are included within the area actually being effected. The overall count is considered to be fairly robust and is likely to slightly overestimate the number of properties effected as dead ends are also included in the shutdown count.

B.2 Water Pressure Standard Confidence

A number of measurements are taken to determine the count of properties that experience a low pressure incident. Each measurement has associated levels of error due to manual intervention and subjectivity in modelling inputs such as setting elevation contours, property boundaries, pressure recorders, system demands and system configurations.

The number of properties effected by a low pressure incident is derived from system modelling and confirmed complaints by consumers. Errors can occur in hydraulic modelling from incorrect assumptions for demand or pipe configurations that exist in the field. The accuracy of the model is increased however through verification and validation of model outputs with field data. Hunter Water has an extensive monitoring network used in ongoing model validation. The monitoring network includes pressure recorders, pressure gauges at pumping stations, flow meters, and reservoir levels. Approximately 240 pressure recorders have been placed in known or suspected low pressure areas. Over the last 12 to 18 months replacement pressure recorders have been purchased increasing the accuracy from +/- 1 metre to +/- 0.5 metre. Pressure recorders are placed within hydrants and can be approximately 0.5 metre above the main which results in a conservative pressure measurement being taken.

Hunter Water uses digital contour data purchased from NSW Department of Lands where urban areas are covered by 2 metre contours and rural areas are covered by 10 metre contours. Almost all of Hunter Water's area of operation is covered by the 2 metre contours, and as a result most points are within half a contour interval of the true level (that is, an accuracy of +/- 1 metre). The cadastral database that contains information on the location of properties has a horizontal accuracy of +/- 0.5 metres. This means that this has very little impact on the number of properties effected.

A total of 36 complaints by customers were verified by field tests during the year. This number was small and reflects Hunter Water's confidence in the robustness of the current models and monitoring techniques. The accuracy of models is generally within +/- 1 to 2 metres of actual system pressures. The software is in the process of being upgraded to use dynamic contours that will further increase accuracy.

B.3 Sewage Overflows Standard Confidence

Sewer overflows are only counted if consumers report them or they are identified by field staff. It is likely that the number of overflow events recorded is less than the number actually occurring. The counting of properties effected by an overflow can be difficult if significant time has passed since the event occurred and reliance is placed on the observations of field staff.

The occurrence of an overflow event is determined by field staff and called off in AOMS by dispatch along with the response time. The number of properties effected, for compliance against the Customer Charter, is determined by field observations. A daily report is sent to Assets Information and exception reporting is used within AOMS to identify where two or more overflows have been experienced on a property at the same time and possible errors may be present.

The method used for determining the number of overflow events recorded is likely to be quite accurate. It is logistically difficult to improve the proportion of events captured given the time delays that can occur.

Appendix C

System Performance Indicators
Report

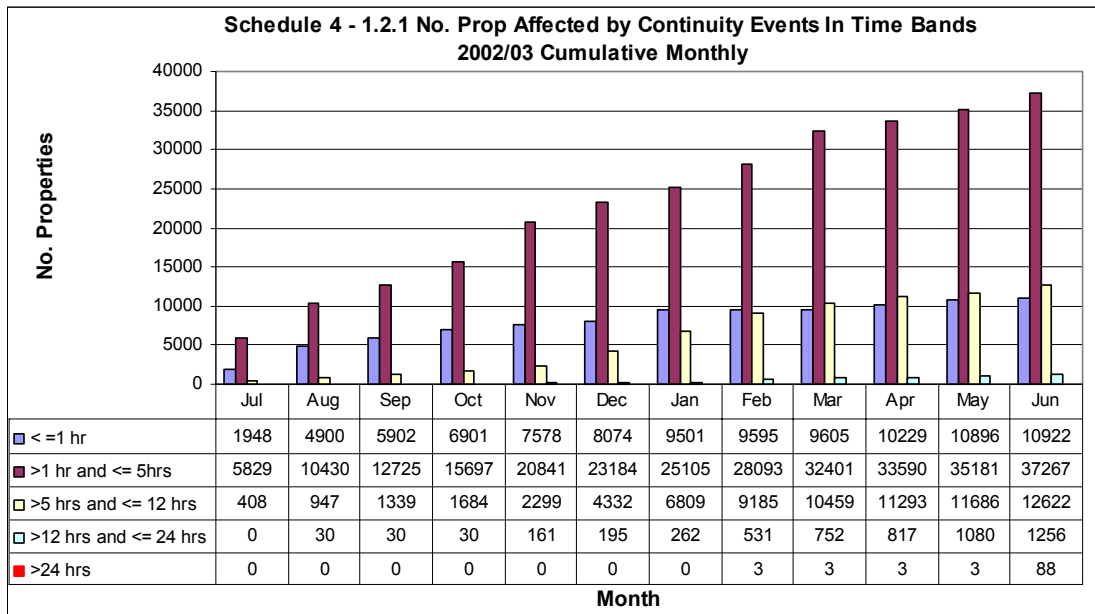
Appendix C: HWC System Performance Indicators (Schedule 4) For 2002/03 Financial Year

The following system performance indicators are specified under the Hunter Water Corporation Operating Licence as set by IPART. The Corporation is required by the Licence to report its performance against these indicators.

Clause 1.2: Water Interruptions

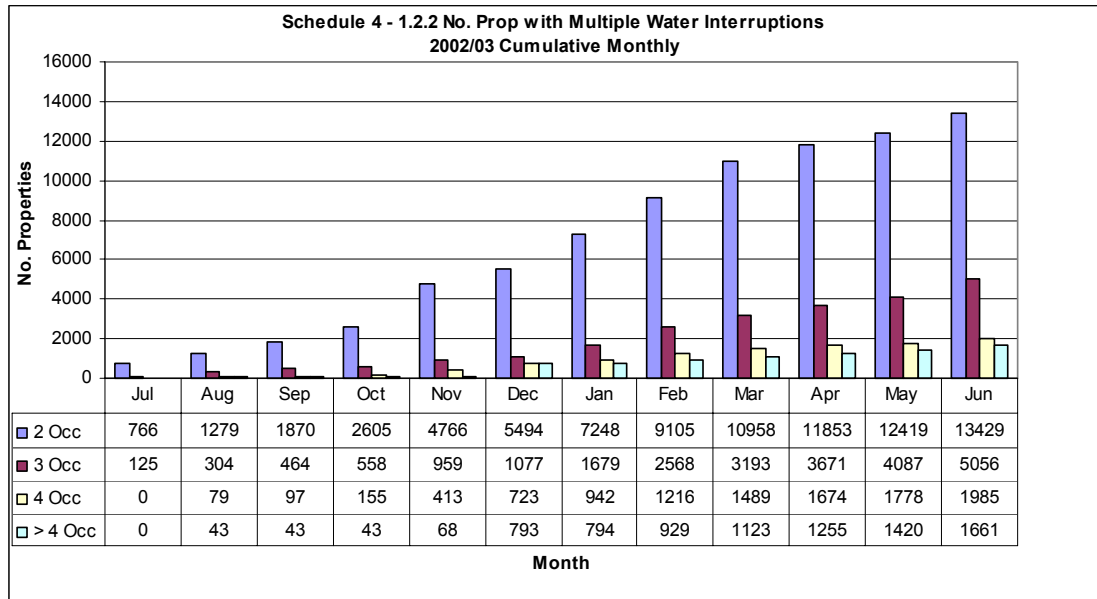
Clause 1.2.1 Number of Properties effected by Planned and Unplanned water interruptions where the cumulative duration of the interruption is:

- a) Less than 1 hr (≤ 1 hr);
- b) Between 1 and 5 hrs (> 1 hr & ≤ 5 hrs);
- c) Between 5 and 12 hrs (> 5 hrs & ≤ 12 hrs);
- d) Between 12 and 24 hrs (> 12 hrs & ≤ 24 hrs); and
- e) More than 24 hrs (> 24 hrs).

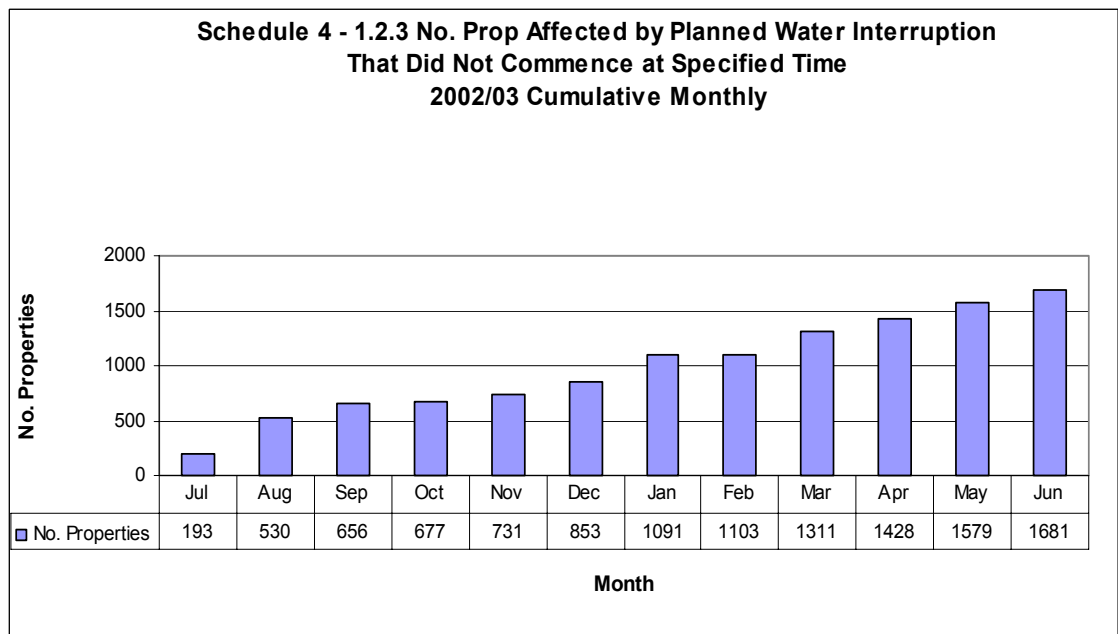


Clause 1.2.2 Number of Properties effected by Water interruptions (whether a Planned or an Unplanned water interruption):

- a) On two occasions;
- b) On three occasions;
- c) On four occasions; or more



Clause 1.2.3 Number of Properties effected by a Planned water interruption that did not commence at the time specified in the notice.



Water interruptions are generally caused due to the need to shut down watermains for purposes of either undertaking repairs due to operational problems or alternatively for issues such as the creation of new connections or extension of services. By far the greatest number of supply interruptions in Hunter Water's operational area are a result of operational problems and as such the work is often reactive in nature and shut down notices cannot be provided beforehand. For issues such as new connections, extension to new services etc the work can be programmed in advance and notices given to effected customers. It is generally these types of works which are undertaken by way of planned shutdowns.

Watermain breaks and leaks are generally reported to Hunter Water by members of the community and based on information collected at the time of the call these can be categorised as a Priority 1, 2 or 3 maintenance task. Generally Category 3 maintenance tasks are designated that way because the nature of the leak is minor and there is a very high probability the work to repair the main can be undertaken without necessitating a watermain shutdown. That is, a repair clamp can be inserted on the main under pressure. From this perspective category 3 maintenance tasks are often scheduled for times which may be days after the initial call.

Category 3 jobs are therefore considered to be scheduled jobs in terms of our work allocation for resource management but they are not deemed to be planned jobs in the context of planned or unplanned shutdowns for customers. As such they have not been incorporated into these statistics.

Clause 1.2.4 Detail of events where 250 or more properties were effected in a single event by either a Planned or an Unplanned water interruption either of which is longer than five hours.

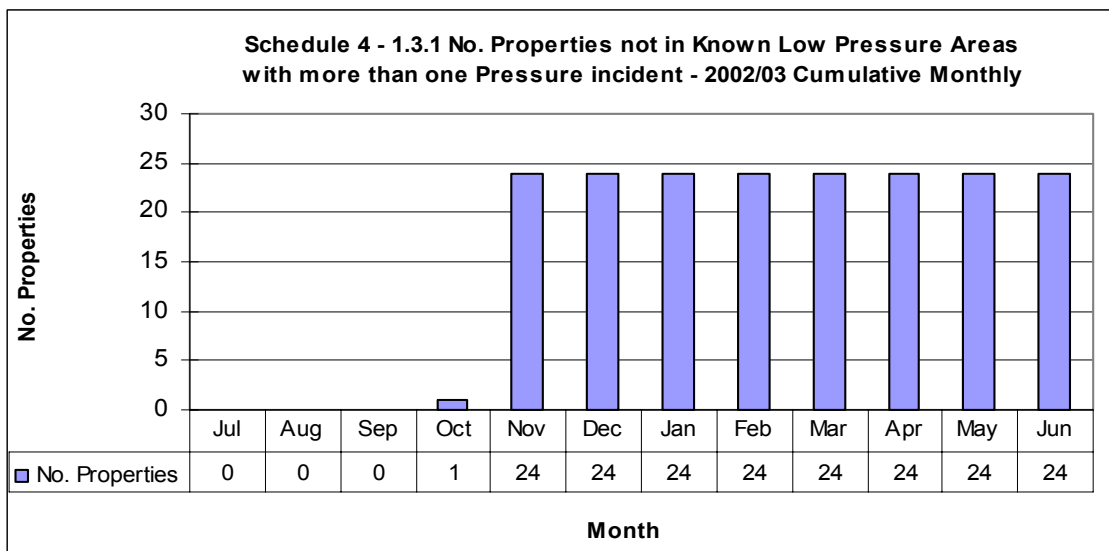
Job No	Date of Interruption	Location	No. Properties	Duration (hrs)
115728	10 Jan 2003	Tyrrell St, Wallsend	1004	7.0
109079	1 Feb 2003	Violet Town Rd, Tingira Heights	458	6.0
118613	10 Feb 2003	Floraville Rd, Floraville	502	9.8

- The Tyrrell Street, Wallsend interruption was caused by a break in a 300 millimetre cast iron watermain located at the corner of Cowper and Union Street, Wallsend. The break was caused by corrosion resulting in a piece of pipe blowing out. The 300 millimetre main is the sole feed to the properties in Wallsend and Maryland that were out of water until the break was repaired.
- The Violet Town Road, Tingira Heights interruption was the result of two concurrent breaks, possibly due to a water pressure spike, in the 150 millimetre cast iron watermain supplying this area. This is an unusual operational scenario. The majority of the properties impacted were supplied from the section of main that was isolated by the two shutdowns required. Both breaks were longitudinal fractures requiring removal and replacement of the broken pipe.

- The interruption to Floraville Road, Floraville was caused by a break in a 300 millimetre cast iron pipe in the Pacific Highway, Jewells. The main is the main feed to the elevated areas of Floraville with the back-up main not having sufficient capacity to supply this area in periods of elevated demands. The break was caused by a horizontal split originating from an area of corrosion. The main was repaired by removing and replacing the section of pipe.

Clause 1.3:Water Pressure

Clause 1.3.1 Number of Properties not in a low pressure area that experienced more than one Pressure incident in a financial year.

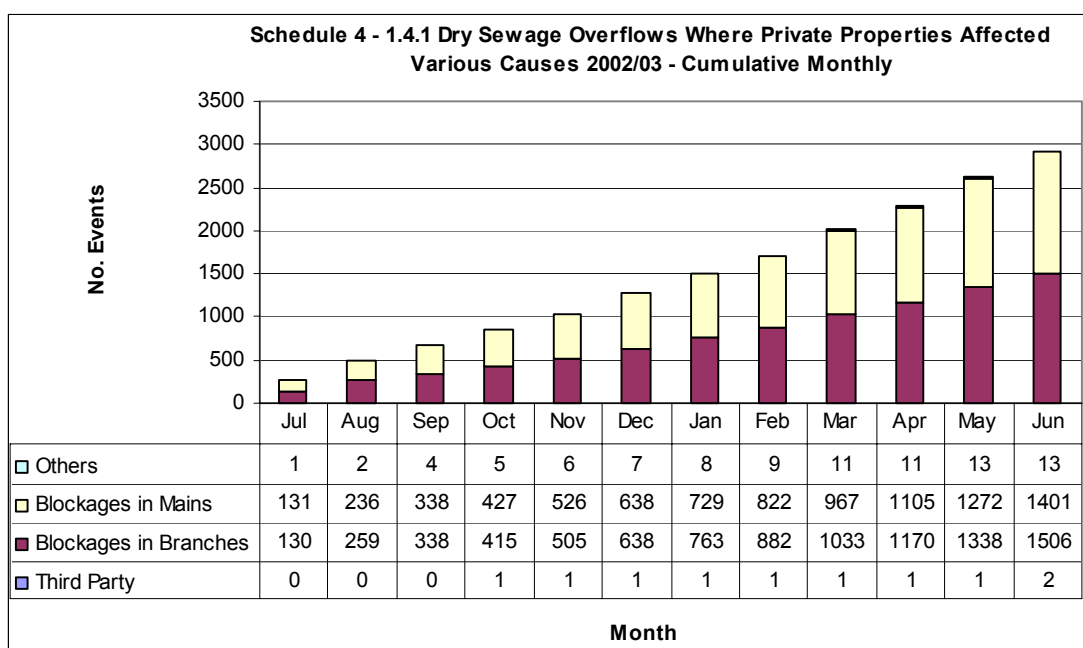


The table above shows a very low level number of properties outside known low pressure areas experiencing more than one pressure incident. The increase in the number of properties, albeit very small in percentage terms, that occurred in November is due to the fact that over the course of 2002/03 our highest demands occurred in November. It is high demands across the water distribution network which will drive pressure complaints.

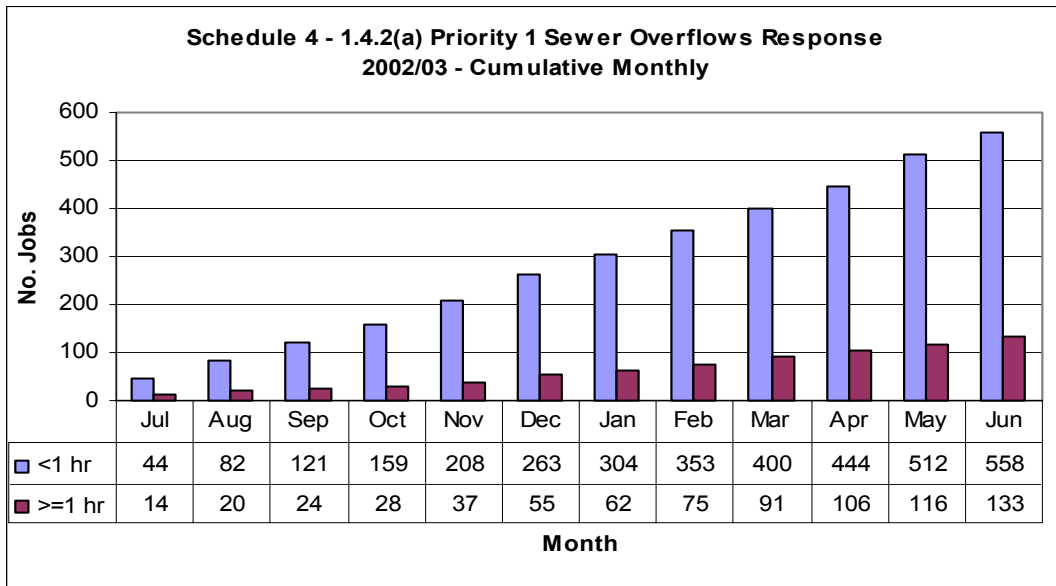
Clause 1.4: Sewage Overflows

Clause 1.4.1 Number of Uncontrolled sewage overflows (other than on Public land) in dry weather caused or resulting from:

- a) A blockage in the main pipe
- b) A blockage in a branch pipe
- c) Third party damage; or
- d) An event other than one described in (a), (b) or (c)

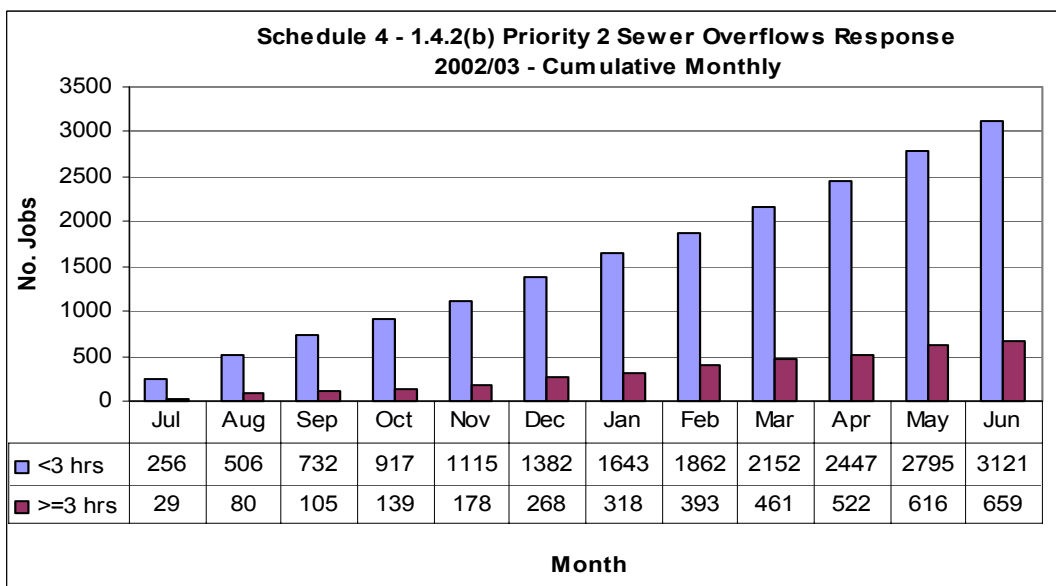


Clause 1.4.2 (a) Number of Priority 1 sewage overflows to which it responded in less than one hour and those to which it responded in more than one hour.



Of the events that were not responded to within the 1 hour period the vast majority (110) were responded to inside two hours. A small number took three to four hours with 3 jobs being in excess of four hours.

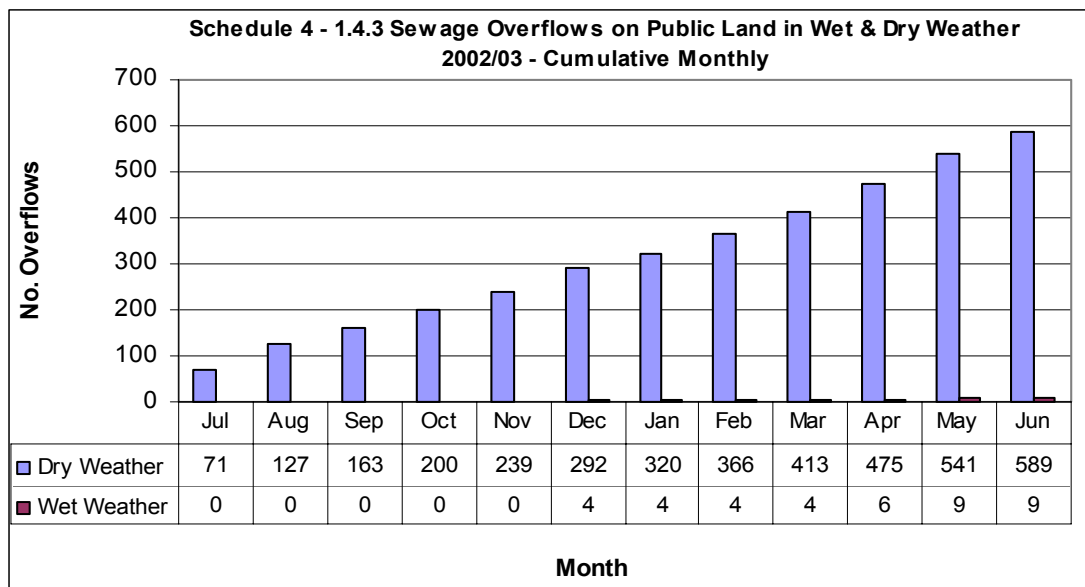
Clause 1.4.2 (b) Number of Priority 2 sewage overflows to which it responded in less than three hours and those to which it responded in more than three hours.



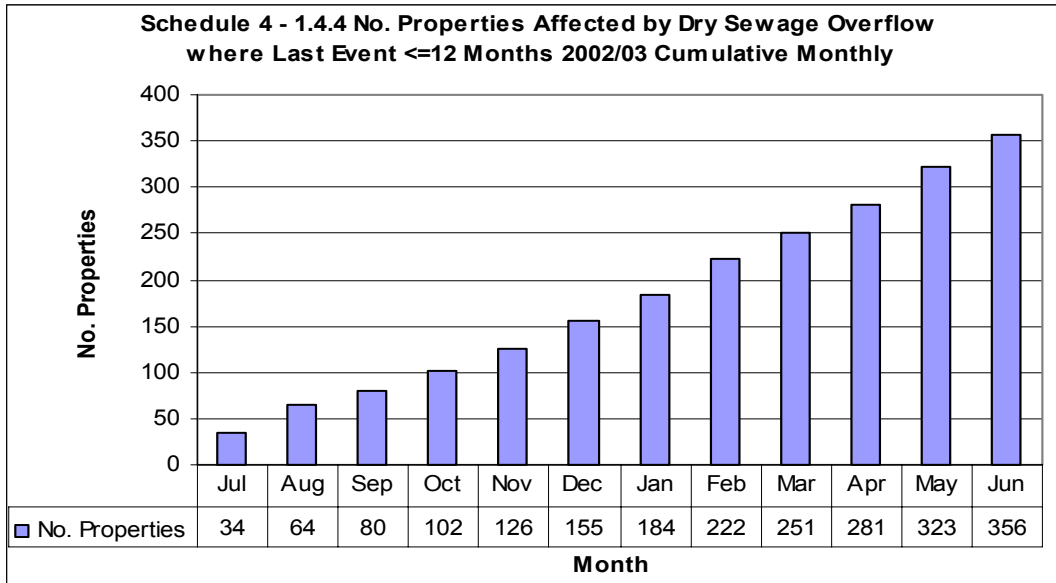
Within our maintenance service agreements there is a requirement to respond to Priority 2 sewer overflows within a 3 hour period where these are called in within normal working hours. Where Priority 2 jobs are reported to Hunter Water outside of normal working hours they are responded to the next working day. Generally a priority 2 job will be a minor sewer overflow which is very localised. They do not have any significant environmental impact nor do they provide significant inconvenience to customers. Given the type of assets from which priority 2 events will occur the overflows are generally of small volume and intermittent in nature.

It is for this reason that there are a significant number of Priority 2 jobs which show a response time in excess of 3 hours.

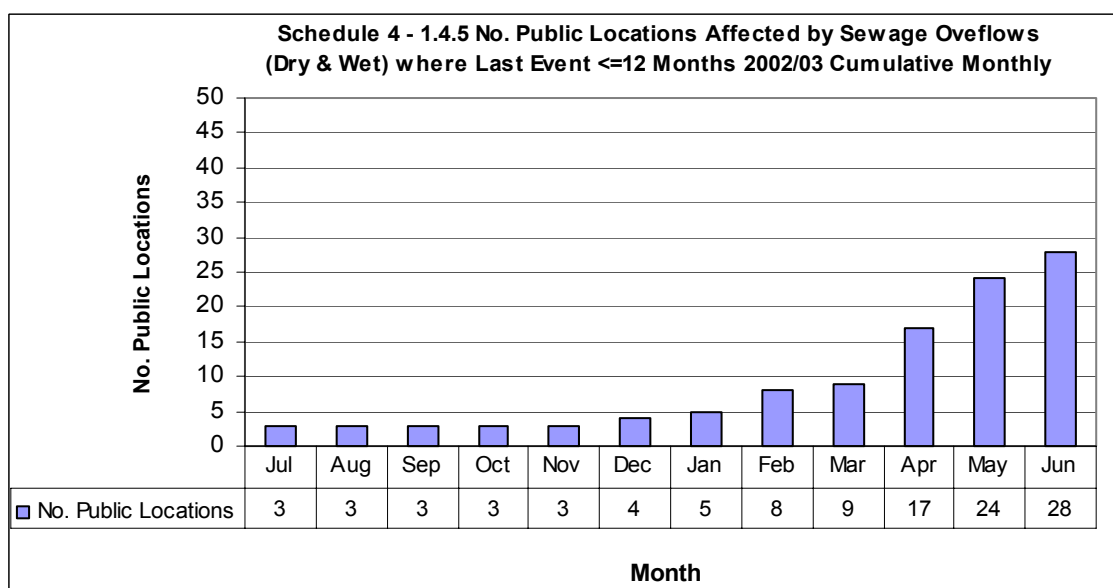
Clause 1.4.3 Number of Uncontrolled sewage overflows on Public land that occurred in dry weather and in wet weather.



Clause 1.4.4 Number of Properties effected by an Uncontrolled sewage overflow in dry weather where the period since the last Uncontrolled sewage overflow in dry weather on that property is less than 12 months.



Clause 1.4.5 Sewage overflow (whether an Uncontrolled sewage overflow or otherwise and whether occurring in dry weather or wet weather) where the period since the last sewage overflow on that Public land is less than twelve months (note: The precise overflow locations on Public land necessary for this indicator have only been recorded in our database since 1 July 2002 – we would therefore expect figures for this indicator to be higher in future years as there is now a complete 12 month record against which to assess).



Appendix D

Environmental and ESD Indicators

ENVIRONMENTAL AND ESD INDICATORS REPORT 2002-03



caring for our
community and the
environment

HUNTER WATER CORPORATION
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In accordance with section 9.2 of Hunter Water's Operating Licence, Hunter Water developed a draft list of environmental and ESD indicators. In developing the list of indicators the Corporation had regard to the Commonwealth State of the Environment reporting system and the Australia State of the Environment environmental indicator report series produced by Environment Australia.

The draft Environmental and ESD Indicators were available for public comment from 14 August to 16 September 2002. Hunter Water's Community Consultative Forum had early input into the development of the draft Environmental and ESD Indicators as part of the consultative process. The Community Consultative Forum comprises representatives from business, community, environmental, catchment management and landcare groups from the lower Hunter region.

The forum meets quarterly and provides a vehicle for the Corporation to involve a wide range of interest groups in discussion of current and future initiatives.

The Minister for Energy and Utilities (the Hon Frank Sartor, MP) approved the final set of indicators in May 2003 and these were then published on the internet (see www.hunter.com.au). This report against the Environmental and ESD Indicators has been produced in accordance with the Operating Licence.

For further information on Environmental and ESD Indicators for 2002-03 please refer to the Community and Environmental Annual Report, which is available on Hunter Water's website at www.hunter.com.au

FULL SET OF HUNTER WATER CORPORATION ENVIRONMENTAL / ESD INDICATORS

WATER RESOURCES

ENVIRONMENTAL INDICATOR	MEASUREMENT	COMMENT	STATUS 2002 - 2003
<p>Compliance with the Operating Conditions (Section 4), Monitoring and Reporting Conditions (Section 5) and Management Plan (Section 6) of the Water Management Licence (WML) issued under the Water Act.</p>	<p>Annual report on compliance and any reports of non-compliance to the Department of Land and Water Conservation.</p>	<p>This indicator is important as it reports on Hunter Water's compliance with the Water Management Licence issued by DLWC. Compliance with this licence ensures we extract water in a sustainable manner.</p>	<p>Hunter Water has operated its water extraction activities under a WML since 1998 and complied fully with the requirements of that licence. However, in 2002 one extraction provision of the Anna Bay licence was exceeded due to higher than expected water demand in that area at a time when the sandbeds were the only source of potable water. The water levels in the aquifer were high during this short period and as a result there were no negative impacts on the aquifer or the environment. The Tomago to Tomaree pipeline (under construction before the breach occurred) was recently commissioned, which reduced reliance on this aquifer. As the Tomaree Peninsula is now interconnected with our primary water distribution system, similar breaches of the WML should be avoidable in the future, as extraction can be balanced between the sources.</p>
<p>Catchment Management</p>	<p>Key indicators from the annual Catchment Management Report (See Operating Licence, Section 10.1).</p>	<p>This indicator is important as it is a measure of the health of the catchment where the Corporation obtains its raw water.</p>	<p>The Catchment Report 2002-03 will be published on the web in September 2003. During 2002-03, available storage, water availability and water quality conditions permitted the transfer of 21,241 ML of water from the Williams River to Grahamstown Dam. Key catchment activities have included:</p> <ul style="list-style-type: none"> • Commencement of construction at Bandon Grove Fishway which is scheduled for completion by the end of 2003. • Another hydroelectric power station has been installed in the pipeline that transports water from Chichester Dam to Dungog water treatment plant. • Hunter Water, working in conjunction with HCMT, is proposing to establish a demonstration site for best practice riparian management around Seaham Weir Pool. <p>In 2002-03 the Corporation extracted water from its works in accordance with the Water Management Licence for Chichester Dam, the Williams River and Tomago Sandbeds. However, due to higher than expected water demand in the Tomaree Peninsula a greater volume of water than permitted by the Licence was extracted from the Anna Bay aquifer. The water levels in the aquifer were high at the time and no adverse environmental impacts have been observed.</p> <p>The Corporation also continues to satisfy the requirements of the Dams Safety Act. With generally favourable water quality coupled with ongoing appropriate catchment management actions and a multi-barrier approach to water quality protection, the Corporation's source water catchments should continue to provide suitable quality water for the region's requirements for the foreseeable future.</p>

FULL SET OF HUNTER WATER CORPORATION ENVIRONMENTAL / ESD INDICATORS

WATER RESOURCES

ENVIRONMENTAL INDICATOR	MEASUREMENT	COMMENT	STATUS 2002 - 2003
Environmental releases from Chichester Dam	Annual flow volume in the Chichester River at Chichester Dam when dam is not spilling to be expressed as a proportion of flow requirements specified in Water Management Licence, cl 4.3 for period when there is no flow over spillway. To be also expressed as a percentage of inflows passed in the dam as translucent environmental flows.	These environmental releases are important to protect the sensitive ecological processes in the Williams River.	Annual flow volume in Chichester River at Chichester Dam when the dam is not spilling is expressed as a ratio of flow requirements specified in WML. The actual release/required releases equals 410% and this complies with the WML for environmental releases. Annual flow is expressed as a percentage of inflows passed in the dam (ie a translucent environmental flow). The actual release/actual inflow equals 46%. Greater releases than required was due to discretionary releases from Chichester for the purpose of drawing the dam level down to make it safe for dam wall remedial works. In a normal year actual would be much closer to required than this year, and not spilling releases would be a much smaller proportion of not spilling inflows.
Extraction of water at Chichester Dam	Annual extraction volume as proportion of Water Management Licence limit (cl 4.2) Graphical five year trend	This is an important measure as it demonstrates Hunter Water's impact on the river system in relation to the total amount of water we extract from the river at Chichester.	27,532 ML were extracted at Chichester Dam.
Extraction of water from Tomago aquifer	Annual extraction volume as proportion of Water Management Licence limit (cl 4.11) Maximum daily extraction level as proportion of maximum daily limit in cl 4.11 of the Water Management Licence. Average daily extraction level as proportion of maximum. Graphical five year trends	This indicator is critical in terms of achieving sustainable extraction of water from the Tomago aquifer.	15,729 ML were extracted from Tomago sandbeds.
Extraction of water from the Williams River	Annual extraction volume including total flow and total extraction by Hunter Water Corporation.	This indicator is a measure of the total water extracted from the Williams River and is an indicator of the Corporation's potential impact on the river.	10,650 ML were extracted from the Williams River at Boags Hill, Seaham Weir.
Extraction of water from Anna Bay aquifer	Annual extraction volume as proportion of Water Management Licence limits (cl 4.16)	Also important in terms of achieving sustainable extraction of water from the aquifer.	3,224 ML were extracted from Anna Bay aquifer.

FULL SET OF HUNTER WATER CORPORATION ENVIRONMENTAL / ESD INDICATORS

WATER RESOURCES

ENVIRONMENTAL INDICATOR	MEASUREMENT	COMMENT	STATUS 2002 - 2003
Water levels in Seaham Weir Pool	Report on Seaham Weir Pool water levels and compliance with the Seaham Weir Pool Operating Plan administered by the Department of Land and Water Conservation.	This indicator enables the variation in Seaham Weir Pool to be reported. It also indicates the number of days the weir pool level exceed those required by the Seaham Weir Pool Operating Plan.	Hunter Water will be reporting to the Department of Land & Water Conservation (now Department of Infrastructure, Planning & Natural Resources) compliance with the Seaham Weir Pool Operating Plan. Levels in the weir pool rose above normal operating level only during flow events. Gates were placed in "normal" operations (as compared to drainage mode) only when pumping was planned or actually occurred at Balickera.
Mean monthly water table levels at Tomago	Mean water table levels as required by Water Management Licence, cl 4.13 compared to 1.0m reference level. Comments on strategies if below 1.0m level. Graphical five year trend.	This indicator helps to measure the impact water extraction has on the sensitive ecosystems associated with the aquifers.	With respect to the last twelve months, the Tomago aquifer was at a near-full condition at July 2002, showing a net decline in level over the spring-summer-autumn period. Two distinct recharge events are observed. As at June 2003, watertable level was within 0.8m of the full level. Spatially-weighted watertable level for the Tomago Sandbeds is not required to be calculated under Hunter Water's Water Management Licence until watertable level at a number of key points fall below certain levels.
Mean monthly water table levels at Anna Bay	Mean water table levels in accordance with Water Management Licence cl 4.16 compared to extraction rate reference levels. Comments on strategies if below 1.0m level. Graphical five year trend.	This indicator helps to measure the impact water extraction has on the sensitive ecosystems associated with the aquifers.	With respect to the last twelve months, the Anna Bay aquifer was at about 70% of its capacity at July 2002. Watertable level decline over a dry warm season period. Heavy rain in April/May 2003 caused a recovery in watertable levels to around 65% from a summer low point of about 55%. Spatially-weighted watertable level for the Anna Bay Sandbeds is not required to be calculated under Hunter Water's Water Management Licence.
Movement of salt water interfaces at Anna Bay	Graphical representation of quarterly movement in salt water interface. Water Management Licence, cl 4.16 (f) and (g).	This indicator measures the sustainability of water extraction in relation to preventing salt water intrusion into the aquifer.	Groundwater from the Anna Bay Sandbeds discharges to Port Stephens at Shoal Bay, and excessive drawdown of the fresh groundwater level can lead to intrusion of saline groundwater from off shore. For the last twelve months, saline groundwater was detected at the most oceanward monitoring piezometer and did not intrude any more than 100m inland from this point. This observation is typical of other observations over the last four years. Groundwater from the Anna Bay Sandbeds discharges to Port Stephens at Fingal Bay as well, and excessive drawdown of the fresh groundwater level can lead to intrusion of saline groundwater from off shore. For the last twelve months, saline groundwater was not detected at the monitoring bores. This observation is typical of other observations over the last four years.
Residential sector water use	Measured as Kilolitres / household / annum (5 year rolling average)	This indicator measures household water consumption. It is important as a critical part of the Corporation's demand management strategy is targeted at sustaining low residential water consumption.	41,953 ML 5 Year rolling average: 37,618

FULL SET OF HUNTER WATER CORPORATION ENVIRONMENTAL / ESD INDICATORS

WATER RESOURCES

ENVIRONMENTAL INDICATOR	MEASUREMENT	COMMENT	STATUS 2002 - 2003
Commercial sector water use	Measured as total Megalitres / annum (5 year rolling average)	This indicator measures commercial water consumption. It is important as a critical part of the Corporation's demand management strategy is targeted at sustaining low commercial water consumption.	11,249 ML 5 Year rolling average: 10,772
Industrial sector water use	Measured as total Megalitres / annum (5 year rolling average)	This indicator measures industrial water consumption. It is important as a critical part of the Corporation's demand management strategy targeted at sustaining low industrial water consumption.	8,927 ML 5 Year rolling average: 10,366
Total Water Supplied	Measured as total kilolitres of water supplied to customers. (5 year rolling average)	This is an important indicator as it measures water extracted from all sources to supply all customers.	Five year rolling average is 62,261ML. In 2002-03 total metered water consumption was 65,967ML due to hot/dry conditions and growth in our customer base.
Water Restrictions	Number of days/year when water restrictions are imposed on customers.	This indicator measures impact on the community relating to drought management.	Nil water restrictions were imposed on customers.
Non-revenue water (water loss)	In ML and % of source supply per year. Separate into components.	It is important to include this as an indicator as it measures water that can be lost due to leaks, fire fighting, flushing etc.	Real losses from Hunter Water's system were 7,919ML and a slight improvement on the previous two years. This involved: total authorised consumption 66,407ML; water losses 11,220ML; apparent losses 3,301ML; real losses 7,919ML; real losses per connection per day 106 litres; real losses per connection/m pressure 2.11 litres. In accordance with our Operating Licence (OL), non-revenue water is defined as per the Water Service Association of Australia benchmarking of water losses (refer to Section 8 of the OL). The Water Loss Management manual is to be revised by December 2003. Night flow analysis of the water supply system has not revealed any significant leaks. Minor leaks have been scheduled for repair. There have been no major advances in leak detection technology in the last year.

FULL SET OF HUNTER WATER CORPORATION ENVIRONMENTAL / ESD INDICATORS

WASTEWATER

ENVIRONMENTAL INDICATOR	MEASUREMENT	COMMENT	STATUS 2002 - 2003
Compliance with EPA wastewater treatment plant conditions	Flow weighted compliance as reported for Open Board	It is important to measure and report against EPA licences as this is an indicator of Hunter Water Corporation's potential impact on the environment by wastewater treatment works.	<p>Of 1469 samples collected 1438 complied with the 90 percentile concentration limits. This equates to 97.9% compliance, compared with 98.0%, 99.5%, 99.4% and 99.5% for 01-02, 00-01, 99-00 and 98-99 respectively.</p> <p>2002-03 also saw the introduction of load-based limits for eight WWTW. Out of 40 load limit conditions applied across the eight plants, 34 were complied with for the year. The main areas of exception were at the Cessnock and Kurri plants which are scheduled to be upgraded or have recently been upgraded.</p> <p>Of the 15 annual licence returns submitted to the EPA in 2002-03, 9 were in full compliance with the conditions specified in the relevant licences, one plant reported a technical noncompliance in terms of a missed sample, while the remainder had minor quality or quantity exceedances. As indicated above, the main areas of exception were at the Cessnock and Kurri plants which are being upgraded.</p>

Effluent quality	Exceedances for BOD, NFR, Grease & Oil, P and N as produced for Open Board	In relation to EPA licence requirements, effluent quality is the best indicator of potential environmental impact on waterways from treatment plants.	<p>BOD: there were four 90 percentile licence exceedances. NFR: there were sixteen 90 percentile licence exceedances. Grease, oil and total nitrogen: there was full compliance. Total Phosphorus: there were six 90 percentile exceedances. A number of wastewater treatment works suffered significant algal blooms during the year which led to a number of exceedances for NFR, BOD and Total Phosphorus. For all other exceedances there were no observable adverse environmental impacts.</p>
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Sewage Treatment	Number and capacity of wastewater treatment plants by level of treatment.	This indicator is used to report on the potential impact of wastewater treatment works by level of treatment (primary, secondary, tertiary).	Plant Name	Treatment Level*	Capacity in EP
			Belmont	Secondary	85,000
			Boulder Bay	Tertiary	45,000
			Branxton	Tertiary	4,200
			Burwood Beach	Secondary	220,000
			Cessnock	Tertiary	26,000
			Dora Creek	Tertiary	16,000
			Edgeworth	Tertiary	70,000
			Farley	Tertiary	50,000
			Karuah	Tertiary	2,500
			Kearsley	Secondary	2,000
			Kurri Kurri	Tertiary	21,500
			Morpeth	Tertiary	60,000
			Paxton	Tertiary	1,000
			Raymond Terrace	Tertiary	24,500
Shortland	Tertiary	40,000			
Tanilba Bay	Tertiary	10,000			
Toronto	Tertiary	42,000			

*Level of treatment based on Water Services Association of Australia definitions

Bathing beach water quality	Key indicators from Beachwatch data	This indicator is important as it is an indirect measure of the Corporation's coastal wastewater treatment performance.	All beaches monitored by Hunter Water complied with faecal coliform bathing guidelines in the summer bathing period 2002-03. All beaches except one complied with enterococci guidelines over the summer bathing period. Compliance at Swansea Heads Little Beach was achieved 90% of the time.
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FULL SET OF HUNTER WATER CORPORATION ENVIRONMENTAL / ESD INDICATORS

WASTEWATER

ENVIRONMENTAL INDICATOR	MEASUREMENT	COMMENT	STATUS 2002 - 2003
Recycled water	<p>Direct and indirect reuse as currently calculated.</p> <p>Proportions of total average dry weather flow.</p> <p>Graphical five-year trend representation</p>	<p>This indicator is a key part of the Corporation's demand management strategy as it measures the amount of effluent provided to industry and agricultural uses as a replacement for potable water.</p>	<p>Hunter Water reused 8% of average dry weather flows produced by wastewater treatment plants in 2002-03. This is slightly lower than recent years where effluent reuse has fluctuated between 9-11%. Figures are highly dependent on rainfall. Industry continues to be the major reuser, consuming about 40% of effluent recycled over 2002-03. This is less than the past five years where the average proportion was 70%. A new water recycling management system is being developed (50% complete) to consolidate, streamline and document Hunter Water's recycling initiatives.</p>
Biosolids Reuse	<p>Annual tonnage (dry tonnes) and proportions of dewatered biosolids available for reuse.</p> <ul style="list-style-type: none"> • Recycled for agriculture or mine rehabilitation. • Municipal waste minimisation (co-composting/vermiculture) • Disposed of to landfill. • Other reuse. <p>Graphical five-year trend representation.</p>	<p>Important measure of the amount of biosolids that are beneficially reused for landscaping, agriculture etc from Hunter Water's wastewater treatment works.</p>	<p>During 2002-03 Hunter Water produced 4,823 dry solid tonnes of dewatered biosolids, 3,990 dst were beneficially reused, the rest was stockpiled for future reuse. In 2002-03 biosolids were reused in: minesite rehabilitation 81%; agriculture 8%; pasture/tree trials 6%; co-composting 5%.</p> <p>The amount of biosolids dewatered during 2002-03 is comparable to 2001-02, however in the last five years the production of dewatered biosolids has increased as plants have been upgraded with improved wastewater treatment technology and greater capture of solids.</p>
Sewer transport system performance (wet and dry weather surcharges)	<ul style="list-style-type: none"> • Sewer surcharges (no. and no./km main) • Surcharges to private land (no. & proportion of customers affected) • Repeat sewer surcharges to public land locations whether occurring in wet or dry weather (See Schedule 4, Section 1.4.5 of HWC's Operating Licence) 	<p>This indicator measures and reports on surcharges from the sewer transport system. It is an indicator of the impact on both the environment and customers. Reference should be made to Hunter Water Corporation's Operating Licence, Schedule 4, Section 1.4 regarding detailed reporting requirements for sewage overflows.</p>	<p>Confirmed sewage overflows affecting private land was 2,961. Overflows per kilometre was 0.66. The number of private lands subject to a confirmed sewage overflow was 2,860 which equals 1.49% of the customer base.</p> <p>Number of public locations affected by more than one sewage overflow in 2002-03 was 28.</p>
Trade waste incidents within the sewerage system	<p>Number & five-year trend representation</p>	<p>This indicator provides a measure of the impact of contaminants on HWC's sewerage system.</p>	<p>There were two trade waste incidents involving the discharge of hydrocarbons to the sewerage system. These incidents were responded to and the situation rectified.</p>
Odours	<p>Treatment plant and transport system complaint numbers and trends</p>	<p>This indicator gives a measure of the impact of odours from HWC's wastewater transport and treatment systems on the local community.</p>	<p>In 2002-03 there were 166 complaints; a slight increase on the average of 139 complaints over the last five years. The increase was due to a prolonged hot, dry spell which tends to accelerate septic conditions within the sewerage system resulting in odours.</p>
Chemical Collection	<p>Requests for collection:</p> <ul style="list-style-type: none"> • From customers (no. & per 100,000 households) • From catchment areas <p>Tonnage of waste collected</p> <p>Graphical five year trend representation and cumulative visits and tonnages.</p>	<p>This indicator is used to measure the amount of requests for the collection of environmentally damaging chemicals.</p>	<p>Hunter Water continued its free household chemical collection campaign, with 328 requests for the service (165 requests per 100,000 households), 3.7 tonnes of chemicals were collected in 2002-03.</p>

FULL SET OF HUNTER WATER CORPORATION ENVIRONMENTAL / ESD INDICATORS
CUSTOMERS AND COMMUNITY

ENVIRONMENTAL INDICATOR	MEASUREMENT	COMMENT	STATUS 2002 - 2003
Customer survey perceptions	Overall performance rating Community acceptance of water supply standard Community support for water conservation Community acceptance of household sewage disposal service	This indicator is used to measure and report on community perceptions in relation to social, ecological and environmental issues. This survey is conducted every 2 years.	2003 Perception Survey Results Overall performance rating 91% commercial and 92% domestic rated overall performance as excellent / good / or fair. Community acceptance of water supply standard 90% domestic and 89% of commercials agreed with statement that 'water supplied is of an acceptable standard.' Community support for water conservation 86% of domestic customers and 90% of commercial customers surveyed agreed with the statement 'there is a genuine need for Hunter community to do more to conserve water.' Community acceptance household sewage disposal service 86% of domestic customers agree with the statement that 'HWC household sewage disposal service is satisfactory.' Note: As part of Hunter Water's Perception Survey there were 500 face-to-face interviews (350 domestic and 150 commercial) between 16 May 11 June 2003.

Environmental Education	This will be a qualitative measurement of environmental education initiatives run by Hunter Water	This indicator is used to provide a qualitative description of environmental education programs run by Hunter Water.	<ul style="list-style-type: none"> • In 2002-03 Hunter Water continued to promote community ownership and responsible use of water resources through public education programs including 'Catchment Day' (held during National Water Week). Hunter Water also targeted schools, tertiary education institutions and community groups through tours and school/community presentations. • In 2002-03 a broad-based community awareness campaign focusing on water conservation was publicised through the media and promoted at community events (including the National Maritime Festival, Newcastle Show, Dungog Autumn Festival, Surfest, Tocal Field days and Festival of Whales). • In 2002-03 stormwater education programs were conducted in partnership with Cessnock, Lake Macquarie and Newcastle City Councils. One of the most successful was the 'Streets to Creek' project in the Lambton sub-catchment involved installing stormwater pollution traps, community information days and the official renaming of the stormwater creek running through Lambton Park (now known as Ker-rai Creek). • In 2002-03 Hunter Water continued to sponsor local Council's environmental education programs and school environment awards.
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FULL SET OF HUNTER WATER CORPORATION ENVIRONMENTAL / ESD INDICATORS

STORMWATER

ENVIRONMENTAL INDICATOR	MEASUREMENT	COMMENT	STATUS 2002 - 2003
Stormwater Environmental Improvement Program	Progress against implementation of the program.	This provides a qualitative description of progress with stormwater improvements by Hunter Water in accordance with the established Stormwater Environmental Improvement Program.	<p>Current initiatives include stormwater education and community awareness in the Lambton sub-catchment of Throsby Creek and the Kotara Roof to Creek stormwater recycling project with Newcastle City Council.</p> <p>Hunter Water has combined with local Government and the Hunter Catchment Management Trust (HCMT) to promote stormwater education in various catchments in our region.</p> <p>Hunter Water has supported the Waterwatch Program involving Hunter schools monitoring the health of our waterways in their local catchments and raising awareness of issues affecting water quality.</p> <p>Hunter Water supports research into water sensitive urban design. This currently involves:</p> <ul style="list-style-type: none"> • Research on rainwater tank designs and appropriate end uses of rainwater based on a review of water quality results from rainwater tanks. We are providing \$120,000 to an Australian Research Council grant with Newcastle University, Gosford and Wyong Water, Brisbane Water and the Lower Hunter Councils. This is a three year research project, currently in its second year. • The Kotara Roof to Creek stormwater project. Hunter Water is contributing \$44,000 to this joint Newcastle City Council/EPA initiative. This involves installing rainwater tanks within existing properties in an urban stormwater catchment and some appropriate landscaping. The project will assess the impact of installing rainwater tanks on both total reticulated water usage and also downstream stormwater flows.

CORPORATE RESPONSIBILITIES

Solid waste management	<p>Indicators included in the 'Waste Recycling and Purchasing Policy'</p> <p>Quantity of waste to landfill by HWC and contractors</p> <p>Proportion office paper recycled</p> <p>Proportion of construction waste recycled/reused</p>	<p>This indicator will measure and report on the quantity of waste that is recycled and reused and is important in terms of reducing the Corporation's impact on landfill.</p>	<p>An audit of Hunter Water Corporations WRAPP was undertaken in June 2003. The audit found that:</p> <ul style="list-style-type: none"> • The amount of recyclables in the general waste bins has reduced by 60% from the previous audit (2001). • The material that HWC currently recycles includes paper, cardboard, cans, bottles and printer/toner cartridges. • 80% of all office paper is recycled. <p>Other activities include:</p> <ul style="list-style-type: none"> • Reuse of soil during Grahamstown Reservoir (200 tonnes) and Kurri Kurri Waste Water Treatment Plant (over 100 tonnes) upgrades. • Tree planting at Morpeth Waste Water Treatment Plant used excavated soil from pipe maintenance projects mixed with biosolids. • Hunter Water Corporation has become part of the Newcastle City Council recycling collection system for bottles and cans. • Further opportunities for recycling of waste office material need to be investigated. • A data collection system to capture construction and demolition waste and recycling is to be developed.
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FULL SET OF HUNTER WATER CORPORATION ENVIRONMENTAL / ESD INDICATORS
CORPORATE RESPONSIBILITIES

ENVIRONMENTAL INDICATOR	MEASUREMENT	COMMENT	STATUS 2002 - 2003
Environmental training	<p>Proportion of staff receiving refresher training in 3yr cycle</p> <p>Proportion of new operations staff receiving environmental induction training.</p>	<p>This is important to ensure that HWC staff are aware of the Corporation's responsibilities and are able to minimise Hunter Water's environmental impact and in some cases help to restore the environment, eg Landcare projects.</p>	<p>88 staff trained during 2002-03 in environmental incident response including responsibilities, procedures, reporting requirements etc.</p>
Noise	<ul style="list-style-type: none"> No of breaches of Protection of the Environment Operations Act due to noise complaints. Number of validated noise complaints from the community due to Hunter Water activities. 	<p>This indicator measures the Corporation's noise impact on the community from any of its activities, eg pump stations, machinery etc.</p>	<p>There were no noise infringements for Hunter Water activities during 2002-03.</p>

ENERGY MANAGEMENT

Energy consumption in buildings	Total kWh (10 year trend)	It is important to measure and report on energy consumption as this is an important greenhouse issue.	2,216,930 kWh of energy was used in Hunter Water's buildings in 2002-03.
Energy efficiency of water and sewer services <ul style="list-style-type: none"> water cycle wastewater cycle 	<p>kWh per ML of water and per ML of sewage</p> <p>10 year trend</p>	<p>This is also an important indicator in relation to reducing greenhouse gases.</p>	<p>Energy usage for water services equals 458 kWh/ML.</p> <p>Energy usage for wastewater services equals 643 kWh/ML.</p>
Generation of Greenhouse Gases	Key Greenhouse gases to be measured in tonnes per annum due to electricity consumption.	It is important to report on the Corporation's production of greenhouse gas emissions associated with energy usage.	Electricity usage resulted in an estimated 69,746 tonnes of carbon dioxide generation.

FULL SET OF HUNTER WATER CORPORATION ENVIRONMENTAL / ESD INDICATORS
FINANCIAL AND SERVICE DELIVERY

ENVIRONMENTAL INDICATOR	MEASUREMENT	COMMENT	STATUS 2002 - 2003
Costs	<ul style="list-style-type: none"> total operating cost cost per property cost per ML water delivered cost per head of population 	Costs have been chosen as an ESD indicator as they form third part of the ESD triangle, ie the economic part with the others being social and environmental.	<p>\$59,378,000</p> <p>\$291.39</p> <p>\$904.35</p> <p>\$122.10</p>
Overall Service Delivery			
• Population in our area of operations	No. people residing in HWC area of operations 10yr trend	Population is a broad indicator of demand that can be placed on water & wastewater services	502,436 in Newcastle, Lake Macquarie, Maitland, Port Stephens, Cessnock
• Population supplied water	Residential estimate by census	Population is a broad indicator of demand that can be placed on water & wastewater services	485,554 in Newcastle, Lake Macquarie, Maitland, Port Stephens, Cessnock.
• Number served by treated water supply	residential estimate for areas served by treated water	Population is a broad indicator of demand that can be placed on water & wastewater services	485,554 in Newcastle, Lake Macquarie, Maitland, Port Stephens, Cessnock.
• Pop. supplied water & sewer	Residential estimate for people connected to water and sewer	Population is a broad indicator of demand that can be placed on water & wastewater services	468,880 in Newcastle, Lake Macquarie, Maitland, Port Stephens, Cessnock.
• Sewered population or population of water supplied population (%)	Residential estimate for sewerage areas of percentage of residential areas supplied water	Population is a broad indicator of demand that can be placed on water & wastewater services	96.9% of people served with water are also connected to the wastewater system.
Price	Measured in \$ per KL of water supplied to customers.	The SOE indicators include price as a demand management indicator. In this context price changes are assessed side by side with consumption indicators.	<p>IPART approved new water charges in May 2003, which continues a strong user pays incentive, that rewards water conservation and continues to ensure that the price of water reflects all costs related to the provision of water.</p> <p>Prices charged in 2002-03 were in accordance with IPART's 2002 determination.</p> <p>Residential water usage charges for 2002-03 are:</p> <ul style="list-style-type: none"> 93.9 cents/kL for metered consumption < 1000kL pa 86.4 cents/kL for metered consumption > 1000kL pa

GLOSSARY FOR ENVIRONMENTAL / ESD INDICATORS

AERATE Charge or treat with air or gas.	CATCHMENT An area of land that water travels through to reach the lowest point, usually a lake, river or ocean. Also commonly used to refer to areas that feed into dams, or to areas that are served by a sewerage or stormwater system.	DISINFECTION Destruction of pathogenic organisms that can cause infectious disease.	FILTRATION A process for removing particles from a solution by passing it through a porous structure or medium, such as a screen, membrane, sand or gravel.
ALGAL BLOOM Rapid growth of algae in surface waters often due to increases in temperature and nutrients such as nitrogen and phosphorus.	CLEANER PRODUCTION Business/industry program to reduce energy and water consumption and waste production through better management strategies and/or altering production techniques.	DUE DILIGENCE Guidelines for taking reasonable care in order to minimise any environmental impacts.	FISHWAY Fishways or 'fish ladders' help migrating fish over in-stream weirs or dams via a stairlike series of small ponds.
AMPLIFICATION Enlarge or increase capacity.	COAGULATION Adding a chemical to water/sewage to remove tiny suspended particles.	ECOLOGICALLY SUSTAINABLE DEVELOPMENT Using, conserving & enhancing community resources, so that the ecological processes on which life depends are maintained.	GREENHOUSE EFFECT The natural warming of the earth's atmosphere due to a concentration of trace gases in the atmosphere which retard the escape of heat radiation. The 'enhanced greenhouse effect' refers to the expected increase in the earth's temperature resulting from the increase in greenhouse gas concentrations released due to human activity.
AQUIFER Underground geological formations containing water.	COLIFORMS Non-pathogenic bacteria indicating microbiological water contamination.	ECOLOGY Relationship between organisms and their environment.	GREENHOUSE GASES Atmospheric gases which enhance the natural greenhouse effect, including carbon dioxide, methane & chlorofluorocarbons.
ASSETS Resources of a person or business such as real property and machinery. For water agencies like Hunter Water this includes dams, pipelines, pumping stations, and water and wastewater treatment plants.	CONSERVATION Management and protection of our resources so they are not degraded, depleted or wasted and are available on a sustainable basis for present and future generations.	EFFLUENT Final wastewater product after the purification process is complete.	GREY WATER Wastewater from your shower, bath, basin, laundry, kitchen, but not your toilet waste.
AUDITING Critically examine organisation's records of performance to see if they accurately reflect actual performance.	CONTAMINANTS Pollutants entering and mixing with water or wastewater, which may require further treatment before providing drinking water or disposing of effluent to waterways.	ENVIRONMENTAL RELEASES A release (flow) of water from a dam needed to maintain all aquatic biota & ecosystem processes.	GROUNDWATER All sub-surface water, such as artesian basins and sandbeds.
BEACHWATCH Branch of NSW EPA that is responsible for reporting ocean beach water quality.	DEMAND The total quantity of water that individuals, homes, businesses, institutions and industries seek to consume at the prevailing water prices.	ENVIRONMENTAL IMPACT STATEMENT Detailed report outlining the likely impacts of a proposed development and ways to minimise any impacts.	HARVESTING The collection of water from catchments for transportation to treatment works; followed by distribution to customers.
BIO-ACCUMULATION Where chemical substances in the environment build up in organisms, especially water and food sources.	DEMAND MANAGEMENT Strategies to reduce consumption of water and the need for new sources.	EROSION The process where the surface of the earth is worn away by the constant action of running water, wind and waves.	HEAVY METALS Occur naturally in the environment, ie iron, copper, nickel etc.
BIOSOLIDS Solids generated during biological treatment of wastewater.	DEWATERING The removal of water from sludge, the dewatered sludge is then referred to as a Biosolid.	EXTENDED OCEAN OUTFALL A submarine pipeline to carry treated wastewater away from the coast into deep ocean waters to be diluted and dispersed.	HYDROLOGY Study of water and its behaviour eg flow characteristics in pipes channels, waterways & aquifers.
BLUE-GREEN ALGAE Aquatic plants which form green or blue scum in water; this algae can produce toxins that sometimes affect humans and animals.		FAECAL COLIFORM Bacteria in the intestines and faeces of humans and other mammals. Faecal Coliform (FC) is often used to measure or detect sewage pollution.	INFILTRATION Water entering sewerage system via cracked pipes or faulty joints.
BUNDING Embankment used to contain water or other liquids in a confined area.			

KILOLITRE 1kL = 1,000 litres.	RIPARIAN Of or near the bank of a river or other body of water, a healthy riparian zone helps filter runoff before it enter waterways.	SURCHARGE Sewage overflows from pipes, manholes and pumping stations.	WATER MANAGEMENT LICENCE A licence issued to water authorities inc. Hunter Water by the Department of Infrastructure, Planning and Natural Resources for the extraction and use of water from rivers and aquifers.
MATURATION PONDS Large shallow ponds that naturally disinfect wastewater by exposure to sunlight, especially UV lightwaves.	RUNOFF Rainwater (other precipitation) which which runs over land to enter a waterway. It is usually associated with heavy downpours able to transport pollution into creeks, rivers, lake and harbours.	TELEMETRY Equipment for transmitting information from a remote facility for monitoring or to initiate a response, eg. to turn pumps on.	WATER SENSITIVE URBAN DESIGN Design building & landscaping to create low-impact developments that mimic natural catchment hydrology functions ie discharge, frequency, recharge and volume.
MEGALITRE 1ML=1,000kL or 1,000,000 litres.	SANDBEDS Deep sand containing ground-water eg the Tomago Sandbeds.	TOTAL CATCHMENT MANAGEMENT Ecologically sustainable management of land, plants, water in catchments.	WEIR A dam in a river or stream.
NUTRIENTS Compounds needed for growth by all plants and organisms, especially phosphorus and nitrogen.	SECONDARY TREATMENT Biological wastewater treatment processes to remove fine dissolved organic solids.	TRADE WASTE Liquid waste from business/industry that requires special treatment. Can contain food residues, greases, oils, toxic substances and metals. A trade waste policy between Hunter Water and business/industry customers restricts toxic and other potentially harmful liquid substances being discharged to the sewerage system. The policy sets appropriate charges and limits the discharge of waste.	WETLAND A low-lying area periodically covered with water, which supports a diverse ecosystem.
PHOSPHORUS Plant nutrient naturally found in waterways, soils and excrement, and added to some cleaners, household detergents and fertilisers.	SEPTIC Condition caused by low oxygen levels that produce odorous gas.	TRANSLUCENT ENVIRONMENTAL FLOW An Environmental Release whereby a minimum percentage of inflows to a dam must be released to waterways.	WOODLOT A tree plantation irrigated by treated effluent (recycled water).
POTABLE Fit or suitable for drinking.	SEPTIC TANK Underground tank for treatment of wastewater by bacteria.		
PRISTINE Having its original purity.	SEWAGE - SEE WASTEWATER		
RAINWATER TANK A storage vessel used to collect rain water from roofs for domestic or industrial purposes.	SEWER Pipes transporting wastewater to wastewater treatment plants.		
REBATE Financial support which may be provided to a customer to reduce the cost of the item or charge.	SEWERAGE SYSTEM Network of pipes, pumping stations and treatment works used to collect, transport, treat & discharge sewage.	TRUNKMAIN Large water main or sewer pipe.	
RECEIVING WATER A stream, river, lake or ocean that receives wastewater discharges or stormwater flows.	SHORELINE OUTFALL The disposal of treated effluent by pipe into the surf zone of a beach, or from a headland.	WASTEWATER Sewage from homes, business and industry discharged to the sewer (wastewater transport system) or to septic tanks. This includes wastewater from toilets, kitchens, bathrooms & laundries.	
REGIONAL ENVIRONMENT PLAN Strategy developed by Department of Infrastructure, Planning & Natural Resources to control an area's development in a sustainable way.	SLUDGE - SEE BIOSOLIDS		
RETICULATION Separate networks of pipes that supply water to and remove wastewater from properties.	SOIL BED FILTER Reduces odours by filtering in layers of soil and pinebark mix.	WATER CONSERVATION LABELLING SCHEME A scheme similar to the five star energy rating to identify water efficient appliances.	
RETROFIT The removal and replacement of water and energy appliances with more efficient technologies.	STORMWATER Rainwater that runs off land and flows directly into creeks, rivers, harbours and oceans.	WATER CYCLE Circulation of water around the earth through evaporation and transpiration, condensation into clouds, precipitation as rain, ice or snow, runoff into waterways before beginning again.	

ABBREVIATIONS:

EAR

Environmental Annual Report

EMP

Environmental Management Plan

ESD

Ecologically Sustainable Development

HWC

Hunter Water Corporation

IWRP

Integrated Water Resource Plan

KL

Kilolitres

KWH

Kilowatt hours

ML

Megalitres

OL

Operating Licence

SOE

State of the Environment

WML

Water Management Licence

WRAPP

Waste Recycling & Purchasing Policy

WWTW

Wastewater treatment works