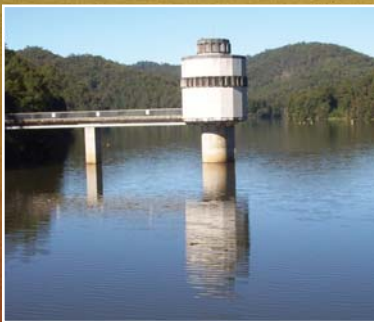




Tweed Link

Water

OUR FUTURE



Integrated Water Cycle Management - June 2006



Pottsville reservoirs

Glossary

| | | | |
|-------|--|--------|--|
| IWCM | Integrated Water Cycle Management | WEL | Water Efficiency Labelling |
| WSUD | Water Sensitive Urban Design | AAA | Water Efficiency Rating |
| DEUS | NSW Department Energy, Utilities and Sustainability | DNR | NSW Department of Natural Resources |
| ESD | Ecological Sustainable Development | STPs | Sewage Treatment Plants |
| CMA | Catchment Management Authority | WTPs | Water Treatment Plants |
| ADWG | Australian Drinking Water Guidelines | GPTs | Gross pollutant traps |
| BASIX | The Building and Sustainability Index is a NSW Government Planning requirement ensuring new residential designs include water reduction and energy targets | SQUIDS | Stormwater quality improvement devices |

Integrated Water Cycle Management – What is it?



Water is a precious natural resource for the maintenance of ecosystems and human activities.

Much of Australia is now at the limit of its available water resources and there is clear evidence of the degradation of our rivers, groundwater and estuaries.

Recent droughts across Australia have produced a heightened awareness of potential impacts of climate change.

Integrated Water Cycle Management is a way of managing water in which all components of the water system are integrated so that the water resource is optimally used, reused and discharged to maximize benefits to the community and the environment. It involves integration of the three main town services of water

supply, sewerage and stormwater, which should be planned and managed together.

The Federal Government initiated the water reform process in 1994 and subsequently new water legislation and policy has been introduced in NSW to provide for the sustainable and integrated management of water for present and future generations.

Tweed Shire is in an ideal position to develop an Integrated Water Cycle Management Strategy as the entire Tweed River Catchment is within the shire boundaries.

Successful Integrated Water Cycle Management depends on our capacity to find alternate uses for recycled water and smart use of our finite water resources.

As an example smart water use could include:

- Wider use of rainwater tanks.
- Tertiary treated effluent (treated sewage) substituting water for toilet flushing and selective outdoor uses including garden watering and car washing.
- The use of stormwater runoff for irrigation.
- Installation of water efficient household appliances such as trigger nozzles, shower roses, tap aerators and water from hand basins filling toilet cisterns.
- The use of treated effluent for broader irrigation purposes.
- Greywater (wastewater from sinks and toilets) reuse for selective residential outdoor irrigation.

What is Tweed Shire Council doing?

Council has prepared an Integrated Water Cycle Management Context and Strategy Report.

The Tweed Integrated Water Cycle Management Context and Strategy Report is now on public exhibition until at least Friday August 11, 2006.

The report and attachments can be viewed at Council's offices in Tweed Heads and Murwillumbah, the libraries and on the internet at

www.tweed.nsw.gov.au following the links under Your Council and What's On Exhibition.

A list of stakeholders will be developed from the public consultation process to assist in the ongoing development of the strategy.

A future report will be brought before Council detailing submissions received and recommending a strategy for adoption by Tweed Shire Council.

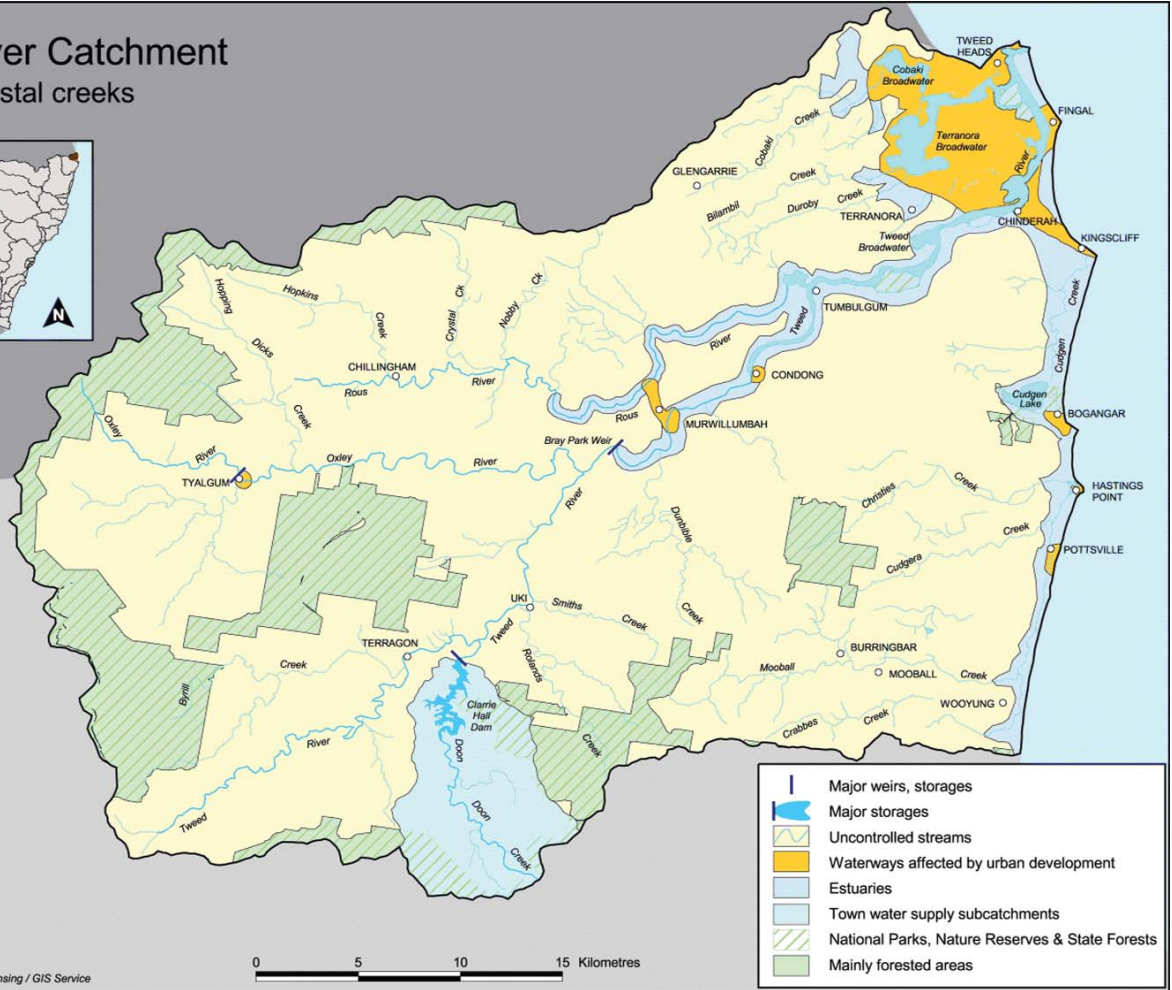
Responses and feedback

to Council's Integrated Water Cycle Management Strategy can be mailed to

Tweed Shire Council
Reply Paid 816,
Murwillumbah 2484, or

Email: tsc@tweed.nsw.gov.au
Hotline: 1800 649 394

Tweed River Catchment and small coastal creeks



Prepared by NSW EPA's Remote Sensing / GIS Service

0 5 10 15 Kilometres





The Current Situation

LEVELS OF SERVICE

The level of service expected by the community and government agencies is ever increasing. This includes better quality drinking water and effluent. Treatment Plants are therefore required to treat to a higher level.

- Banora Point Sewage Treatment Plant completed in 1995, can cater for 62,500 persons and provides biological nutrient removal and secondary treatment and was constructed for a cost of \$18 million.
- The new Kingscliff Sewage Treatment Plant currently under construction will cater for 25,000 persons and will include tertiary filtration and cost a total of \$39 million.
- Bray Park Water Treatment Plant Upgrade is required to meet new Australian Drinking Water Guidelines and meet future growth. A detailed design is well advanced with construction expected to start in 2007 at a cost of \$50 million. Because Tweed Shire has an unprotected water supply catchment a higher level of treatment must be undertaken. (A protected water catchment excludes any type of development and agricultural uses.)

POPULATION GROWTH

Population is expected to increase to more than 100,000 people in 10-15 years

time and to more than 150,000 in 30-plus years.

The majority of urban release areas are located within five to 10 kms of the coast. An issue impacting on the IWCM is the variation in population projections for the Shire and that two of the proposed development areas represent more than 50 per cent of the identified potential growth for the area.

Therefore any projections will be sensitive to changes in the timing of these developments.

The provision of Water and Sewer infrastructure capacity, which is required in advance of development, therefore involves risk in this uncertain environment.

WATER SECURITY IN MAJOR DROUGHTS

Responding to issues of global warming and climate change, historic methods for determining water security in drought conditions are being reviewed.

In simple terms the new methodology suggests providing a contingency storage equivalent to the time required to implement an emergency supply.

In Tweed's case it is likely neighbouring authorities will be in a worse situation before the Tweed.

As there is very limited ground water resources the only other emergency source likely to be available would be via desalination of salt water.

Providing for contingency storage will mean bringing forward and increasing the augmentation of Clarrie Hall Dam and the potential construction and size of Byrill Creek Dam.

CATCHMENT CHARACTERISTICS

Much of the floodplain areas throughout the Shire have potential or are actual acid sulfate soils and around two-thirds is zoned for rural and agricultural purposes, with around half the catchment cleared of natural vegetation. The predominant agricultural pursuit is sugarcane.

The catchment of the Tweed River, its tributaries and those of the three coastal creeks are contained within the Shire boundaries. This produces obvious advantages for the management of our waterways and allows a valley or catchment approach to be taken with decision making at the local level.

Although river and estuarine waters on the Tweed have a fair to good quality this declines upstream of the river mouth.

Conversely freshwater is best at the top of the catchment near the water supply dam and deteriorates downstream.

TOWN AREAS

The major town areas within the Tweed River catchment are Murwillumbah on the upper estuary, Tweed Heads, Banora Point, Fingal Head, Chinderah and parts of Kingscliff on the lower estuary; and Terranora, Bilambil and Banora Point West around the Terranora Broadwater.

There are substantial areas of undeveloped urban land in the Tweed River catchment, primarily located adjacent to the lower estuary and around the Terranora and Cobaki Broadwaters.



The Current Situation (cont)

CUDGEN CREEK

Cudgen Creek catchment is located to the south of the Tweed River catchment. Cudgen Creek feeds into and out of Cudgen Lake and has its mouth near Kingscliff. There is substantial urban development within the catchment, and a large amount of undeveloped urban land. Urban areas include Casuarina, Bogangar / Cabarita Beach and parts of Kingscliff.

CUDGERA CREEK

Cudgera Creek catchment is located to the south of Cudgen Creek catchment. Cudgera Creek has its mouth at Hastings Point. There is some urban development within the catchment, with limited potential for further development. Urban areas include Hastings Point, Koala Beach and Seabreeze.

MOOBALL CREEK

Mooball Creek catchment is located to the south of Cudgera Creek catchment. Mooball Creek has its mouth at Pottsville. Within the catchment there is urban development in Pottsville, rural townships of Mooball and Burringbar and substantial cane farming activities at the southern end. There is limited potential for further urban development.

WATER RESOURCE CHARACTERISTICS

Council has one major dam (Clarrie Hall Dam), one major water supply weir (Bray Park Weir) and one minor water supply

weir (Tyalgum Weir).

Major pollutant sources for the Tweed Estuary include urban stormwater, effluent and rural runoff (via the Upper Tweed River).

Rural runoff and urban stormwater appear to be the dominant influence on pollutant inputs to the other coastal estuaries.

Water users in the catchment include extractions for town water (around 10,000 megalitres per year including 60 per cent for residential) and rural irrigation (around 4800 megalitres annually of surface water and 1700 megalitres annually of groundwater), commercial enterprises (fishing, oyster farming, houseboats / cruises) and recreational activities (fishing, boating, swimming and skiing).

TOWN WATER CHARACTERISTICS

The town water supply system includes one major water treatment plant (Bray Park WTP, which supplies the majority of the shire) and two minor plants. Bray Park WTP is soon to be upgraded from 60 megalitres daily to 100 megalitres daily to cater for expected population growth and improve treatment processes.

A new WTP is required sometime in the future for Tyalgum to improve supply security during times of low water quality. Uki has a small Water Treatment Plant that was upgraded in the late 1990s.

FUTURE CONSUMPTION

Future consumption for the Shire is likely to increase to around 16,000 megalitres

per year by 2019 and 22,000 megalitres annually by 2034 (assuming per household consumption levels remain unchanged).

URBAN WASTEWATER

The urban wastewater system includes five major sewage treatment plants (Tweed Heads, Banora Point, Kingscliff, Hastings Point and Murwillumbah) and three minor plants. Tweed Heads, Banora Point and Kingscliff STPs require future augmentation in order to cater for predicted population increases, with Murwillumbah and Hastings Point STPs being recently upgraded.

Around 7500 megalitres of effluent is discharged per year to various receiving waters (the majority to the Tweed Estuary), with less than 5% of dry weather flows currently being reused. Future effluent volumes are likely to increase to around 13,000 megalitres annually by 2019 and 19,000 annually by 2034.

URBAN STORMWATER

Urban stormwater runoff contributes to nutrient and sediment loads in the Shire's waterways (mainly the Lower Tweed Estuary), with only limited treatment of urban stormwater currently occurring.

Challenges



The Integrated Water Cycle Management Strategy (IWCM) recognises that there are major challenges for Tweed Shire Council in managing growth in a water cycle context within the catchment and they include:-

The ability of existing surface water sources to adequately service future populations. This issue is driven by a number of factors including ongoing high population growth rates, a recent reduction in the estimate of safe yield,

and the possibility of a reduced entitlement to water in the future.

The impacts of urban stormwater and effluent on the Lower Tweed Estuary. The impacts of urban stormwater on the lower Tweed estuary are driven by high population growth, high urban runoff rates and the minimal use of stormwater quality improvement devices. The impacts of effluent are driven by population growth, low effluent reuse and effluent from the four major sewage

treatment plants discharging directly into the Lower Tweed Estuary.

The impacts of agricultural runoff on the Upper Tweed River and Bray Park Weir. This issue is driven by the high proportion of agricultural land in the catchment, past land management practices that have lead to loss of vegetation (including riparian) and past and existing agricultural practices.



Clarrie Hall Dam

IWCM Issues

| TOWN WATER ISSUES | TOWN WASTEWATER ISSUES | TOWN STORMWATER ISSUES | GENERAL URBAN ISSUES | RURAL CATCHMENT ISSUES |
|--|---|---|---|---|
| <ul style="list-style-type: none"> ▶ High extractions for town water ▶ Town water security ▶ Poor raw water quality | <ul style="list-style-type: none"> ▶ Sewerage system discharges ▶ Effluent discharges | <ul style="list-style-type: none"> ▶ Urban stormwater runoff | <ul style="list-style-type: none"> ▶ Residential development ▶ Renewals / augmentations of assets | <ul style="list-style-type: none"> ▶ Rural residential development ▶ On-site sewage treatment system failures ▶ Contaminated rural stormwater runoff / riparian vegetation clearing ▶ Wastewater from intensive agriculture |

Preliminary Improvement Objectives

| | | | | |
|--|--|---|---|---|
| <ul style="list-style-type: none"> ▶ Reduce hydrological stress on Tweed River ▶ Maintain high level of town water security ▶ Improve raw & treated water quality | <ul style="list-style-type: none"> ▶ Minimise dry/wet weather system discharges ▶ Minimise discharge from Upper Tweed STPs ▶ Reduce point loadings of nutrients and bacteria to the Tweed Estuary ▶ Improve effluent quality to reuse standard ▶ Maximise effluent reuse opportunities. | <ul style="list-style-type: none"> ▶ Reduce pollutant loads on Upper Tweed River ▶ Reduce diffuse loadings of nutrients and sediments to Tweed and coastal estuaries ▶ Minimise impact of urban runoff on estuaries & groundwater ▶ Attenuate peak flow rates caused by urbanisation. ▶ Maximise stormwater reuse. | <ul style="list-style-type: none"> ▶ Continue incorporating WSUD / ESD principles into new urban development ▶ Adequately maintain assets | <ul style="list-style-type: none"> ▶ Reduce rural nutrient and sediment loads to waterways ▶ Minimise vegetation removal ▶ Minimise septic system failures ▶ Restrict / minimise on-site disposal where not sustainable ▶ Reduce point source pollutant loads to Upper Tweed |
|--|--|---|---|---|

Potential Solutions

| | | | | |
|---|---|---|---|--|
| <ul style="list-style-type: none"> ▶ Water Sharing Plan ▶ Demand management & substitution / effluent & stormwater reuse ▶ Community Education ▶ Environmental flow substitution ▶ Supply enhancement options ▶ Water supply catchment management plans ▶ Upgrade WTPs | <ul style="list-style-type: none"> ▶ Increase dry/wet weather storage volumes ▶ Monitor I/I rates & I/I works ▶ Prepare effluent management plans ▶ Increase effluent reuse ▶ Augment STPs ▶ Decentralised sewerage / dual reticulation | <ul style="list-style-type: none"> ▶ Targeted retrofit of detention / treatment systems in existing areas ▶ WSUD / rainwater tanks ▶ Ongoing tightening of planning requirements ▶ Stormwater treatment / detention/reuse ▶ Groundwater recharge ▶ Targeted community education | <ul style="list-style-type: none"> ▶ Demand management / WSUD ▶ Subdivision based stormwater treatment ▶ Greywater reuse ▶ Decentralised sewerage / effluent reuse ▶ Implement Asset Management Plan | <ul style="list-style-type: none"> ▶ Work with CMA to improve farm management practices, including education ▶ Identify / monitor 'hot spots' ▶ Work with CMA / land care groups on targeted riparian vegetation restoration ▶ Fencing of riparian zone to restrict stock access ▶ Upgrade failing septic systems / septic pump-outs / centralised collection & treatment |
|---|---|---|---|--|

Demand Management Solutions



A preliminary assessment of a range of demand management options are summarised below:

| Option | Details | Benefits |
|--|---|--|
| Targeted Residential Retrofit Program | Installation of AAA showerheads, tap aerators & toilet flush control. | Directly contributes to reductions in consumption in existing dwellings, around 20 kilolitres annually, while also raising water conservation awareness. Secondary benefit of reduced power costs. |
| Showerhead Subsidies | Subsidies provided by Council to offset the cost of new AAA showerheads. | Each showerhead can save around 15 kilolitres annually. Secondary benefit of reduced power costs. |
| Water Efficiency Labelling (WEL) | Mandatory water efficiency labelling of showerheads, toilets, washing machines & dishwashers. Will be dealt with at a national level. | Around 5% reduction in total household indoor consumption. If mandatory, inefficient appliances would overtime become obsolete. |
| BASIX NSW Government Building Sustainability Index | The implementation of BASIX in 2005 requires all new residential developments to be water efficient. This is a mandatory requirement of the NSW Government. | Minimum water savings of 40% of town water usage (compared to average NSW homes). |
| Monitoring Programs | Metering of the various components of indoor and outdoor usage to monitor impact of demand management strategies. | Provides valuable local data to aid in the formulation of future demand management initiatives. |
| Permanent Restrictions | Permanent banning of daytime watering and washing of impervious surfaces | The reduced consumptions associated with lower level restrictions could be achieved every year. |
| Loss Reduction | Improve the efficiency of the water supply system | Total water loss is currently around 15%. Further reductions in this amount are likely to only be minor. |

An ongoing demand management program should contain a suite of tools (as above) that target a broad spectrum of customers. The tools should target existing residential properties, future residential properties (built under the

requirements of BASIX) and non-residential properties. While most low-cost demand management options should be implemented, the benefits associated with more costly demand management

options, such as retrofit programs, will need to be compared to alternative options such as water recycling and augmentation of the existing supply.

Water Recycling Solutions



A preliminary assessment of a range of water recycling options are summarised below:

| Option | Details | Benefits |
|---------------------------------|--|---|
| Non-Residential Reuse | Supplying effluent to selected commercial, industrial properties to offset existing town water usage. | As there are limited large commercial, industrial users – non-residential reuse is likely to be limited. |
| Agricultural Reuse | Supplying effluent to selected agricultural properties to offset existing town water and/or raw water usage. | Agricultural water usage is limited in areas adjacent to major urban areas (mainly the Tweed River floodplain). |
| Dual Reticulation | Supply effluent to residential properties via a third pipe for outdoor and toilet usage. | Residential average town water consumption could be reduced by around 50%. |
| Environmental Flow Substitution | Use effluent to provide an environmental flow downstream of Bray Park Weir. | Secure yield reductions of up to 4000 megalitres annually could be offset by advanced quality effluent flows. |
| Sewer Mining | Similar to Dual Reticulation except sewage is extracted from transportation system and treated locally, in the vicinity of the demand. | Potentially beneficial where future development areas are remote from STPs. |
| Stormwater Recycling | Use rainwater collected from residential roofs for outdoor, and some indoor (eg toilet) usage. Community based stormwater collection, treatment & reuse for open spaces | Residential average town water consumption could be reduced by up to 50%. |
| Greywater Reuse | Use of domestic greywater for irrigation and toilet usage. | Further research is required to assess the potential benefits and the risks of greywater reuse. |
| Aquifer Storage & Recovery | Recharge of coastal dune system with suitable effluent or stormwater | Local spear point extraction by residents and council for irrigation and non-potable reuse in expanding coastal communities |



Supply Enhancement Solutions

A preliminary assessment of a range of supply enhancement options are summarised below:

| Option | Details | Benefits |
|----------------------------------|---|--|
| Raising of Clarrie Hall Dam | Required in the medium term to meet growth identified in Tweed Futures (Council’s Strategic Plan). Storage capacity doubled by raising dam five metres. | Provides solution to medium term water demand requirements. |
| Construction of Byrill Creek Dam | Required in the long term to meet growth in identified urban release areas. Council owns 80 per cent of land required for future dam site. | Provides solution to long term water demand requirements. |
| Desalination | Construction of a plant on the Tweed River or in the coastal strip to treat salt water to a level suitable for drinking. | Partially offset or totally eliminates the need for a new dam. |
| Groundwater | Construction of one or a number of bores and treatment facilities to tap into limited groundwater sources throughout the Shire. | May partially offset the need for a new dam. |

It is not appropriate to raise the level of the existing dam or build a new one without fully justifying the need to do so. Council and the community need to fully investigate all alternative solutions including the reduction in average household consumption and desalination before determining a course of action.



Bray Park Weir

Water Quality Improvement Solutions



A preliminary assessment of a range of water quality improvement options are summarised in the table below:

| Option | Details | Benefits |
|--|---|---|
| Targeted Riparian Vegetation Restoration | Funding program to help landowners and Landcare groups replant riparian areas. | Increased filtering of runoff from agricultural and urban landuses River bank stabilisation. |
| Stewardship agreements and farm forestry | Foster best management practices on farms Fencing of riparian zone to restrict stock access. | Improve quality of runoff from agricultural land. |
| Improve Treatment Processes at STPs | Upgrade STPs to produce high quality effluent. | Increases reuse potential while reducing nutrient and bacterial loadings on waterways. |
| Stormwater Quality Improvement Devices (SQIDS) | Existing SQIDS installed throughout the catchment SQIDS located in appropriate locations for future development. | Can intercept a range of stormwater pollutants before they enter local waterways. |
| Rainwater Tanks | The implementation of BASIX in 2005 includes an option to install a rainwater tank for new residential development Incentive scheme for installation of rainwater tanks to existing residential homes and connection to internal water uses. | Conserve mains water supply by substituting use with rainwater Reduction in peak discharges related to storm events. |
| Water Sensitive Urban Design (WSUD) | WSUD requirements in Development Design Specification D7. | Minimise erosion and discharge of sediments, nutrients and pollutants into the stormwater system. |

STORMWATER MANAGEMENT

Some of these measures can be implemented through stormwater management plans and associated council planning instruments. Existing planning instruments may need to be reviewed and subsequently revised. However, many of these measures will

require a partnership to be formed with other management or community groups such as the Catchment Management Authority or Farming community to ensure that water quality improvements are achieved.

There is the opportunity for local Landcare groups to be supported financially by Council to undertake

projects which aid in the replanting or restoration of riparian areas. This would ensure that Landcare projects can be well planned and long-term maintenance occurs at each site. This approach also allows community participation and ownership of improvement options.

What we are proposing to do now



As Council continues with the preparation, refinement and implementation of IWCM, including annual reviews of strategy priorities, the following 26 specific actions are recommended within the short term.

TOWN WATER ACTIONS

1. Formalise a Demand Management Program to explore demand substitution options such as effluent and stormwater reuse including targeted non-residential audit and education (eg motels, caravan parks, clubs, etc).
2. Target 12% for unaccounted for water by 2010.
3. Explore demand substitution options such as effluent and stormwater reuse.
4. Review and refine current estimates of system yields and supply security, including assessing the potential impacts of environmental flow rules being applied at Bray Park Weir and determining increased yields from supply enhancement options such as raising Clarrie Hall Dam and constructing Byrrill Creek Dam.
5. Determine the impacts on town water supplies of the proposed water sharing plans in association with DNR and the CMA, which will define environmental flow requirements for the Tweed River (including defining fish ladder and estuary fresh water requirements).
6. Investigate and implement improved treatment process at Tyalgum WTP and assess impact of water sharing plan on town water supply security.
7. Undertake detailed, long-term town water demand forecasts.

8. Determine impact of new Australian Drinking Water Guidelines (ADWG) on Town Water Supplies and operations.

TOWN WASTEWATER ACTIONS

9. Undertake sewerage system flow gauging and build a calibrated sewerage system model in association with monitoring of inflow / infiltration rates and sewerage system overflow locations.
10. Ongoing implementation of sewerage system optimisation including targeted inflow / infiltration works.
11. Prepare Effluent Reuse Opportunities Report.
12. Monitor wet weather performance of Upper Tweed treatment plants.
13. Assess short-term options for increasing effluent quality and reuse.
14. Implement investigation and planning for dual reticulation and/or decentralised sewerage systems for future development areas, such as Cobaki and Kings Forest.
15. Undertake detailed, long-term sewage loading forecasts.

TOWN STORMWATER ACTIONS

16. Prepare a targeted retrofit program of stormwater detention and/or treatment devices for 'hot spot' pre 2000 development areas.
17. Ongoing review and development of Stormwater Management Plans.

GENERAL TOWN ACTIONS

18. Ongoing implementation Water Sensitive Urban Design principles for new developments, including education of developers and the community and ongoing

strengthening of local planning requirements.

19. Update existing local planning instruments to be in line with and to complement BASIX.
20. Undertake preliminary planning for alternatives to rainwater tanks for new development areas (eg grey water reuse, dual reticulation of treated effluent, stormwater reuse). Hold forums with local developers and the community to discuss the advantages and disadvantages of various options.
21. Prepare and implement Asset Management Plans.

RURAL CATCHMENT ACTIONS (in association with DNR, CMA & local land care groups)

22. Continued implementation of DEUS Best Practice Guidelines with a focus on IWCM outcomes.
23. Continue to identify and assess critical areas where on-site sewage disposal is ineffective and implement appropriate solutions.
24. Identify and monitor catchment 'hot spots' areas that adversely impact on water quality in the Upper Tweed River.
25. Support ongoing catchment management initiatives, including planning controls, education, vegetation restoration (by assisting land care groups and individual landholders) and engage with the CMA.
26. A detailed groundwater study needs to be undertaken in order to assess current quality issues and the potential for aquifer storage and recovery.

What progress has been made to date



AUGMENTATION OF SUPPLY

Clarrie Hall Dam's spillway needs to be modified to satisfy revised dam safety requirements in the situation of an extreme flood.

Consideration should also be given to the feasibility of additional augmentations to increase the total storage volume of the dam.

Initial assessments indicate the wall can be safely raised to accommodate an increased top water level increasing the dam storage volume by up to twice the existing capacity.

Council is currently assessing how much additional water the dam raising will yield. In association with an augmentation of the dam, the construction of a pipeline from the dam to Bray Park weir or the water treatment plant may also be considered.

Detailed assessment of options, selection of the preferred option and concept/detailed design are due to occur in 2006/07.

TWEED RIVER FESTIVAL

The annual Tweed River Festival is another innovative method (modelled on the successful Brisbane Riverfestival, albeit on a much smaller scale) to



increase community participation in river management activities. A wide range of activities is presented for community involvement, enjoyment, education and celebration of the Tweed River. The Tweed River Festival, commenced in 2002, is designed to showcase activities based around the river and educate the community on the importance of a healthy river to all our lives.

EFFLUENT REUSE

The Uki Sewerage scheme, commissioned in 2004, was designed to reuse nearly all of its effluent on irrigating eucalyptus trees in a joint venture with the Currumbin Wildlife Sanctuary.

Other schemes include irrigation of Coolangatta Tweed Heads Golf Club, which has been operating for over 15 years and the proposed Condong Cogeneration facility which requires effluent for cooling tower water and is currently under construction.

Several options have been identified and investigated for possible effluent reuse opportunities. These include:

- South Tweed Heads cemetery in Sunshine Avenue.
- Arkinstall Park Sportsground
- Cabarita Sportsgrounds
- Private turf farm, Round Mountain Road.
- Chinderah Golf Course and Ti Tree farms.
- Additional irrigation areas at Tyalgum and Uki Sewerage Treatment Plants.

ENERGY AND WATER SAVING KIT GIVE-AWAY

In an effort to change the poor public perception of water wise showers, TSC

ran a "new for old" showerhead exchange in November 2005. Two thousand AAA rated showers were given away to shire residents in exchange for their old water-guzzling shower. The overall aim of this initiative is to convince 2000 households that AAA rated showers deliver a good quality shower and have these households influence the water consumption attitudes and behaviors of their family and friends.

PROMOTIONS AND EDUCATION

There is continuous Waterwise programs operating in schools in the Shire and other promotional activities through Council's newspaper Tweed Link.

COUNCIL RESOURCE CENTRE

Council has a resource centre where students and teachers from local schools can access information on environmental and water education in the local area. This is enabling students, teachers and the community to access council reports, maps, management plans and studies easily and efficiently.

These include: management plans, reports, maps and information sheets on water quality, tradewaste, water and wastewater treatment, estuaries, environmental issues, recycling, acid sulphate soils, coastal care, community services and planning.

The centre is open to the public two hours a week for students, teachers and residents to drop in and at other times by appointment. Much of the information available in the resource centre has been placed on to the council website to enhance public access.

What progress has been made to date (cont)



WATER SENSITIVE URBAN DESIGN

Water Sensitive Urban Design for the management of stormwater is an integral part of Integrated Water Cycle Management.

Its guiding principles are to:

- Protect natural water systems
- Integrate stormwater treatment into the landscape
- Protect water quality by removing pollutants close to the source
- Reduce runoff and peak stormwater flows
- Add value while minimising drainage infrastructure costs.

Generally WSUD principles are most effective when integrated into the early planning and design of new settlements rather than retrofitting new ideas to existing urban structure.

Council's subdivision manual now mandates WSUD principles being used for all new subdivisions.

The development of new urban areas to cater for population growth has the potential to harm the natural water cycle. This is due to increased quantities of stormwater contaminates discharging to natural water bodies both during

construction, and once occupied by new residents and increased peak flows from impervious surfaces. In response, innovative Water Sensitive Urban Design (WSUD) measures have been implemented in numerous contemporary developments along the Tweed Coast.

The new developments of Casuarina and Salt have incorporated many innovative designs to beneficially reuse and dispose of stormwater. eg Grassed swales, infiltration areas and retention basins doubling as parks and landscaped open spaces.

WSUD advocates a treatment train approach to stormwater quality control and attenuating flows to mimic pre-development peaks. The first barriers to pollutants entering the natural system are gross pollutant traps (GPTs). GPTs collect large pollutants, such as leaf litter, plastic bags and food containers by metal screens or trash bags. Proprietary stormwater quality improvement devices (SQUIDS) have been developed to capture finer pollutants, such as soil sediments, oils and grease. These are typically large concrete separation pits that are installed in piped road drainage systems downstream of GPTs. Fine

sediments from road and carpark surfaces often contain heavy metals and chemicals, which may also be removed from stormwater runoff by these devices. In coastal developments, with highly porous sandy soils, subdivision stormwater is retained and infiltrated to further reduce impacts on receiving water bodies. Roof water is infiltrated directly into the soil, recharging ground water. Where possible, stormwater is conveyed through the urban areas via vegetated swales, to maximise filtration of pollutants and further infiltration. This saves on the cost of installing piped infrastructure and reduces the number of treatment devices required in the treatment train.

Rainwater tanks are promoted by the BASIX system for all residential development. In addition to their benefits in reducing potable water demand, rainwater tanks can be designed to provide additional retention and reuse of stormwater to minimise urban stormwater flooding and reduce runoff volumes and peak reaching natural watercourses.

CATCHMENT ACTIVITY MODEL

An education trailer (pictured below left) known as The Catchment Activity Model (CAM) is an interactive 3D model of a typical catchment on the north coast of NSW. CAM allows people to see the accumulated impact of day to day activities on the local environment. But more importantly, CAM demonstrates how these activities can be adjusted to reduce environmental harm. Designed to visit local schools and events, CAM is delivering environmental education through demonstration.



Have your say



INTERGRATED WATER CYCLE MANAGEMENT SUBMISSION FORM

Please provide comments on your priorities in regard to Water Cycle Management including growth, environmental, economic and social aspects.

Please detach this page to post (add additional pages if necessary)

Post your response to
Council's Integrated Water
Cycle Management Strategy

Tweed Shire Council
Reply Paid 816,
Murwillumbah 2484,

Other ways to give feedback:
Email: tsc@tweed.nsw.gov.au
Hotline: 1800 649 394