Catchment Report

Annual Operating Licence Report

2010-11
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HW2009-1194/7/3

2010-11
Hunter Water Corporation
36 Honeysuckle Drive Newcastle, NSW 2300
PO Box 5171 HRMC NSW 2310
www.hunterwater.com.au
About the Annual Operating Licence Reports

Hunter Water Corporation (Hunter Water) delivers services under an Operating Licence granted by the NSW Government. The licence protects consumers by prescribing minimum standards of service that Hunter Water must meet in relation to:

- Drinking water quality - supplying customers with safe drinking water
- Water continuity - providing customers with a reliable supply of water
- Water pressure - providing customers with water pressure as specified in the licence
- Wastewater transport - providing the reliable transport of sewage

The Operating Licence also sets out conditions relating to community consultation, customer and consumer rights, customer complaint and dispute handling, managing water demand and supply, environmental management, publication of environmental and Ecologically Sustainable Development (ESD) indicators and independent auditing of operational performance.

The current Operating Licence came into force from 1 July 2007 and is effective until 30 June 2012. The content of the licence was determined after a full public review by the Independent Pricing and Regulatory Tribunal (IPART) of the performance of the previous licence, which had been in place since 2002. A full copy of the Operating Licence is available on Hunter Water's website www.hunterwater.com.au

Each year, an independent audit of Hunter Water's operations is conducted to assess the Corporation's compliance with the Operating Licence. The audit assesses Hunter Water's performance against service standards and associated conditions of the licence. This annual audit is overseen by IPART.

To assist in the audit process, the Operating Licence requires a number of reports to be provided annually to IPART. These reports are:

- Catchment Report
- Consultative Forum Report
- Customer Services Report
- Drinking Water Quality Management Report
- Environmental Performance Indicators Report
- Service Quality and System Performance Report

The reports must be submitted by 1 September each year with the exception of the Drinking Water Quality Management Report, which is submitted by 31 December. All reports, or key elements of them as set out in the Operating Licence, must also be posted on Hunter Water's website or made available to the community free of charge at Hunter Water's offices.
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Executive Summary

Protection of our water sources and catchments is paramount to Hunter Water and is a cornerstone of the Australian Drinking Water Guidelines. Catchment management and source water protection provides the first barrier for the protection of water quality. In providing the community’s water needs both in terms of quality and quantity, Hunter Water operates to ensure protection for the source catchments and their respective environments.

This report presents Hunter Water’s performance in relation to catchment management activities undertaken during 2010-11 as required by section 7.3 of the Operating Licence.

During 2010-11 the Hunter Water (Special Areas Regulation) 2003 was repealed and combined into the Hunter Water Regulation 2010.

Hunter Water continues to adopt a “catchment to tap” philosophy in regard to the supply of high quality water to customers.

During 2010-11, Hunter Water has built upon a project to develop our own version of the Sydney Catchment Authority’s Catchment Decision Support System (CDSS). Hunter Water has renamed this system Source Water Improvement Support System (SWISS). The SWISS model uses inputs from various spatial Graphical Information Systems (GIS) data ‘layers’ and weightings to determine the areas with greatest contribution to nutrient, turbidity and pathogen risk in catchments.

To effectively address catchment risks, a Catchment Management Plan (CMP) has also been written to benchmark Hunter Water’s methods against current best practice catchment management. The plan has identified a range of leading principles for catchment management and opportunities for Hunter Water to improve on current practices.

Some of the additional key activities undertaken during the 2010-11 reporting period were:

- Bushfire Management
- Illegal access control
- Park Maintenance
- Weed control across Hunter Water property
- Irrawang State Environmental Planning Policy 14 (SEPP) wetland rehabilitation project
- Study into Algal Nutrient and Sediment Nutrient Sources
- Various community environmental education and sponsorship programs

Greater detail of these and other catchment activities are provided in the main body of this report.
1 Background information

Hunter Water is a provider of urban water, and wastewater services in the lower Hunter region incorporating the Local Government Areas of Newcastle, Port Stephens, Dungog, Maitland, Cessnock and Lake Macquarie. In the six Local Government Areas within its area of operations, the health and hygiene of approximately half a million residents depend upon the services provided by Hunter Water. Water supplied by Hunter Water to these domestic, industrial and commercial customers is sourced from catchment areas in the Local Government Areas of Dungog and Port Stephens only.

Protection of our water sources and catchments is paramount to Hunter Water and is a cornerstone of the Australian Drinking Water Guidelines. Catchment management and source water protection provides the first barrier for the protection of water quality. In providing the community’s water needs both in terms of quality and quantity, Hunter Water operates to ensure protection for the source catchments and their respective environments. Drinking water catchments include areas that capture water from surface runoff and/or groundwater aquifers. Protection and enhancement of catchment areas is essential to the provision of cost effective treatment and distribution of high quality water. In simple terms the higher the quality of source water the lower the cost of treatment, thereby protecting and enhancing community health and providing an asset for business, industry and a diverse range of domestic requirements.

The region’s source waters are drawn from a combination of surface storages and groundwater resources. Under the Water Management and Water Access Licences issued by the NSW Office of Water (NOW), surface water is permitted to be extracted from the environment at Chichester Dam, the Allyn and Paterson Rivers at Gresford, and the Williams River at Seaham (from where it is transferred to Grahamstown Dam). Groundwater is permitted to be taken from the aquifers at Tomago (also known as Tomago Sandbeds) and the Tomaree Peninsula.

Figure 1.1 indicates the location of these sources and how they are related to one another and major population centres in the area.

Under its 2007-2012 Operating Licence, Hunter Water is required to report its performance and catchment activities in all of its source catchments, both surface and groundwater, in this report known as the Catchment Report. This report has been prepared to meet this requirement.
Figure 1.1 – Hunter Water’s major water sources
2 Catchment to tap risk management

The Australian Drinking Water Guidelines 2004 (ADWG) Framework for the Management of Drinking Water Quality (referred to as ‘the Framework’) outlines a holistic ‘catchment to tap’ approach to the management of drinking water quality. Hunter Water has adopted this approach, which emphasises a preventative risk management approach for all steps in the water supply process.

Hunter Water applies a ‘multiple-barrier’ approach to protecting water quality, where water is:

- protected within the catchment
- detained within a protected reservoir
- treated using coagulation and filtration to remove impurities
- disinfected to protect against microbiological contaminants
- transported and stored within a closed, well maintained distribution system
- routinely sampled and analysed for compliance

This process is shown in Figure 2.1. It should be noted that costs associated with catchment to tap risk management are captured in Table 3.1 covering the barriers of ‘Catchment’ and ‘Reservoir’ only. Discussion of costs of other barriers is beyond the scope of this report.

Figure 2.1 – ‘Multiple barrier’ approach to water quality
The ADWG recommend that best practice drinking water quality management is achieved using a multiple barrier process. This approach is based on the premise that no single treatment mechanism is infallible; each ‘barrier’ reduces risk to water quality incidents when it is applied in a robust manner - the greater the number of robust barriers that are implemented, then public health risk is reduced proportionally. The ADWG further recommend continual strengthening of barriers to strengthen the preservation of quality drinking water.

Catchment management and source water protection provide the first barrier against disease. Various engineered solutions to further reduce the risk of disease are placed downstream of catchments and dams. It should be noted that downstream solutions such as treatment cannot always be relied upon in isolation. According to the ADWG (2004, p. 3-8)

"Preventive measures by their nature should be applied as close to the source as possible, with a focus on prevention in catchments rather than sole reliance on downstream control."

Qualitative risk assessments have been applied to all of Hunter Water’s catchments to inform a risk management approach to catchment management. To build on this, a more quantitative system of catchment risk assessment was formulated as part of Hunter Water’s recently developed Catchment Management Plan 2010. (Hunter Water’s Catchment Management Plan is discussed in greater detail in section 4.2.2.2 of this report.)

Around Australia, water authorities and catchment management bodies employ a range of methods to identify and rank catchment risks. Most authorities view the identification of the level of risk and the location of these problems as the foundation data upon which to build a catchment management plan. During 2010-11, Hunter Water has engaged a specialist consultant to help build a model of the drinking water catchments. This Source Water Improvement Support System (SWISS) catchment model will better inform how to prioritise catchment improvements. A working model will be delivered during the 2011-12 reporting period.

The catchment model uses inputs from various spatial Graphical Information Systems (GIS) data ‘layers’ that can be continuous (e.g. rainfall) or point source (e.g. intensive animal sheds). The model then uses weightings to multiply the importance of each layer to determine the areas with greatest contribution to nutrient, turbidity and pathogen risk in catchments. Catchment risks are then ranked according to a prioritisation process, which factors in practical aspects such as the cost of reducing each hazard, the likely effectiveness of remediation works, and the level of confidence in the data. During 2009-10, a demonstration model for Grahamstown Catchment was developed, which has been built upon and extended during 2010-11.

Development of the SWISS for Hunter Water’s catchments will improve the prioritisation process of catchment management activities in the future. Hunter Water currently undertakes strategic and routine activities to manage risks to drinking water quality within the catchment, in line with the framework for management of drinking water quality. The SWISS will be used as a tool to prioritise and better target catchment management at Hunter Water. SWISS is discussed further in section 4.2.2.3 of this report.
3 Catchment activities

Activities carried out during the 2010-11 reporting period, and a brief description of each, appear in relevant sections of this report. These activities are either a direct or indirect requirement to fulfil the intent of the following pieces of legislation or regulatory instruments:

- Hunter Water Regulation 2010 (HWR 2010);
- Water Act 1912 and Water Management Act 2000 (WMA 2000);
- Water Sharing Plans.

It should be noted that most catchment activities carried out are an indirect requirement of the Hunter Water Regulation 2010 as this Regulation does not require any specific activities to be carried out; only that certain activities and types of developments be prevented. The repeal of the Hunter Water (Special Areas)Regulation 2003 is discussed in greater detail in section 4.1.

Table 3.1 below shows estimated and actual expenditure for the current reporting period (2010-11) as well as estimates for activities planned for the next reporting period (2011-12). It should be noted that this expenditure does not, in most cases, include salaries of Hunter Water employees, whose primary function it is to either carry out, plan or manage these activities.

<table>
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<tr>
<th>Activity</th>
<th>Regulatory instrument</th>
<th>2010-11 estimated ($)</th>
<th>Percentage completed (%)</th>
<th>2010-11 actual ($)</th>
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The following sections of this report provides a brief background to each of the above pieces of legislation, how it fits into the context of this report, and the activities undertaken in relation to that legislation.
4 Hunter Water Regulation 2010

4.1 Background

The Hunter Water Regulation 2010 (the Regulation) was gazetted in September 2010 and repealed the Hunter Water (Special Areas) Regulation 2003. This is now the only regulation under the Hunter Water Act 1991 and is regulated by the NSW Office of Water (NOW). It should be noted that due to the combining of the two now repealed Regulations (Special Areas and General) into one Regulation, only certain sections of the 2010 Regulation are relevant to “Special Areas” namely those within Part 2. It should be further noted that whereas the current reporting period straddles the transition of the now repealed Hunter Water (Special Areas) Regulation 2003 and the Hunter Water Regulation 2010 the requirements of these are unchanged in regard to this report.

Section 53 of the Hunter Water Act 1991 defines the meaning of a Special Area and states that:

“(1) The Governor may, on the recommendation of the Minister, by order published in the Gazette, declare an area of land described in the order to be a special area.” and

“(2) The Minister may recommend an order only if of the opinion that the exercise of the State’s water rights under the Water Management Act 2000 could be adversely affected unless the order is made”.

In simple terms a “Special Area” is defined in legislation because of its recognised importance to protecting fresh water for drinking. This section of the Hunter Water Act sets the scene for catchment protection with the primary objective of ensuring that water emanating from a Special Area is not polluted.

The Regulation defines the geographical boundaries of Special Areas mentioned in this Regulation and also specific activities that are not allowable within each Special Area. Sections 7, 8, 9, 10, 11 and 12 of the Regulation define these activities. It is primarily the responsibility of respective local government authorities (Councils), being in most cases, the relevant consent authority, to ensure adherence with these sections.

The primary mechanism to fulfil this responsibility is the review of all development applications that may trigger the Regulation during the development application approval process. It is the responsibility of Local Government Authorities to refer such development applications (DAs) to Hunter Water for comment. An abbreviated list of the more significant DAs referred to Hunter Water during the 2010-11 reporting period is provided in section 4.2.2.1.

The Regulation defines the following Special Areas:

- Chichester Catchment Area
- Grahamstown Catchment Area
- Nelson Bay Catchment Area
• North Stockton Catchment Area
• Tomago Sandbeds Catchment Area
• Williams River Catchment Area

Although not explicitly stated, the Regulation does not require Hunter Water to carry out any specific activities within these areas, however its intent is to make provision for healthy catchments and thus reduce the pollution risk to water captured by the catchment. Pursuant to the intent of the Regulation, Hunter Water carries out various activities, which are broadly divided into operational and strategic planning activities.

A brief description of activities carried out under the current Regulation is provided below and associated costs (if applicable) are provided in Table 3.1. In regard to costs, it should be noted that operational activities can at times, be highly reactive by necessity and this is highlighted in budget estimates by having a substantial contingency for reactivity. Annual estimates of operational expenditure can differ significantly to actual expenditure because of this high contingency factor. Explanations of variation between the estimated and the actual expenditure for line items in Table 3.1 have been provided in the discussion of each activity in the following respective sections.

4.2 Activities carried out under the Hunter Water Regulation 2010

4.2.1 Catchment management – operational

4.2.1.1 General catchment management

In addition to specific catchment activities listed and discussed in subsequent headings, Hunter Water conducted the following operational activities under the theme of ‘General catchment management’. The following points are brief descriptions of some of the most significant of these activities. All are carried out annually and will continue in 2011-12. During this reporting period Hunter Water spent an estimated $15,000 in the current reporting year on general incidental reactive activities and has budgeted $20,000 in 2011-12. These activities include:

Patrol and monitoring

Hunter Water regularly monitors water activities and riparian zone health within Special Areas such as the Seaham Weir Pool, Grahamstown and Chichester Dams for activities contravening the Regulation. These activities are carried out by Hunter Water Rangers who also look at the general functionality of assets, as well as riparian vegetation and shoreline conditions. The very nature of this activity is to observe and assess assets and the environment and as a result, generates expenditure to address observations made.

Grahamstown Dam recreational plan of management

This plan of management is implemented by Port Stephens Council in consultation with, and approval from, Hunter Water, to allow for and manage limited recreational activities on Grahamstown Dam. These limited activities allow for sailing and fishing within a defined area...
of Grahamstown Lake between the months of October and April and is also limited to daylight hours only. A representative from Hunter Water attends a quarterly meeting with representatives from both Port Stephens Council and Sailability NSW (Grahamstown Sailing Club), who administer the activities.

**Feral animal management**

Hunter Water is a founding member of the Port Stephens Vertebrate Control Committee which manages a strategic and coordinated annual control program. As in past years, the 2010-11 program targeted wild dogs and foxes using 1080 baiting. Baiting was carried out in July and August 2010. These months are selected as the risk of exposure to non targeted species is minimised, thereby maximising the program’s effectiveness.

Hunter Water is a major landholder in the Upper Williams and Chichester catchments and as an initiative to increase the effectiveness of wild dog control in the upper catchment area Hunter Water provided sponsorship funding to the Allyn, Paterson, Williams Wild Dog Association. This association is endorsed by the Livestock Health and Pest Authority (LHPA) who also provide technical support to association members. This funding will be used to provide training on trapping and safe baiting procedures and environmental awareness to members as well as purchase traps and assist the aerial baiting program. Further enhancement of the aerial baiting program was made by Hunter Water making improvements to the Chichester Dam helicopter pad, which provides a central and safe landing site for refuelling and bait-loading. Planning is currently underway for the 2011-12 program.

**Partnership project – Corrective services**

During the 2010-11 reporting period Hunter Water continued with a partnership with the NSW Department of Correctional Services. This partnership provides a significant benefit to the community and the environment by utilising teams who are required to perform community service as a penalty for minor offences. Projects carried out to date and ongoing are graffiti removal from Hunter Water assets, and weed removal at several locations in the Grahamstown Dam catchment.

This partnership is at no labour cost to Hunter Water; however Hunter Water provides all consumables and some specialty equipment such as paint, brushes, pruning saws, tree removal tools etc. Unfortunately this program was cancelled by the Department of Correctional Services during the current reporting period due to their budgetary constraints but they plan to re-establish this program as soon as possible.

Hunter Water would like to re-establish the relationship with Corrective Services should the opportunity present itself in the future.
Native seedling planting and distribution

During the reporting period, Hunter Water planted approximately 17,702 native seedlings as part of capital works and operational activities. These trees were planted on land owned or directly under Hunter Water’s control, at various locations throughout the Corporation’s operating area. Changing approaches to land management practices have led to opportunities for Hunter Water to revegetate land previously maintained as cleared land for operational purposes. Examples include the buffer zone around Grahamstown Dam. Hunter Water has long-term plans for large-scale planting in these areas; however most of these areas require significant preparation, such as weed control prior to planting. This process has commenced with the pine tree removal project around Grahamstown Dam. In addition to the native seedlings planted, Hunter Water gave approximately 400 native seedlings to residents of Hunter Water’s catchment areas at community days such as the Tocal Field Days. The cost associated with all native seedling planting has been included in either the budget for property management, general catchment management or absorbed as part of the capital works delivery process.

4.2.1.2 Park maintenance

Hunter Water has public parks located at Chichester Dam, Grahamstown Dam (Finnan Park), Seaham Weir and Balickera Pump Station. All parks have toilets, picnic tables, barbeques and children’s play equipment and are extremely well patronised by the general public, necessitating substantial budget funding in order to maintain a suitable and safe standard. Park maintenance is conducted to maintain functional and tidy facilities for not only water quality reasons but also for the general public. During this reporting period Hunter Water planned to spend $25,000 and spent $36,700, and has budgeted $25,000 again in 2011-12. Increased expenditure was due to improvements required to public safety and amenity at Finnan and Chichester Parks, which includes the children’s play area, internal roads, barrier fencing and picnic shelters.

4.2.1.3 General property management

Hunter Water privately owns large areas of land surrounding Grahamstown Dam, Chichester Dam and around the Tomago Sandbeds. Other property owned by Hunter Water requires continual surveillance in order to carry out repairs to infrastructure such as (but not limited to) fencing, roads, tracks and fire-breaks. These properties are largely rural or undeveloped land, which in most cases share a common boundary with other private properties. During this reporting period Hunter Water planned to spend $25,000 and expended only $1,000. The annual budgeted amount is a contingency for unplanned reactive work.

4.2.1.4 Bushfire management

Hunter Water is required to carry out bushfire protection as it is a Public Authority under the Rural Fires Act 1997 Section 63.

Hunter Water is a member of the Port Stephens Bush Fire Management Committee, which is convened and coordinated by the Port Stephens Rural Fire Service. All bushfire management planning by Hunter Water is carried out in full consultation with the Port Stephens Rural Fire Service.
The primary objective of Hunter Water’s Bushfire Management Plan is risk minimisation of identified assets in and adjacent to Hunter Water land by means of hazard reduction. Hazard reduction methods fall into two main strategies:

1. Mechanical clearing (slashing) of fire trails and asset protection zones
2. Controlled burning at strategic locations

During the current reporting period Hunter Water conducted only mechanical hazard reduction.

The Corporation’s budgeted $92,000 for the current reporting period. Actual expenditure totalled $92,000. The majority of this expenditure is for mechanical hazard reduction in the form of slashing of fire trails and protection zones around infrastructure. Hunter Water has budgeted $94,300 for the 2011-12 year.

4.2.1.5 Illegal access mitigation

As in previous period reports, unauthorised access on Hunter Water land continued to be a significant problem during 2010-11. Vandalism and illegal dumping is often associated with illegal access and as reported in previous periods, typically involves such things as; cut fencing, ramming and/or cutting access gates, ramming bore-heads with stolen cars and general vandalism to buildings. Through experience Hunter Water has determined that the best barrier to illegal access is the placement of interlocking concrete blocks, however this strategy can not be employed in all situations.

Hunter Water continues to be actively represented on the Hunter Regional Illegal Dumping Group, which was setup in 2006 by the Department of Environment Climate Change and Water (DECCW) as a means to help combat this problem. The committee is represented by all local councils and government agencies such as Department of Lands, NSW Police, DECCW, Forests NSW, Energy Australia (now known as Ausgrid) and Hunter and Central Rivers Catchment Management Authority. Meetings are held quarterly. Hunter Water is also represented on the Hunter Illegal Trail Bike Riding Group convened by the Department of Premier and Cabinet. This group works toward addressing illegal access issues and its undesirable effects such as public safety, noise, vandalism and environmental damage.

It should be noted that after the change of Government in the NSW March 2011 election the DECCW ceased to exist and all functions of the former DECCW now fall under the responsibility of a new Department known as the Office of Environment and Heritage (OEH).

Hunter Water budgeted $40,000 for illegal access in 2010-11, a total of $28,300 was spent in 2010-11 which was for repairs to gates, fencing and the installation of large concrete blocks as physical barriers. The under budget expenditure was largely due to a decision not to purchase covert video surveillance equipment discussed in the 2009-10 report. This is due to Hunter Water taking a more whole-of-business approach to security as well as rapidly changing technology. Hunter Water is still investigating the use of covert surveillance equipment.

Hunter Water has budgeted $30,000 for illegal access mitigation activities in 2011-12.
4.2.1.6 Catchment information signage

Hunter Water planned to expend $15,000 on catchment signage in 2010-11, however due to budgetary prioritisation this project was not progressed and there was no actual expenditure. Hunter Water has budgeted $10,000 in 2011-12.

4.2.1.7 Weed management

Balickera canal and seaham weir

In 2010-11, $45,000 was budgeted for weed management in Balickera Canal and the Seaham Weir. Actual expenditure, however, only amounted to $11,900 (includes $5,000 funding provided to Port Stephens Council – see below). This was primarily due to minimal weed problems during the year and a direct result of Hunter Water's past and current proactive approach to weed management.

During the current reporting period Hunter Water has focused on aquatic weeds especially where this has the potential to create operational and/or water quality problems. Regular visual inspections of Special Areas waterways indicate that Chichester Dam and Grahamstown Dam have no current aquatic weed problems.

Hunter Water treats aquatic weeds in the Balickera Canal in accordance with a licence issued by OEH to treat Water Hyacinth and Alligator weed. This licence allows for up to three treatments per growing season.

Hunter Water continues to work closely and liaise regularly with Port Stephens Council noxious weeds officers regarding the treatment of all weeds within the Port Stephens LGA on land that is owned or under the care and control of Hunter Water. In 2010-11 funding of $5,000 was again provided to Port Stephens Council to assist in weed treatment within the Seaham Weir Pool. This cost is included in the total cost for Balickera Canal, as the Balickera Canal draws water directly from the Seaham Weir Pool and therefore Hunter Water is a major stakeholder in the Seaham Weir Pool.

As detailed above, Hunter Water takes a proactive approach to weed control from an operational perspective, however weed infestation is dependant on many environmentally variable parameters and therefore it is extremely difficult to predict future requirements in this area. As such, Hunter Water plans to continue weed control in the next reporting period but due to consistent under expenditure for this item the budgeted amount for 2011-12 will be reduced from $45,000 to $20,000 and the savings in this item transferred to “Weed management other”.

Weed management – other

Hunter Water carried out the following weed control within land owned or controlled by Hunter Water:

- Pine trees from the species Pinus elliottii are a major introduced weed in the Port Stephens LGA. Over many years this species has infiltrated large areas of Hunter Water property especially within the area buffering the Grahamstown
Dam and has become a mono-culture in several locations. This species provides no ecological benefit and in fact has a major deleterious effect on native ecosystems as it out-competes native vegetation causing the slow destruction of natural systems. This species presents a major problem to the environment and Hunter Water is committed to take action to reduce and control this weed. This therefore has implications to planned budgeting for this issue.

- Blackberry was treated in the upper Chichester catchment on Hunter Water property, which is adjacent to the Barrington Tops National Park.

During the 2010-11 reporting period Hunter Water continued with a long-term project to control pine trees and other weeds throughout Hunter Water property. Hunter Water budgeted $30,000 for 2010-11 and expended $68,100. This large variation was due to the large scale of the Pine Tree problem and savings with weed control at Balickera Canal. It is also due to Hunter Water’s commitment to large-scale revegetation of Hunter Water property in the coming years. This project will be delivered jointly by Hunter Water and the Federal Government as a carbon sequestration / biodiversity project.

Hunter Water plans to spend $55,000 in 2011-12 for weed control other than Balickera Canal aquatic weeds with particular emphasis on Pine trees.

4.2.1.8 Medowie floodplain management plan

Medowie was identified in the NSW Government’s Lower Hunter Settlement Strategy as a major area of urban growth. Medowie was formally a rural locality but has transformed into a higher density rural residential and residential area in recent years. This transformation has increased stormwater runoff rates and, with increased pressure from current and planned developments, stormwater runoff is expected to continue to increase. Hunter Water’s interest in this issue is that Campvale Canal is the only drainage point for approximately 60 per cent of Medowie and all water that flows along the Campvale Canal must be pumped into Grahamstown Dam via Hunter Water’s Campvale Water Pump Station. Port Stephens Council, OEH and Hunter Water have collaborated to commission the Medowie Floodplain Management Plan. Conceptual development of the plan commenced in early 2009 and after a tendering process coordinated by Port Stephens Council, a contract was awarded to WMA Water.

It has been estimated that the Medowie Floodplain Management Plan will take up to three years to complete and will comprise two stages. Stage one will develop a hydrological model of the catchment. Stage two of the study will use the model developed in stage one to compare options to mitigate current and future flooding issues. At the time of preparation of this report stage one of this plan was complete but in draft form due to requests from the technical committee for the consultant to check baseline calibration data. A budget of $15,000 was included in the 2010-11 year as an estimate of Hunter Water’s contribution to stage two of this plan, however due to delays in completion of stage one, this money was not expended. Hunter Water has budgeted $55,000 in 2011-12 for stage two of this project. The increase in the unexpended budgeted amount of $15,000 in 2010-11 to $55,000 in 2011-12 is due to the potential for the scope of Stage two to significantly increase.
Hunter Water will continue to work closely with all stakeholders to develop a sustainable strategy so that both drainage and water quality risks in the catchment are effectively managed.

### 4.2.1.9 Crime prevention

During the reporting period Hunter Water provided $10,000 to NSW Police (Port Stephens Local Area Command) in conjunction with Port Stephens Council and AusGrid (formerly Energy Australia) for the purchase of two trail bikes and a trailer transporting the bikes. This initiative will provide the Police with the tools to carry out proactive crime prevention and from Hunter Water’s perspective, detection and deterrent to illegal access, vandalism and illegal dumping. As this was a new initiative during the current reporting period it was not forecasted in the last Catchment Report, however Hunter Water has worked closely with NSW Police in the past. The new trail bikes were used in a joint operation in January 2011 on Hunter Water and National Parks and Wildlife Service land.

### 4.2.1.10 Lead investigation project

A review of Hunter Water landholdings in 2010 identified the Chichester Trunk Gravity Main (CTGM) as a site with a high risk of localised soil contamination due to lead joints and the previous use of lead in associated maintenance practices. During 2011 Hunter Water, in consultation with the Livestock Health and Pest Authority (LHPA), has undertaken investigations into the extent of localised lead contamination along the pipeline and have taken steps to notify adjacent land owners about the potential risk. This project will be ongoing and will involve liaising closely with landholders, OEH and DPI regarding the results of the testing. Hunter Water will implement actions to limit access to the pipeline and is also currently developing a long-term strategy for the management of lead along the CTGM.

Under our extensive drinking water monitoring program, Hunter Water conducts fortnightly tests of the water quality at 68 points along the delivery network, representative of water supplied to customers. Hunter Water’s drinking water supplies consistently record high level compliance with the Australian Drinking Water Guidelines and there is no risk to drinking water supplied through the CTGM from the lead pipe joints.

As this issue was identified after submission of the last Catchment Report it was not included as estimated expenditure in 2010-11. Hunter Water expended $71,000 in 2010-11 and plans to spend up to $1,500,000 in 2011-12 on further investigations and short – medium term site management strategies.

### 4.2.2 Catchment management – strategic

#### 4.2.2.1 Development applications

Hunter Water provides comments on notable development projects within, or that potentially effect, water catchments (Special Areas). Large projects on which Hunter Water provided comment during 2010-11 are included in Table 4.1.
### Table 4.1 – Development Applications

<table>
<thead>
<tr>
<th>Development Application</th>
<th>Drinking water catchment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sandvik Machinery and Maintenance Facility, Heatherbrae</td>
<td>Tomago Sandbeds</td>
</tr>
<tr>
<td>142 Lot Industrial Subdivision - Kinross, Heatherbrae</td>
<td>Tomago Sandbeds</td>
</tr>
<tr>
<td>Extension to Boral Quarry, Seaham</td>
<td>Grahamstown Dam</td>
</tr>
<tr>
<td>AGL Gas Storage facility, Tomago</td>
<td>Tomago Sandbeds</td>
</tr>
<tr>
<td>Boatfalls 120 lot subdivision, Limeburners Creek</td>
<td>Williams River</td>
</tr>
<tr>
<td>Williamstown Aerospace Park, various industrial developments</td>
<td>Tomago Sandbeds</td>
</tr>
<tr>
<td>Professional Motorsport Circuit, Ringwood Raceway, Seaham</td>
<td>Grahamstown Dam</td>
</tr>
<tr>
<td>Coal Seam Gas Exploration, Fullerton Cove</td>
<td>Referred under <em>Hunter Water Regulation 2010</em></td>
</tr>
<tr>
<td>Mackas Sand extraction quarry</td>
<td>Stockton</td>
</tr>
<tr>
<td>Williamstown Wastewater Transfer Scheme</td>
<td>Tomago Sandbeds</td>
</tr>
<tr>
<td>Proposed petroleum exploration, various sites</td>
<td>Referred under <em>Hunter Water Regulation 2010</em></td>
</tr>
<tr>
<td>DAREZ development, Newcastle Airport</td>
<td>Tomago Sandbeds</td>
</tr>
</tbody>
</table>

There were many other smaller developments referred to Hunter Water for comment. It should be noted that the Tomago Sandbeds (Special Area) experienced increased development pressure during this reporting period.

#### 4.2.2.2 Catchment management plan (CMP)

As discussed in section 2 of this report, Hunter Water has adopted a ‘catchment to tap’ approach to manage the risks associated with drinking water quality. To effectively address catchment risks, a Catchment Management Plan (CMP) has been written to benchmark Hunter Water’s methods against current best practice catchment management. The CMP also reflects best practice management according to the Australian Drinking Water Guidelines (ADWG).
Current Australian and international leaders in catchment management effectively implement eight principles, and these will be progressively implemented over time; these principles are:

1. Identify the top hazards
2. Have effective legislation
3. Work with stakeholders
4. Monitor high risk areas
5. Foster research
6. Perform proactive surveillance
7. Engage the community
8. Plan for emergencies (fire)

Refer to Section 8 for a summary of status of actions under the CMP. All costs to date associated with development and implementation of the CMP document has been covered by existing internal labour. Hunter Water is in the process of preparing submissions for ongoing funding of the CMP for the next price path. The CMP is a dynamic document and will be revised periodically and as required.


4.2.2.3 Grahamstown dam adaptive management strategy

The Grahamstown Dam Adaptive Management Strategy (AMS) was implemented as part of the recommendations of an external expert panel. The strategy is comprised of the following two main components:

Algal nutrient and sediment nutrient source study

This investigation is being undertaken as a Masters research project and is a combination of two components of the Grahamstown Dam Adaptive Management Strategy (AMS) implemented from recommendations of an external expert panel. The study investigates the limiting nutrient concept controlling algal growth in Grahamstown Dam as well as the importance of internal nutrient source from sediments derived from the catchment. This will aid Hunter Water in determining catchment priorities for nutrient control to maintain good quality water in Grahamstown Dam. The budget of $60,000 was fully spent in 2010-11. Completion of results analysis and thesis write up will extend into the end of calendar year 2011.
Predictive algal growth model (probabilistic bayesian network model for predicting algal growth in Grahamstown Dam)

The various components of the Grahamstown Adaptive Management Strategy were designed to fill knowledge gaps to enable development of a modelling management tool. This tool will allow Hunter Water to assess risks from catchment and operational activities in promoting harmful and nuisance algal blooms in Grahamstown Dam. A review of model possibilities and requirements recommended that a management action-focussed Bayesian Network model should be developed. Such models were seen to be increasingly used in situations where there is much uncertainty and complexity (such as predicting algal blooms). Development of this model commenced in 2009-10 with Stage 1 (a functioning basic model) delivered in June 2010. Development of Stage 2 a broader dynamic model progressed through 2010-11. Stage 2 was originally budgeted at $40,000 but an extension increased this to $45,000. This is still below the estimated budget of $50,000.

4.2.2.4 Catchment and water quality model (SWISS) (formerly CDSS)

The provision of a safe and reliable drinking water supply begins in the catchments. As the Hunter’s drinking water catchments have multiple uses, it is important that land uses are made as low impact as possible. In order to rank and address the more problematic areas the location of highest land use risks is needed. This model is a major adjunct to the implementation of Hunter Water’s Catchment Management Plan.

Around Australia, water authorities and catchment management organisations employ a variety of methods to identify pollution sources and guide catchment effort. Hunter Water has partnered with the Sydney Catchment Authority (SCA) to use its Catchment Decision Support System (SCA CDSS). Hunter Water has called its version Source Water Improvement Support System (SWISS) as the Hunter Water model is somewhat different to that of the SCA.

SWISS has a relatively simple structure and can be built, run and analysed by catchment managers rather than specialists. It is built on a platform that is scientifically proven, easily updated and takes a logical approach to decision making with graphical outputs. It is used to develop investment plans in an organisation with a similar regulatory regime.

Hunter Water has performed a pilot run of the SWISS on the Grahamstown Dam catchment.

SWISS identifies catchment areas that pose greatest risk from:

- pathogens (disease causing organisms),
- suspended solids, and
- nutrients (nitrogen and phosphorus).

The SWISS model inputs various data ‘layers’ such as rainfall or intensive animal sheds. It then uses weightings of the layer’s importance based on scientific knowledge to determine areas with greatest contribution to nutrient, turbidity and pathogen risk in catchments. The
output is a ranking of activities and associated areas in the catchment that pose the greatest hazard to drinking water quality.

The raw catchment risks may then be ranked according to a prioritisation process, which may factor in practical aspects such as the cost of reducing the hazard, the likely effectiveness of work and the level of confidence in the data within the model.

The model may be used to predict the effects of land use changes in catchments by running scenarios. This is a powerful exploratory tool which could be used when considering broad catchment planning decisions in the future.

It will also be possible to begin analysis of the areas that pose the greatest risk to drinking water quality in the Hunter’s catchments. For example, it will greatly assist where activities such as bank stabilisation and tree planting may be best conducted. It will facilitate investment planning to achieve multiple environmental, financial and social outcomes. The process of collecting and organising the required maps alone will be of great benefit to the region.

Hunter Water estimated a budget of $150,000 for 2010-11 and expended $180,000. Expenditure variance on the catchment model in 2010-11 was due to a combination of timing and scope variation. Variation in scope included specialised modelling by an external consultant to feed in to SWISS; these models were MUSIC – (Modelling for Urban Stormwater Improvement Conceptualisation) and MOUSE – (MOdel for Urban Sewers).

During 2010-11 Hunter Water signed an agreement with the SCA to access the tools and systems that underpin its CDSS and to collaborate on future development of the tool. Implementation of the catchment model within Hunter Water’s catchment areas was delayed during the negotiation period. The catchment model operates on a specific GIS platform and implementation (and associated expenditure) was affected by consideration of a corporate GIS upgrade. A budget of $150,000 for 2011-12 has been approved for further development of this work.

**4.2.2.5 Baseline faecal sterol sampling - Grahamstown catchment**

Faecal sterols are excreted by animals and humans as a by-product of digestion. Each animal has its own sterol ‘fingerprint’ which means sterols in water can be analysed and the faecal source can be tracked. In 2010-11 Hunter Water completed analysis of faecal sterols in Campvale Canal. This canal is of interest as it has previously returned high faecal indicator bacteria levels during and after periods of rainfall and discharges into Grahamstown Dam. Faecal sterol testing has indicated that human effluent is not a significant issue in the rainfall events tested to date, however more testing is required on high rainfall events. This will continue during the next reporting period.

As budgeted during 2010-11, $40,000 was spent on faecal sterol analysis and reporting. The University of Newcastle was engaged to produce a summary report commenting on the likely source of pollution.
4.2.2.6 Irrawang SEPP 14 wetland rehabilitation project

Irrawang Wetland contains State Environmental Planning Policy 14 (SEPP 14) Wetland number 804 and is close to the junction of the Williams and Hunter Rivers. Levy banks, drainage lines and flood gates were installed many years ago in the area that has prevented natural tidal fluctuations within the wetland. These structures are owned and operated by the NSW Office of Water (NOW).

Hunter Water Corporation owns Irrawang Wetland and the surrounding land. In the past 12 months Hunter Water has been working in partnership with the Department of Primary Industries (Fisheries) (DPI) to reintroduce natural tidal flows to the wetland. During the previous 12 months two trial openings of the flood gates have been undertaken, and a draft Review of Environmental Factors (REF) prepared including a flora and fauna assessment.

During the reporting period the gates were opened, with closing only occurring during flood warnings. Over the period 2012-13 to 2015-16 (next Hunter Water price path) a modelling study is proposed to determine whether the gates can be permanently opened.

In the 2010-11 financial year Hunter Water has spent approximately $40,000 on this project. This project is a new project and was not forecasted in the 2009-10 Catchment Report.

It is estimated that up to $60,000 will be spent during the 2011-12 reporting period.

4.2.2.7 Engaging the community - Tocal field days

This activity was additional to Hunter Water’s sponsorship of the Tocal Field Days and involved a catchment awareness display at the Field Days, which was fully staffed by Hunter Water catchment staff. Costs associated with this activity were for production of high quality interpretive posters and interactive displays and also native seedlings were given away. Hunter Water budgeted $3,000 in 2010-11 for this activity and expended $4,000 with the variation due to inclusion of the cost of purchase of native seedlings and increase in the estimated cost of poster production.

4.2.3 Community sponsorship

4.2.3.1 Landcare sponsorship

Hunter Water continues to provide support and sponsorship to Landcare groups within the lower Hunter region. Hunter Water recognises the benefits of healthy catchments and contributes significant funding towards catchment works, both on-ground and in-river. Grants of up to $1,500 are provided to individual local Landcare groups, which are then administered by the Hunter Region Landcare Network.
Funded Landcare activities must fall into one of the following categories:

- conserve, rehabilitate and better manage river systems
- restore bushland and conserve sensitive areas by planting native trees, shrubs and grasses
- provide protection for native species including threatened and endangered flora and fauna
- protect our urban environment

With Hunter Water’s sponsorship funding, Landcare groups undertook projects that either directly or indirectly impact upon the water cycle by reducing stormwater surges, increasing creek bank stabilisation, minimising erosion and salinity near seasonal watercourses and natural waterways, or by providing mulch and new plants to restore degraded areas.

Landcare sponsorship empowers local community groups to identify water conservation issues and encourages them to implement practical, efficient and sustainable solutions. In each case, community volunteers were involved. With an increasing community awareness of fluctuating climate issues and local resource challenges, these projects lend a positive and practical statement to the maxim “think globally, act locally”. Total expenditure on Landcare sponsorships in 2010-11 was as budgeted at $15,000. Due to similar projects offered by other organisations Hunter Water does not plan to fund Landcare in the 2011-12 budget.

4.2.3.2 Tocal field days sponsorship and student scholarship

The Tocal Field Days are the largest agricultural field exhibition in the Hunter Valley and are held annually over three days. Hunter Water is a major sponsor of the ‘Land Management’ section of the event and more specifically sponsors the Tocal Field Days Education Program which promotes environmentally sustainable farming and living practices in rural and urban settings.

This sponsorship covers two components, the Best Land Management Exhibit Awards and Tocal student education scholarships. The exhibits in the Land Management area provide education and free advice about salinity, water-saving plants, floods and drought management and strategies to save water. The 2010-11 budget of $10,000 was fully spent on this program. Hunter Water again plans to budget for sponsoring the Land Management Tocal Field Days to $5,000 with the remaining $5,000 used to fund student scholarships in courses related to sustainable farming practice in 2011-12.

4.2.3.3 CMA waterwatch and CMA catchment crawl

The Hunter-Central Rivers Catchment Management Authority’s Waterwatch program carries out water quality monitoring including physical, chemical and biological parameters at local waterways while educating the community and schools on the importance of protecting our environment.

The 2010-11 catchment crawl took school students from Chichester Dam to the Williams River at Raymond Terrace. The theme of this activity is to compare the health of the top of a
catchment to that of the bottom of the catchment by examining sites along the way. Students produce individual reports as well as a group report at the end of the day.

Due to an oversight the expenditure in the current reporting period was not listed in the planned activities cost matrix. Hunter Water expended $25,000 for the Water Watch program and $5,000 for the Catchment Crawl and has budgeted the same amount for each project in 2011-12.

4.2.3.4 Hunter wetlands centre education program

The Hunter Wetlands Centre Australia plays a central role in the conservation and management of the Shortland Wetlands with important work in environmental education and building capacity within the community. The RAMSAR¹ protected site provides habitat for a wide variety of birds, mammals, frogs and reptiles.

Due to an oversight the expenditure in the current reporting period was not listed in the planned activities cost matrix. Hunter Water expended $15,000 in 2010-11 and has budgeted $15,000 again in 2011-12.

4.2.3.5 Schools education program

This program is targeted at school children and provides an overview and increased awareness of the importance of catchment management for the provision of clean drinking water, natural resource management and also the importance of saving water. This service is supplied by a local clown troop know as ‘Ship-O-Fools’. Throughout the year Ship-O-Fools visited primary schools to present this light-hearted and enjoyable but informative show. Hunter Water budgeted $30,000 for 2010-11 and expended $31,000 on this project and has budgeted $25,000 in 2011-12.

¹ A ‘declared Ramsar wetland’ is an area that has been designated under Article 2 of the Ramsar Convention or declared by the Minister to be a declared Ramsar wetland under the Environment Protection and Biodiversity Conservation Act 1999.
5 Water Act 1912 and Water Management Act 2000

5.1 Background

Hunter Water’s Water Management Licence is currently issued under Part 9 of the Water Act 1912. Part 9 defines such things as how, why and to whom a Water Management Licence is issued, as well as the conditions of that licence. The introduction and enactment of the Water Management Act 2000, makes provision for ‘Water Sharing Plans’. Water sharing plans and how they apply to Hunter Water are discussed in greater detail later in section 6 of this report. As water sharing plans are completed for each specific river system or group of river systems in accordance with the Water Management Act 2000, the existing water management licences issued under Part 9 of the Water Act 1912, are converted to “Access Licences”, which is the approval mechanism under the Water Management Act 2000. The following are brief descriptions of activities carried out during the reporting period, that directly or indirectly relate to this legislative framework.

5.2 Activities carried out

5.2.1 Balickera tree and silt management

The Balickera Canal is a man made canal of approximately 10 kilometres in length, designed to pump water from the Williams River at Seaham (Seaham Weir) to the Grahamstown Dam. In order to maintain the efficient flow of water through this canal it is necessary to continually control the growth of woody vegetation within the banks of the canal. In 2010-11 Hunter Water budgeted for expenditure of $15,000 and actual expenditure was $12,600. The budget for 2011-12 is again $15,000.

5.2.2 Flood gate and levee bank maintenance

Hunter Water owns and maintains 33 flood gates and several constructed levee banks throughout the Seaham Weir Pool to mitigate flooding of farmland due to the operation of the Seaham Weir. An amount of $40,000 was budgeted in 2010-11 for the maintenance of these flood gates and levee banks. Hunter Water conducts six-monthly inspections of all flood gates and carries out repairs as required, and also responds to landholder complaints in a timely manner. Actual expenditure during the year amounted to $26,000. Due to the nature of the system it is difficult to predict maintenance requirements and the budgeted amount is set as an estimate only.

The budget for 2011-12, is set at $300,000. This amount is due to an identified repair to a levee bank plus contingency for repairs to other structures in the system.
6 Water sharing plans

6.1 Background

The following is an extract from the NSW Office of Water website to provide background to water sharing plans (www.water.nsw.gov.au/default.aspx):

“A water sharing plan is a legal document prepared under the Water Management Act 2000. It establishes rules for sharing water between the environmental needs of the river or aquifer and water users, and also between different types of water users such as town supply, rural domestic supply, stock watering, industry and irrigation.

By setting the rules for how water is allocated for the next ten years, a water sharing plan provides a decade of security for the environment and water users. This not only ensures that, for the first time, water is specifically provided for the environment through a legally binding plan, but also allows licence holders, who require fairly large quantities of water such as irrigators, to better plan their business activities. Irrigation accounts for about 80% of all water used in NSW.

In addition, water sharing plans set rules for water trading, that is, the buying and selling of water licences and also annual water allocations. For most new commercial purposes, water trading remains the only way that water can now be obtained as in most areas of the state as the available water is fully allocated.”

The purpose of a water sharing plan is:

- to protect the fundamental environmental health of the water source
- to ensure that the water source is sustainable in the long-term
- to provide water users with a clear picture of when and how water will be available for extraction”.

Hunter Water currently extracts water from the Tomago and Tomaree aquifers under a water sharing plan known as ‘Water Sharing Plan for the Tomago Tomaree Stockton Groundwater Sources 2003’. Hunter Water does not currently extract water from the Stockton aquifer.

This Plan took effect on 1 July 2004 and remains in force for a period of 10 years after that date (as is the case for all water sharing plans) and therefore will be repealed on 30 June 2014 at which point a revised plan will be enacted.

No activities were carried out during the reporting period as a direct result of the Water Sharing Plan for the Tomago Tomaree Stockton Groundwater Sources 2003

As discussed in section 5.1, Hunter Water’s current Water Management Licence is issued partly under the Water Act 1912 and partly under the Water Management Act 2000. Although Hunter Water currently extracts water from the Williams River under the Water Act 1912 this will eventually change now that the ‘Hunter Unregulated and Alluvial Water Sources Water Sharing Plan’ has been gazetted. The NSW Office of Water (NOW) gazetted
this plan on 1 August 2009. At the time of preparation of this report, NOW were still in the process of converting Hunter Water’s Water Management Licence to be fully under the new water sharing plan. At this time Hunter Water’s entire Water Management Licence will be issued under the Water Management Act 2000. There will be no significant changes to Hunter Water’s operational activities or regulatory requirements as a result of this legislative change.

Due to 2010-11 still being a transitional period, no activities were carried out during the year as a direct result of the Hunter Unregulated and Alluvial Water Sources Water Sharing Plan.

In July 2008 Hunter Water expanded its area of operations to include the Dungog Shire. In 2009-10 Hunter Water acquired a water access licence for the Paterson River under the Water Management Act 2000 to enable it to provide town water supply services to the towns of Gresford and East Gresford. Extractions are in accordance with the Paterson Regulated River Water Sharing Plan, which is effective for 10 years from 1 July 2007. Hunter Water has no regulatory requirements under this Water Sharing Plan and purchases water from State Water Corporation who bare responsibility for compliance with this plan.
7 Water Management Licence and Dams Safety Act

7.1 Water management licence

Hunter Water holds a Water Management Licence, licence number 20WM000020, under the Water Act 1912. NOW is the regulatory authority of this legislative instrument under which this licence is administered. The general requirements of this licence are defined in section 2 “Records, Reports and Studies” of the licence and summarised below.

7.1.1 General requirements of the licence

Recording data

Sect-2.1 “Hunter Water Corporation must maintain, in a form that can be readily accessible by NOW, all information and records required by monitoring and reporting conditions in the licence.”

A broad range of data is collected and maintained in a database and is available on request. This data is also used to compile the annual report for this licence.

Immediate notification reports

Sect-2.2 “Hunter Water Corporation must notify all events which result in non-compliance with the conditions of the licence to NOW as soon as practicable after it becomes known to Hunter Water Corporation.”

During the 2010-11 reporting period all incidents that had the potential to be a non-compliance of the licence were reported to NOW within the designated timeframe. A brief description of these incidents is provided in Sect 7.1.2 in this report.

Annual reporting

Sect-2.4 “Hunter Water Corporation must, within 90-days of the end of each financial year, submit an Annual Water Licence Report.”

Data collected for the purpose of this licence was presented to NOW in September 2010 in an annual report as required by the licence within the designated timeframe.

Supplementary studies

Sect-2.7 “Hunter Water Corporation must undertake supplementary studies as stated within each 5-yearly licence life-cycle.”

Due to the fact that the current licence is due for renewal, all supplementary studies required under the current licence have been completed and reported in previous Catchment Reports.
7.1.2 Notification reports to NSW Office of Water (NOW)

In accordance with 1.b in Section 7.1.1. above (General requirements of the licence) Hunter Water reported five (5) incidents to NOW in regard to potential non-compliance with the Water Management Licence during the 2010-11 reporting period. All of these were minor non compliances with licence conditions and are discussed below.

Minor non-compliance

- August 2010 – Low Water level - Seaham Weir Pool
  
  o The water level in the Seaham Weir Pool fell to 0.38mAHD when at the time it was required to be between 0.42 and 0.53mAHD. This was due to commissioning of the Balickera Water Pump Station. There were no observable or measurable environmental impacts.

- September / October 2010 – Dissolved Oxygen (DO) – Chichester Dam
  
  o Hunter Water did not achieve DO saturation equal to or greater than 80 per cent during the weekly sampling of 27/09/2010 and 04/10/2010 as condition 3.7 of the Water Management Licence requires at this time of the year (winter period). At the time of this incident the DO was 74 per cent at one metre from the bottom of the dam and greater than 80 per cent in the remainder of the water column. The primary reason for this condition of the licence is to ensure an adequate level of oxygen saturation for downstream ecosystems. At the time of this incident the level of oxygen saturation immediately downstream from the dam was 94 per cent and therefore there was no environmental impact as a result of this incident. This incident was beyond the control of Hunter Water as the de-stratification system was operating at full capacity and therefore no available redundancy.

- November 2010 – Temperature Differential – Chichester Dam
  
  o A temperature difference equal to or less than 3°C from the top of the water to the bottom of the water body during the weekly sampling of 08/11/2010 as condition 3.7 of the Water Management Licence requires was not met. This was caused by a large and rapid inflow into the dam which created stratification at the time of sampling. The primary reason for this condition of the licence is to reduce the potential for cold water to be released from the dam and potentially have an affect on downstream ecosystems. At the time of this incident the water temperature downstream of the dam was within 1°C of the surface temperature of the dam and therefore there would not have been any downstream impact as a result of this incident.
• **February 2011 – Dissolved Oxygen – Chichester Dam**

  - Hunter Water did not achieve DO saturation equal to or greater than 60 per cent during the weekly sampling of 07/02/2011 as condition 3.7 of the Water Management Licence requires at this time of the year (summer period). At the time of this incident the DO was 58 per cent at one metre from the bottom of the dam and greater than 60 per cent in the remainder of the water column. The primary reason for this condition of the licence is to ensure an adequate level of oxygen saturation for downstream ecosystems. At the time of this incident the level of oxygen saturation immediately downstream from the dam was 88 per cent and therefore there was no environmental impact as a result of this incident. This incident was beyond the control of Hunter Water as the de-stratification system was operating at full capacity and therefore no available redundancy.

• **April 2011 – Dissolved Oxygen – Chichester Dam**

  - Hunter Water did not achieve DO saturation equal to or greater than 80 per cent during the weekly sampling of 18/04/11 as condition 3.7 of the Water Management Licence requires. At the time of this incident the DO was 78 per cent at one metre from the bottom of the dam and greater than 80 per cent in the remainder of the water column. The primary reason for this condition of the licence is to ensure an adequate level of oxygen saturation for downstream ecosystems. At the time of this incident the level of oxygen saturation was 100 per cent and therefore there was no environmental impact as a result of this incident. This incident was beyond the control of Hunter Water as the de-stratification system was operating at full capacity and therefore no available redundancy.

The NSW Office Water accepted all of these as adequate responses and no action was taken.

### 7.2 Dams Safety Act

Dam operation and maintenance in NSW is legislated under the *Dams Safety Act 1978* and regulated by the Dams Safety Committee, which is a Constituted Corporation under this Act. The primary purpose of the Act is to define the membership, function and powers of the Dams Safety Committee. Only dams that are prescribed under the Act need to meet the requirements of the Act. It should be noted that there is no accompanying Regulation for this Act. Hunter Water has three prescribed structures, those being:

- Chichester Dam
- Grahamstown Dam
- Winding Creek Detention Basin
Hunter Water continues to satisfy the requirements of the Act as required by the Dams Safety Committee for its structures. The NSW Dams Safety Committee requires a surveillance report at intervals of not greater than five years. The last five-yearly surveillance report was completed in late 2008 and will be due again 2013.

Under the Dams Safety Act 1978 Hunter Water holds a permanent position on the NSW Dams Safety Committee and is represented at all meetings where possible and practicable. This representation maintains close and ongoing contact with the Committee.

8 Catchment Management Plan – action status

<table>
<thead>
<tr>
<th>#</th>
<th>Action</th>
<th>Completion date</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Engage an expert to assist with construction of the CDSS model</td>
<td>Sep-10</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Finish Grahamstown Catchment CDSS demonstration model</td>
<td>Sep-10</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Remake Hunter Water Regulation 2010</td>
<td>Sep-10</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Collect data required to input into complete CDSS</td>
<td>Jan-11</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Prepare a Bushfire Management Plan for the catchment regions</td>
<td>Deferred</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Determine data priorities for improving low resolution / quality CDSS data</td>
<td>Mar-11</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Run complete catchment model to determine high hazard areas</td>
<td>Mar-11</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Continue and complete GAMS (excluding model)</td>
<td>Jul-11</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Continue targeted sampling of faecal sterols at Campvale Canal</td>
<td>Jul-11</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Continue targeted sampling of pathogens and nutrients at Campvale Canal</td>
<td>Jul-11</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Continue to implement the new DA referrals process</td>
<td>Jul-11</td>
<td>continual ongoing process</td>
</tr>
<tr>
<td>12</td>
<td>Continue to train council planners to reinforce regulation</td>
<td>Regular meetings by Jul-11</td>
<td>continual ongoing process</td>
</tr>
<tr>
<td>13</td>
<td>Continue to train Hunter Water staff to recognise inappropriate development</td>
<td>Regular training by Jul-11</td>
<td>continual ongoing process</td>
</tr>
<tr>
<td>#</td>
<td>Action</td>
<td>Completion date</td>
<td>Comments</td>
</tr>
<tr>
<td>----</td>
<td>------------------------------------------------------------------------</td>
<td>--------------------------------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td>14</td>
<td>Continue to work with councils for inclusion of catchment regulation in LEPs</td>
<td>Jul-11 (PSC), Jul-12 (DSC)</td>
<td>continual ongoing process</td>
</tr>
<tr>
<td>15</td>
<td>Convene expert panels to prioritise outputs from catchment model</td>
<td>Jul-11</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Develop a public CMP document to give to stakeholders</td>
<td>Jul-11</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Develop communication plan with landholders and customers</td>
<td>Jul-11</td>
<td>Deferred – 2011-12 reporting period</td>
</tr>
<tr>
<td>18</td>
<td>Develop preliminary catchment ‘stakeholder map’ and engagement plan</td>
<td>Jul-11</td>
<td>Deferred – 2011-12 reporting period</td>
</tr>
<tr>
<td>19</td>
<td>Develop simple, catchment specific surveillance templates</td>
<td>Jul-11</td>
<td>Deferred – 2011-12 reporting period</td>
</tr>
<tr>
<td>20</td>
<td>Implement a method to store records, retrieve data and follow up on actions</td>
<td>Jul-11</td>
<td>Deferred – 2011-12 reporting period</td>
</tr>
<tr>
<td>21</td>
<td>Install posters promoting Hunter Water Special Areas in the council foyers</td>
<td>Jul-11</td>
<td>Deferred – 2011-12 reporting period</td>
</tr>
<tr>
<td>22</td>
<td>Instate regular interagency meetings, target one initial meeting with each stakeholder</td>
<td>Jul-11</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Promote Landcare sponsorship grants in catchments</td>
<td>Jul-11</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Commission research into the source of high catchment risks using outputs of the CDSS</td>
<td>Sep-11</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Develop and cost programs from CDSS outputs to address risk in catchments</td>
<td>Sep-11</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Identify low quality data inputs into the CDSS and engage research to improve</td>
<td>Sep-11</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Include outcomes of CDSS model in price path preparations</td>
<td>Sep-11</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Ground truth the model, compare with monitored data and expert panel verification</td>
<td>Oct-11</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Investigate pesticide use and develop of a pesticide monitoring program</td>
<td>Jul-12</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Implement a signage strategy for catchments</td>
<td>Jul-12</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Continue the series THINK about your DRINK in the customer newsletter</td>
<td>4 monthly until Dec-11</td>
<td></td>
</tr>
<tr>
<td>#</td>
<td>Action</td>
<td>Completion date</td>
<td>Comments</td>
</tr>
<tr>
<td>----</td>
<td>------------------------------------------------------------------------</td>
<td>-----------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>32</td>
<td>Continue current regular committee meetings with catchment organisations</td>
<td>Ongoing</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>Continue to run slide show on TV in HWC Head Office foyer</td>
<td>Ongoing, every 3 months</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>Continue to use the templates for inspections of RAAF Williamtown</td>
<td>Ongoing, review annually</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>Continue to financially support and attend rural field days in catchments</td>
<td>Ongoing, yearly</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Identify low quality data inputs into the CDSS and engage research to improve</td>
<td>Jun-13</td>
<td></td>
</tr>
</tbody>
</table>
9 Operating Licence checklist

9.1 Operating Licence checklist: Section 7.3 - Catchment Report for 2010-11

Table 8.1 – Environmental Indicators and Management (7.3 Catchment Report)

<table>
<thead>
<tr>
<th>Section In Licence</th>
<th>Item description</th>
<th>Location in Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.3.1</td>
<td>Hunter Water must report its performance by no later than 1 September each year against its catchment management activities for the immediately preceding financial year, in a report to be known as the Catchment Report. The Catchment Report must include:</td>
<td>Section 7.1.1</td>
</tr>
<tr>
<td></td>
<td>a) details of activities conducted by Hunter Water under the Hunter Water Corporation Limited (Special Areas) Regulation 2003, and approvals under the Water Act 1912 and the Water Management Act 2000, Water Sharing Plans and any other relevant land or water management activities carried out jointly with other authorities or landholders together with a comparison of: must publish on its internet website the latest</td>
<td>Section 4.2</td>
</tr>
<tr>
<td></td>
<td>(i) those activities planned against those activities undertaken by Hunter Water during the immediately preceding financial year; and</td>
<td>Section 3</td>
</tr>
<tr>
<td></td>
<td>(ii) the estimated cost of planned activities against actual costs incurred by Hunter Water relating to these activities;</td>
<td>(Table 3.1)</td>
</tr>
<tr>
<td></td>
<td>b) details of Hunter Water’s performance against the Water Management Licence and the <em>Dams Safety Act 1978</em> and</td>
<td>Section 7.1.2 &amp;</td>
</tr>
<tr>
<td></td>
<td>c) details of activities proposed to be undertaken in accordance with clause 7.3.1 (a) for the next financial year including costs that Hunter Water estimates it will incur in undertaking these activities.</td>
<td>Section 7.2</td>
</tr>
<tr>
<td>7.3.2</td>
<td>Hunter Water must also publicly display the Catchment Report on its website on the internet for downloading free of any charges imposed by Hunter Water, and make it available at its premises for access or collection by any member of the public free of charge.</td>
<td>✔</td>
</tr>
</tbody>
</table>
### 9.2 Catchment Performance Indicators checklist

#### Table 8.2 – NWI Element: Environment

<table>
<thead>
<tr>
<th>Identifier</th>
<th>Indicator</th>
<th>Definitions &amp; interpretation (Hunter Water context)</th>
<th>Requirement source</th>
<th>Located in Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>OL CM-1</td>
<td>Total number of trees planted</td>
<td>Trees may be planted as part of revegetation projects, bush regeneration activities or for the purpose of carbon sequestration. Shrubs planted will be also be included in the number. This indicator recognises all works on Hunter Water land and the works undertaken by or on behalf of Hunter Water on land that is not owned by Hunter Water, such as offsetting impacts to one area by rehabilitation or replanting at another area. Public disclosure of other catchment management activities, including their nature and associated expenditure occurs through publication of an annual Catchment Report, as defined in Operating Licence Clause 7.3.</td>
<td>2008-13 EMP</td>
<td>Section 4.2.1.1</td>
</tr>
</tbody>
</table>