SUSTAINABLE WATER RESOURCE USE AND MANAGEMENT

THE WATER CORPORATION'S RESPONSE TO THE DRAFT STATE SUSTAINABILITY DISCUSSION PAPER

August 2002

Why Sustainability?:

"I conceive of the land as belonging to one large family, some who have already been, some who are here today, and others who are yet to come." (a Nigerian tribesman)

"No generation has a freehold on the earth. All we have is a life tenancy – with a full repairing lease."
(UK Prime Minister Margaret Thatcher, 1988)

"In the end we will conserve only what we love, we will love only what we understand and we will understand only what we are taught." (Baba Dioum, Senegalese conservationist)

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1. Context

The Water Corporation is a statutory corporation, established in 1996 with an Act that requires it to:

- Acquire, store, treat, distribute, market and otherwise supply water for any purpose;
- Collect, store, treat, market and dispose of wastewater and surplus water;
- Act in accordance with prudent commercial principles, and
- Endeavour to make a profit, consistently with maximising its (the Corporation's) long-term value.

The Water Corporation of Western Australia is the operator responsible for various parts of the water cycle - from the abstraction and supply of clean water, collection and treatment of wastewater, and its safe return to the environment. It manages main drainage in Perth and rural drainage in six country drainage districts, and supplies bulk water to agriculture for irrigation. Through improved management of the total water cycle, the Water Corporation has the opportunity and a public duty to positively influence the sustainability agenda in Western Australia, both within the water industry as well as through contributing to sustainable outcomes in other sectors. However, current attitudes and legal and institutional arrangements are significant barriers to fully being able to follow through on best use and management of water in the context of the total water cycle.

2. Closing the Water Cycle

The four main parts of the water cycle are shown in Figure 1 and the comments in this section relate to the four main aspects of that cycle. At present water is abstracted, either from groundwater or surface water sources such as dams, it is then used, resulting in it being transformed into "wastewater". This wastewater then re-enters the environment in some manner, whether through an outlet to the ocean, by evaporation, or by infiltration into land.

At present the community, particularly in Perth, is quite wasteful in its use of water, regarding it in most years as an unlimited resource. Even in low rainfall years there is an expectation that one or two wet years will replenish the supplies that we are used to. Traditionally the name applied to water that has been used once is "wastewater", when in fact it is still simply water, that can be treated and used again before being put back into the environment. This terminology has led to a mentality of single pass use of water. It is estimated that around one third of water supplied by the Water Corporation passes directly to sewage, thus re-using this amount even a single time before it re-enters the environment (eg by industry) represents a real gain in terms of sustainability. The remaining two thirds of the water supplied is used outdoors, or is lost to evaporation.

One useful objective for increasing efficiency in water use, is to move from thinking of water at the big cycle level, to a smaller one, where there is increased cycling between water use and wastewater, before re-entry to the environment.

A second objective can be to bend the route currently taken by drainage water, so instead of moving directly to wastewater or to the environment, it is forced to get there through some other form of water use.

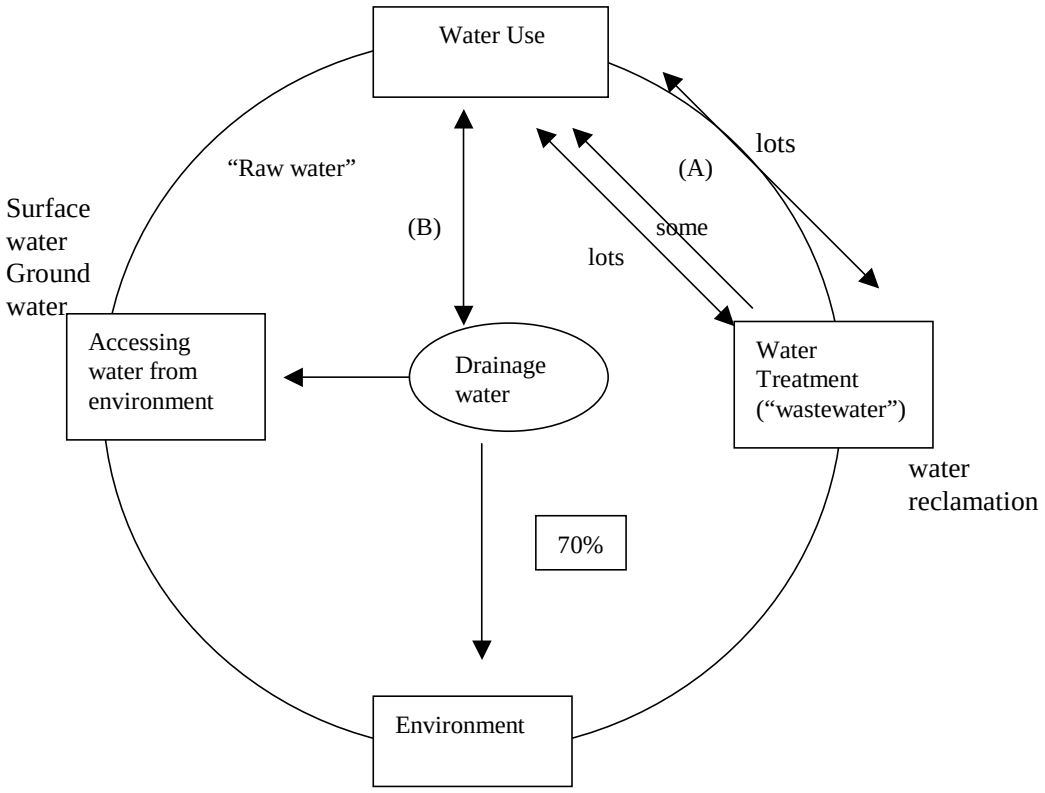
These two objectives offer significant opportunities for improving sustainability in the water industry and in other States of Australia are being driven by limiting the total amount of water available to the community as a whole. The "cap" on the total amount of water available from the Murray-Darling system for human use is an example of applying a driver to bring about change. To drive greater water-use efficiency in WA it is useful to regard water as being a precious resource which is limited in supply.

Major high-technology alternatives, such as desalination plants, may undermine efficient use of water as they can lead people to believe that supplies are then unlimited. To a large extent, sustainability should not be driven just by economics (price of water and willingness to pay) but by larger moral and ethical considerations. If part of sustainability is having to learn to do more with less, then it is the moral rather

than cost aspects which become the main drivers. We become careful with water because it is the right thing to do, not just because it saves us money.

The Corporation has to operate as a community-owned business within externally imposed constraints, including the need to satisfy regulators, the availability of funds, the willingness to pay of its customers (as reflected through pricing policies of the Government of the day), and expectations of the community in regard to service provision and protection of the environment.

Figure 1 A Simple Representation of the Water Cycle



= current pathways

= potential pathways

Gains can be made the more times water is used before it re-enters the environment (circuit (A) above)
There are also potential gains from drainage water use prior to it re-entering environment (B)

The Corporation operates in an environment where the operating license sets service and performance standards that must be met. The Corporation has little control over the fees it can charge for services, as these are set by Cabinet and Treasury. It is important to understand that significant financial aspects of the Corporation's business, for example fees charged for services and size of CSO (Community Service Obligations) payments are not fully under its control and rely on undertakings made by Government and Treasury. The size of a CSO paid for loss-making services, for example rural drainage where a decision was made by government to abolish drainage rates, affects the scope of work that can be carried out for those areas. In addition, each year, the Corporation is required to pay a dividend to State Treasury reflecting a return on assets utilised which becomes part of total State revenue.

3. The Water Corporation's View of Sustainability

The Water Corporation has adopted sustainability as the key driver of its business. This entails assigning equal importance to financial, social and environmental factors in its planning and operations. The Corporation's 2002 Annual Report states:

Partners in sustainability

"Sustainability is about meeting the needs of today's society while preserving the quality of life for future generations.

The Water Corporation is committed to delivering quality water and wastewater services in ways that are economically viable, in ways that are economically viable, environmentally sound and socially responsible.

Our partners in achieving this aim are the Western Australian community, our customers, water industry regulators and resource managers.

These partners in sustainability make it possible for the Corporation to operate in a way that sustains our present and safeguards our future.

This annual report recognises these partnerships and reaffirms the belief that without their cooperation and support, the Corporation cannot achieve the level of excellence to which it aspires."

The Corporation's operational view of "sustainability" is shown in Box 1. The Water Corporation at all times tries to make sustainable decisions, taking account of investment in services, the needs of the community, the requirements for environmental protection, technical issues and the requirements to return an agreed dividend to Government. These constraints present a great challenge in moving towards achieving more sustainable outcomes where these will inevitably lead to the need for behavioural change, increased costs and the consequent need to increase charges.

A diagrammatic representation of this view is known as the "Russian Doll" model of the world (Figure 2), in which the biosphere (the planet) contains human society, and the economy is a subset of that society. To place economic or financial considerations above those of the welfare of society or the planet is by definition unsustainable.

Box 1 – The Water Corporation's view of "Sustainability"

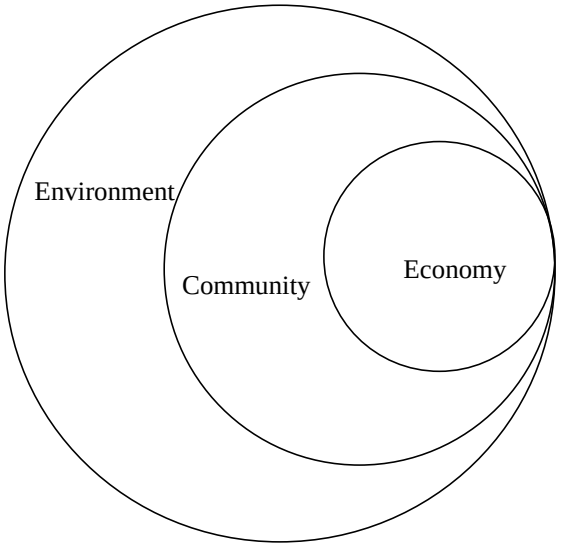
The Corporation regards a sustainable outcome as being one that meets the requirements of the following questions in a positive way:

Do existing or proposed activities provide gains in all the areas of social, environmental and economic? If the answer to all three is "yes" then the activity or proposal can be regarded as sustainable.

Do existing or proposed activities lead to harm in any of the areas of social, environmental or economic? If the answer is a "yes" to any of those, then the activity or proposal may not be sustainable.

For both questions, time, spatial scale and inter-generational considerations are important and are additional inputs in arriving at a conclusion on sustainability.

Figure 2 - "Russian Doll" model of the world for sustainability



Taking action today to satisfy future stakeholder needs requires the development of innovative approaches to a company's business, so that products, services and other company actions help fulfil growing demands for moving to sustainability. It also means anticipating the risks that a company will face into the future and managing the company today so that those risks are turned into opportunities.

Meeting the challenges of tomorrow will require well-developed processes for strategic planning, recognition of needs and opportunities and good managers and thinkers to make it all happen.

Demonstrating good environmental and social performance is becoming an important element of good business performance. An essential component of socially responsible performance is clear, accurate and transparent communication and maintaining good relations with the company's wide range of stakeholders, as the reputation of a company is based to a large extent on what stakeholders say about it.

The diverse geographic range and the broad nature of services provided by the Water Corporation in Western Australia presents significant challenges. This provides the Corporation with a particularly valuable and realistic perspective on sustainability issues in the State (Humphries, et al, 2001).

Whilst focusing on sustainability in Western Australia, the Corporation is also mindful of the international context and of the need to begin to address the divide between the rich and poor nations, as well as between rich and poor within nations. Sustainability is also a time-based concept where consideration of inter-generational equity is vital.

Moving to sustainability will not be easy and there are many barriers both within the Water Corporation and external to it. Some of these are shown in Box 2, and must be addressed if improvements are to be made.

The Water Corporation has adopted the following sustainability principles, and has openly advertised them to all of its staff:

Socially responsible

- Delivery of essential services
- Employee and public safety
- Work conditions and public safety
- Regional development
- Openly engage stakeholders

Environmentally sound

- Minimise impacts
- Efficient resource use
- Integrate into business
- Restore habitats and biodiversity

Economically viable

- Commercial return on assets
- Efficient processes and delivery
- Equitable and efficient pricing signals
- Adequate dividend return to shareholder

Box 2
Barriers to sustainability in the Water Corporation's operating environment

Internal Barriers

- Varying degrees of understanding, knowledge and commitment to the concepts of sustainability
- Differing visions of the business (selling water versus selling services; maximising returns in the short term; not considering inter-generational equity in decision-making about big issues such as re-use)
- Need for employee loyalty with "public servant" image
- Internal organisation (branches and Divisions)
- Attitudes to across-agency functions (eg environment)
- Terminology – the term "Divisions" fosters insularity and works against cooperation
- Need to consider differences between country and metro, and area/cost/population issues

External Barriers

- Lack of broad-based community understanding of and support for a sustainable water cycle
- Scope of the Water Corporation Act
- Governance and regulatory issues (Acts will need to be re-written to be facilitatory rather than overly prescriptive as we are used to)
- Water pricing
- Expectation by government of a significant dividend
- Requirements of Operating Licence
- Requirements of other regulators
- Attitude of environmental regulators (the Corporation is the largest business in the State in terms of environmental licensing and has some 60 times more licenses than any other business. Problems in any of the licensed premises receives media attention and reflects negatively on the whole business. The very high standard of excellence in performance becomes hidden by even small events)
- Requirements of COAG reform agenda

4. Is Sustainability a Worthwhile Pursuit?

The Water Corporation adopted sustainability principles in 2001 and regards the pursuit of sustainability as its core business. The Corporation does not regard "sustainability" as achieving a balance between social, environmental and economic considerations, rather the view taken is that if any existing work or new proposals can be demonstrated to provide gains in all three areas they can be regarded as meeting the requirements for a sustainable outcome (see Box 1). Achieving sustainability can only occur if society returns to a more responsible, caring and less selfish approach by adopting an attitude of "duty of care". Duty of care for land and water, duty of care for the environment, duty of care for communities and society, sharing of resources, and application of equitable principles for today and for future generations (inter-generational equity). The following statement says it very well:

"*No generation has a freehold on the earth. All we have is a life tenancy – with a full repairing lease*." (UK Prime Minister, Margaret Thatcher, 1988)

Thus, collectively, we do not only have a responsibility to use resources wisely, we also have a responsibility to carry out repairs where the activities of previous generations have caused environmental damage. We have a responsibility to hand the earth on to future generations in at least as good quality as when we received it.

5. What Could be Happening in Sustainability

Table 1 - Summary of what the Water Corporation could be doing better in achieving sustainability, if various barriers were removed

Issue	**Potential Water Corporation Sustainability Initiative**	**Changes Needed**
Energy	Increased use of renewables	• open access to the power grid at reasonable price needed; • penalties for black energy use; • government to drive more use of cleaner fuels for power generation etc • restrictive attitude
Biodiversity	Minimise impacts on biodiversity and where appropriate make use of green offsets to achieve biggest bang for the buck approach to environmental management Increased use of offsets eg purchase and protection of high values areas of biodiversity in preference to restoration of degraded areas	Attitude of regulators overly focused on individual plant emissions minimisation and/or impact minimisation, when better overall environmental gains can be achieved by a more creative outlook over a larger area - for example the Busselton Environmental Improvement Initiative (EII).
Water re-use	Significantly increase the amount of treated wastewater being re-used. Create wastewater to meet requirements for specific re-uses (eg remove less nitrogen to create effluent with ideal P:N ratio for plant irrigation) – savings in energy and chemicals	Competition with "free" groundwater makes more costly reclaimed water use very difficult. Needs attitudinal shift in regulators to move from an approach of "waste minimisation" that allows wastewater to be made into a useful commodity
Secondary product re-use/use issues	Historical increase in use of alum for phosphorus removal. Use of alum versus micro-filtration	Leads to a chemical sludge which is not suitable for beneficial environmental re-use. Can also increase the costs of desludging. Alum needs safe environmental disposal if used to remove phosphorus

Drainage - urban	Effective use and management of urban drainage water as part of the water cycle. Potential for significant gains in biodiversity and amenity. Environmental protection of receiving water bodies. Potential business opportunity. Water sensitive urban design has the potential to replicate original hydrology in man-modified environments.	Needs institutional and governance arrangements to be sorted out and responsibilities to be clearly allocated. Needs strategic approach at catchment scale if water quality issues are to be managed. Requires a shift in valuing the importance of the water cycle.
Drainage – rural	Effective use and management of rural drainage water as part of the water cycle. Potential business opportunity. Potential for significant gains in biodiversity and amenity. Environmental protection of receiving water bodies.	Needs institutional and governance arrangements to be sorted out and responsibilities to be clearly allocated. Needs strategic approach at catchment scale if water quality issues are to be managed. Water quality improvement not by treatment in drains, but by using catchment scale and EII approach.
Drainage for salinity mitigation	Engineering options are a major part of any solutions to salinity at least over the short-term. Potential business opportunity. Potential for significant gains in biodiversity (engineering solutions to protect nature reserves at risk)	Needs a co-ordinated approach to drainage for salinity mitigation and leadership from experts in engineering and drainage.
Aquifer storage and recovery	Could significantly increase use of ASR	Regulatory aspects including health and environment
Protection of key infrastructure	Long-term use of infrastructure. Use of energy and chemicals can be minimised if plant is away from residential areas.	Needs government to put in place guaranteed mechanism for protecting key infrastructure from encroachment by non compatible land uses
Level playing field in sustainability	Cost of unreasonable regulation to Water Corporation. Money can be better spent on other environmental and sustainability initiatives.	Need attitudes to change so that expectations on Water Corporation are not higher than for other industries. Water Corporation is not a resource-rich organisation and is restricted by its Act in terms of what it can deliver.
External governance issues	Various restrictions which prevent the Water Corporation from moving into significant areas of gain for sustainability	Needs a risk-weighted approach by regulators, especially environmental and health, to permit greater re-use of reclaimed water and maximise potential re-use options whilst ensuring adequate level of environmental protection.
Internal governance and management	Lack of real targets relating to internal organisational issues and staff.	Internal attitudes and vision need to change to achieve a common integrated approach within the business.

One major challenge for sustainability is to develop meaningful indicators of sustainability. This requires the setting of targets and adequate monitoring and reporting. Historically there has been enough difficulty in developing single sector indicators, and sustainability demands the development of multi sector indicators that represent in a simple manner the complexities of the area. The WA Auditor-general

attempted a "trial" audit of environment several years ago but reported that the area was too complex and difficult because of the many agencies and authorities (as well as the community) involved in achieving environmental outcomes. The National Audit Office also found major shortcomings in the National Landcare Program (ANAO, 1997).

Key indicators of sustainability for parts of the water industry are listed in Table 3.

6. Key Sustainability Issues in Water Resource Use and Management, Big Hairy Audacious Goals (BHAGs) for the State, and Water Corporation Commitments for Sustainability

In this section, the "big hairy audacious goals" (BHAGs) are the Corporation's suggestions as to the outcomes the State community as a whole should be aiming for in the various areas. Where necessary the issue has been briefly outlined to assist general understanding.

Issue 1 - Core Values for Sustainability in Water Resource Use and Management

Key Considerations:

Duty of care for the management and use of all natural resources.

Maintain and improve quality of life of all Western Australians (by ensuring sufficient quantity and quality of water for human use is available).

Water is precious and must be managed and used according to the principles of ecologically sustainable development.

Water is used to maximise its economic, social and environmental returns on a sustainable basis.

Management of water as an integrated aspect of natural resource management.

Involvement of the community in decisions about water and ensuring that they are well informed enough to be able to participate meaningfully.

Knowledge sharing and transparency of decision-making.

Suggested State BHAG in relation to Core Values:

Education, awareness and acceptance that water decisions need to be based on sustainability criteria.

Full pay for use (including costs of protection of the resource and environment).

Payment for water as a valuable resource, comparable to approach to valuing other natural resources such as minerals.

Self responsibility and "duty of care" for the natural environment by all citizens.

Barriers:

Lack of equity in the current approaches to the management of water resources.

Attitudes of the community and expectation by them.

Water Corporation commitments for sustainability:

All Water Corporation employees to be aware of and committed to the above values in all business activities.

See the world as being the "Russian Doll" model where social and economic are subsets contained within environment (Figure 3), then apply the following "test" for sustainability by asking – "If this approach is taken will it lead to net positive outcomes in all three areas of social-environmental and economic?" If the answer is yes, then it is likely to be sustainable. If the answer is no, then redesign what is being proposed to meet net gain on all three (see Box 1).

The Corporation to accept that where step change rather than gradual change is involved, costs may have to be greater in the short-term to better position the Corporation's business when inter-generational equity is taken into account (for example to make extensive reuse of treated wastewater in the future will require very significant outlay over the next 10 years).

Issue 2 – Sustainable Economic Growth

Key Considerations:

Transform patterns of water consumption (eg increased use of waterwise gardens and water-efficient appliances). Total water consumption per unit of GDP output or per kL/consumer.

Improved efficiency in water use and delivery, including using less water per capita; greater reuse of water; reduced leakage and wastage; and significantly improved efficiency of irrigation water use.

Industry should be required to reuse reclaimed water ahead of self supply from aquifers, wherever the option of using reclaimed water is available.

Water pricing should generate incentives for efficient water use – incentives that market forces currently fail to generate of their own accord.

Increasing costs of meeting standards, including drinking water quality, versus the benefits of doing so.

Maximise use of existing infrastructure to facilitate transport of water for its highest and best use, while taking into account the limits of the taking and receiving environments.

Increased focus on reuse of non-traditional water resources including urban stormwater runoff and treated wastewater.

Increased competition in provision of water supply and use services where this is of net benefit to the community.

Increased innovation in urban water supply, use, reuse and treatment (value adding).

Transparency of real price of water supplied to remote areas. The CSO used to provide consistent water pricing is an indicator of societal responsibility.

Conventional attitudes to water service delivery into regional WA, and associated costs of meeting standards.

BHAG in relation to sustainable economic growth:

Politicians and society to tackle the difficult issues of population growth and size of Perth (increased population leads to increased demand for water; increased size of Perth leads to significantly increased costs of distribution and collection).

More efficient water use – improvement targets to be set across all sectors. Setting of water use efficiency targets on an individual sector basis (domestic, industrial, agricultural/horticultural, self supply (eg remote mining industry)).

Establish sophisticated water markets and pricing regimes that encourage the highest and best use of water resources over more wasteful or low value economic uses, and encourage the increased uptake of different solutions.

Clear acceptance of the first priority use for water being protection of ecosystems, followed by water for reticulated supply.

Barriers:

Community perception that water is a right, and a free good.

Existing regulatory attitudes, policies and statutes.

Lack of a mature, established approach to water trading.

Current expectations concerning the “ownership” of water.

Water Corporation commitments for sustainability:

To become a successful provider of advanced sustainable water services, not just a supplier and seller of bulk water.

Issue 3 – Closing the water cycle and key nomenclature changes

Key Considerations:

The water cycle is seen as outlined in Figure 1.

Most frequent water path is abstraction – use – treatment – re-entry to environment (ocean disposal, disposal to inland waters, evaporation or aquifer). Drainage water is a more direct path from rainfall back to environment into wetlands, rivers and aquifers.

Change nomenclature, for example from "wastewater" to "reclaimed water" - as more reuse and recycling occurs, there may be a need to use the term "new water" or "first pass water" for water being drawn from the environment for use for the first time. Such changes can lead to significant attitudinal change.

Opportunity to bring drainage water into the use aspect of the cycle, and to increase the number of times that water is used/reused prior to finally re-entering the environment. This will significantly reduce the need for new water and new water sources.

Opportunity to use aquifer storage and recovery – at least for industrial use.

Suggested State BHAG in relation to closing the water cycle and key nomenclature changes:

Achieve world's best practice in water use efficiency.

Community lifestyle change in which water is no longer regarded as a "free" good.

For people to focus on the quality of their water and not where it comes from as being important**.**
(ie the community fully accepts and trusts the product from the tap and is not concerned about reuse of any water for any purpose).

Full pay for use.

Restrict the amount of "new" water available for use in water supply schemes, to drive improved water use efficiency and demand management.

Barriers:

Negative perceptions of community and of regulators in relation to reuse and water use efficiency.

Attitude that such a "cap" would be impossible to implement or to achieve.

Requires a very significant paradigm shift by the community, service providers and regulators and significant science to determine the appropriate level for a "cap".

Water Corporation commitments for sustainability:

Achieve recognition for excellent practice in water efficiency.

Planning for future supply to prioritise reuse of reclaimed water ahead of potential sources of new water, taking into account the need to consider the environment, minimise pollution and implement water efficiency measures and demand management.

Issue 4 – Urban Drainage

Key Considerations:

Lack of understanding about drainage and governance issues by community and regulators and others – need for reform of governance and pricing policies.

Strategic drainage planning not often carried out. Small scale drainage planning not necessarily on a catchment basis.

Need for a strong catchment focus to drive good decision-making.

Drainage water currently a lost resource as not used prior to re-entering aquifers. However, because of coastal plain, approx 70% of urban stormwater already re-enters the environment and recharges aquifers. Possible to use for other purposes prior to this occurring.

No real pricing for drainage services.

Attitude to drainage still largely "out of sight, out of mind" with use of concrete channels and sumps, rather than regarding drains as potential or actual healthy aquatic ecosystems.

Water quality of receiving water bodies rarely considered, for example, water from freeways drains directly into Swan-Canning system, Lake Monger etc, and in country areas (such as Albany) where tourism value is high.

Water Corporation has no means of controlling quality of water entering its drainage system, and yet could possibly be held responsible for overall water quality in its drains.

Some opportunities for water sensitive urban design.

Wetland filters and artificial wetlands for nutrient stripping do not work according to expectations in the Perth Coastal Plain situation.

Suggested State BHAG in relation to urban drainage:

Pollution of receiving water bodies from drainage water to be properly controlled.

Drainage to be implemented on an ecosystem approach and not just concrete and pipe.

Need for a strong catchment focus to drive good decision-making.

Expect that all developments are designed and constructed according to water sensitive urban design principles (current best practice) or better. Engage all development industry in doing so.

Make more use of local infiltration methods rather than usual reliance on impervious paved surfaces.

Barriers:

Governance and pricing need reform.

Community and government attitudes re willingness to pay.

Retrofitting of existing drainage network may not be feasible to achieve reasonable ecosystems.

Water Corporation commitments for sustainability:

To push for urgent reform of drainage governance and pricing to enable it to be carried out as a proper part of the Corporation's business.

To support a workshop process to develop a governance reform package, involving CSIRO and others.

Continue to provide expert advice into the planning process to ensure that drainage is managed correctly at developer and local levels.

To investigate acquisition of powers to regulate quality of water entering its drains (perhaps from EPA, via an EPA regulation).

Issue 5 – Rural Drainage

Key Considerations:

Two aspects of rural drainage – Water Corporation Declared Drainage areas (Issue 5) and wheatbelt drainage for mitigation of salinity (see Issue 6).

Corporation is under obligation to meet the requirements of its Operating License in regard to provision of drainage.

Need for a strong catchment focus to drive good decision-making.

Differences between urban and rural drainage, and drainage for remediation of salinity.

Operating License limited to drainage to prevent flooding.

Operating License has requirements for rural drainage to be paid for by CSO. However, financial constraint is real and only minimum maintenance to meet Operating License requirements is possible.

Corporation cannot charge drainage rates for rural drainage. Maintenance work is funded from CSO and amount is decided by Treasury. Figure is always low and not of a level that permits consideration of environmental issues in drainage work.

Water Corporation has no means of controlling quality of water entering its drainage system, and yet could possibly be held responsible for overall water quality in its drains.

Suggested State BHAG in relation to rural drainage:

Need for a strong catchment focus to drive good decision-making.

Rural drainage to be carried out in a manner that is more beneficial to the environment. Rural drainage program to be developed jointly between Water Corporation and DEWCP and payment from collection of drainage rates or from CSO to be at a level that enables implementation of agreed program.

Control of pollution of receiving water bodies from drainage water.

Require major cooperation between agencies, including expertise, resource capability and regional structure of Water Corporation.

Barriers:

Lack of drainage rates.

Previous decisions in relation to the CSO for rural drainage.

Limitations on Operating License.

Perceived lack of willingness to pay by community.

Lack of ability to control quality of water entering Water Corporation drains.

Water Corporation commitments for sustainability:

To push for urgent reform of drainage governance and pricing to enable it to be carried out as a proper part of the Corporation's business.

To support a workshop process to develop a governance reform package, involving CSIRO and others.

Continue to provide expert advice into the planning process to ensure that drainage is managed correctly at developer and local levels.

To investigate acquisition of powers to regulate quality of water entering its drains (perhaps from EPA, via an EPA regulation).

Issue 6 – Rural Drainage for Salinity Mitigation

Key Considerations:

Two aspects of rural drainage – Water Corporation Declared Drainage areas (see Issue 5), and wheatbelt drainage for mitigation of salinity.

Corporation Operating License does not make any provisions for involvement in drainage for salinity mitigation.

Water Corporation has extensive expertise and engineering capability and is regionalised, including into the wheatbelt area. The Corporation could be involved in catchment scale drainage planning and implementation in the area of salinity mitigation works in the wheatbelt.

Any involvement by the Corporation would have to be on a full cost recovery basis as required by its Act, although reducing money to dividend could provide a fund for salinity works.

Water Corporation could have carriage of obtaining approvals on a catchment basis from the EPA (and others) for salinity mitigation work, if a key player in design and implementation.

Whole community of WA has a responsibility to share the costs of salinity mitigation, particularly for the protection/restoration of public assets such as infrastructure and biodiversity.

The issue of who benefits and who pays and over what timeframes – issues of equity (today versus inter-generational timeframe).

Suggested State BHAG in relation to rural drainage for salinity mitigation:

Rural drainage for salinity mitigation to be carried out on a whole catchment basis and in a manner that is more beneficial to the environment.

Government to treat salinity mitigation (including proper management of saline drainage) as a priority for WA, and initiate a properly funded, project-managed approach to the problems.

Government to develop a mechanism for covering the cost of salinity mitigation for public assets.

Reduction of damage to receiving water bodies from drainage water in the context of environmental remediation, relative costs and benefits and short and long-term environmental risks.

Barriers:

Rural drainage rates were abolished by the previous government and have not been reinstated.

Limitations of Operating License.

Probable resistance of rural farmers to Water Corporation involvement, even though the Corporation has much of the necessary expertise.

Perceived lack of willingness to pay by community as a whole, although an environmental or salinity levy could be used to cover costs, including for Water Corporation services.

The issue of who benefits and who pays and over what timeframes – issues of equity (today versus inter-generational timeframe).

Water Corporation commitments for sustainability:

To support urgent reform of drainage governance and pricing (including of rural drainage for salinity mitigation) to enable it to be carried out as a proper part of the Corporation's business.

To support a workshop process to develop a governance reform package for rural drainage, involving CSIRO and others.

Explore involvement in salinity drainage issue with a view to providing expert advice into rural drainage planning to ensure that drainage is managed and implemented on a catchment basis.

Issue 7 – Water from the sewerage system (1) - more sustainable use of existing system

Key Considerations:

Two aspects – (1) Running the existing sewerage system in a more sustainable manner (Issue 7) and
(2) Innovation – reuse of water reclaimed from WWTPs (Issue 8), which includes treatment by-products (biological and chemical sludges).

Perth's sewerage system designed and established many years ago to slope towards the coast and ocean outfalls. This was to save energy of pumping. Not easily altered or reversed.

Significant economies of scale and reduced environmental impacts in having a few large WWTPs over many small ones. Small wastewater treatment plants are difficult to manage - more variability in operation. Small plants use greater energy and resources, produce odour over larger areas and require proportionally more land for chlorine and odour buffers.

Extensive reuse from existing system not an environmental "free lunch" as irrigating woodlots has potential for nutrient pollution of coastal plain. Also seasonal problems re infiltration during winter wet periods. Requires research, sensible design and reasonable risk to be considered, also design effluent produced to suit the end re-use.

Current major and some minor WWTPs have some odour issue resulting from failure of the land planning system to prevent encroachment by residential and other uses.

Suggested State BHAG in relation to water from the sewerage system (1):

Significantly increased reuse of water from existing WWTPs in Perth (already significant in country areas).

Significantly improve waste treatment technology, for example the egg shaped digesters at Woodman Point turn sewage sludge into stabilised biosolids and into energy or other useful products.

Generate re-use opportunities and design production of effluent for end use (eg produce effluent with appropriate N:P ratio for plant growth; sludge for vermiculture etc).

Barriers

Existing infrastructure installed to minimise energy use. Irrigation on the scarp would be expensive in energy and increase greenhouse gases.

Considerations relating to location of large WWTPs close to land now developed for residential areas, eg Beenyup and Subiaco.

Producing renewable energy from WWTPs requires large plants and large investment. Few opportunities exist at suitable scale.

Water Corporation commitments for sustainability:

Operate current WWTPs to achieve maximum environmental and social benefit.

Innovate in relation to beneficial re-use of solids for a broad range of purposes including possible generation of energy.

Increase investment in regional wastewater treatment and reuse schemes.

In collaboration with others, establish at least one demonstration energy- and water-efficient house.

Issue 8 – Water from the sewerage system (2) – Innovation and reuse

Key Considerations:

Two aspects – (1) Running the existing sewerage system in a more sustainable manner (Issue 7) and (2) Innovation – reuse of water reclaimed from WWTPs (Issue 8).

Produce tailor made by-products for specific re-use purposes.

Extensive reuse from existing system not an environmental "free lunch" as irrigating woodlots has potential for nutrient pollution of coastal plain. Also seasonal problems re infiltration during winter wet periods. However, other biological systems (eg Werribee Melbourne) harness the power of environmental processes.

Good opportunities exist if there is careful design and selection of species for re-use schemes, including horticulture, parks and gardens, industry, and woodlots.

Optimising nutrient removal against end use of treated wastewater needs to be addressed. For example, tertiary wastewater treatment plants may remove too much nitrogen for optimal tree growth. Tailoring effluent quality to fit the end use will save energy and materials and lead to better overall resource utilisation.

Suggested State BHAG in relation to water from the sewerage system (2):

Significantly increased reuse of water from existing WWTPs in Perth (already significant in country areas) – Reuse 80% of water from WWTPs around WA within 20 years.

Significantly improve waste treatment technology, for example the egg shaped digesters at Woodman Point, to turn human waste or biosolids into products that can be beneficially reused.

Require plantations and agricultural activities using new water to be licensed, while plantations and agricultural activities relying on re-use (where quality is appropriate) would not be licensed.

Greatly increased re-use of water as standard practice.

Barriers:

New groundwater and surface water resources cost substantially less than treated wastewater. Therefore there is a need to change the approach to access and the pricing regime to favour reuse ahead of accessing new water. In addition, there should be penalties for using new water in any situation where reclaimed water of a suitable quality and quantity is available.

Over-precautionary environmental and health regulation of wastewater reuse.

Negative community perception of wastewater and/or storage underground for later usage. Reuse of treated wastewater for drinking water generally not considered acceptable in community surveys.

Producing renewable energy from WWTPs requires large plants and large investments. Few such opportunities exist at suitable scale.

Water Corporation commitments for sustainability:

Reuse of 20% of water from WA's WWTPs within 10 years.

Significant other reuse within 10 years.

Issue 9 – Aquifer storage and recovery (ASR)

Aquifer storage and recovery (ASR) involves injecting water into aquifers so that it can be removed and used at a later time.

Key Considerations:

Not a new approach, as ASR is already being used for non-potable uses, especially at Kwinana.

Already occurs in Perth from annual recharge of aquifers from annual precipitation and stormwater.

Contaminants and technical constraints. For example, aquifer clogging can occur from suspended solids.

Bacteria and viruses that can affect human health when treated wastewater is re-injected into aquifers. Although pathogen die-off can be managed and disinfection can occur, community nervousness remains.

Past, current and future land uses within the groundwater recharge area need to be considered within the context of proposed use of ASR water.

Important to consider proposed use of ASR water prior to using ASR, as different criteria will need to be applied for injection to ensure water quality for proposed end use.

Protection of downstream environment (post use) and ecosystems.

Suggested State BHAG in relation to aquifer storage and recovery:

Reuse of 20% of water from ASR within 10 years.

Barriers:

Current over precautionary attitudes of environmental and health regulators.

Negative community perception in relation to reuse of various kinds of water for various uses, eg reuse of treated water for drinking water is generally not considered acceptable in community surveys to date. There is also a strong aversion to injection of treated wastewater into aquifers.

Perceptions about contaminants and long-term effects from any reuse for human consumption.

Current regulatory regime.

Cost of infrastructure already in place – could mean earlier write-off of assets already installed.

Water Corporation commitments for sustainability:

Carry out the research necessary to demonstrate the safety of ASR for potable and other uses.

Inform the community and regulators to influence a positive shift in opinion towards ASR.

To promote re-use in some areas may need to deliver higher quality water (eg reduced hardness).

Initiate one or two demonstration schemes with detailed monitoring of efficacy and safety, including environmental aspects such as eutrophication.

Issue 10 – Secure access to land for key infrastructure (see also Issue 11)

Key Considerations

Although the Water Corporation plans 20+ years ahead for sites for key infrastructure, Water Corporation land often becomes the target for development by other government agencies and private developers, and government initiatives such as Bushplan/Bush Forever.

Consider current and future land uses especially future land uses that would not be compatible with the proposed infrastructure (eg residential too close to existing wastewater treatment plants).

Although the Water Corporation supports Bush Forever, government has to recognise that some sites with high quality bushland are essential for some key infrastructure. Key water service infrastructure is essential to support the planning and development of urban land (eg WWTPs should be sited down-gradient to allow gravity flow down sewers to minimise energy costs; hill top reservoirs must be sited on hilltops near residential areas).

Who pays the costs of protection of land in Bush Forever sites where alternatives do exist (eg for pipe corridors)? For public infrastructure, it could be argued that if the Water Corporation is required to incur significant additional cost to protect bush (eg re-routing a pipeline) the additional cost should be paid for by government in the form of a reduced dividend to government.

Suggested State BHAG in relation to secure access to land for key infrastructure:

Need for excellent long-term strategic planning for conservation on equivalent timeframe to Water Corporation planning for key infrastructure (ie 20+ years).

The State system to provide secure access and long-term security of access to key infrastructure sites that are identified early. Such sites need to be protected from erosion by initiatives such as Bush Forever and developer pressure.

Barriers:

Poor land planning at State level undermines good long-term planning by the Water Corporation.

No secure mechanism (yet) for setting aside buffers and protecting them in the long-term (apart from some Agreement Acts).

The Water Corporation is often still regarded as a government agency and resource-rich in terms of expectations that it should relinquish land – Water Corporation Act actually prevents the Corporation from operating other than in a fully commercial manner in regard to assets.

There is no replacement option for much of land acquired be Water Corporation for key infrastructure.

Water reuse decisions etc will have an impact on long-term strategic planning. The development front incorporates provision of sewerage pipes and decisions will need to be made on whether sewerage already installed must be abandoned in favour of reuse options. However, asset write-off can be made a priority to achieve this.

Water Corporation commitments for sustainability:

Establishment of initiatives such as a Biodiversity Trust Fund to provide for green offsets to enable key sites affected by Bush Forever to be accessed in accordance with long-term plans whilst maintaining biodiversity.

Carry out a strategic biodiversity and conservation plan to review all Bush Forever sites affecting key Water Corporation landholdings and secure essential land.

Water Corporation to be more aggressive in obtaining and retaining the land that environment and society needs and to use the resumption rights where necessary to do so.

Issue 11 – Long-term protection of key infrastructure (buffers) (see also Issue 10)

Key Considerations:

Failure of planning to protect buffers from encroachment by odour-sensitive land uses into areas where residential development is not compatible with existing Water Corporation facilities.

Total control of odour is not technically possible, so adequate buffers are an essential element in protection against odour nuisance.

Perception that buffers "sterilise" land when in fact they still provide development opportunities for odour-compatible land uses.

The decision to locate a major wastewater treatment plant is essentially irreversible because sewers have to flow into WWTPs, sewerage pipes are installed at the development front well in advance of connection, and use of gravity for flow significantly reduces use of energy, greenhouse effects and long term operating costs to the community.

There may be opportunity for relocation of small and rural WWTPs.

Suggested State BHAG in relation to long-term protection of key infrastructure (buffers):

State to put in place fail-safe mechanism for establishment and protection of adequate buffers from encroachment. Planning has failed to achieve this and an Environmental Protection Policy provide more certainty, whilst also being reviewable each 7 years.

State needs to establish a mechanism to re-obtain/obtain adequate buffer land where this has been "lost".

Barriers:

Resistance from developers, planners and government.

Appeals to the Minister etc undermine planning/approval process in some cases.

Water Corporation has not carried out adequate on-site meteorology and monitoring to enable scientific buffers to be determined at present, therefore are using interim generalised buffers in the short-term.

Perception that buffers "sterilise" land when in fact they still provide development opportunities for odour-compatible land uses.

A 20-year planning horizon for provision of buffers may not always be a long enough time horizon.

Water Corporation commitments for sustainability:

Water Corporation will continue to carry out meteorology, monitoring and modelling at key WWTP sites where incompatible land uses within the buffer are or may become a threat.

Use the above information to establish a scientifically determined buffer for significant WWTPs and for projected "ultimate" growth.

Continue to apply pressure to government for legal protection of buffers from encroachment by land uses that are not compatible.

Work with existing landholders to develop odour-compatible plans for landholdings within existing and proposed buffer areas.

Issue 12 – Sustainability of water resources (1) - groundwater

Key Considerations:

Climate and climate change.

Assumptions made in the 1970's and 1980's relating to the long-term rainfall and recharge regime no longer seem to be valid.

Water use efficiency and demand management.

Water pricing.

Inter-basin transfers (environmental issues and perceptions of "equity" and who owns the water).

Saline water and salinity.

Currently there are different rules for different users of water in terms of allocation, abstraction, use, measurement of use, pricing, control and mitigation of environmental effects (public water supply, mining, industry, and agriculture).

Lack of knowledge (eg domestic bore abstraction is not metered or measured; most industrial and horticultural groundwater use is not measured) so too much reliance on estimation of the amount of water used.

Known over-allocation is locally significant in some areas and is an increasingly significant issue even particularly given the current low rainfall regime.

Environmental concerns in use of water but most of environmental responsibility falls to Water Corporation. Water probably over-allocated (in addition to above) as a result of persistent poor rainfall/recharge regime.

No ranking of water use priority, other than securing provision to the environment as the initial allocation.

No mechanism to deal with the ranking issue (currently no mechanism for water trading and/or compensation, however care is needed here as States where water trading is in place are now finding it does not solve the problems is was meant to).

Irresponsible attitudes that advocate unlimited access to and use of water in a State where water resources are limited.

Suggested State BHAG in relation to sustainability of water resources (1) - groundwater

Use actual sustainable yield that protects the environment to ensure that water is not being mined.

The challenge is over what timeframe should the above be determined and whether a more accurate estimate is feasible.

Apply same set of rules to all users across whole water abstraction/use/disposal cycle, including in remote areas.

Barriers:

Working out a mechanism by which true sustainable yield can be determined over an appropriate timeframe for sustainability of allocation and use (needs more flexibility and ability to reduce use at short notice, which links to establishing and protecting priority users ahead of others.

Unwillingness of Water and Rivers Commission (now DEWCP) to reduce water allocations to low value uses or prevent use of water in drier years, by users other than the Water Corporation.

Community and regulatory resistance to re-use of water, and in terms of aquifer storage and recovery - regulatory resistance to reinjecting water of different quality than already in the aquifer (including better quality).

Irresponsible attitude that advocates unlimited access to and use of water in a State where water resources are limited.

Within Water Corporation, need better resourcing and education of staff to meet increased pressure on the resource, and to properly service the level of technology of various high tech assets.

Water Corporation commitments for sustainability:

Obtain agreement on the uncertainties above and how to manage them.

Remodel sustainable yield of Gnangara and Jandakot Mounds over all 3 aquifers (Superficial, Leederville and Yarragadee).

Remodel the sustainable yield of Albany's groundwater systems.

Contribute to s46 amendment to restate the environmental requirements and sustainable water yields of the Gnangara Mound.

Contribute to reform of groundwater allocation and governance policy.

Support resolution of the issue of establishing a prioritised hierarchy of water uses.

Continue to offset and mitigate any adverse environmental effects of Water Corporation abstraction.

Increase level of resourcing and education of staff to meet increased pressure on the resource, and to properly service the level of technology of various high tech assets (eg IDEA plants).

Issue 13 – Sustainability of water resources (2) – surface water

Key Considerations:

Climate and climate change and rainfall and runoff regime and catchment wetting.

Water use efficiency and demand management.

Water pricing.

Inter-basin transfers (environmental issues and perceptions of "equity" and who owns the water).

Saline water and salinity.

Community resistance to new dams.

Privatisation of irrigation schemes and attitude to inter-basin transfers.

Incompatible activities in catchments affecting water quality and quantity and increasing community pressure to access surface water resources for recreation (increases risk of pathogens harmful to humans and increases costs of water treatment).

Relationship between forests conditions and management, and runoff.

Impacts on aquatic flora and fauna (downstream of dams).

Desire by some to use reservoirs for feral fish for recreational fishing and aquaculture.

Irresponsible attitude that advocates unlimited access to and use of water in a State where water resources are limited.

Suggested State BHAG in relation to sustainability of water resources (2) – surface water:

The State to re-structure forest management to optimise forest production whilst maximising water yield and biodiversity values (requires broadly based community support).

To achieve the above in the face of climate change and probable reduced rainfall (determining the appropriate timeframe over which this should be considered is vital).

Barriers:

Community resistance to new dams.

Community perceptions of risk and regulatory resistance to re-use of water.

Irresponsible attitude that advocates unlimited access to and use of water in a State where water resources are limited.

Community attitudes to forest management and use of native forests for productive purposes.

Privatisation of irrigation schemes and attitude to inter-basin transfers.

Natural characteristics of local aquatic fauna (eg depauperate fish fauna) and technical difficulties of providing mechanisms for WA aquatic fauna to by-pass dams (conventional fish ladders do not work).

Water Corporation commitments for sustainability:

Maintain/improve (where feasible) water quality from areas already dammed for potable use.

Examine the issue of stem density, forest management and runoff to optimise forest values (biodiversity) and water production.

Maintain ranger presence in catchments at Water Corporation cost, to increase water quality and biodiversity (eg prevent poaching of wildlife).

Increase coverage of ranger presence into non-metropolitan dam catchments.

Issue 14 – Protection of water sources

Key Considerations:

Sectoral community demands for land uses in catchments that are not compatible with production of high quality water.

Costs of water treatment (increase if catchments are not fully protected).

Management of catchments - Water Corporation harvests bulk water from areas managed by others (eg Water and Rivers Commission; Forest Products Commission).

Lack of adequate catchment protection; while Water Corporation is required to guarantee the quality of water it supplies.

Salinity and salinisation.

Suggested State BHAG in relation to protection of water sources:

Appropriate pricing of water as a resource, that fully internalises the costs of water protection (catchments) as well as water treatment costs.

Acceptance that protection of water quality and quantity is the highest value after the environment has been adequately protected.

Acceptance of closed catchments as providing the essential first barrier of defence against bacteria and viruses to ensure high quality water is delivered that requires minimum treatment.

Barriers:

The attitude by some (including regulators) that "adequate protection of the environment" means no environmental change, when in fact "adequate" may lead to environmental improvement if considered in a broader context (eg environmental "green" offsets).

Water Corporation commitments for sustainability:

To continue investment in catchment protection.

To fully internalise the costs of catchment protection into the price of water, to enable better (more) catchment protection to occur.

Extend catchment protection (rangers) to the rest of the State (currently only in metropolitan and South West Region catchments).

Issue 15 – Biodiversity

Key Considerations:

Have a clear definition of environmental water requirements for different water-dependent vegetation and fauna, and to accommodate varying levels of protection and risk from drought.

Determination of environmental water requirements for water-dependent vegetation and fauna.

Introduction of feral aquatic species into dams, eg for fishing and aquaculture.

Inter-basin transfers and implications for biodiversity.

Community attitudes to forest management and use of native forests for productive purposes - opportunities to enhance biodiversity and forest management if forest thinning is implemented.

Salinisation and rising water tables leading to loss of biodiversity, especially in areas where it is already diminished from extensive land clearing.

Suggested State BHAG in relation to biodiversity:

Maintain all significant ecosystems whilst accessing water for highest value uses.

Arrest and reverse loss of biodiversity**.**

Barriers:

No such thing as an environmental "free lunch" and impossible to do something in one part of the environment without having some effect on the environment elsewhere or on another element.

Increasing population size and pressure to consume resources.

Lack of recognition that resources are limited.

The attitude by some (including regulators) that "adequate protection of the environment" means no environmental change, when in fact "adequate" may lead to environmental improvement if taken in a broader context (eg environmental "green" offsets).

Irresponsible attitude that advocates unlimited access to and use of water in a State where water resources are limited.

Water Corporation commitments for sustainability:

Maintain commitment to always put back (directly or via offsets) more than is permanently removed in terms of biodiversity values.

Progress the Water Corporation's proposed Biodiversity Trust Fund to facilitate its achievement of "biggest bang for the buck" biodiversity protection.

Work with others to develop economically and socially attractive models for biodiversity protection and enhancement (form partnerships; for example with the housing industry and conservation organisations).

Issue 16 – Water use and hierarchy of water value

Key Considerations:

Currently no formal hierarchy of water uses is established for WA, and therefore no priority users identified, even though this issue has been tackled elsewhere (eg Murray-Darling Basin). Priority use in times of shortage should be public water supply, provided that long-term protection of the environment is achieved. Other priorities need to include considerations such as perennial crops being a higher priority than annual crops.

Because of above lack, Water Corporation is the target for management of reduced groundwater simply because it is easier for the regulator to require Water Corporation bores to be turned off than it is to properly manage the whole groundwater resource across all users.

Need regulator to consider other options such as paying horticulturalists growing annual crops not to grow them for a year to be able to access more water for public water supply purposes.

Suggested State BHAG in relation to water use and hierarchy of water value:

Establish a clear hierarchy of water uses based on importance to society, which can be used to provide greater certainty in times of reduced rainfall and recharge.

Implement the above and deal with the equity issues as necessary.

Barriers:

It is easier for the regulator to continue to "manage" water resources by managing whether or not the Water Corporation can use its bores.

Apathy – lack of will to address the issue of priority users.

Water Corporation commitments for sustainability:

To have the issue of determining hierarchy of priority uses and users investigated by an independent expert with a view to the State accepting that hierarchy as the basis of water resource management in difficult times.

To continue to husband existing and future water resources allocated to the Corporation in a sustainable manner in accordance with other key issues in this statement.

Issue 17 – Energy

Key Considerations:

Water Corporation is a major user of energy and will continue to be because of the nature of the business (pumping water around the various piped systems, running wastewater treatment plants etc).

Sewerage system is already designed to minimise pumping (energy use) by being designed to maximise use of gravity flow through pipes.

Energy use by the Corporation will increase significantly if desalination is used for Perth.

Opportunities to reduce power use are limited but very significant environmental gains can be achieved through a major shift to using energy generated using renewables.

Because the Water Corporation is such a large user of energy it is well placed to drive production of renewable energy and can provide a very significant market opportunity for sale of renewable energy.

Water Corporation's use of renewables is now 10.5% of total energy use. Ability of Water Corporation to take more renewable energy at current time is limited by availability of renewable energy.

Water Corporation is a significant producer of renewable energy from the egg-shaped digesters at Woodman Point (some 5.5% of energy is from self-generation).

Pricing needs to be looked at and incentives provided for renewable energy use. Differential pricing between power supplied to the grid and withdrawn from the grid needs to be addressed as currently a very large disparity between the price given to the Water Corporation as an energy provider and the price it has to pay to buy back energy.

Significant opportunities for the Water Corporation to establish tree plantations for a range of purposes including greenhouse gas offsets, use of treated wastewater, energy savings on producing effluent which is optimal for irrigation over maximum removal of nutrients. Double savings can be achieved through greenhouse mitigation during plantation growth, and use of material as a renewable fuel for power generation.

Suggested State BHAG in relation to energy:

For the State to become greenhouse neutral in terms of energy use.

Barriers:

Although improvements can be made to reduce total energy use, some industries will remain large consumers of energy and will have to rely on provision of greenhouse offsets to reduce greenhouse gas generation across their business.

The nature of the Water Corporation's business means that its use of energy will remain high.

Water Corporation commitments for sustainability:

To progressively increase use of green power to a feasible maximum, taking account of availability of green energy and price considerations.

Water Corporation's use of renewables is now 10.5% of total energy use. Ability of Water Corporation to take more renewable energy at current time is limited by availability of renewable energy.

Establishment of initiatives such as the proposed Biodiversity Trust Fund to provide for green offsets including for greenhouse mitigation purposes.

To reduce the use of power per kL of water produced.

To aim to be greenhouse neutral across the whole business.

Issue 18 – Use of materials

Key Considerations:

Consideration of whole of life cycle resource use for all materials traditionally used throughout Water Corporation's business, with the objective of reducing the "ecological footprint" of the services provided by the Corporation.

Opportunities for innovation in use of materials.

Suggested State BHAG in relation to use of materials:

Consider the whole of life costs for all materials used be the WA community, and bias future materials selection and purchase towards those with the smallest "ecological footprint" and lowest whole of life costs.

Barriers:

Attitudes, habits and traditional ways of doing things.

Lack of innovative thinking in design and construction and development of materials.

Traditional engineering protocols and specifications.

Financial and risk considerations involved in change.

Water Corporation commitments for sustainability:

Initiate an audit of materials across the various sectors of the Corporation's business to reduce waste generation and underpin selection of components that will enhance sustainability.

Use results of audit to influence future purchasing policies.

Issue 19 – Generation and management of wastes

Key Considerations:

Whole of life cycle considerations to selection and use of materials across all aspects of the Corporation's business, including raw materials, energy and greenhouse gas, renewability, reuse options, vehicles etc.

Suggested State BHAG in relation to generation and management of wastes:

"Zero Waste" by 2020 – although the definition of waste will need careful thought.

Barriers:

Traditional thinking and current purchasing policies.

Habits, apathy and resistance to change.

Water Corporation commitments for sustainability:

Reduce waste generation across all sectors of the Water Corporation's business.

Carry out an audit of materials across the various sectors of the Corporation's business to reduce waste generation and underpin selection of components that will enhance sustainability.

Use results of audit to influence purchasing policies.

Issue 20 – Environmental "Duty of Care"

Key Considerations:

Industry Commission report into ecologically sustainable land management ("A Full repairing Lease", 1998) (p.133-4) stated:
Each (State) comprehensive regime to regulate the use of natural resources "should impose a statutory "duty of care" for the environment on everyone whose actions influence the management of land and other natural resources. The duty should require them to take all reasonable and practical steps to prevent harm to the environment" that could have been reasonably foreseen.

A duty of care seeks to have land holders and natural resource managers meet the cost of protecting the environment where and when it is expected to be economically efficient to do so.

The above is an extension and codification of the common law duty of care which is concerned with minimising any harm that one person may cause another, and requiring each person to take every practical and reasonable step to avoid causing foreseeable harm to another. The purpose of such codification is to firmly establish in the minds of all concerned that protecting the environment is a continuous social and legal responsibility and to encourage a more proactive approach to preventing environmental problems, including biological diversity and ecological integrity.

Suggested State BHAG in relation to duty of care:

Land management obligation (or duty of care) should apply uniformly to all kinds of land tenure and to all owners and managers of land.

All organisations and individuals operating in Western Australia to demonstrate a duty of care for the environment.

Western Australian government to expect organisations and individuals to demonstrate a duty of care for the environment.

Entrench "environment" in all business – as heavily as OSH now is.

Embody the duty of care as outlined above in all relevant State legislation on natural resource management of land, water, air, biodiversity, ecosystems and minerals.

Carry out major reform of legislation to ensure duty of care is codified in legislation.

Western Australian government to lead by example in the area of duty of care for the environment.

Barriers:

Requires very significant attitudinal change across all sectors of the community.

Requires significant changes to legislation and development of a strategy for implementation.

Water Corporation commitments for sustainability:

Entrench "environment" in all aspects of the Corporation's business – as heavily as OSH now is.

Lead by example - cultivate duty of care ethic in all staff and throughout the Water Corporation.

Take leadership role with government to have duty of care embedded in all relevant legislation.

Continue to demonstrate duty of care through regular exceedence of minimum environmental requirements and establishment and continuation of initiatives such as Cockatoo Care, Busselton Environmental Improvement Initiative and the proposed Biodiversity Trust Fund.

Issue 21 – A level playing field in sustainability

Key Considerations:

Regulatory control on Water Corporation is much greater than on other industries such as agriculture where there is almost no environmental regulation.

The size of the business - Water Corporation is an unusual business because of the large number of prescribed premises in its portfolio, and the fact that it is regionalised throughout WA. Where most industries only have a few licensed premises under the Environmental Protection Act, the Water Corporation has in excess of 90 premises as each wastewater treatment plant has to be licensed. In addition there are over 800 pumping stations. This greatly increases the chance of there being a problem in one of them at some time in a year and makes perfect compliance a greater commitment than for industries with one or a small number of licenses.

Suggested State BHAG in relation to a level playing field in sustainability:

Western Australian government to implement a more level playing field for sustainability.

Fair assessment of the performance of the Water Corporation in the context of its whole business, for example, it is not reasonable to use a minor spill from a pumping station from a power outage, or small sewage spill from a cause unrelated to the Corporation (eg East Perth pipe collapse) to damn the whole performance. Need to focus on how well the Water Corporation does things to provide the context for any incident.

Barriers

Unreasonable level of regulation of Water Corporation compared with other industries.

Higher expectations of Water Corporation by regulators (eg environmental).

Assumption made that Water Corporation is resource rich and easy to lean on in terms of increased expectations, leading to more onerous requirements from regulators.

Lack of trust of the Water Corporation by some regulators, even when there are no grounds for it.

Water Corporation commitments for sustainability:

To continue to perform to above basic requirements whilst working to secure a more even playing field.

To work to establish a high trust level from the environmental regulators.

Better informing and education of regulators and the public about the full scope of the Water Corporation's business and its performance.

Report incidents in a context of knowledge of both what it has done well (eg how much wastewater is moved and treated per year) and incidents (eg spills).

Issue 22 – Civic responsibility

Key Considerations:

How is the Water Corporation viewed?
(a) in the Perth region
(b) out in the more remote regions of WA
(c) within the Corporation (by employees at various levels)

Who are the Corporation's primary stakeholders?

What is the impact of the Water Corporation on the primary stakeholders?

How would the Water Corporation rate its performance in the social, environmental and ethical arena? How is this communicated both within and outside the organisation?

How does the Water Corporation's environmental impact compare with that of peers?

What is the Water Corporation's social footprint and how does it compare with peers?

What are the positive values surrounding the "Water Corporation" as a brand name?
(a) in the Perth region
(b) out in the more remote regions of WA

See also Boxes 3 and 4 and Table 2 that follow

Suggested State BHAG in relation to social responsibility:

All organisations operating in Western Australia to demonstrate a very high level of social responsibility including care for the environment and treatment of employees.

Western Australian government to expect organisations to demonstrate a very high level of social responsibility.

Western Australian government to lead by example in the area of social responsibility.

Barriers:

Cultural differences between organisations in different sectors.

Cultural differences between Australian owned companies in different States of Australia as well as with companies owned overseas.

Cultural differences between countries.

Perceptions within organisations and from the outside.

Water Corporation commitments for sustainability:

Establishment of socially and environmentally responsible initiatives such as the proposed Biodiversity Trust Fund to provide for green offsets.

To continue to achieve biggest bang for the buck environmental, social and other outcomes.

To achieve the "Superior" level of performance as measured against the Monash Performance Benchmarks (see Table 2).

Box 3 - What is Corporate Social Responsibility?

- A Company's obligation to be accountable to all of its stakeholders in all its operations and activities – not just to shareholders.

- Socially responsible companies consider the full scope of their impact on communities and the environment when making decisions, balancing the needs of stakeholders with their need to make a profit.

- An organisation's commitment to behave in an economically and environmentally sustainable manner, while honouring the interests of direct stakeholders.

- The commitment of business to contribute to sustainable economic development, working with employees, their families, the local community and society at large to improve their quality of life.

- Doing well by doing good.

The following issues are also typically included in the dimensions of corporate responsibility:

- Workplace issues – recruitment policies, treatment of employees, health and safety
- Environmental issues
- Human rights
- Community involvement and development
- Marketplace issues – characteristics of products; marketing; timely payment of bills
- Fiscal issues
- Accountability
- Corporate governance and ethics

(Source: Deni Greene Consulting Services et al, 2001)

Box 4 - Stages in the Relationship between Environmental and Financial Performance

Phase 1 – Minimisation of Regulatory Compliance Costs

- Companies regard environmental requirements as a drag on profitability and only a cost, so they try to minimise them.
- Environmental performance not seen as related to achieving business objectives
- Financial opportunities that could be achieved through improved performance are not realised

Phase 2 – Proactive Approaches to Environmental Management

- Industrial processes are redesigned to prevent pollution – most often through resource recovery and use or sale of materials and chemicals that were previously discarded as a waste of an emission
- Compliance costs are reduced from improvements in operating margins and greater energy and materials efficiencies
- Environmental audits and environmental management systems are implemented to encourage understanding of and reduction of environmental impacts in a more systematic way
- Shift in attitude towards environmental regulation with some advocating incentive-based environmental regulation to allow flexibility and allow responsible performance to be demonstrated
- Emergence of eco-efficiency – redesign of production processes to reduce waste and environmental risk is seen as improving operating margins, increasing returns and reducing working capital expenses
- Realisation of overall financial gains through improved environmental performance
- Transparency and community audit

Phase 3 – Creation of Value through Environmental Strategies

- Product innovation, including products to be reused or recycled
- Market redefinition – often from production of a product to provision of a service

(Source: Deni Greene Consulting Services et al, 2001)

Table 2 - Performance Benchmarks applied by Monash Sustainability Enterprises used in Evaluating Companies

Nascent

- Either a lack of recognition of environmental issues at the strategic level or company strategy does not reflect public expectations
- Effectiveness of environmental management systems, where they exist, limited; environmental impact not being adequately addressed. Or present activities have unacceptable levels of environmental risk

Emergent

- The environment is not yet seen as a strategic business issue; policy and management systems beginning to be developed
- Typically compliance-oriented; environmental management systems not integrated with business management processes
- Systematic programs to minimise environmental impact not yet in place; significant environmental impacts may have been identified
- Public trust recognised as important issue; emphasis tends toward management of stakeholders rather than meaningful engagement

Responsive

- Environmental management is high priority in company's business strategy and policies; commitment to go beyond compliance; management systems near completion/integration
- Major environmental impacts systematically tracked; programs in place to reduce impacts
- Engaging stakeholders directly affected by operations, provides comprehensive information, factors stakeholder concerns into plans and activities

Superior

- Industry best practice for its industry sector
- Sustainable development practices integrated into strategy and policies and backed by EMS integrated into decision-making
- Striving to ensure that operations, products and services are sustainable; environmental impacts are declining
- High priority given to stakeholder relations; demonstrated by meaningful consultation and disclosure of environmental performance information

(Source: Deni Greene Consulting Services et al, 2001)

Issue 23 – External governance issues

Key Considerations:

Water Corporation Act.

Other natural resource management Acts and policies.

Need for extensive reform of state's Acts to embody ethic of "duty of care".

Cabinet decisions which influence Water Corporation operations.

Operating License, pricing and CSOs.

Commonwealth initiatives affecting reform of the water industry throughout Australia (eg COAG).

Actions and limitations on business from various regulators, including Health, Environment, Water Resource Manager, Office of Water regulation etc). In particular Health Department requirements limit the reuse of treated wastewater and the environmental regulator restricts use of biosolids.

Need to implement best practice approach to regulation (see Box 5 that follows).

Government policies and attitudes.

Community perceptions and attitudes, including in relation to water restrictions resulting from low rainfall.

Suggested State BHAG in relation to external governance issues:

Embody "duty of care" in all Acts.

Full overhaul of state statutes and governance and removal of all barriers to achieving sustainability. Approach needs to change to one that facilitates the taking of corporate responsibility, and a move from "command and control" to cooperative management and partnerships. Focus os government should move to one of defining a broad framework that allows flexibility within a prescribed "playing field" to enable innovation by organisations.

Barriers:

Political will. Requires very significant commitment by government to total reform of familiar approach to legislation (enabling/prohibiting) to one of providing facilitation and incentives.

Water Corporation commitments for sustainability:

To provide leadership in moving towards achieving the BHAG above.

To gain the public reputation of meeting or frequently exceeding regulatory requirements.

To score a consistent positive average public perception rating for environmental performance of at least 70%.

Box 5 – Key aspects of good regulation

- **Where regulation/control is being considered, is there an environmental issue that needs to be controlled/managed**. It is important to ask *"Why do it at all?"* and to consider what the results would be from not taking the action. Any constraint that imposes significant cost or technological change should be justified not only on a basis of cause and effect, but balanced against consideration of the social, economic and environmental costs for failing to do so. However, *where there indications that there may be an emerging problem,* this does not preclude the application of a precautionary approach.

- **Any control measure envisaged should have a basis at law**. *"Does the regulator have the authority to do this?"* The regulator should not be acting beyond head powers (*Ultra Vires*).

- **Any action to be taken is attainable**. *"Can we realistically expect this to be done? Is the technology available to deliver this condition?"* The measure should not set unattainable goals that "engineer" the operator into non-compliance circumstances or economically unsustainable operation unless the social or economic consequences for failing to do so outweigh the economic benefit derived.

- **The legislation, policy, procedure or practice to be imposed is reasonable and practicable**. *"Is this consistent with what we would expect others to do in similar circumstances?"* Current state of knowledge and acceptable practice in like industries in like circumstances forms the basis of this question. Demands for "beyond best practice" or for "Best Available Technology" are unreasonable if out of balance with the social, economic and environmental needs and values, or requirements on other comparable industries. There is the "golden thread" of reasonableness and practicability throughout the Environmental Protection Act. This takes into account cost, on the basis of cost to do something versus the cost for failing to have done so (not direct economic burden).

- **The measure to be applied should be enforceable**. *"If imposed, do I know what I have to do to comply?"* If there is insufficient specificity at law from which the licensee can clearly determine his responsibility, the measure should not be written.

- **Performance (comply/non-comply) should be measurable.** *"Can I measure my performance against the condition and relevant standards to determine whether my performance is adequate?"* There must be a means of determining performance (compliance/non-compliance) The absence of appropriate analytical techniques that are in themselves relevant, reasonable and practicable, traceable to the appropriate standards and defensible technically suggests the instrument should be rethought/abandoned in its mooted form.

- **The instrument should have Parity and Equity in approach.** *"Are we being treated differently?"* This has several dimensions in terms of limits and standards:

a) an even-handed approach to application for all stakeholders:
b) in terms of environmental outcomes, ensuring that one player does not get forced to world's best practice while other contributors to an environmental problem remain unregulated and the environmental load (say from an emission) consequently remains unacceptably high; and
c) an "equal opportunity" to negotiate concessions or variations to accepted standards and management processes available to all. The opportunity to argue and sustain their case to be based on the merit of the argument and balanced with the societal and economic benefit to be gained. The decision in this process must be recognised as less technical and more political in nature.

Source: Baker, A R, 2001, Philosophy of Sustainable Environmental Regulation (unpublished report)

Issue 24 – Internal Water Corporation governance and management

Key Considerations:

Ethical approach to all – government, business partners, community (customers), employees.

Lack of cohesive view about the full scope of the Corporation's business over the long term, and its true role in the sustainability agenda of the State (differences exist between various internal groups, including the Board, the Executive, various levels of management and employees, and different business units).

Is the Corporation in the business of selling services, selling water or selling sustainable water services? In the business of sustainability or of selling Water? Of maximising returns in the short term or planning for a sustainable business future?

Various issues impact on ability of the Water Corporation to do its job, including continuing cost reductions, internal organisational issues (branches and divisions), and attitudes to key across-agency functions (eg OSH, environment).

Is the Water Corporation an employer that would appeal to the children of its employees? What do employees say about the organisation?

Suggested BHAG in relation to internal governance and management:

Secure commonality of vision and direction of sustainability business.

Establish organisations that become the employer of choice to the children of our employees.

Establish an organisation with the right number of people to provide the services required. Numbers to be determined by the requirements of the function.

Set up business environment where branches do not have a budget but have to argue the case for resources.

Barriers:

Organisational attitudes – more similarities to a public service department than a private businesses.

Comparison/move to use other industry standards/systems into a business that is fundamentally different.

Water Corporation commitments for sustainability:

Ensure that the Board is well briefed on the suite of sustainability issues, including climate change, biological diversity and biological resources, social equity and development.

Ensure that all employees have sufficient understanding of the scope of sustainability issues to carry out their jobs.

Reduce artificial division of business within the Corporation. Re-structure on basis of acknowledgment of water cycle and sustainability not just historical.

As an organisation, continue to take a leadership role in sustainability.

Continue to evolve and develop improved measures of sustainability suitable for the water business.

Issue 25 – Education and engagement

Key Considerations:

Ability to resource various initiatives that may be desirable.

How much informing versus how much true education and training?

Suggested State BHAG in relation to community education and engagement:

Real, effective engagement with community, stakeholders and partners that understand sufficiently to partake in decision-making.

People to move out of their zone of self interest into one of considering society as a whole

Barriers:

Apathy.

Different expectations of stakeholders who expect to be making the final decisions rather than making effective input to decision-making.

Water Corporation commitments for sustainability:

Continue to establish initiatives such as Cockatoo Care and the proposed Biodiversity Trust Fund to protect biodiversity and provide for green offsets.

Continue community education initiatives including:

- Waterwise schools program
- Aqua van (mobile marine education van)
- Jetty cam at Busselton Jetty.

Public education in general, including on the status of the dams, water use.

Web-based information on water, including compliance information.

Carry out regular business promotion in a local context.

Continue to develop new community and school-based education initiatives that =advance understanding and participation in sustainability.

8. Key Indicators of Sustainability for Parts of the Water Business

The Water Corporation has been developing key indicators of sustainability with concurrent work occurring throughout the organisation. The main sources of reference used have been :

- Draft Global Reporting Initiative;
- Sydney Water Corporation's ESD indicators;
- WSAA "lite" indicators;
- Water Corporation Performance Measures; and
- Victorian Water Industry Association Triple Bottom Line Reporting guidelines.

The basic principles being addressed are:

- Incorporation of measures already existing in the Corporation;
- Inclusion of benchmark measures;
- The business can actually measure it; and
- Definitions should be consistent with benchmarking definitions where applicable.

General indicators for sustainability can be tailored for the water business as set out below (after Deni Green et al, 2001).

Table 3 – Key indicators of sustainability for the water business

Aspect of Water Business	**Key Indicators**
Water for use	Per capita consumption by sector (domestic; commercial; industrial; agricultural/horticultural) Industrial water consumption per unit of GDP output Input water quality (before use) (domestic; recreational; industrial; agricultural) Output water quality (after use) and pollution risk (sectors as above)
Water supply/Demand	Number of times the water supply meets demand (target 1.8), (ie surface water + g'water + trading water entitlements + desalination – system distribution losses/water delivered to metro customers). This is a Corporate Performance Measure (5-year) in the Corporate Performance Contract

Sewage and other water treatment in WWTPs and disposal	Water Corporation proposing how it will operate to regulators (best practice environmental requirements) and achieving this WWTPs operating in accordance with regulatory requirements Essential infrastructure (eg WWTPs) protected for the long-term from encroachment by incompatible land uses Per cent of treated effluent/wastewater/re-use water spilled to environment, as proportion of total throughput being treated Incidence of significant spills to environment (based on environmental risk) Per cent settlement connected to sewerage system Per cent sewage treated to secondary level Per cent sewage treated to tertiary level Number of days per year beaches or rivers above WHO levels for pathogens Water quality of receiving water bodies (marine; freshwater) and measured significant environmental impacts in receiving water bodies Percent treated sewage reused
Drainage water (urban)	Drainage operating in accordance with requirements of Operating License in regard to control of flooding Per cent stormwater harnessed for use (not just discharged or infiltrated) and/or recycled Percent stormwater returned to aquifer (via local infiltration) Per cent stormwater with solids collected Water quality of receiving water bodies in urban areas (eg wetlands, rivers) and measured significant environmental impacts in receiving water bodies (including loss of colour in blackwater wetlands) Extent of drains where reasonable ecosystems have been re-established
Drainage water (rural)	Drainage operating in accordance with requirements of Operating License in regard to control of flooding Water quality of receiving water bodies including wetlands, rivers and estuaries, and measured significant environmental impacts in receiving water bodies (including loss of colour in blackwater wetlands) Measured loss of nutrients from catchments into drainage (loads) and impacts on receiving waters Linear extent of drains where reasonable ecosystems have been re-established

Energy	Per capita energy consumption in provision of water services by Water Corporation (total energy) Energy consumption by Water Corporation per unit of GDP output (total energy) Per capita energy consumption in provision of water services by Water Corporation (renewable energy portion) Energy consumption by Water Corporation per unit of GDP output (renewable energy portion) Percentage of renewable energy to total energy Level of RoI for investment for renewable versus non renewable projects
Greenhouse gas	Greenhouse gas emissions (tonnes CO2 equivalent) Percent CO2 equivalent emissions sequestered
Biodiversity and water-dependent ecosystems	Per cent of Water Corporation land affected by Bushplan sites finally protected for Bushplan No loss of plant or animal species that can be directly attributed to Water Corporation activities No loss of a threatened ecological community that can be directly attributed to Water Corporation activities Establishment of "green offset" programs for instances where some impact is unavoidable and/or a greater environmental benefit can be achieved (eg Cockatoo Care; Trust Fund; Environmental Improvement Initiatives eg Busselton WWTP) Provision of funding to relevant biodiversity research projects Consideration of the 5 types of wetland ecosystems (phreatophytic, wetlands, river baseflow systems, cave and aquifer systems) in water resources planning, development and management
Protection of water resources	Management of surface and groundwaters on a catchment basis Surface and groundwater protected from incompatible land uses that may cause degradation of the resource Prevention of degradation of water for human and ecosystem use from contaminants including fuels and fuel additives
Waste	Waste generated per FTE at head office Waste generated per $1m capital expenditure Ratio of waste recycled to waste generated

Land stewardship	Number of sites possibly contaminated – restricted use Number of sites possibly contaminated – investigation required Number of sites contaminated – restricted use Number of sites contaminated – remediation required Percent sites remediated or with plans, to percent sites with remediation required

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