# Central Coast
# Community Environment Network Inc.

*An alliance of community and environment groups from Lake Macquarie, Wyong and Gosford.*


23 November, 2004

IPART
Review of Water Agency Prices
PO Box Q290
QVB Post Office
NSW 1230

**Re: Submission for Gosford and Wyong Areas on: Review of Metropolitan Water Agency Prices.**

Dear Sir,

The Central Coast Community Environment Network Inc. (CCCEN) is a not for profit, non-government community group that is active in the Gosford, Wyong and Lake Macquarie region for ***Ecologically Sustainable Development (ESD).*** We have over 300 members including nearly 70 groups.

Thank you for the opportunity to provide comment on the structure of the Metropolitan Water Agencies pricing.

CCCEN has previously produced a report on the Joint Water Authority (JWA) (December 2001, copy attached with response from the JWA). "*Its purpose was to clarify the powers and responsibilities of local government and various government departments and agencies associated with water management on the Central Coast of NSW. The impetus for the report stems from the desire to achieve optimum environmental outcomes from the NSW Water Reform Process.*"

The Tribunal in its Issues Paper notes that the two councils (Gosford and Wyong) are not covered by an Operating Licence but are required to develop management plans under the Local Government Act *(IPART page 20, A2.1).* However, these plans cover all of the councils' services and are prepared differently for each council. It is virtually impossible for the public to assess the councils' performance in regard to water supply from these reports. The result is that public reporting is minimal (apart from periodic reviews by the Tribunal) and little information is available on water quality, environmental protection licences issued by the NSW Environment Protection Authority or other relevant activities in the council reports. *(IPART Sections 4.3, 4.5 and 6.3)*

This lack of consistent and useful reporting is well demonstrated by the graphs presented in the Tribunal's Issues Paper, A2.25, A2.26 and A2.27 on sewage overflows. In each case the vertical axis is different and there is no graph at all for Wyong Council, presumably because this information is not available (Wyong Council is not a member of the Water Services Association of Australia (WSAA)). How are the public to make informed comment or be assured of service levels when it is not at all clear that the water authorities know themselves?

Three further factors impact on the ability of the current arrangements to deliver sustainable and accountable outcomes to their customers. These include:

- JWA is a monopoly supplier but there is no ' service guarantee' or operating licence to ensure customers' needs are met;

- only bulk and treated water are covered by the JWA arrangement, rather than integrated management of the water cycle on the Central Coast;
- finally, water supply by the councils does not come under the responsibility of the Energy and Water Ombudsman, (EWON).

It is of concern that while pre-construction plans and studies have commenced for desalination, no similar work is being planned for augmenting the dam levels from additional river extractions. The councils' current approach of presuming nil or little rainfall in planning for the augmentation of the water supply is creating a situation where there is insufficient planning to make use of normal rainfall. Hence we will be locked into desalination as stated by Gosford councils' submission: "*This project is vital to ensure the medium term minimum supply of water to the Central Coast community" (GCC, p22).*

This pricing submission is divided into two parts:
- Part 1 considers organization issues, catchments, service quality, penalty pricing and operations;
- Part 2 considers demand management, additional supplies, water tanks, subsidies and desalination.

These could be summarized as: Part 1 primarily looks at operations, while Part 2 looks at capital budgets.

Yours sincerely,

Jane Smith
Water Project Officer

Attachments:

1. CCCEN report on the Joint Water Authority (JWA) (December 2001
2. Response from the JWA, February 2002.
3. Economic appraisal of Sustainable Water Options (Syneca, 2004)

**Central Coast Community Environment Network**

# Submission to IPART on Review of Metropolitan Water Agency Prices

This submission has been prepared by the

Central Coast Community Environment Network (CCCEN)
PO Box 149
Ourimbah  2258

Ph: 4349 4756
Fax: 4349 4755
Email: cccen@cccen.org.au
Web: www.cccen.org.au

# Contents



**Attachments:**

1. CCCEN report on the Joint Water Authority (JWA) (December 2001
2. Response from the JWA, February 2002.
3. Economic appraisal of Sustainable Water Options (Syneca, 2004)

# Executive Summary

The Central Coast Community Environment Network Inc. (CCCEN) is a not for profit, non-government community group that is active in the Gosford, Wyong and Lake Macquarie region for ***Ecologically Sustainable Development (ESD).*** We have over 300 members including nearly 70 groups.

The Tribunal in its Issues Paper notes that the two councils (Gosford and Wyong) are not covered by an Operating Licence but are required to develop management plans under the Local Government Act. However, these plans cover all of the councils' services and are prepared differently for each council. It is virtually impossible for the public to assess the councils' performance in regard to water supply from these reports. The result is that public reporting is minimal (apart from periodic reviews by the Tribunal) and little information is available on water quality, environmental protection licences issued by the NSW Environment Protection Authority or other relevant activities in the council reports.

Three further factors impact on the ability of the current arrangements to deliver sustainable and accountable outcomes to their customers. These include:

- JWA is a monopoly supplier but there is no ' service guarantee' or operating licence to ensure customers' needs are met;
- only bulk and treated water are covered by the JWA arrangement, rather than integrated management of the water cycle on the Central Coast;
- finally, water supply by the councils does not come under the responsibility of the Energy and Water Ombudsman, (EWON).

Generally, outcomes are to be designed in line with the principles of ecologically sustainable development (ESD).

This submission puts the case on pricing based on the following strategies:

1. Promote demand management more aggressively with service, education and a range of subsidies, incentives and disincentives.
2. Increase the rate of installation of rain water tanks by 1% above the expected rate of installation on new homes and with home renovations. This means retrofitting tanks at a faster rate on existing homes.
3. Enhance the interconnection with the Hunter to 20% to improve system reliability and security. This should be designed to work in both directions. As this is treated water there is not a significant issue of inter-catchment transfers.
4. Increase pumping from Wyong River directly into Mangrove dam to raise the dam level within a reasonable time frame. The additional water required should be purchased on the water market from current extractors.
5. Include a levy for catchment rectification works by the CMA.
6. Review cost and equity issues associated with water releases down Wyong river and the levels of Mangrove Dam during water restrictions.
7. IPART to prepare an Issues paper as a precursor to developing a full Operating Licence.
8. Review and make public Price Waterhouse corporate structures report.
9. Allocate resources away from pre-construction work on desalination to more economic and sustainable sources of water supply.

# 1 Operations of Joint Water Authority

## 1.1 Framework

The COAG policy provides the framework to ensure the authorities operate efficiently. Water Authorities are a public service for the community and have a responsibility to act in the broader public interest based on the principles of *ecologically sustainable development.*

Arguments have been forward in the submissions by the councils that water tanks and demand management will cost the JWA income. **However, our position is that it is not the role of the JWA to maximise income.**

In this regard it is useful to consider the objectives that have been provided for the Sydney Water Corporation in section 21 of the Sydney Water Act 1994.

> (1) The principal objectives of the Corporation are:
>
> (a) to be a successful business and, to this end:
>
> (i) to operate at least as efficiently as any comparable businesses, and
>
> (ii) to maximise the net worth of the State's investment in the Corporation, and
>
> (iii) to exhibit a sense of social responsibility by having regard to the interests of the community in which it operates, and
>
> (b) to protect the environment by conducting its operations in compliance with the principles of ecologically sustainable development contained in section 6 (2) of the *Protection of the Environment Administration Act 1991*, and
>
> (c) to protect public health by supplying safe drinking water to its customers and other members of the public in compliance with the requirements of any operating licence.
>
> (2) Despite section 8 of the *State Owned Corporations Act 1989*, each of the Corporation's principal objectives is of equal importance.

The reference to maximising net worth of the State's investment is not identical to income maximisation. For example, in the USA energy utilities subsidise energy efficiency programs by consumers since this is less expensive than the capital cost associated with installing new plant. Given that the JWA has been granted two privileges not enjoyed by the vast majority of private firms, arguments in regard to loss of income are not particularly forceful.

The two privileges are:

- more or less unfettered access to a valuable natural resource at minimal cost
- in effect, monopoly rights to provide certain services to a community.

There are also questions of consistency with broader Government policy, specifically the COAG agreements on competition. While in a strict legal sense the JWA may not need to comply with the competitive neutrality policy that applies to local councils, nevertheless the objectives of this policy would still appear to apply equally.

In effect, although the JWA is a monopoly supplier of water services, it does compete with private sector firms in the water efficiency devices and water tank industries. Competitive neutrality principles should apply to all government assistance (such as grants or low interest rate loans). But it also applies to 'hidden' cross subsidies such as use of council resources such as overhead services without appropriately accounting for them.

## 1.2 Holistic Approach to Environment, Supply and Demand

An approach based on the principles of *ecologically sustainable development*, which considers social, environment and economic impacts on the community should be a priority.

Equity requires that high users (being well above average) should pay penalty prices to compensate for the capital costs of augmenting the system. CCCEN would like to see more help provided to customers to save water by providing information, advice and support.

CCCEN considers desalination driven by fossil fuels to be an unconscionable approach. This is because the additional greenhouse gases produced are unnecessary and only add to the problems attributed to climate change.

The statements in the council submission (GCC, p22) that; *"only an extreme wet period over the next 9 months could provide sufficient water resources for consideration of the desalination project not proceeding"* is challenged. There is no explanation of what logic is behind this argument, there is no acknowledgement that an interconnection with the Hunter will increase security of supply in the short and medium term and there is no acknowledgement of the impact of the current rainfall. Desalination appears to have been decided.

Unless there is some other key information that is not apparent, then the following would indicate a significant **lessening** of the need for a quick decision on desalination, ie within the next 9 months:

- Mangrove Dam level has recently risen to 26% (providing a 4 month window) from recent rainfall.
- Interconnection with the Hunter will shortly be able to handle 2,000 ML/yr (7% of total supply) and could be increased to 8,000 ML/Yr.
- Demand has the potential to reduce in line with reductions in Sydney.
- Infrastructure improvements in 2005 will increase yield by 4,350 ML/yr. (*WSC p18*)
- Water reclamation and reuse projects totaling nearly 2,500 ML/Yr are in progress.
- New homes having reduced usage due to council policies requiring water tanks and BASIX.

In addition, the interconnection with the Hunter has an impact on sustainable yield calculations and security of supply. This is due to the system becoming bigger and more resilient. The larger the interconnection becomes the higher will be system security and reliability. The reason for this is that the strengths of both systems are added together. Hence, proposals to increase the interconnection would improve system security and reliability at minimal cost.

There is also an opportunity to revise the water restriction levels based on the level of Mangrove Dam due to the six factors above. The two councils have not been able to provide the algorithm used that relate Mangrove Dam levels to water restrictions. It would not seem unreasonable that a changing of the criteria on level 3 restrictions to a lower level should be possible and prudent.

Rebates for water tanks are currently offered by the councils. This is the same as the level for Sydney and the Hunter agencies. The rebate is currently:

| Tank Size | Tank Subsidy | Plumbing Subsidy | TOTAL |
|---|---|---|---|
| 2000-3999 Litres | $150 | $150 | $300 |
| 4,000 – 6999 Litres | $400 | $150 | $550 |
| > 7,000 Litres | $500 | $150 | $650 |

Yield from a 5,000 tank is approximately 55 kilolitres per annum *(Coombes, 2003)*

Councils' submissions state that alternate sources of water are only the Hunter water interconnection, desalination and groundwater. This paper supports a range of cheaper and more sustainable options including water tanks, demand management and additional extraction to fill Mangrove dam.

Metered Water Consumption Scenarios 1/7/05 to 30/5/10, (*WSC Appendix 1*) place too much emphasis on desalination and not enough on other more sustainable options. These other options would include more aggressive promotion and support for demand management, installation of water tanks, increased extraction from Wyong River, upgraded Hunter interconnection and storm water recovery.

A precautionary approach is needed on climate change impacts on the water supply. This has two aspects; firstly, reduced rainfall, it is thought that climate change may reduce runoff by 3% over the next 50 years, secondly, increased greenhouse emissions from desalination. The impacts of accelerated climate change are unknown and uncertain. However, they are being used to justify programs and expenditure even though these are long term and slow changes. Projecting the driest year on record, 2003/2004 as the average or most likely case is problematic and if it is to be used then it needs to be justified by climate experts. A major concern with the councils' current approach of presuming nil or little rainfall in planning for the augmentation of the water supply is that there is insufficient planning to make use of normal rainfall. Hence we will be locked into desalination as stated by Gosford councils' submission: *"This project is vital to ensure the medium term minimum supply of water to the Central Coast community" (GCC, p22).*

The following table summarises key aspects of the present system.

| **Source** | **Catchment Area sq. km.** | **Storage Volume ML** | **Annual Mean Inflow** | **Volume Supplied (4 yr Avg.)** | **% Total Usage** |
|---|---|---|---|---|---|
| Mangrove Dam | 101 | 190,000 | 25,974 | 8,000 | 23 |
| Mangrove Weir | 140 | 300 | 40,807 | 4,700 | 14 |
| Mooney Dam | 39 | 4,600 | 12,095 | 7,144 | 21 |
| Mardi Dam | 2 | 7,400 | 7,400 | 0 | Na |
| Ourimbah Creek Weir | 87 | 100 | 32,573 | 3,620 | 10 |
| Lower Wyong River Weir | 355 | 300 | 105,193 | 11,000 | 32 |
| Upper Wyong River (Proposed) | (175) | Na | (48,606) | Na | Na |
| **Total Mean Annual Inflow in Streams** | **Na** | **>200,000** | **217,000** | **34,468** | **100** |
| | | | | | |
| Hunter Interconnection | Na | 170,000 | >300,000 | 2,000 (2004/5)<br>8,000 (2005) | |
| Desalination | Na | Na | Na | 7,000 | |

**Table 1: Water Supply Source, Catchment, Inflow and Usage**
*(Source: Expert Panel Report, 2000 and Council briefing sheet 2004)*

Table Observations:

- The volume of water available for extraction from Wyong river appears very high;
- Mangrove Dam catchment is very small and needs to be augmented by pumping to raise the water level in the dam;
- The Hunter interconnection increases the sustainable yield of both systems hugely. The security of both systems would increase with a larger interconnection and this would take advantage of different climate zones, storages and existing infrastructure.

## 1.3 Corporatisation

Media reports note that a report on corporatisation has been tabled with the Board of the Water Authority. According to the media on 12/11/2004, five options were considered by the councils. Each had significant benefits to the councils and hence to the consumers. Apparently the benefits over ten years varied from a maximum of $59 million for one option to $10 million for the one favoured by the councils. The reported difference of $5 million per year is very significant and consumers should not be forced to forego such a benefit without being informed of the reasons for the difference and having the opportunity to respond. Having regard to the organisational efficiency criteria used by the Tribunal, the favoured structure should be reviewed by the Tribunal.

It is very difficult for public submissions to be meaningful in the absence of such information and the reasoning behind apparent decisions taken by the Board. In addition, the Tribunal should not only take such reports into consideration in the pricing determination but also make them public. Such reviews are what structural efficiency is about and the benefits are a once only opportunity to the councils and their customers. Offering the opportunity for public comment would provide for better decision making as the public presently have only a small part of the story.

The former Chief Justice Street stated when adjudicating on a matter as the independent legal arbiter that: " I have reached the conclusion that public interest in disclosure preponderates". This had the effect of releasing information on water consumption and operations that were claimed to be "commercial in confidence" by a state utility. *(NSW Legislative Council, 20/10/1999)*

The Price Waterhouse Report into the structure of the water supply should be made public.

## 1.4 Population and Usage

It is often claimed in reports and the media that the Central Coast has a very low per capita (household) consumption *(IPART Section 6.2, figure A2.4)*. However, a review of the WSAA Annual Report reveals other regions on the edges of Australian cities including the Gold Coast have a similar low per capita consumption. CCCEN believes that the actual **per capita consumption may be higher than stated** by the Central Coast councils. The reasons for this are several and include:

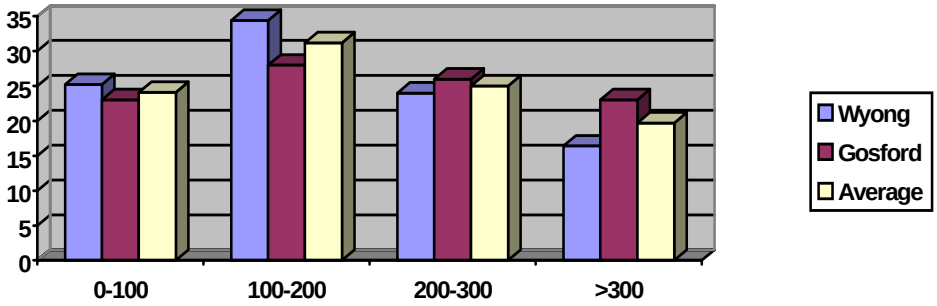
- The region has a very high proportion of commuters, holiday homes and seasonal holidaymakers. All of these groups bias the per capita consumption figure down as follows;
- Commuters are away from the region for an average of twelve hours per day five days per week and they comprise approximately 15% of the population.
- Holiday homes, which are vacant most of the time give an impression that household consumption is low.
- Holidaymakers staying in commercial accommodation could be using less on a per capita basis as the establishments have; less gardens, more efficient water appliances, water economies of scale (eg a single pool) and maintenance on leaks would be better than individual residences.
- There is considerable evidence that per capita consumption is increasing as more non-commuting permanent residents move into the area.
- There is no demand management strategy which would support an argument that initiatives by the councils are impacting significantly on consumption.

The impact of these factors has not been fully explored and CCCEN believes that **a more accurate model of per capita water consumption is needed** to give a more reliable prediction of usage with population increase. Sound objective information is essential if a well planned and comprehensive approach to a sustainable water supply is to be achieved.

In reviewing the consumption figures in the councils' submissions to the Tribunal, household consumption falls into four bands as shown in the graph below.

Penalty or disincentive pricing should target those users above 300 kL/Year/Household as they are using a disproportionate quantity of water. It is expected that the top water users are the ones that will respond most readily to increased charges, since they will be able to make changes to their water usage patterns most easily. Moreover, it is incorrect to consider the cost of supplying water to be constant, so that everyone should pay the same unit price per kilolitre. As the limits of capacity for the water supply infrastructure are approached, the effective marginal costs of supply rise dramatically to accommodate the capital investment needed to fund the next increment of supply. By hastening the point at which major investments in water capacity are reached, heavy water users impose increased costs on the community. The user-pays principle provides support for increased levels of charges for these users to reflect these higher costs.

Where high usage is due to a large family this can be addressed through concessional arrangements.




**Graph 1: % of Households versus consumption in kL/Year**
*(Source Gosford and Wyong Councils' IPART Submissions 2004)*

Comparison tables with usage in Sydney during the current drought show that the Central Coast has barely responded to restrictions. The reasons for this are unknown but could be related to price, media attention or lack of opportunity to reduce consumption.

**Table 2: Sydney Water Consumption** (Source: SWC reports 19/11/04)*

| Month | Usage ML 2002/2003 | ML (% change) 2003/2004 | ML (% Change) 2004/2005 |
|---|---|---|---|
| July | 51,327 | 45,276 (-12%) | 42,576 (-17%) |
| August | 50,842 | 47,324 (-7%) | 43,429 (-15%) |
| September | 55,112 | 50,701 (-8%) | 42,021 (-24%) |
| October | 62,063 | 44,222 (-29%) | 42,806 (-31%) |
| November | 60,743 | 45,556 (-25%) | |
| December | 54,167 | 46,620 (-14%) | |
| January | 59,885 | 49,571 (-17%) | |
| February | 51,228 | 47,049 (-8%) | |
| March | 50,284 | 46,136 (-8%) | |
| April | 45,483 | 44,032 (-3%) | |
| May | 45,393 | 46,492 (+2%) | |
| June | 43,777 | 42,670 (-2%) | |
| **TOTAL** | **630,305** | **1 (-12%)** | **(-22%)** |

*** Notes:** Population growth = approx 1% pa. **Restrictions:** Voluntary - Nov 2002; Mandatory – Oct, 2003

**Table 3: Central Coast Water Consumption** *(Source: Wyong Council website 17/11/04)*

| Month | Usage ML 2002/2003 | ML (% change) 2003/2004 | ML (% Change) 2004/2005 |
|---|---|---|---|
| July | 2,500 | 2339 (-6%) | 2,471 (-1%) |
| August | 2,443 | 2,430 (-1%) | 2,410 (-1%) |
| September | 2,469 | 2,729(+10%) | 2,336 (-5%) |
| October | 2,950 | 2,452(-17%) | 2,404 (-18%) |
| November | 2,973 | 2,493(-16%) | |
| December | 2,767 | 2,847(+3%) | |
| January | 3,296 | 3,034(-8%) | |
| February | 2,622 | 2,629(+.03%) | |
| March | 2,458 | 2,546(+4%) | |
| April | 2,271 | 2,479(+9%) | |
| May | 2,319 | 2,624(+13%) | |
| June | 2,245 | 2,432(+8%) | |
| **TOTAL** | **31,314** | **1 (-1%)** | |

****Notes:** All percentages are calculated against base case of 2002/2003.
Population growth = 2% pa approx. **Restrictions:** Level 1 - Jan 2003; Level 2 - July/Aug 2004

In addition, the impact of BASIX on the future level of demand needs to be considered. The ongoing impact on per capita consumption of BASIX and retrofitting houses with water efficient devices that are sold as per government announcements will increase over time. It would not be unreasonable to expect that a significant reduction in overall per capita consumption would be achieved over a twenty year period from these two initiatives alone. However, the council figures of a 30% reduction to 2007 in their submissions appears very optimistic.

**Recommendation:**
Review the population and per capita estimates, and apply higher charges for excessive consumption.

## 1.5 Water Pricing in General

Statistics on the performance of water supply authorities suggest that Central Coast water prices are lower than for other water suppliers. It is important to note that it is not possible to know whether water charges actually cover costs of supply, or whether there are cross subsidies from other Council funds. Consumers may be paying for their water services through higher council charges or losing out on inferior levels of council service in areas other than water supply. In the absence of detailed financial reporting on JWA activities it is not possible for the public to know just what water services are costing the community. Reporting on water supply services by the two Councils is of a very broad nature within their separate annual reports, and it is impossible to determine what the actual performance of JWA has been.

It is disappointing that the councils have not seen fit to investigate alternate pricing structures to reduce demand. However, we take strong issue with the statement that such price structures could have unsubstantiated impacts on commercial users (GCC page 15). The impact would depend on the type of user and their approach to good water management. For example our understanding based on feedback from industry is that the low price of water precludes changes in water usage and a ‘once–through’ system is

considered the cheapest. Commercial users not receiving appropriate price signals include; car washers, chemical manufacturers and food processing.

A theme in the councils' pricing submissions is the impact of lower demand due to restrictions and demand management on costs and hence prices claiming there is a need for very significant infrastructure spending. However, there are two issues here, firstly demand is not reducing in response to restrictions and secondly, much of the infrastructure proposed is needed to improve the performance of the current system. CCCEN supports the infrastructure augmentation proposals recently put to the Councils excepting for those involving expenditure on desalination.

The two councils propose to increase meter readings to 3 times per year at an estimated annual cost of $200,000. This is claimed to be best practice. The benefit to the councils is presumably in reduced borrowings and easier cash flows. Currently accounts are sent out twice per year at uneven intervals (at roughly 4 and 8 month gaps). It could be argued that this proposal is a case of a monopoly supplier transferring costs to its consumers (who cannot avoid them) so as to optimise its own operations. If the increased frequency of meter reading is approved the charges for water should be **discounted by an amount corresponding to the increase in costs** to consumers of more frequent payments.

## 1.6 Marginal costs of Production

The councils quote the following costs, and the last column is estimated.

| Source | Existing Water Supplies | Groundwater | Desalinated Water | Hunter Water | Wyong River Increased Pumping |
|---|---|---|---|---|---|
| Cost | 5.4 c/kl # | 50 c/kl # | 80 c/kl # | 93 c/kl # | < 10c/kl (Note) |

(# Source: WSC, p16)

*Note: This estimated cost for Wyong River is based on a calculation for additional pumping plus some inefficiencies associated with storing the water in Mangrove Dam.*

These figures appear to exclude the costs of capital and we are unsure of the basis of some of these numbers. In the Dept of Commerce reports, the figure of $1.33/kL is used for desalination and includes a component for cost of capital (return on assets) and depreciation. Research by Atech reports a figure of $0.84 per kL is the annual cost (energy, labour, maintenance, etc) only for desalination. The DoC reports don't say what estimate they have used for their O&M costs, nor do they say what the discount rate of life of the plant is. For the assumptions we have used 5% discount rate, 23 year life.

Pumping from Wyong river raises many environmental and community issues. These include, greenhouse emissions form pumping, impact on flows and aesthetics of infrastructure in rural areas. However, a major benefit of such an approach is that advantage can be taken of predictions that climate change will cause more frequent and heavier storms. The high flows from such runoffs will be able to be readily stored in Mangrove Dam. Hence, system security and reliability will be enhanced.

**Recommendation**:
Increased pumping from Wyong river should become a priority to increase dam storage levels and increased frequency of billing should not impose cost increases on residents.

## 1.7 Impact of Low water prices

The **low price for water has not served the area well** in terms of building up capacity for sustainable water usage.

There are several recent or current examples:

- A proposal for the recovery of water from exceptionally large new buildings for reuse is under consideration. This proposal has the potential for both economic and environmental benefits in that large flows could be diverted away from sensitive wetlands and water bodies. The proposal would be expected to avoid irreversible damage to threatened species and ecological communities since the wetlands will no longer become inundated with heavy rain. However, the companies involved cannot justify expenditure for this proposal on commercial grounds. Subsidies consistent with those being offered in Sydney will be required from the councils or JWA, and these should be provided for in the price determination.
- The power stations operated by Delta Electricity currently use 3% of the potable supply from the JWA. Until about 1990, the price of water to the power industry was higher than to other users. This cross subsidy was abolished by COAG and the creation of the Tribunal's predecessor organisation. Earlier price determinations reduced the price to industry and created the current level playing field approach. While water conservation is clearly a social obligation it is unlikely to be paid for as such. The industry is a state owned trading enterprise and is required to justify any capital expenditure on the basis of a business case. The technology is now available for use of treated effluent and internal water reuse with a reverse osmosis plant, but the low price of water has contributed to the failure of **water reuse to be implemented**.

  At nearby Eraring Power Station a similar plant has saved Hunter Water huge quantities of potable water. The JWA claims that; to provide treated water in this way would be more expensive than potable water from the reticulated system. However, their figures are based on waste water being provided externally by the JWA rather than from internal sources, which would enable savings in infrastructure, waste water and cheaper energy to reduce the costs. The estimates for reuse at Vales Point and Lake Munmorah have not been subjected to independent public scrutiny. By contrast, the actual water quantities, operating costs and capital requirements are readily available for water reuse at Eraring power station which is also a public trading enterprise. The schemes can only be viable if treated effluent is supplied to users at no cost. It is worth noting that media reports ("*Sewerage pipe to power plant*", Telegraph 1/11/2004) identifies similar barriers in the Sydney catchment.

  Other large industries on the Central Coast such as Masterfoods, Sarah Lee and Bayer all have the technical potential to significantly reduce their consumption by water reuse and technological improvements. Feedback provided to CCCEN is that such **changes are not happening due to the low price of water** and the corresponding low level of potential savings in water charges being insufficient to justify the associated expenditures.

All of these examples demonstrate the need for price incentives and other drivers to promote the introduction of water saving technologies or reuse. *(IPART Section 6.8)*. The State government has adopted *The Metropolitan Water Plan (2004)* as a policy document. With it the government announced a Demand Management Fund of $30 million per year for 4 years. It is to be established to allow for government bodies and business to apply for assistance for water efficiency projects.

In addition, the plan requires the top 200 commercial and industrial water users to prepare water conservation plans from March 2006 and 4 yearly thereafter. Verbal advice is that these initiatives will be paid for out of Sydney Water revenue. Similar programs are needed for the Central Coast with similar funding sources.

Barriers to stormwater harvesting need to be removed. Private companies are challenging Sydney Water's resistance to privately funded programs to produce and sell recycled water. According to newspaper reports (Telegraph 20/10/2004) the companies have approached the National Competition Commission over the monopoly suppliers approach.

**Recommendations:**

- price incentives and other drivers to promote the introduction of water saving technologies or reuse. *(IPART Section 6.8)*
- treated effluent is supplied to users at no cost.

## 1.8 S94 Pricing Issues:

The Tribunal Issues Paper does not make clear how S94 contributions for headworks under the EP&A Act are used and their impact on the price structure. Media reports earlier in 2004 by the JWA reportedly claimed that desalination plant would be paid for out of such contributions.

## 1.9 Environment Flows

There have been 3 overarching activities occurring which impact on environmental flows. The Stream Flow Management Strategy (2001) was prepared by a team of experts acting as consultants to the Joint Water Authority. Their task was to identify and make recommendations on key environmental issues associated with the water supply. Due to the drought, the only aspect of their study which has been implemented has been some changes in water quality monitoring.

Water Management Plans were prepared in the period 2000 to 2003 through a stakeholder committee process. They cover Jilliby Creek and Ourimbah Creek and provide for small environmental flows (approx. 96$^{th}$ percentile) during dry weather conditions. A water sharing plan was also prepared for the Kulnura/Mangrove plateaus area. Information available on flows, extractions and environmental impacts was very poor. This resulted in increased monitoring and adaptive management being included in the plans. All the water sharing plans were gazetted and came into force on 1$^{st}$ July 2004. A water sharing plan has not been prepared for Wyong River and this is needed as a priority to allow future extractions and environmental flows to be determined. If a specific plan is not prepared in the near future, Wyong River will be covered by the generic plans being prepared on a state wide basis.

In 2003, CCCEN sought to have a moratorium placed on further groundwater extraction until the ecological impacts, sustainable yield and impacts on the water supply were determined. A study, due for completion in 2006, is currently underway which seeks to determine sustainable yields and baseflows in Ourimbah Creek from Groundwater. Groundwater licences are currently not being issued due to the uncertainty associated with the water supply. Recently, evidence has come to light that sand and gravel extraction on the Somersby Plateau is using approximately 5,000 to 7,000 ML/Annum of groundwater for washing. This water seeps into the extraction pit and is not required to be licensed, monitored or quantified.

## 1.10 Catchment Environmental Services Levy

An outstanding feature (by its absence) of the submissions from Gosford and Wyong councils is that no funding is identified for catchment health, rehabilitation or maintenance. Significant funding is being spent by State and Federal governments through the Natural Heritage Trust and Catchment Management Authorities (CMAs) to address a range of riparian vegetation and estuary issues.

The Catchment Management Authorities are required to implement the Catchment Blueprints. In particular your attention is drawn to Integrated Catchment Management Plan for the Central Coast 2002, (Central Coast Blueprint) priority 15:

"Develop a strategy for local and regional planning instruments and council rating structures to improve natural resource outcomes through the use of incentives such as:
*S94 contributions*
*Differential rating;*
*Other innovative approaches"*

It should be noted that eight out of the first ten priority targets are related to impacts from the councils' water and sewerage services. Of the total of 57 priority targets there are 32 that are impacted by the water and sewerage services.

The Blueprint will be revised slightly as it is incorporated into the Catchment Action Plan which will come into force on 1st July 2005. The Catchment Action Plans are called up under the Catchment Management Authorities Act (2003).

Environmental services used in the extraction, operation and disposal of the water system should be accounted for and paid out of the price charged to consumers. A levy should be imposed to pay for catchment works and to compensate for rectification of Tuggerah Lakes and Brisbane Waters issues caused by operation of the water supply system. Examples of works currently being funded by the state and federal governments include rivercare plans and associated grants to landholders, funding to address water extraction impacts on the lake and impact from spills and sewer overflows.

The levy proceeds should go to the CMA for expenditure on these purposes as it is the body charged with the responsibility to rectify these problems as defined in the Blueprint. Current money used for these purposes comes from the Natural Heritage Trust and the State Government. It is more appropriate that, as the current sources of funds are reduced over time, the 'user' pays for the works that are essential for the sustainable delivery of water supply services.

**Recommendation:**
A Catchment Levy of up to $20 per residence be phased in over four years with funds collected as part of water rates and paid to the CMA. Such funds should be tied to specific Catchment Action Plan outcomes.

## 1.11 Quality of Service

### Customer Water Service

An alternative approach to support customer needs is required. Presently, water supply ends at the meter rather than at the point of usage. Investigation by Sydney Water on the quantities of water used domestically reveals that wastage is around 15% (unaccounted losses) and in addition another 1% is lost from leaking toilet valves.

Current regulations require that repairs and the fitting of water saving devices be carried out by qualified tradesmen only, and give powers for water authorities to check for compliance. But water agencies should be required to provide a wider service by helping customers save water by offering a complete water service. Such a service would finish at the tap rather than the meter. Customers would have a single telephone number to ring for minor repairs and leak checks. Such work could be performed by outsourced contractors.

### Quality of Supply: Maximum Water Pressure

IPART sets performance standards for minimum water pressure. There is a case for setting an upper limit on water pressure to reduce consumption and provide a better quality of supply. Quality being defined as minimal variability in pressure. In addition, many manufacturers require the fitting of pressure limiting

valves on their water appliances. Anecdotal advice from a plumber is that he often has to fit 500kPa pressure limiters on water heaters and dishwashers.

**Recommendation:**
Fit pressure reduction valves in areas with excessive pressure.

### Service Quality: Information to Customers

Information on the average usage at the home is provided on accounts. However, there is no explanation of what this means or a comparison with how this compares to the average consumption on the Central Coast. People do not read it and don't understand what it means.

**Recommendation:**
The information on water bills, which is already printed on the bills, be highlighted and shown against average consumption to give customers an appreciation of their usage.

## 1.12 Mangrove Dam

### Role of Mangrove Dam and water restriction levels

We are of the strong view that there has been no debate on the optimal level of Mangrove Creek Dam. Storage in Mangrove Dam is currently at 25%. This is claimed to be two years supply. However this estimate is based on an assumed total lack of rainfall, whereas the catchment is suffering 'reduced rainfall' not total drought, so the realistic estimate is closer to 5 years supply. A key issue is the level of the dam and the resultant trade off between costs to fill and the risks of running out in any given period. The capacity of the dam at 190,000 million litres is huge in comparison to other storages. The dam is this large because it was built for industry development in the region that did not eventuate. However, most of the region's water comes directly out of the rivers not from the dam. In fact last year, the driest on record, the region used around 15,000 ML from Mangrove Dam. This means that when the dam is full it stores up to 13 years usage.

In addition, there is an issue with the historical and current levels in the dam being used as the driver for water restrictions. Discussions with water authority staff have failed to clarify the rationale for this linkage in the light of the fact that most water comes directly from the streams. Storage and pumping capacity associated with the streams is limited. There is a capacity to store only several months supply outside of Mangrove Dam. The rationale behind the choice of storage levels that trigger restrictions are also unclear; our understanding is that they were modified at a JWA Board meeting, but no background to any decisions has been made public.

**Recommendation:**
Review level of the dam as the driver for water restrictions.

### Water Releases from Mangrove Dam down Wyong River

At particular times of year and during extended dry periods there is a need to release water down the Boomerang Tunnel into Wyong River to supplement supply. This method of release is inefficient and creates inequity. It is inefficient because less water arrives at the weir than was released from the dam. Irrigators extract from the Wyong River by pump when the river is flowing and the geomorphology of the river causes water to be lost. So the difference between the amount of water released from Mangrove and that available at

Wyong weir is much reduced. Most extraction from the river would be during dry periods, this is precisely when releases would be occurring from Mangrove dam. It is inequitable as the water extracted by the irrigators is paid vie their water licence to DIPNR. It does not compensate council water consumers for what they have paid to capture, store and manage the water released.

The councils claim that the volume of water used by extractors is small in comparison to the total supplied by the Water Authority. The Water Authority extracts around 10,000 ML/Year from Wyong River according to JWA figures. Total extraction by irrigators is not known, but a newspaper quoted one irrigator saying he had a licence for 370 ML/Year (ie 4% of the total town water extractions). It would be expected that irrigators use large quantities as many are growing turf. Turf requires approx. 3-4 ML/Ha. Without knowing the full amount of extraction it is hard to determine how much water is used but best possible estimates range up to 10,000 ML/annum. Finally, turf would require more water when water restrictions are in force as there would be less rainfall.

**Recommendations:**

- The amount of water released from Mangrove Dam should be monitored and reported against water used at Wyong weir.
- There should be limits on water extraction when water is being released down Boomerang Tunnel if water restrictions are in force.
- Water extractors for agriculture should be treated no differently to large industrial or commercial users and be supported in Waterwise programs and the like.

### Waterplan 2050

The JWA is endeavouring to establish a long term framework for water supply management. It has called the process Waterplan 2050. A twelve volume set of reports has been prepared by the NSW Department of Commerce and is now being discussed in public forums at consultation meetings.

The final decisions from Waterplan will be made by the two councils. It is not clear what other approvals the JWA will be seeking at a State Government level once the plan is adopted by the councils. The outcomes of the process and studies will have a large impact on any future price determinations. CCCEN are very concerned at the methodology and limited approach being taken in developing Waterplan 2050.

### Need for an Operating Licence

In the Sydney Greater Metropolitan Region there are five water supply authorities. All five authorities are subject to the Tribunal in regard to water pricing determinations. Sydney Catchment Authority, Sydney Water and Hunter Water are required to have an operating licence issued by the Tribunal and to come under the Electricity and Water Ombudsmen (EWON).

Gosford and Wyong Councils do not have operating licences but instead work under an exchange of letters called the 'Joint Water Authority'. These Councils have resisted having an operating licence in the past. As a result, residents of the Central Coast (now numbering 320,000) do not have the same access to information and government processes as other residents of the Metropolitan region. There is limited information available to the public with no Annual Report or Environmental Report targeted to the water supply services on the Central Coast. Instead the Councils report on their water supply services within the body of their annual reports, thus making it impossible to determine what the performance of their water authority has been.

The other significant issues relate to inadequate public scrutiny, accountability or consideration of more sustainable water supply and wastewater disposal options. The Central Coast is currently preparing the future of its water supply and these authorities are investigating various alternative supply options. However, there are grave fears that the current resource use is not being optimised and that the most sustainable solutions are not being considered. The public is unable to fully participate in these processes due

to a lack of reporting requirements and transparency.

There is also a lack of basic data for audit and price setting purposes. Currently, the councils collect limited data some of which are provided for pricing determinations. The two councils also collect data in different manners and so comparison is difficult. The Tribunal is often forced to commission consultants to aid in gathering data and determining basic resource management statistics for their pricing determinations.

These two water authorities are already subject to pricing deliberations by the Tribunal. As part of the Greater Metropolitan Region the residents deserve to have the same level of access to information and process as other residents living in Sydney or the Hunter areas. The Tribunal was given a reference for determining prices for these authorities because they were considered to be significant monopolies for water supply due to the size of the population served. Such considerations would be consistent with requirements for an operating licence to ensure transparency and accountability. Therefore, CCCEN has requested the Government to instruct the Tribunal to prepare an issues paper to support the development of Operating Licences for the Gosford and Wyong Water Supply Authorities as a matter of urgency.

Whatever structure water supply management takes in the future there is a need for an operating licence. Such licence would set out benchmarks, independent auditing and standard reporting. Enabling direct comparisons to occur between water organisations which can only be attained if they are structured in a similar way and expected to perform to similar standards. It is clear **IPART are only doing part of the job in regulating price**. In effect, Central Coast residents are second class citizens on the subject of water services.

**Recommendation:**
IPART to prepare a discussion paper on a water licence for Gosford and Wyong councils.

# 2 Economic Evaluation of Water Supply Options

The attached report by Syneca Consulting reviews the proposed options and provides economic evaluations for seven options starting with the introduction of desalination in 2007. In three cases the costs of water tanks and/or demand management are lower than desalination.

In Option 6 the cost appears higher but does not include the benefits from the remaining life of the tanks and certain energy efficient devices that are likely to defer the time for augmentation of the water supply system by at least an additional 10+ years. All options are relative to a base case assumed to include no action in regard to ensuring water supply security beyond continuation of the current trends. These trends include council policies for the fitting of water tanks and the implementation of BASIX in July 2005.

Alternative strategies are proposed by CCCEN as follows:

## 2.1 Reduction Strategy: Demand Management

Consumption figures in Sydney and the Central Coast since water restrictions were introduced reveal that the response on the Central Coast has been very poor. Part of the reason for this is that the JWA has no integrated plan for demand management.

It is not clear how a statement that *demand management strategies since the 1970s has achieved….comparable with industry best practice"* is able to be supported by evidence.(WSC, p15)

However, water restrictions and media campaigns have been successful in making the public well informed when it comes to water usage and the impact of drought. It is also clear that these actions have failed to achieve the significant a reduction in water consumption desired. The common attitude by members of the public is that 'we need to save water' but this is not reflected in consumers' behaviour.

There is a **need for a demand management strategy** similar to the document produced by Hunter Water. However, that document needs significant improvement to adopt a wider range of water consumption options. These should include manipulating system pressure, incentives to industry, system maintenance and more generous retrofit programs. The costing of these programs should be evaluated based on alternative uses of the funds.

The JWA currently is offering a refit program to customers, where for $39 they can have water saving shower heads fitted with some other devices. This program needs to be expanded to include; pressure reduction devices, toilet cistern modifications and incentives for other water saving measures.

These programs should be provided at a subsidised cost to customers who fit water saving devices. In other words from the customer point of view they should pay little for improvements leading to water savings. The costs should be borne by consumers who use high quantities of water. This structure should save the JWA considerable expenditure on system augmentation.

*The economic analysis prepared by Syneca Consulting has assessed demand management in a house with installation of all three of the following types of water efficient devices:*

- *AAA rated shower roses (assumed to be one shower per house)*
- *AAA rated washing machines*
- *6/3 toilet cisterns (assumed to be one toilet per house).*

*The analysis demonstrated that water efficient appliances could be cost effective in ensuring security in water supply as a result of long term economic benefits and the need for a more concerted effort to achieve a greater rate of adoption.*

Reductions in income to the JWA as a result of demand management programs needs to be considered in a more constructive manner. The councils' submission to the Tribunal quotes figures of between $1 million and $2 million income loss in each of the next two years. The actual impact on the councils' operations needs to be detailed in order to assess the veracity of the claim. (WSC,p3)

## 2.2 Reduction Strategy: Front Loading Washing Machines

Front loading washing machines (rated AAA) will save an amount approximately 25 kL/Year in an average household. This makes them one of the most socially acceptable and effective means of reducing water consumption.

In addition, the limited life of washing machines means that many people will be purchasing them on a regular basis. A subsidy of $150 to $200 should be offered for a fixed period of no more than 5 years to encourage the move to more water efficient machines.

## 2.3 Reduction Strategy: Water Pressure

The cost to supply and fit a pressure limiting valve at a property is $150. The installation of 700kPa valves at the meter on all properties where the pressure exceeds 700kPa would save water (approximately 20 kL/Yr per household) and provide a better quality of supply. The economic evaluation reveals that while this would not solve the problem of supply a small subsidy could be offered to encourage fitting of the valves as a way of saving water.

In conclusion, demand management is one tool in the toolbox for making wiser use of water. Assistance to the public to encourage wise use should be justified. There is a need for these subsidies to be applied equally on all water saving devices based on their contribution to water savings.

For example, subsidies for the fitting of efficient shower heads ($40 each), toilet hold only flushing mechanisms or weights ($50) and front loading washing machines (from $550) would yield very large water savings (approx. 30%) without diminishing lifestyle choices. These options have a nominal one-off cost of less than $50 per percentage point improvement in water usage per household.

The cost of further subsidising the above options need to be evaluated.

## 2.4 Supply Strategy: Water Tanks

A 3,000 litre water tanks is able to provide approximately 22% of household demand in the western suburbs of Sydney. (*Coombes, Heritage Mews, November 2003*). This equates to 55 kL/Year based on the 250kL/Year consumption on page 23 of the IPART issues paper.

Water tanks are already compulsory for new houses in Gosford City and Wyong Shire under council policies. In July 2005 BASIX will apply in Gosford and Wyong and water reduction designs will be compulsory. The state government announced as part of the Metropolitan Water Plan that houses being renovated and those being sold would be brought into the requirements for BASIX. The installation of tanks in new houses will have a significant impact in high growth areas such as Wyong. Hence, the Business as usual model includes this occurring from 2003.

Renovations and retrofitting mean that Option 3 is a likely scenario to evaluate the impact of water tanks beyond these existing requirements. Under option 3 a 1% retrofitting rate is expected to defer the need for construction of a desalination plant by at least 8 years if all else stays constant. The real cost to the water authority will be much less as renovators and house sellers will be required to meet most of these costs. The case for a significant increase in the subsidy for installation of water tanks would appear to be justified.

## 2.5 Supply Strategy: Desalination Plant

In regard to a possible desalination plant, there has been considerable media attention and both councils' submissions put a case on the urgent need for a desalination plant sized at about 20% of supply to ensure reliability during the current drought. The case is based on continued climate uncertainty with an expanding population. However, desalination does not directly assist the problem of how to get more water into Mangrove Dam. The last two months have seen very heavy rain but there is no infrastructure to move water into the dam. Because of the emphasis on desalination, consideration of other options has been downplayed, particularly water tanks and the Hunter interconnection.

CCCEN are very concerned at heading in the direction of desalination for several reasons:

- Any arrangements between JWA and the power industry must meet minimal conditions for probity and accountability given the potential for mutual benefits to the two parties as customers for the services provided by the other
- The use of fossil fuels to drive such plants is contrary to Government greenhouse policy;
- Better alternatives to provide security of supply are available for the same or lower cost, such as incentive programs to reduce consumption;
- The cost of water from such plants is high and will increase pressure for higher charges for water;
- The cost to customers and the community of a desalination plant could be unjustified if wetter weather patterns return;
- Water produced by the plant will need to be stored if the plant is to be utilised fully over its economic life. There are two major impacts:
    - Desalinated water will be wasted by evaporation in dams, and;
    - Significantly more energy will be used in pumping if it is stored in the dams.

In discussions with the councils, it appears that the proposal currently favoured involves an increase in the quantity of water in Mangrove Dam by using the output of the plant to supply Gosford. This is so that Gosford will use less water from Mangrove Dam via releases to the Mangrove weir. Our strong view is that the business case for a desalination plant that has been put forward for public exhibition is skewed, and fails to include the additional costs of pumping water from the plant to Gosford. Gosford does not fluoridate its water supply. According to the Mayor of Gosford (Telegraph, Extra, p3, 19/11/2004) it does not intend to change that situation. This could mean duplication of piping to Gosford from any desalination plant built in Wyong shire.

The result of omitting pumping costs is to give a lower estimate for costs of increasing security of supply through desalination than by reducing usage by fitting water efficient devices and the other options outlined above. CCCEN has sought expert advice from an economist in evaluating the costs associated with a desalination plant based on detailed modelling of the supply/demand situation for water on the central coast. This does not include any costing for pumping to Gosford. The evaluation suggests that a desalination plant is not the least cost option for consumers over a 23 year life cycle in comparison to water tanks and retrofitting water efficient devices. *(Syneca Consulting, Option 1 depending on assumptions about how the plant would be operated).*

There is a pressing need for an open and balanced assessment of all options based on objective quantified estimates of the impacts before the JWA spends more money on the current accelerated planning and pre-construction activity for a desalination plant.

## 2.6 Substitution Strategy: Extraction Licences in Wyong River and Ourimbah Creek

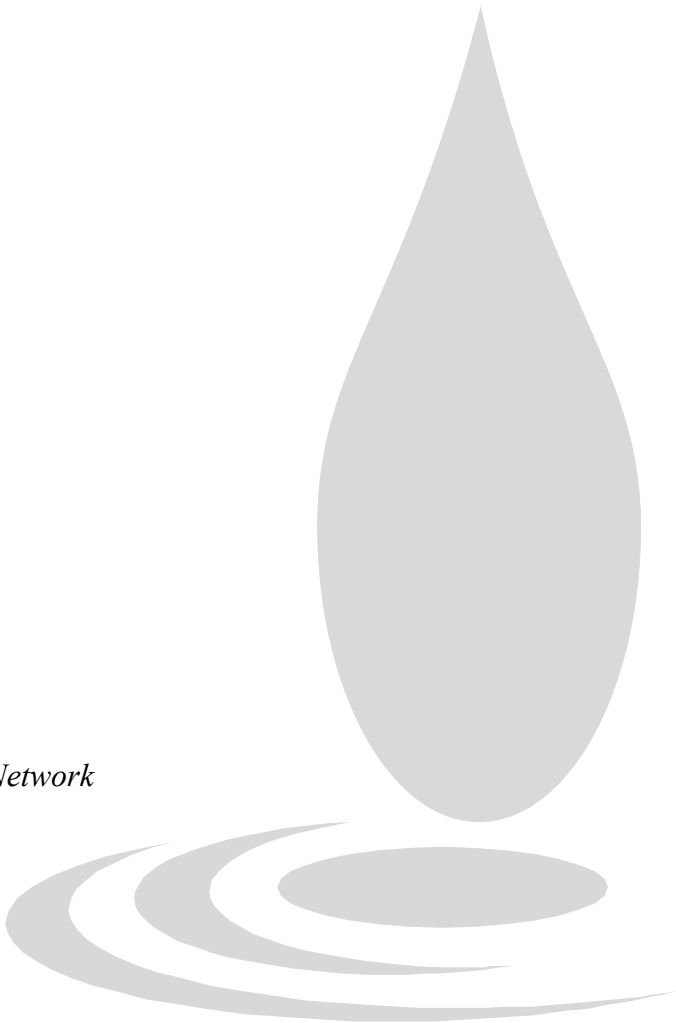
The quantity of water extracted from Wyong River and Ourimbah Creek by irrigators is estimated at 10,000 ML/annum. This water is extracted in drought and during transfers from Mangrove Dam. There is also a need to obtain additional water to pump into Mangrove Dam as the catchment of the dam is very small. Such pumping could be either from Wyong weir or at Bunning Creek above Yarramalong.

Consideration should be given to supplementing supply by having the Water Authority to offer to buy water extraction licences from the irrigators. Irrigators potentially have significant amounts of licences or part licences to sell. The price for a permanent transfer of the licence is not easy to determine but if the price were to lie in the plausible range $1,000 to $1,500 per ML this would be the least cost means to obtain water incrementally. In addition, as the water is already being extracted for agriculture, the alternative use of the water for urban supply would have negligible environmental impact. It would be important in doing this to encourage irrigators to become more water efficient. The case outlined in the Syneca report gives the economic cost if buying the licences leads to a reduction in economic activity by turf growers. However, the alternative case for increased economic activity by increasing the quantity of urban water supply was not able to be computed. It is likely that the value of economic activity from urban water supply would be much greater.

# Discussion Paper on

# Gosford-Wyong Joint Water Supply

**December 2001**



*Commissioned by the*
*Central Coast Community Environment Network*

Central Coast Community Environment Network
PO Box 149
Ourbimah,  2258

Phone: 02 4349 4756
Fax:  02 4349 4755
Email: *cccen@terrigal.net.au*

## Contents



**Note:**
*This Discussion Paper contains a number of direct references to a wide range of materials that were reviewed in order to compile it. Every effort is made to ensure that references and quotations are faithful to their original context and should any reader seek further clarification, they are encouraged to consult the original source.*

## Executive Summary

This Discussion Paper has been commissioned by the Central Coast Community Environment Network (CCCEN).

Its purpose is to clarify the powers and responsibilities of local government and various government departments and agencies associated with water management on the Central Coast of NSW. The impetus for the report stems from the desire to achieve optimum environmental outcomes from the NSW Water Reform Process. In particular, the CCCEN aims to ensure that environmental flows and trial flows are implemented in priority rivers and streams in the Central Coast catchments, and that any impediments, whether physical or political, be identified and addressed.

In recent years, successive governments at both State and Federal level have enacted legislation to specifically endorse ***Ecologically Sustainable Development*** as an objective of resource management. Similarly, community participation and public accountability have been recognised as integral to meeting such an objective. This Discussion Paper seeks to explore some of the concerns that have arisen in the practical implementation of the stated objectives and seeks to clarify community rights and expectations in relation to these issues.

The content of the Report is specific to catchments and waterways within the Gosford and Wyong Council areas. Gosford and Wyong Council are Water Authorities under the provisions of the *Water Management Act* 2000. The two councils have an agreement between them such that specific headworks and waters are managed jointly by the Gosford-Wyong Councils' Water Authority.

Feedback and comments on this CCCEN Position Paper or other water issues are welcome and should be forwarded to:

Executive Officer
CCCEN,
PO Box 149,
OURIMBAH, 2258.

## Section 1: What is the legislative basis of Gosford-Wyong Councils' Water Authority?

Historically, council water and sewerage activities were managed under the *Local Government Act 1919* (LGA). In 1987 Gosford and Wyong became water supply authorities under the *Water Supply Authorities Act (1987)* and it was this Act that provided the legislative basis upon which the water and sewerage arms of both councils were administered.

Prior to the 1987 Act, the councils executed a formal agreement known as the Gosford/ Wyong Joint Water Supply Agreement. The initial agreement was signed in 1977 and provided for the construction, operation, maintenance, use and cost sharing of the joint water supply system which provides water resources to the Central Coast. (KPMG, 1993). With the exception of headworks facilities, each council independently operated, maintained and constructed its water supply and sewerage infrastructure. As at 1993 the agreement was being renegotiated.

The *Local Government Act* of 1919 was replaced by that of 1993. Recently the *Water Supply Authorities Act* 1987 was repealed by the *Water Management Act* 2000 (WMA),although both Wyong and Gosford Councils retain their status as Water Authorities under the new Act (s 20 (1) of Schedule 9).

The dual status of the councils and the fact that the council is subject to the provisions of the *Water Management Act* (2000) while acting in the capacity of a Water Authority gives rise to some concerns regarding the requirements of the Councils to remain publicly accountable. These concerns are highlighted by a number of comments contained in the literature which was reviewed in order to compile this report. Such comments include:

- The Councils became Water Supply Authorities …having accepted an invitation from the NSW State Government to become Authorities and "enjoy greater flexibility in operation than provided by the *Water Supply Authorities Act* 1987". (KPMG, 1993).
- As Water Supply Authorities, the Councils "will have increased powers and flexibility, particularly of rating policy" (Interdepartmental Committee Report, 1987).
- A specific recommendation recorded in the above IDC Report is that "Gosford City Council and Wyong Shire Council should be provided with increased powers and more flexible arrangements by making them Water Supply Authorities under the *Water Supply Authorities Act*" (Interdepartmental Committee Report, 1987).

Further, distinctions are drawn between the responsibilities of a Council and a Water Authority. General Purpose Councils are said to have a "commercial and social focus" with a managerial authority "linked with community interests." Water Supply Authorities are said to be "focused on commercial returns" with "absolute" authority within the terms of the Act. Perceived disadvantages of the Water Supply Authority model are identified as "reduced local community accountability" and "absence of general accountability measures as prescribed by the *Local Government Act*". (KPMG May, 1994). In terms of common goals, both the *Water Management Act* (2000) and the *Local Government Act* 1993 have ecologically sustainable development (ESD) as a stated objective.

Section 342 of the *Local Government Act* provides that the General Manager is to designate a member of staff as the public officer of the Council. Two of the functions the public officer is to perform include dealing with requests from the public concerning the Council's affairs and assisting people to gain access to public documents of the Council (s 343 LGA).

Chapter 13 also states that members of the general public are entitled to inspect a wide range of Council documents (s 12 LGA). Members of the general public are also entitled, under the *Freedom of Information Act 1989*, to access to certain other documents held by a Council. They are also entitled to require the correction of certain kinds of information in the event that the information is incomplete, incorrect, out of date or misleading.

The inspection provisions under the *Water Management Act* (2000) appear much more limited. Registers recording information about licence applications, transfers, cancellations and the like must be made available at the head office of the Department of Land and Water Conservation for inspection, free of charge, by members of the public. Similar access must be granted to registers recording information about Water Management Work approvals, suspensions, cancellations etc.

These distinctions in power and responsibility between a Council and a Water Authority leads to concerns that accountability may be compromised or reduced by constituting Councils as Water Authorities.

Legislatively, there are distinctions between Councils and Water Authorities. For example, a Water Supply Authority is subject to the direction and control of "the Minister" (s 293 (1) (b) WMA); the relevant Minister being the Minister for Land and Water Conservation. As such, a Council acting in the capacity of a Water Authority reports to a different Minister to when it is merely acting as a Council. Interestingly, section 293 (2) of the Water Management Act (2000) provides "If a function conferred or imposed on a Water Supply Authority by this Part is inconsistent with a function conferred or imposed on the Water Supply Authority by or under another Act, this Part prevails."

Again, concern arises as to whether in some circumstances, either Gosford or Wyong (or both) Councils will be directed to act in a certain manner or to perform a certain function which is outside the general scope of Council actions conferred under the LGA.

It would appear that there are clear advantages, even if only in terms of "powers and flexibility" for Councils to act as Water Authorities rather than merely as Councils. CCCEN and NCC require assurance that the obligations relating to ESD and public accountability, of both Gosford and Wyong Councils under the *Local Government Act* are in no way reduced by the *Water Management Act* or by constituting the Councils as Water Authorities.

*Issues for further discussion:*

*1.1 What benefits are envisaged by extending to Councils "greater powers and flexibility?"*

*1.2 Clarification is required regarding the application of the public scrutiny provisions of the Local Government Act to the Water Supply Authorities.*

*1.3 What situations can we anticipate will give rise to such inconsistencies between the LGA and WMA and what is the likely significance of the WMA prevailing?*

## Section 2: The significance of the Healthy Rivers Commission Recommendations and the Establishment of a Statement Of Joint Intent

The Healthy Rivers Commission (HRC) is an independent Commission set up by the NSW Government in 1996. It forms just one aspect of the Government's Water Reform Program. The Commission was established to conduct public inquiries into selected NSW river systems, and to make recommendations to the Government on appropriate long-term approaches and strategies to achieve environmental, social and economic objectives for the systems (Healthy Rivers Commission 2000b).

Recommendations made include those relating to suitable objectives for water quality, flows and other goals central to achieving Ecologically Sustainable Development (ESD) in a realistic time frame. (Healthy Rivers Commission 2000a).

The 1998 Final Report of the Healthy Rivers Commission Independent Inquiry into the Hawkesbury-Nepean River System made a number of recommendations relating to flows and river health. Recommendation FL4 states that " a program of trial environmental flows should be conducted, under the guidance of independent experts, for those rivers affected by all components of Sydney Water, Gosford-Wyong Joint Water Supply, …". However, as noted in Section 3 of this report, Wyong Shire Council is not a party to the SOJI. Therefore, it would appear that Recommendation FL4 is impractical without the cooperation of Wyong Shire Council.

Certain recommendations of the Commission Inquiry into the Hawkesbury-Nepean River System were endorsed by State Government in February 2000. In its decision the NSW Government approved the development of a Statement of Joint Intent (SOJI) to record the commitments of State Agencies and Councils to implement the HRC recommendations.

Parties to the SOJI include the twenty-six local government authorities whose area falls within the Hawkesbury-Nepean River System. This includes Gosford City Council, but not Wyong Shire Council. Government Departments and Agencies that are parties to the SOJI include:

- Department of Urban Affairs and Planning;
- Environment Protection Authority;
- Department of Land and Water Conservation;
- NSW Agriculture;
- NSW Fisheries;
- National Parks and Wildlife Service;
- The Cabinet Office;
- Sydney Catchment Authority;
- Department of Mineral Resources;
- Department of Local Government;
- Sydney Water Corporation; and
- Hawkesbury Nepean Catchment Management Trust (now disbanded).

The Statement of Joint Intent reproduces some text from the HRC Report. However, the SOJI does not reproduce a significant part that states " The program of trials should be completed and new flow arrangements implemented by July 2000. Where this deadline is not met, action should be taken to protect all low flows less than or equal to the natural 95$^{th}$ percentile exceedance condition plus ten percent of all higher flows until such time as the outcomes of the trial program are implemented." (p 143 Healthy Rivers Commission Report, August 1998).

The SOJI, being a record of the state agencies and relevant agencies to implement the endorsed recommendations of the HRC is government policy rather than legislation. There is a review of the progress of the SOJI every 6 months by the Water CEOs group within Cabinet or by the Healthy River Commission (both of which report to Government). This is to determine whether recommendations are being met within the agreed timeframes. There is to be a more formal review at the end of two years; however it is unclear

which department or agency will undertake this review. Under the SOJI various agencies were appointed the "Lead Responsibility" for certain actions to be undertaken. However, there appears to be no avenue for ensuring compliance by the various agencies.

*Issues for further discussion:*

2.1 *The SOJI refers to "rivers affected by all components of…Gosford-Wyong Joint Water* Supply". *However as Wyong Shire Council is not a signatory to the SOJI how is its commitment recorded?*

*2.2 If discussions were had and/or undertakings given, where are these recorded?*

*2.3 Who is responsible for monitoring and implementing the SOJI?*

*2.4 Why was Recommendation FL 4 not adopted in full?*

*2.5 Is a timetable and progress report of the 6 monthly Water CEO reviews available?*

*2.6 Are minutes of meetings of the Water CEOs available for public inspection?*

*2.7 Who is to conduct the two-year formal review of the SOJI?*

## Section 3: Impediments to achieving the recommendations made by the HRC

The recommendations of the HRC do not appear to be well monitored. Inquiries regarding the role of the Water CEOs and other bodies did not reveal any clearly documented or planned approach. There did not appear to be any public reporting or accountability regarding progress in implementing the HRC recommendations.

The greatest impediments to achieving ecological sustainability are firstly a lack of understanding on how to seek ESD and secondly, the desire by Government and business to promote economic growth. Other considerations include the organisational culture in the councils and patchy accountability for environmental outcomes.

There is a concern by government that the water supply may become a factor which inhibits economic growth on the Central Coast. This also aligns with the organisational culture of the JWA which seeks the opportunity to augment the water supply despite the generous margin that currently exists between demand and supply. It is worth noting that the proposed augmentation of the water supply primarily involves the construction of pumps and a weir pool on the Upper Wyong River (Wyong Shire) to allow pumping of high flows into Mangrove Creek Dam.

The SOJI was made by 12 government agencies and 26 councils but, as previously stated did not specifically include Wyong Shire Council or the entity known as the Gosford-Wyong Councils' Water Authority. This means that the joint water supply is not exempted from the recommendations made by the HRC, but rather, not a party to them. This is because Gosford City Council is a party to the SOJI but Wyong Shire Council is not.

*Issues for further discussion:*

*3.1 How and when are Environmental Flows to be achieved given that Wyong Council is not a party to the SOJI?*

*3.2 How and when are Environmental Flows to be achieved given that the Gosford Wyong Joint Water Authority is not a party to the SOJI?*

*3.3 Did Wyong Council and the Gosford Wyong Joint Water Authority agree to cooperate with the terms of the SOJI or were they directed to do so by the Minister?*

## Section 4: Environmental flows in the Central Coast Catchment Area

Under the current water sharing planning process a great deal of emphasis has been placed on water allocation and the debate between different stakeholders about the right to access water. However in recent times, recognition has also been given to the need for "environmental flows"; that is, the need to sustain the health of rivers and the ecosystems that rely on them, by ensuring that adequate flows of water through river systems are maintained in a manner which more closely resembles that which occurs naturally.

The Healthy Rivers Commission, in its Final Report 1998, recommended that the Gosford-Wyong Joint Water Supply Scheme be exempted from a proposed cap on water users for a number of reasons. These included the observations that Mangrove Creek is not hydrologically linked to river flows in the impacted Nepean and Hawkesbury Rivers, it has limited opportunities to absorb further growth in water demand or access another source of water and it has potential to improve the creek through management of water storages and releases (p 89 HRC Report).

The HRC did however state the exemption from the cap be contingent on the Joint Water Supply Scheme maintaining a high level of demand management. It follows then, that the exemption would be forfeited if the high level of demand management was not maintained.

The Independent Pricing And Regulatory Tribunal (IPART) (2000a, 2000b) urged that the Councils continue their current initiatives in demand management and explore further mechanisms to reduce water. It is keen to see progress in water reuse projects over the next three years.

In regard to demand management strategy, the HRC noted in its 1998 Report that the GWJWSS advised that its residential consumption is about 215 kilolitres per tenement per year which compares favourably with Hunter Water Corporation's achievements (HRC, p 126). It is noted elsewhere that "Gosford-Wyong operating costs and revenues present a better picture of a well managed organisation than either the Hunter Water Corporation or the [then] Sydney Water Board or other local or overseas water and sewerage suppliers" (KPMG, May 1994). Positive comment regarding the comparison of the councils' performance with that of other authorities was found throughout an additional Report (KPMG 1994b).

However, despite this the consumption for Gosford City Council area in 2000 was 235 Kl per tenement per year (Water Services Association, 2000). It appears that per capita water consumption is increasing and that population is also increasing (Gosford Wyong Councils' Water Authority 2001).

The HRC recommendation regarding a cap on water extraction in more stressed streams is contained in FL3b. The recommendation is that a cap should be introduced at the 1997 level of diversion on more stressed streams for five years pending the results of flow trials. Gosford-Wyong Joint Water Supply Scheme should be exempted from the cap pending the outcome of the program of trial environmental flow release and subject, as stated above, to it maintaining its current demand management achievements (p 143 HRC Report). In any event, GWJWSS indicated to the Commission that it had "commenced the initial planning stages to undertake the flow trials program" (p 127 HRC Report).

The Healthy Rivers Commission Report contains a number of Environmental Flow recommendations. These are contained in Chapter 1 of the report and include:

- Capping the growth in water extractions from highly developed streams (p11);
- Protecting critical periods of low flows by restricting existing access to water;
- Modifying the moratorium on low/ medium stressed streams to allow new users access to water in less critical periods of flow;
- Improving the measurement of water use;
- Establishing a market in water entitlements;
- Integrating management of flows and sewage effluent disposal; and

- Conducting a program of trial environmental flows to enable informed decisions to be made on longer term flow protection.

A number of riverine corridor issues were identified by the Commission including channel and bank stability, the status of riparian vegetation, the presence of native water animals, the extent of weed infestations, and overall aesthetic appeal. The Commission recommended that Councils be required and empowered to undertake land use planning, stormwater management, sewage management and management of aquatic weeds and extractive industries as an integrated approach to environmental planning, management and reporting (Ch 1).

The Commission classified the issue of environmental flow trials as a recommended medium term action. It noted (at pp 94-95), that the opportunity exists to conduct a limited number of trial releases of water to determine the possible range of ecological responses for various levels of flow protection (including Mangrove Ck and Mooney Mooney Ck).

Further, the Commission recommended that these trials be conducted under the guidance of a panel of experts that would develop, evaluate and report in an independent and transparent way. These processes and trials should be extended "to include the infrastructure operated on rivers adjoining the Hawkesbury-Nepean catchment, where this is necessary to establish the likely implications of flow protection on specific water supply schemes (ie the Gosford-Wyong Joint Water Supply Scheme), (p 95).

The Statement of Joint Intent 2001 recognised the firm proposal to implement trial environmental flows and committed to the establishment of a Hawkesbury-Nepean River Management Forum by October 2000. The lead agency for the implementation of this Forum was the Department of Land and Water Conservation. It was agreed that the Forum's recommendations on environmental flow provisions be made to the Ministers for Land and Water Conservation and the Environment by October 2001(SOJI p 12).

In the meantime, Gosford and Wyong Councils' Water Authority established an independent Expert Panel to evaluate the environmental health of Mooney Mooney Creek, Mangrove Creek, Ourimbah Creek and Wyong River. An Environmental Flows Expert Panel Report, dated January 2001, was prepared by Quality Environmental Management Pty Ltd.

Despite a dearth of empirical evidence relating to the streams, the Panel formed the view that "the four streams are at high risk of future degradation from impacts derived from existing or further developments within the four catchments." The Panel also considered that "there are particular aspects of the current flow regime that could be causing progressive decline in river health" (p ii).

The Panel also considered that the JWS Authority should:

- "adopt (in principle) the preliminary water quality and river flow objectives that have been set for relevant sections of Lake Macquarie and Tuggerah Lakes catchments" (p iii);
- "introduce to Mangrove Creek increased flow variation as well as a pilot program of channel maintenance flows" (p iii); and
- "seek ways to mimic the natural flow variability as far as practical" (p iv).

In addition, the Panel identified the following issues as priority considerations:

- Reintroducing low flows in dry periods particularly in Mangrove Ck;
- Flows to ensure horizontal connectivity between stream and wetlands;
- Flows for channel maintenance downstream of Mangrove Dam;
- Flows to ensure that fishways operate effectively (p iv).

A number of comments in the Expert Panel Report gave rise to concerns similar to those detailed in Section 1 of this report.. Such concerns relate to the ambiguities that arise when councils are also Water Authorities. Comments in the Report include:

- "Most of the panel's advice and recommendations to the Authority therefore focuses on the flow regime on the basis that flow is under the Authority's direct control whereas the performance of the catchment is more a matter for the individual Councils." (p 47);
- "The Expert Panel also considers that the Authority will be held partially accountable for river health and to that end it should develop a mechanism that demonstrates recognition of its responsibilities and objectives and its performance in relation to:
  - the actual current health of the riverine systems affected by its operation;
  - the future improvements that it is able to make to river health" (p 67);
- "The…panel members consider that it is likely that the primary impacts on riverine health for… [Mangrove Creek and Mooney Mooney Creek]…(as distinct from Ourimbah Creek and Wyong River) are derived from factors under the control of the Authority" (p 71);
- "The Expert Panel stressed that the health of the four streams cannot be assumed to be the sole responsibility of the Authority" and that "the river health management systems introduced by the Authority"… are effected by Councils … "arrangements that manage landuse-based impacts (p 77)."

The Expert Panel Report also comments on water supply systems generally and Gosford-Wyong's specifically. It notes that large water supply systems are generally designed with a long service life, of 20 to 30 years, before augmentation in required. Paraphrasing from the Report, it concludes that the scheme may be designed such that until it reaches its design level in say 20 years, it is under-utilised in all conditions other than extreme drought. Therefore, during all other climatic conditions the additional, or spare, water may be able to be provided to the environment without seriously prejudicing the security of supply from the scheme (p 58).

Information provided to CCCEN indicates that the water supply is designed for a safe yield of 47,000 ML/Year and that the current consumption is 33,500 ML/Year ( JWA 2001).

The Expert Panel then made certain recommendations for the review of water supply operations. In relation to flows, the recommendations included ensuring ongoing improvement to the information base related to actual hydrologic modelling of flows to provide a foundation for environmental programs, investigating feasibility of "translucency" into the operation of Mangrove Dam to increase day-to-day variation in flow, to introduce low flows and to investigate potential thermal pollution impacts associated with releases from the dam. (p 64-5).

A number of issues or problems associated with implementing flows were raised. These included the problem of limited flow data and therefore the limited use of modelling (pp 65, 66). There was also reference to potential difficulties presented by the issue of two systems; one being the western part (catchment of Mangrove Dam) and the eastern part (where demand is generated). However, the Report stresses the need for obtaining additional environmental data and knowledge. It suggests that there may be "merit in considering whether dividing the modelling into two interconnected models would provide a useful tool particularly if the Authority wishes to seriously address environmental issues within the river with the supply system" (p 66). This model would "enable testing of various environmental flow options and their impact on supply" (p 67).

A further consideration of the Panel is that the maintenance of river health "should …be viewed as a long-term cost minimisation strategy both from the point of view of minimising water treatment costs and minimising environmental remediation works"
(p 67). This is given as one reason why the Authority should seek ways to mimic the natural flow variability as far as practicable. In further reference to remediation, the Panel advises that a preliminary cost-benefit and impact analysis should precede any intervention (including flows, removal of Lower Mooney Dam and fishways). Such analyses should incorporate present worth and future benefit including the cost savings of avoiding costly and unnecessary future environmental remediations (p 72).

Finally, the Panel adopted a position in respect to a number of other issues including:

- it would not support any future transfer of water from Wyong River to and through Mangrove Creek where these flows are proposed specifically for environmental management; i.e benefits sought should come from within Mangrove Ck catchment (p 69);
- it believes there should be a channel maintenance flow to ensure appropriate seasonality for support of habitat management for downstream aquatic biota. This is envisaged as a single channel maintenance flow in around two out of every three years. Recommends 400Ml / day over two days being 800 Ml in total (p 70);
- it recommends the Authority develop a program that enables detection of long term trends in river health and satisfies the general public expectation that the Authority has an understanding of how the four streams are performing. The Panel suggests that the relevant data could be regularly reported through Councils' SoE Reports (p 74);
- it recommends a review of existing and potential threats to river health including users, nutrient inputs, chemical pollution and sediment input (p 78).

It is evident from the reviewed documentation that there is a lack of appropriate records, (particularly historical and scientific data), relating to the condition of the river systems. However the CCCEN endorses the application of the precautionary principle in such instances. That principle seems particularly well-suited to the issues at hand. Moreover, water management and particularly environmental flows, exemplify a classic situation that may well reflect the exact type of eventuality that was anticipated when the principle was legislated.

It is equally evident that considerable effort has been expended by local and state governments in reviewing information that is available and seeking independent opinion and recommendations from recognised experts. The CCCEN is anxious to ensure that the endorsed recommendations are undertaken in order to deliver the best outcomes for river health without compromising water supply. Where a decision is made to disregard any given recommendation, it is expected that full justification for this decision be made public. The community, as a concerned and responsible stakeholder, looks forward to working with government in order to best manage one of our most precious resources.

*Issues for further discussion:*

*4.1 Can the success of demand management be definitively attributed to factors other than meters, user pays and excess water charges? If so, the other factors should be identified with the proportion of cost saving attributable to them. How will the performance of the demand management scheme be assessed and made available for public scrutiny?*

*4.2 How is the demand management being monitored to establish whether the exemptions should still be extended the GWJWSS?*

*4.3 There is a need to clearly delineate the responsibilities of individual councils as well as the Water Supply Authority in light of comments such as*:

- "Most of the panel's advice and recommendations to the Authority focuses on the flow regime on the basis that flow is under the Authority's direct control whereas the performance of the catchment is more a matter for the individual Councils." (p 47 ).
- "The health of the streams cannot be assumed to be the sole responsibility of the Authority. The management systems introduced by the Authority are effected by the Councils management of landuse-based impacts." (p 77).
- "The Expert Panel also considers that the Authority will be held partially accountable for river health and to that end it should develop a mechanism that demonstrates recognition of its responsibilities and objectives and its performance" (p 67).

- The Panel considers that the primary impacts on riverine health of Mangrove Ck and Mooney Mooney Ck (cf Ourimbah Ck and Wyong River) are derived from factors under the control of the Authority. (p 71)

*4.4 In relation to the last quotation, there is a need to identify what factors under the Authority's control could effect the riverine health of Mangrove Ck and Mooney Mooney Ck compared to factors under the control of Council or other Authority.*

*4.5 As with 4.4. above, there is a need to identify what factors under the Authority's control could effect the riverine health of Ourimbah Ck and Wyong River compared to factors under the control of Council or other Authority.*

*4.6 There is a need to clarify the statement that the system is under- utilised in all conditions except extreme drought and that it is not expected to reach its design level for 20 years (p 58 Expert Panel Report). Does "the system" refer to the existing infrastructure or to the adopted plans for augmentation or a mix of the two?*

*4.7 On the basis of the Expert Panel Report (p58) what guarantees are there that additional or spare water will not be sold and will instead be retained in the creek system for the environment?*

## Section 5: Conclusions

The report raises many issues relating to the Joint Water Supply. However, for CCCEN these are best summarised by considering the Principles of Ecologically Sustainable Development (ESD) and the issues that follow from that approach.

**Ecologically Sustainable Development** (ESD); The environmental impacts of water extraction from streams and discharges into waterways have a very significant impact on the natural environment. Ecologically Sustainable Development requires that natural resources are 'used wisely' and with appropriate stewardship. Minimising the usage of water, maximising renewable energy usage and eliminating pollution of waterways are significant steps towards achieving ESD. An Operating Licence could be a significant tool for government to provide direction and incentives in achieving compliance with the principles of ESD.

**Accountability and the Public Interest**; It is important that the Joint Water Authority remain under the control and management of councils. The reasons for this are several:

- income remains in the local economy,
- a proven record in economic management of the water supply
- councils have control of the rest of the water cycle, and;
- finally council have the powers through the EP&A Act to control development in the catchments so that water quality and yield is maintained.

However, there is a conflicting interest in councils operating the water supply, which also provides an economic benefit to council. This conflict of interest needs to be managed such that the public interest for a clean and healthy water supply is protected. For this reason and as water is such an important part of our lives some mechanism is needed to ensure the public interest is maintained. The way this has been achieved in the metropolitan areas is through appointment of independent board members and for IPART to issue an Operating Licence to the Water Supply Authority.

**Environmental Flows and Sustainable Yields**; The SOJI that followed the Healthy Rivers Commission Inquiry into the Hawkesbury Nepean needs to be reactivated and the anomalies resolved. CCCEN is keen to see the trial flows commence and to ensure that after extractions the low flows should be better than the 95th Percentile. For groundwater an adaptive approach to achieve sustainable groundwater extraction and monitoring is needed.

**Catchment Protection**; Since the Boake report (1991) it has been evident that the drinking water catchments need to be protected from inappropriate development in order to maintain water quality and a safe yield. Councils are in the fortunate position of being the regulator of development and also providing the water supply. Councils control development in the catchments and so can control impact on waterways. A Regional Environmental plan under the EP&A Act (1979) would be the most appropriate method of protecting the drinking water catchments and ensuring that there is consistency in approach across both local government areas.

## Section 6: Recommendations

The Gosford Wyong Joint water Authority (JWA) should:

1. Remain a single entity under the control of Gosford and Wyong councils for all water cycle matters with independent members on the Board. However, public accountability and conflicts of interest need to be improved by adopting an Operating Licence issues by IPART.

2. Operate under an Operating Licence, which includes accountabilities and public education for:
   - Implementing ESD
   - Demand Management Strategy
   - Water Conservation Strategy
   - Reporting on water quality to community;

3. Protect the drinking water catchments through the implementation of a Regional Environmental Plan under the EP&A Act..

4. Resolve anomalies with the SOJI and establish a program for Trial Environmental Flows in streams they utilise.

5. Not sell any surplus water allocation in the Water Sharing Plans that is not utilised.

## Appendix A: Issues for Discussion

**Section 1**

*1.1 What benefits are envisaged by extending to councils "greater powers and flexibility?"*

*1.2 Assurances are required that the Local Government Act obligations of both Gosford and Wyong Councils are in no way reduced by the Water Management Act or by constituting the councils as Water Authorities.*

*1.3 Clarification is required regarding the application of the public scrutiny provisions of the Local Government Act to the Water Supply Authorities.*

*1.4 What situations can we anticipate will give rise to such inconsistencies between the LGA and WMA and what is the likely significance of the Water Management Act prevailing?*

**Section 2**

*2.1 The SOJI refers to "rivers affected by all components of...Gosford-Wyong Joint Water Supply". However as Wyong Shire Council is not a signatory to the SOJI how is its commitment recorded?*

*2.2 If discussions were had and/or undertakings given where are these recorded?*

*2.3 Who is responsible for monitoring and implementing the SOJI?*

*2.4 Why wasn't Recommendation FL 4 adopted in full?*

*2.5 Is a timetable and progress report of the 6 monthly Water CEO reviews available?*

*2.6 Are the reviews (or minutes of meetings of Water CEOs) available for public inspection?*

*2.7 Who is to conduct the two-year formal review of the SOJI?*

**Section 3**

*3.1 How and when are Environmental Flows to be achieved given that Wyong Council is not a party to the SOJI?*

*3.2 How and when are Environmental Flows to be achieved given that the Gosford Wyong Joint Water Authority is not a party to the SOJI?*

*3.3 Did Wyong Council and the Gosford Wyong Joint Water Authority agree to cooperate with the terms of the SOJI or were they directed to do so by the Minister?*

**Section 4**

*4.1 Can the success of demand management be definitively attributed to factors other than meters, user pays and excess water charges? If so, the other factors should be identified with the proportion of*

*cost saving attributable to them. How will the performance of the demand management scheme be assessed and made available for public scrutiny?*

*4.2 How is the demand management being monitored to establish whether the exemptions should still be extended the GWJWSS?*

*4.3 There is a need to clearly delineate the responsibilities of individual councils as well as the Water Supply Authority in light of comments such as*:

- *"Most of the panel's advice and recommendations to the Authority focuses on the flow regime on the basis that flow is under the Authority's direct control whereas the performance of the catchment is more a matter for the individual Councils." (p 47 ).*
- *"The health of the streams cannot be assumed to be the sole responsibility of the Authority. The management systems introduced by the Authority are effected by the Councils management of landuse-based impacts." (p 77).*
- *"The Expert Panel also considers that the Authority will be held partially accountable for river health and to that end it should develop a mechanism that demonstrates recognition of its responsibilities and objectives and its performance" (p 67).*
- *The Panel considers that the primary impacts on riverine health of Mangrove Ck and Mooney Mooney Ck (cf Ourimbah Ck and Wyong River) are derived from factors under the control of the Authority. (p 71)*

*4.4 In relation to the last quotation, there is a need to identify what factors under the Authority's control could effect the riverine health of Mangrove Ck and Mooney Mooney Ck compared to factors under the control of Council or other Authority.*

*4.5 As with 4.4. above, there is a need to identify what factors under the Authority's control could effect the riverine health of Ourimbah Ck and Wyong River compared to factors under the control of Council or other Authority.*

*4.6 There is a need to clarify the statement that the system is under- utilised in all conditions except extreme drought and that it is not expected to reach its design level for 20 years (p 58 Expert Panel Report). Does "the system" refer to the existing infrastructure or to the adopted plans for augmentation or a mix of the two?*

*4.7 On the basis of the Expert Panel Report (p58) what guarantees are there that additional or spare water will not be sold and will instead be retained in the creek system for the environment?*

## Appendix B: Documents Reviewed


Boake M, 1991, *Report on condition of Wyong Shire's Water Supply Catchment*, Wyong Shire Council.

Cullen P, undated, *Rivers and fish in stress – The NSW Rivers survey,* Cooperative Research Centre for Freshwater Ecology.

Cullen P; J Harris; T Hillman; P Liston; R Norris and J Whittington J, 2000, *Scope of the Sustainable Rivers Audit*, CRC for Freshwater Ecology

Department of Land and Water Conservation, 2000a, *An Overview of the proposed new water legislation for NSW - the benefits for the environment, industry and the community,* DLWC.

Department of Land and Water Conservation, 2000b, *NSW Water Conservation Strategy,* DLWC.

Department of Water Resources, 1987, *Legislative and administrative arrangements for urban water supplies Gosford/ Wyong,* Report of the Interdepartmental Committee established by the Minister for Water Resources.

Environment Protection Authority of NSW, 1999a, *Water quality and river flow interim environmental objectives - Guidelines for River, Groundwater and Water Management Committees Lake Macquarie and Tuggerah Lakes Catchments,* EPA.

Environment Protection Authority of NSW, 1999b, *Water quality and river flow interim environmental objectives - A review of Community Consultation,* EPA.

Gosford-Wyong Councils' Water Authority, 2001, *Stream flow management strategy – an urban and environmental balance.*

Gosford-Wyong Councils' Water Authority, 2001, *letter to Central Coast Community Environment Network re Streamflow Management Strategy,* 24 August 2001.

Healthy Rivers Commission of NSW, 1998, *Independent Inquiry into the Hawkesbury-Nepean River system, Final Report***.**

Healthy Rivers Commission of NSW, 2000a, *Securing Healthy Coastal Rivers – A strategic perspective.*

Healthy Rivers Commission of NSW, 2000b, *http://www.hrc.nsw.gov.au/site/about_frame.html*

Independent Pricing and Regulatory Tribunal of NSW, 1999, *Pricing Water Supply, Sewerage and Stormwater Services*, IPART.

Independent Pricing and Regulatory Tribunal of NSW, 2000a, *Prices of Water Supply, Sewerage and Drainage Services Gosford City Council,* IPART.

Independent Pricing and Regulatory Tribunal of NSW, 2000b, *Prices of Water Supply, Sewerage and Drainage Services Wyong Shire Council,* IPART.

KPMG Management Consulting, 1993, *Gosford and Wyong Councils' Water Supply and Sewerage Position Statement,* KPMG, Sydney.

KPMG Management Consulting, 1994a, *Gosford and Wyong and Councils opportunities to extend the operations of the current joint water supply committee,* KPMG, Sydney.

KPMG Management Consulting, 1994b, *A comparison of Gosford & Wyong Council's performance in the provision of water supply and sewerage services with that of other authorities,* KPMG, Sydney.

Markwort K (ed), 1997, *Watershed*, CRC for Freshwater Ecology, Univ of Canberra, ACT.

Quality Environmental Management Pty Ltd, 2001, *Gosford-Wyong Councils' Water Authority Environmental Flows Expert Panel Report.*

*Statement of joint intent for the Hawkesbury-Nepean River system Incorporating decisions of the NSW government on the reports of the Healthy Rivers Commission on the Hawkesbury-Nepean River system*, 12 March 2001.

Water Services Association of Australia Inc, 2000, *The Australian Urban Water Industry WSAAfacts 2000,* Water Services Association of Australia Inc, Melbourne.

***Legislation***
*Local Government Act 1993*
*Water Management Act 2000*

***Licences issued to Wyong Shire Council***
20SL019691
20SL028527
20SL033407
20SL039342
20SL039830
20SL050740

***Licences issued to Gosford City Council***
10SL5106
10SL13213
10SL23693
10SL39289
10SL45333

Licence No 10AW00075 has also been granted to Gosford Council but DLWC has indicated that difficulty in printing the document prevents them providing a copy.

# Economic appraisal of water supply options for Central Coast

Prepared for

**Central Coast Community Environmental Network**

# Contents

# 1. Desalination versus reduction in water usage

## 1.1 Framework

The analysis in this report is based on the economic appraisal methodology. Economic appraisal is securely grounded in the theory of welfare economics and has been widely used in a range of applications. There is now an accepted body of 'good practice' (for example NSW Government Guidelines on Economic Appraisal (NSW Treasury, 1997), Department of Finance Handbook (Department of Finance, 1999)).

The NSW Government has a requirement that all capital proposals by the inner Government agencies be supported by a valid economic appraisal. Although the JWA is not an inner Government agency, the requirement for economic appraisal would be expected to cover any financial assistance from the Budget for construction of proposed capital works. Moreover, the State Government's Total Asset Management Policy (NSW Treasury, 2004) for agencies in the public sector in NSW[1] cites the Guidelines on Economic Appraisal as providing assistance to agencies in improving the quality of their planning.

Economic appraisal is a methodology based on comparing estimates of the costs and benefits of different options that have been identified to deliver some well-stated objective (we return to the question of objective below)[2]. The option with the highest net worth is the preferred option based on the economic appraisal.

The fundamental point in regard to economic appraisal is that the costs and benefits are stated in terms of the community as a whole, not as impacts on an individual or group of people, or an organisation. Payments for services, for example, are not treated as 'costs' since the loss to the buyer is cancelled by the (equal) gain to the service provider. This is of special importance in the case of water supply since water charges do not represent the real value of the supply of water to consumers and may not always reflect the resource costs for provision because of various Government assistance schemes.

Nor do the details of specific funding arrangements (loans etc) enter the analysis. Interest does not appear explicitly in economic appraisal and the 'cost of capital' (which is what interest payments are all about) is handled through the process of discounting. Annual depreciation is an accounting requirement and finds no place in economic appraisal (the cost or value of a depreciating asset enters the calculations when the asset is acquired and as a residual value, if appropriate, at the end of the analysis time period).

It remains to define the term 'community'. From the perspective of the NSW Government the 'community' is the state of NSW, though in some cases the Government's responsibility may be considered to extend beyond the State border. The underlying premise in the use of economic

[1] 'TAM Policy applies to all government departments, statutory authorities, trusts and other government entities. State Owned Corporations under the State Owned Corporations Act 1989 are exempt although they are encouraged to adopt aspects of TAM that are consistent with their corporate intent.'

[2] In this sense economic appraisal resembles the better known concept of cost benefit analysis (CBA). Unfortunately, the term cost benefit analysis is used rather loosely, and what is referred to as CBA may or may not technically be a form of economical appraisal (sometime referred to as social cost benefit analysis).

appraisal to evaluate capital funding bids is that the Government should support only those proposals that make the people in NSW as a whole 'better off' in some sense. This is the position adopted for the analysis presented in this report.

How can the rather vague term 'better off' be translated into a criterion for decision making? For economic appraisal, the criterion of worth is that community benefits (positive impacts) must exceed community costs (negative impacts). Or, stated slightly differently, the net benefits of a proposal must be positive, and in fact greater in magnitude than the net benefits of any other option to achieve the objective. What delivers these positive net benefits is the improved efficiency which is made of the resources available to the community. The term *resources* is taken to include physical assets (the water available for town supply, water tanks, concrete, membranes, and so on) as well as human capital and, in the broadest sense, non-market goods such as environmental quality.

While economic appraisal is a powerful tool widely accepted by the economics fraternity and decision makers, the very restrictions that are placed on the way the appraisals are conducted mean that it fails to provide all the information that may be needed in reaching a decision. For example, it is possible that in making the community as a whole better off, some sectors within the community (including commercial sectors) or an entire region within the State will in fact suffer a loss. In these circumstances, the broadly accepted position is that the proposal should be supported. The conventional approach is to observe that, if overall the benefits are positive, then in theory the winners will receive sufficient gains to compensate the losers for their losses, and still have something left over. The method of compensation in practice can be quite difficult and complex and often no compensation is paid to the losers. While such distributional issues can be very important, they lie outside the primary focus of economic appraisal and this is viewed as the primary outcome.

## 1.2 Objective

The first requirement in conducting economic appraisal is to set an objective for the action that is proposed. Stating an objective may appear to be very straightforward but in fact poorly defined objectives are a key source of the failure of economic appraisals to provide a sound basis for decision making. The most common error is to make the objective too narrow, commonly by including the preferred means of achievement rather than just the outcome. This practice can exclude possibly valid options. A reasonable objective for this analysis is something along the lines of

**Objective**: To provide for an appropriate level of water services to the Central Coast region now and in the future.

A number of observations may be noted:

- Water is not an homogenous good – it is in fact a 'bundle' of goods defined by such characteristics as water quality, security of supply (defined over a range of different timeframes), water pressure, and location of point of delivery.
- Water is often referred to by economists as a 'derived demand'. People do not necessarily want water as such, but the services it provides: in the residential sector for bathing, cleaning, human consumption, human waste disposal, garden use; and use in industry and for irrigation in agriculture.

The 'appropriate level of service' in the statement of the objective makes explicit that different types of water-use require different aspects of the bundle of goods that water represents.

## 1.3 Scenarios

Economic appraisal is concerned with comparing community welfare under different options. The primary task in such a comparison is to define the 'state of the world' under each option.

The state of the world is determined in part by certain items that can be assumed to remain constant across options. One assumption in this report is that the level of service for water supply will be fixed and must be met by all options. The main parameter to be analysed relates to security of supply. Security of supply is a function of the quantity of water available and the demand for water across all users, and both of these vary over different timeframes.

A key determinant for water demand is the size of the population and the level of economic activity in the region serviced by JWA. The water demand modelling has assumed a level of security for water supply that is adequate to meet the needs of the forecast growth in the region. In other words, within the options considered, water supply will not be an inhibiting factor on future growth. One important consequence is that the size of the population and the level of economic activity will be constant across all options. Since economic appraisal is about comparing options, any constant factor will cancel out and can be ignored in the analysis.

Thus the only differences across options are the different means by which the constant levels of water service are provided and these are described in the section on options.

### Population growth and water demand

Recent statements by the Joint Water Authority indicate that the current water supply arrangements will no longer be able to meet projected demand from 2007 onwards. Accordingly we have set our analysis timeframe to start at 2006 (this becomes Year 0 in the analysis when construction of system augmentation would occur so that it would be available for the succeeding year).

Table 1 below contains projections of numbers of residential tenements that have been used in this analysis.

**Table 1: Population projections for JWA region**

| Year | Number of residential tenements |
|---|---|
| 2006 | 116,220 |
| 2011 | 122,677 |
| 2016 | 129,618 |
| 2021 | 136,585 |
| 2026 | 143,551 |

[***Source:***

Estimates for intervening years have been derived by linear interpolation.

## Option 1 – Desalination Plant in Year 0

Option 1 is defined as construction of a desalination plant with 20 ML/day capacity near Vales Point power station (for details of such a plant see NSW Department of Commerce (2003)). Modelling undertaken for the present study has shown that the plant would defer the need for a new dam by 23 years. In option 1 the desalination plant is assumed to be constructed in Year 0 of the analysis. JWA have expressed their view that augmentation of the Central Coast water supply headworks would be needed by 2007. Accordingly, the desalination plant is assumed to be constructed in 2006 ready for operation in 2007[3].

The timeframe for the economic analysis has been taken as 23 years, corresponding to the period of time over which the water demand modelling has been conducted. Demand reductions under some of the other options investigated are not sufficient to defer the need for a new dam by 23 years. In each of these options it has been assumed that a desalination plant identical to the one considered for option 1 will be constructed once augmentation becomes necessary.

## Option 2 – Water tanks 0.5%R

In this option, it has been assumed that in comparison to the business as usual case (BAU) there will be an increase in the rate at which water tanks are installed on residential premises. The increased rate is an additional 0.5% of all existing houses will install water tanks each year.

This corresponds to installation of an additional 720 water tanks each year compared to BAU. The water demand modelling indicates that the reduction in water supply requirements due to this increase in water tanks will be sufficient to defer the need for augmentation of the water supply headworks by four years. After Year 4 it is assumed that the rate of installation of water tanks will revert to BAU (no further increase). To meet the water demand in Year 5, it is assumed that a desalination plant will be constructed in Year 4.

## Option 3 – Water tanks 1%R

In this option, it has been assumed that in comparison to the business as usual case (BAU) there will be an increase in the rate at which water tanks are installed on residential premises. The increased rate is an additional 1% of all existing houses will install water tanks each year.

This corresponds to installation of an additional 1,440 water tanks each year compared to BAU. The water demand modelling indicates that the reduction in water supply requirements due to this increase in water tanks will be sufficient to defer the need for augmentation of the water supply headworks by eight years. After Year 8 it is assumed that the rate of installation of water tanks will revert to BAU (no further increase). To meet the water demand in Year 9, it is assumed that a desalination plant will be constructed in Year 8.

## Option 4 – Water tanks 1.5%R

In this option, it has been assumed that in comparison to the business as usual case (BAU) there will be an increase in the rate at which water tanks are installed on residential premises. The increased rate is an additional 1.5% of all existing houses will install water tanks each year.

[3] In all scenarios it is assumed that the desalination plant would be constructed in 12 months. This assumption is made for computational ease, but the impacts on the results are expected to be minimal and to have no bearing on the ranking of the options.

This corresponds to installation of an additional 2,180 water tanks each year compared to BAU. The water demand modelling indicates that the reduction in water supply requirements due to this increase in water tanks will be sufficient to defer the need for augmentation of the water supply headworks by 15 years. After Year 15 it is assumed that the rate of installation of water tanks will revert to BAU (no further increase). To meet the water demand in Year 16, it is assumed that a desalination plant will be constructed in Year 15.

### Option 5 – Water tanks 2%R

In this option, it has been assumed that in comparison to the business as usual case (BAU) there will be an increase in the rate at which water tanks are installed on residential premises. The increased rate is an additional 2% of all existing houses will install water tanks each year.

This corresponds to installation of an additional 2,880 water tanks each year compared to BAU. The water demand modelling indicates that reduction in water requirements due to the increase in water tanks will be sufficient to defer the need for augmentation of the water supply headworks by 23 years. This is the end of the timeframe for the water demand modelling and economic appraisal, and no further assumptions are needed.

### Option 6 – Water tanks 2%R and DM G + 1%R

In this option, it has been assumed that in comparison to the BAU there will be an increase in the rate at which water tanks and water efficient devices are installed on residential premises. The increased rate is:

- an additional 2% of all existing houses will install water tanks each year
- all new houses will install water efficient devices
- an additional 1% of all existing houses will install water efficient devices each year

This corresponds to installation of an additional 2,880 water tanks and fitting an additional 2,880 houses with water efficient devices each year compared to BAU. The water demand modelling indicates that reduction in water requirements due to the increase in water tanks and demand management will be sufficient to defer the need for augmentation of the water supply headworks by considerably in excess of 23 years. This is the end of the timeframe for the water demand modelling and economic appraisal, and no further assumptions are needed.

### Option 7 – DM G + 1%R

In this option, it has been assumed that in comparison to the BAU there will be an increase in the rate at which water efficient devices are installed on residential premises. The increased rate is:

- all new houses will install water efficient devices
- an additional 1% of all existing houses will install water efficient devices each year

This corresponds to the fitting of an additional 2,880 houses with water efficient devices each year compared to BAU. The water demand modelling indicates that the reduction in water supply requirements due to this increase in water tanks will be sufficient to defer the need for augmentation of the water supply headworks by six years. After Year 6 it is assumed that the rate of installation of water efficient devices will revert to BAU (no further increase). To meet the water demand in Year 7, it is assumed that a desalination plant will be constructed in Year 6.

## Note on scenarios 6 and 7

Applying the increased take-up rates for demand management to the population forecasts in Table 1 results in slight discrepancies with the numbers used in the water demand modelling (as indicated above for each of the options). For the economic appraisal, the estimate for the total number of fitted with water efficient devices needs to be disaggregated into estimates for new homes and existing homes, but the total must match that used in the modelling. The approach adopted was to proportion up the estimates for numbers of new and existing homes from applying the take-up rates to the population forecasts so that the total equalled the number used in the water demand modelling. The process is illustrated in Table 2 for 2007 (Year 1) – the entries in the last two columns are the estimates that have been used in this analysis.

**Table 2: Adjustment for additional water tanks or demand management - 2007**

| Option | Number of tanks or DM in model | From population forecasts | | | Adjusted to match model | |
|---|---|---|---|---|---|---|
| | | new homes | existing homes | Total | new homes | existing homes |
| 6) 2%R tanks + (G+ 1%R DM) | 2,880 | 1,291 | 1,162 | 2,454 | 1,516 | 1,364 |
| 7) G + 1% DM | 2,880 | 1,291 | 1,162 | 2,454 | 1,516 | 1,364 |

DM = demand management

## 1.4 Costs and benefits

The costs in the economic appraisal represent the community resources needed to supply the required water services. In the first instance, as stated before, we do not concern ourselves with who may incur these costs, be it the water authority, householders or taxpayers more broadly. Estimates for the costs of market goods will be based on commercial prices or charges for equipment and fitting or installation, since, in a competitive market, these should reflect the resource costs involved.

In this study we will make no attempts at placing a monetary value on the environmental impacts (whether positive or negative).

We have avoided the problem of attempting to place a monetary value on the 'benefits' of water supply by fixing the level of service for all options. Since economic appraisal involves comparison of the benefits, when the benefits do not vary across options they cancel out. Accordingly, the economic appraisal takes the form of a cost effectiveness analysis to determine the minimum cost for providing water supply services at a certain level.

In practice there will be some differences in the 'benefits' under demand management compared to system augmentation. For example, some people do place a high value on having a shower with full water pressure. There are those who would argue that this is an unreasonable preference and that in time these people will come to appreciate that this is not really necessary for their continued happiness. It is not valid to rebuff such an argument by recourse to the concept of *consumer sovereignty* (based on the willingness to pay for the water) until such time as water is priced to reflect the full cost of provision (including environmental damage). In any event we are not aware of any work estimates the value different people put on high water usage showers.

All costs are stated relative to the 'business as usual' situation characterised by no system augmentation, no desalination plant and no future increase above the historical trends for uptake of water tanks and demand management. The fact that the BAU fails to meet water demand in the

years after 2007 does not invalidate its use as a base case for comparison of costs. Note also that some of the 'costs' relative to BAU are in fact savings (regarded as negative costs in the appraisal).

## Desalination plant

The capital cost estimate for a 20 ML/day desalination plant sited near the Vales Point power station and using reverse osmosis is $61.6 million (NSW Department of Commerce, 2003). Appendices to the report prepared for the Department of Commerce indicate that this estimate includes the cost of the works for extracting the sea water used as feedstock and a pipeline to the ocean for discharge of the waste brine. However, it does not cover costs for any further items that may be needed to abate the environmental impacts of the brine, for example a deep ocean outfall. We are also of the view that the estimate may not completely account for the costs that will be incurred to link the desalination plant to the water reticulation infrastructure.

The estimate for the unit cost of operation and maintenance of the desalination plant is US$0.63 per kL or AU$0.84 per kL .

There is an issue as to how the desalination plant will be operated. Since desalination incurs substantial ongoing costs for the production of potable water, there is a cost-minimising argument for operating the plant at the lowest level consistent with the need to satisfy the system requirements for water demand. However, there is a view in the industry that desalination plants are best operated at a constant rate close to their maximum capacity so as to avoid problems of an engineering and maintenance nature. Moreover, running the plant beyond the immediate water supply needs will provide additional flexibility during low demand periods in allocating water in the streams to environmental flows.

The yield from the desalination plant is estimated to be 8,600 ML/year. The economic appraisal has considered two possible scenarios:

- The plant is operated each year at full capacity of 8,600 ML yield at an annual cost of $5.712 million.
- The plant is operated each year at the minimum level that satisfies water demand which is assumed to ramp up in equal increments from zero production in Year 0 to full production of 8,600 ML in Year 23 when a new dam is required (the annual cost increases by $248,000 each year).

While neither scenario is entirely convincing in a practical sense, it is considered that they represent the maximum and minimum limits of plausible choices, and the 'true' result will be found somewhere within the range defined by these limits.

It is assumed that the economic operating life of a desalination plant is 23 years. In option 1 the plant has no value at the end of the analysis timeframe. In those other options where desalination is required (but the plant is not constructed in Year 0), a non-zero residual value is included in Year 24 proportional to the remaining life of the plant at Year 23.

## Water tanks

The water demand modelling has assumed that 5,000 litre water tanks will be installed.

The installation cost for a water tank is estimated to be $3,000, including plumbing work. The estimate for the cost applies to an at-ground tank: excavation for a below-ground tank would raise the cost substantially. The life of a water tank exceeds 23 years though no residual values are

included in the analysis. The water pump used in the tank is assumed to have a life of 10 years and a replacement cost of $350.

## Demand management

Demand management in a house as modelled encompasses installation of all three of the following types of water efficient devices:

- AAA rated shower roses (assumed to be one shower per house)
- AAA rated washing machines
- 6/3 toilet cisterns (assumed to be one toilet per house).

The cost estimates for these items have been based on the price of purchase[4] and the costs of fitting the device. The question that needs to be addressed is: should the full cost to the householder be included in the appraisal?

Owners of new houses have to fit out the house under all options including those that do not include demand management measures. If water efficient showers, washing machines and toilets are not fitted then some alternative models will need to be purchased and installed. Since the appraisal is about comparing the various options with the BAU, what is important is the difference in the costs (or price) between the water efficient devices and the alternatives that would need to be installed otherwise.

In the case of existing houses, the situation is not so clear. It is possible that a householder might replace a device that is still functioning well (and has some remaining life) with a water efficient model. However, the mean life of two of the devices is relatively short: in the case of washing machines the mean life is estimated to be 10 years, for shower roses it is 15 years. This implies that 10% of households purchase a new washing machine each year. For the take-up rates considered in the water demand modelling exercise (up to 1% of existing houses per year) it seems more likely that most people would change over to a water efficient device only when their existing device was at the end of its useful life. Accordingly, it could be argued that even for existing houses it is the difference in costs between water efficient and competing devices that should be used in the appraisal, not the absolute cost.

Our view is that in practice, the real cost to householders will be the incremental amount in moving to a water efficient device. However, we have also undertaken the analysis using absolute cost estimates as a sensitivity test to provide a range of plausible costs.

The assumptions on the estimates for unit costs of water demand management are set out in Tables 3a and 3b.

[4] In a competitive market, and all evidence suggests that the market for household fittings is competitive, the only concern in the use of price as a measure of the resources needed to produce the article is the inclusion of Government taxes or other imposts. The main tax is GST at 10% of the price. xx

**Table 3a: Cost estimates for installation of water using devices**

| | New homes | | Existing homes – retrofit | |
|---|---|---|---|---|
| | Water efficient | Alternative | Water efficient | Alternative |
| **AAA rated shower roses** | $ 80 | $ 35 | $ 80 | $ 35 |
| **AAA rated washing machines** | $ 800 | $ 650 | $ 800 | $ 650 |
| **6/3 toilet cisterns** | $ 85 | $ 65 | $ 350 | $ 65 |
| **Total for house** | $965 | $715 | $1,150 | $715 |

**Table 3b: Cost estimates for replacement of water using devices**

| | Water efficient | Alternative | Mean life |
|---|---|---|---|
| **AAA rated shower roses** | $ 45 | $ 35 | 15 years |
| **AAA rated washing machines** | $ 800 | $ 650 | 10 years |
| **6/3 toilet cisterns** | - | - | 40 years |

***[Source:***

## Infrastructure savings

Since water tanks and demand management reduce the volume of water that is taken from the town water supply, it is possible to put in infrastructure with reduced design capacity and this results in capital savings at the time the infrastructure is installed. This applies only for new subdivisions, since the infrastructure for existing homes is already in place[5].

There will also be savings in ongoing costs for water supply in regard to all homes (whether new or existing) that have been installed with water tanks or water efficient devices.

A similarly situation arises with stormwater in regard to water tanks. By reducing the volume of water that stormwater drains need to handle during rainfall events, the capacity of the stormwater system can be reduced in new development areas. Furthermore, there will be less maintenance required for all stormwater assets, and replacement intervals will be extended as a result of lower loads. This results in savings in ingoing (annual) costs.

In the case of demand management programs, the ongoing benefits are realised in the sewer system rather than the stormwater system.

Table 4 lists the estimates of infrastructure savings for water tanks and water efficient devices.

[5] In the jargon of economic appraisal the cost of existing items that cannot be recovered are referred to as *sunk costs*, and this term in the case of water mains may be taken to have a richer meaning.

**Table 4: Savings to infrastructure costs (per home)**

| | Water supply | Stormwater | Sewer |
|---|---|---|---|
| Capital savings (new areas) | | | |
| Demand management | $132 | $554 | - |
| | | | |
| Annual savings (all areas) | | | |
| Water tanks | $4.52 | $22 | - |
| Demand management | $1.16 | - | $7.40 |

## 1.5 Results

This section summarises the results of the analysis in Table 5.

**Table 5: Present values of cost estimates for options under different scenarios ($ million in 2004 dollars)**

| Operation of desalination plant | | Constant maximum production | | Ramp up production over life of plant | |
|---|---|---|---|---|---|
| Cost of water efficient devices | | Gross | Net | Gross | Net |
| Option | Deferral (years) | | | | |
| 1) Desalination 20 ML/day | 23 | 132.0 | 132.0 | 89.7 | 89.7 |
| 2) 0.5%R tanks | 4 | 110.3 | 110.3 | 76.0 | 76.0 |
| 3) 1%R tanks | 8 | 103.7 | 103.7 | 77.0 | 77.0 |
| 4) 1.5%R tanks | 15 | 107.8 | 107.8 | 93.9 | 93.9 |
| 5) 2%R tanks | 23 | 107.8 | 107.8 | 107.8 | 107.8 |
| 6) 2%R tanks + (G+ 1%RDM) | >23 | 147.3 | 107.2 | 147.3 | 107.2 |
| 7) G + 1% DM | 6 | 107.4 | 89.4 | 76.9 | 58.8 |

All prices in 2004 dollars
5% real discount rate
Period of analysis : 23 years (2006 to 2029)

In the scenarios where it is assumed that the desalination plant is operated at maximum capacity from the year it is commissioned, the costs (in present value terms) for desalination (option 1) are higher than the costs for any of the other options with the exception of option 6 when gross costs are assumed for the water efficient devices. It should be observed that comparison of other options with option 6 in Table 5 is not really valid. The entries in Table 5 for option 6 take no account of the further substantial period after Year 23 when no further costs are incurred to satisfy demand because of the large buffer between supply and demand that remains at that stage.

In the scenarios when it is assumed that production will ramp up progressively over the operating life of the desalination plant, the costs for desalination are higher than the costs for options 2, 3 and 7.

The options for which the costs are higher than the desalination costs (options 4, 5 and 6) involve fitting water tanks to existing houses at rates above 1% per year higher than in the BAU. The current redevelopment rate in the Central Coast for residential properties is estimated to be approximately 1% per year. There are some doubts as to whether rates for retrofitting above the rate of redevelopment are achievable.

# 2. Other alternatives

In this section we briefly outline the anticipated outcomes from two other options for meeting water demand in the Central Coast. We have not undertaken the detailed modelling of the form used in the comparison of desalination with reduction in water usage in the previous section. Accordingly, the economic assessment is not as complete as the earlier comparison.

## 2.1 Buy out irrigation extraction licences

Water for irrigation is extracted from both the Wyong River and Ourimbah Creek. One option is to use this water for town supply if the irrigators were compensated appropriately.

The following assumptions have been made:

- a total of 7,000 ML in permanent extraction entitlements to be purchased from irrigators (consistent with the capacity of the desalination plant);
- half of all irrigation water is currently used for turf farming and half for other purposes;
- if the water were no longer available the land currently irrigated would be turned over to pasture grazing beef cattle;
- the area irrigated is 2000 hectares in total (annual use of 3.5 ML/hectare).

The cost to the JWA would be the aggregate outlays paid to the irrigators for permanent transfer of their water entitlements. There is growing experience with water trading, but the price of water is dependent on a range of factors. In NSW, market reports indicate that prices for permanent transfers on regulated rivers range from $550 per ML (MIL) to in excess of $3000 per ML (Gwydir Valley). There are no current quotes for transfers from unregulated rivers. It is understood that Bayswater Power Station has a standing offer of $1,000 per ML to purchase entitlements to extract water from the Hunter River. Recent newspaper reports have referred to prices in the range $1,500 to $1,600 per ML for Hunter River water. At a figure of $1,000 per ML the one-off cost to the JWA is $7 million, rising to $10.5 million if the price were $1,500 per ML.

The value of irrigation water is that it allows land to generate higher returns for the farmer through the production of higher value farm outputs. The value of irrigation water used in this analysis is measured as the foregone agricultural returns when the water is no longer available for use on the land (referred to as the *opportunity cost*).

Data on the gross margin from cattle grazing were obtained from the NSW Department of Primary Industries website (DPI, 2004), for growing out early weaned calves 160-340 kg. The gross margin is estimated at $306 per ha, if pasture costs are included, and $336 per ha if pasture costs are excluded. Of course these estimates refer to average costs and production. It would seem reasonable to assume that the returns from raising beef cattle on the central coast might be higher than these average values, so that the results from the analysis will overstate the value of the irrigation water.

The estimates for gross margin for turf farming come from a paper written under the auspices of Turf Producers Australia Ltd (Greasley, 2004). Indicative income per square metre ($m^2$) is $2.50 and expenses are $2.10. The gross margin is $0.40 per $m^2$ or $4,000 per hectare. Of course, turf farming is a much more labour intensive activity than beef cattle grazing.

The remainder of the irrigation water is assumed to generate a lower gross margin of $2,000 per hectare.

The difference between the gross margins for irrigated agriculture and cattle grazing has a mean value of approximately $2,700 per hectare. These are annual estimates. The present value of the foregone gross margin over 23 years for 2,000 hectares is $73 million (using a discount rate of 5% real).

### 2.2 Pressure reduction devices

This option could be regarded as falling within the demand management approach.

Pressure reduction devices lower water consumption in two ways:

- they reduce the quantity of water used by consumers as a result of lower flows (obviously this will have no effect on volume based uses, such as washing machines);
- they reduce the quantity of water lost as a result of leaks.

Typically, pressure reduction devices are expected to result in 10% lower water consumption. Cost for a device including installation is estimated at $150.

In the absence of modelling it is not possible to provide definitive estimates for the associated savings in water supply infrastructure. For a household with average consumption of 227 kL/year, the computed saving is 23 kL/year. Notionally, it would take approximately 300,000 households to save the 6,800 ML/year of capacity of a 20ML/day desalination plant. This is twice the number of households currently serviced by the JWA.

If all new households (2,880 per year) were to be fitted with a pressure reduction device, the annual cost would be $430,000 and the water savings in year 1 are estimated at 65 ML, ramping up to 1,500 ML in year 23.

## 3. References

Greasley R.J. (2004), *Economic Sustainability - Turf Producers,* Turf Producers Australia Ltd Turfgrass, Education and Equipment Expo

NSW Department of Commerce (2003), *Development of Further Options for the Gosford Wyong Joint Water Supply Scheme: Potential for Desalination*, Working Paper 3, Report No. DC 02205, June

NSW Department of Primary Industries (2004), *Beef Cattle Gross Margin Budget*, Farm Budget Enterprise Series, September, available at http://www.agric.nsw.gov.au/reader/beefbud

NSW Treasury (1997), *Guidelines on Economic Appraisal,* Treasury Policy and Guidelines Paper TPP 97-2, available at http://www.treasury.nsw.gov.au/pubs/tpp97_2/ea-index.htm

NSW Treasury (2004), *Total Asset Management (TAM)*, Office of Financial Management Policy and Guidelines Paper, available at http://www.treasury.nsw.gov.au/pubs/tpp2004/tpp04-3.pdf

Waterexchange (2004), website http://www.waterexchange.com.au/ accessed 14 November 2004