

Background report for the Adelaide Coastal Water Quality Improvement Plan

Report 3 Sample of programs and activities relevant to water quality improvement for Adelaide's coastal waters

Note that information in the following tables was prepared with input from Eco Management Services Pty Ltd. in the timeframe of 2006 to 2008, and does not necessarily represent the current focus for different organisations in 2011.

Table 1 Environment Protection Authority activities

Objectives	Strategies	Actions
<ul style="list-style-type: none"> • focus water quality management on achieving WQOs that will protect or enhance the water quality values assigned by this policy to the various areas of water • ensure that polluting from both diffuse and point sources does not prejudice the achievement of those WQOs • ensure that waste management will be based on the waste management hierarchy. The hierarchy has been amended to reflect the most recent usage: <ul style="list-style-type: none"> – avoiding the production of waste – minimising, as far as reasonably practicable, the production of waste – reusing waste – recycling waste – treating waste to reduce potentially degrading impacts – disposing of waste in an environmentally sound manner <p>To the effect that, first, the production of waste should be avoided and, second, to the extent that</p> 	<ul style="list-style-type: none"> • achieve water quality that meets agreed EVs • setting ambient WQOs for all water bodies in South Australia • using codes of practice that describe best practice environmental management for particular activities and which can be enforced using Environment Protection Orders • providing the ability to set discharge limits for particular activities • establishing an obligation not to discharge listed pollutants into waters • restricting the discharge of listed pollutants onto land where they are liable to enter into waters • monitoring water quality • specifying requirements, with offences as appropriate, to ensure that essential practices are met 	<ul style="list-style-type: none"> • prepare, implement and update the Environment Protection (Water Quality) Policy • undertake Adelaide Coastal Waters Study • prepare Port Waterways WQIP • prepare Adelaide Coastal Waters WQIP • prepare codes of practice, including: <ul style="list-style-type: none"> – wharfing activities – marinas – industrial, retail and commercial stormwater – aquifer storage and recovery. • providing advice and/or direction to ensure appropriate management of activities of environmental significance, taking into account the findings of the Adelaide Coastal Waters Study. Relevant activities include: <ul style="list-style-type: none"> – chemical activities (eg Penrice, fertiliser companies) – power generation

Objectives	Strategies	Actions
<p>avoidance is not reasonably achievable, the production of waste should, as far as reasonably practicable, be minimised, and so on.</p> <ul style="list-style-type: none">• promote best practice environmental management• promote within the community environmental responsibility and involvement in environmental issues.		<ul style="list-style-type: none">– municipal landfills (eg Wingfield, Garden Island)– wastewater treatment plants– desalination plants– dredging– earthworks drainage for major civil contractors– tanneries and/or fellmongery.

Table 2A AMLR NRM Board coastal targets and activities

20-year regional targets	Strategies	Actions	3-year management action targets
<p>T8 Extent of functional ecosystems (coastal, estuarine, terrestrial, riparian) increased to 30% of the region (excluding urban areas)</p> <p>T9 No decline in conservation status of native species (terrestrial, marine, aquatic) from 2008 levels</p> <p>T10 Land-based impacts on coastal, estuarine and marine processes reduced from 2008 levels</p> <p>T11 Halt in the decline of seagrass, reef and other coast, estuarine and marine habitats and a trend towards restoration</p> <p>T12 All waters meet water quality guidelines to protect defined EVs for estuarine and marine waters</p> <p>T13 Increase community capacity and practices through knowledge and engagement to 15% of the population</p>	<p>SS1 Manage and protect coastal habitats</p> <p>SS2 Mitigate impacts on reef and seagrass ecosystems</p> <p>SS3 Improve collaborative management of coast, estuarine and marine environments</p> <p>SS4 Protect marine and coastal wildlife</p> <p>SS5 Build community skills, knowledge and capacity to manage coast, estuarine and marine environments</p> <p>SS7 Support sustainable marine industries</p>	<ul style="list-style-type: none"> • conserve and manage Adelaide coasts through onground action • conserve and manage mangroves and saltmarsh habitats • adaptively manage coastal environments through regular review of Coastal Action Plans • develop, implement and review estuary management plans • improve Adelaide coastal water quality for seagrasses and reefs by support of Water Quality Improvement Plans • support investigations to recover seagrasses and reefs • protect seagrasses and reefs • work with NRM partners to collaboratively manage Gulf St Vincent • support protection and management of remnant marine habitats in Gulf St Vincent (eg hammer oyster and razorfish beds, seagrass and bryozoans beds) • support water quality improvement planning for Gulf St Vincent that identifies land-based actions to reduce pollution • review Gulf St Vincent Marine Plan and prioritise onground works and actions for NRM planning protection of marine biodiversity • review NRM marine monitoring and evaluation framework for integration with marine planning performance assessment systems • provide support for Coast and Marine Protected Areas • support investigations to improve understanding and management of marine species • reduce threats to marine species through local actions to implement threatened species recovery plans 	<p>MAT15 Coastal action plan implemented along 230 km of coastline</p> <p>MAT16 Three estuary management plans developed and implemented</p> <p>MAT17 Water quality parameters (objectives) set for watershed, groundwater and coastal water resources in the region</p> <p>MAT18 Three water quality improvement plans developed and being implemented</p> <p>MAT19 Memorandum of understanding for the management of Gulf St Vincent developed and in operation</p> <p>MAT20 Action underway to protect migratory shorebirds and other threatened marine and coastal species</p> <p>MAT21 Coast, estuarine and marine community and professional NRM practitioner networks and community based monitoring supported</p>

20-year regional targets	Strategies	Actions	3-year management action targets
		<ul style="list-style-type: none"> • protect migratory shorebirds through local actions to support the Wildlife Conservation Plan for Migratory Shorebirds and the Shorebird Site Network • develop and deliver Regional Recovery Plan and Threat Abatement Plan actions for newly listed species and communities • develop and implement community education and awareness programs in marine, coastal and estuarine environments to promote responsible practices • work with Indigenous communities to protect and manage ‘Sea Country’ • increase knowledge and actions to address coastal climate change risk • increase understanding of potential impacts of climate change on marine environments • protect fisheries habitat • work with industry groups and government agencies to promote sustainable commercial and recreational fisheries • collaborate with industry groups and agencies to reduce impacts of shipping and marine industries (ANZECC Impacts of Shipping Action Plan for marine pests, dredging impacts, marine debris, oil and chemical spill prevention and response, etc). 	<p>MAT23 Key marine industry partnerships supported to improve sustainability and mitigate negative impacts upon coastal and marine environments</p>

Table 2B Related AMLR NRM Board catchment activities that will benefit ACWQIP

20-year regional targets	Strategies	3-year management action targets
<p>T1 75% of stormwater reused, 100% of wastewater reused</p> <p>T2 All surface and groundwater resources meet water quality guidelines to protect defined EVs</p> <p>T3 All water resources managed and used within sustainable yield (allowing for variability)</p>	<ul style="list-style-type: none"> • improve water quality and aquatic biodiversity in urban watercourses • improve urban biodiversity (including encouraging and supporting the use of Indigenous native species in plantings in streetscapes, public open space (UL2.2) and backyard plantings (UL2.3) • facilitate stormwater and flood risk assessment • increase awareness and uptake of WSUD • manage water resources within sustainable limits • increase the use of stormwater and treated wastewater • protect and improve surface water and groundwater quality • encourage, maintain and sustain behaviour change by the public • enforce the NRM Act to better manage natural resources • use controls in other legislation to better manage natural resources • develop consistency between the NRM Plan and government strategy and policy • support NRM with targeted research and development • implement the first stage of the Monitoring, Evaluation and Reporting Framework (MERF) • monitor natural resource condition/management action target indicators • evaluate natural resource condition/progress towards management action target indicators 	<p>MAT 24 Sediment migration from urban watercourses to the coast reduced by 5% from 2008 levels</p> <p>MAT 25 Onground action in 20 high priority urban locations supported</p> <p>MAT26 Stormwater master plans developed for 20% of the urbanised area</p> <p>MAT27 One new or retrofit WSUD project completed</p> <p>MAT28 Four water allocation plans completed and in operation</p> <p>MAT29 Three new reuse schemes in operation</p> <p>MAT17 Water quality parameters (objectives) set for watershed, groundwater and coastal water resources in the region</p> <p>MAT30 Watercourse rehabilitation for water quality improvement being undertaken along an additional 40 km above 2008 commitments</p> <p>MAT31 Increase by 3% the community's knowledge and understanding of NRM</p> <p>MAT32 Improve by 3% the positive NRM behaviours in the community</p> <p>MAT36 Operational policies and procedures in place to effectively enforce the NRM Act</p> <p>MAT37 Council development plans amended to incorporate NRM objectives</p> <p>MAT38 Formal arrangements in place to provide technical advice on approvals under other legislation</p> <p>MAT39 Formal arrangements in place to provide input to relevant government strategy and policy</p>

20-year regional targets	Strategies	3-year management action targets
	<ul style="list-style-type: none"> • report on progress of the regional NRM Plan • report natural resource condition to the community • improve data collection, storage and handling to support rapid management response. 	<p>MAT40 Targeted research opportunities identified and collaborative research in progress</p> <p>MAT41 Regular report cards of the Board's business produced</p> <p>MAT42 Regular report cards on the state of the region produced</p> <p>MAT43 Agreed cross-Board and state level reporting implemented.</p>

Table 3 SA Water activities

Objectives	Strategies and targets	Actions	Specific projects (0–5 years)	Current reuse	Proposed reuse at end of project
<ul style="list-style-type: none"> • minimise environmental impact • manage ecological impacts • improve water security 	<ul style="list-style-type: none"> • reduce the nutrient and sediment load being discharged to the marine environment • catchment investment • Adelaide Coastal Water Study • Environmental Improvement Plan–Phase 1 • ensure water for growth, development and quality of life for all South Australians 	<ul style="list-style-type: none"> • increase wastewater reuse from coastal WWTPs where possible (targets confirmed following review of Waterproofing Adelaide Strategy) • increase wastewater reuse in non-coastal WWTPs according to SA Water target (during review of Waterproofing Adelaide Strategy) • improve the treatment system within the WWTPs to reduce the nutrient and suspended sediment load in the treated wastewater • reduce risk from potential indirect impacts • continue to invest in catchment improvement initiatives in partnership with other government agencies and non-government organisations - continue to assist with the implementation of the ACWQIP through investment and further investigations • continue to evaluate the improvements made during the 	<ul style="list-style-type: none"> • Angle Vale augmentation project—extension of the reuse pipeline from Bolivar to enable increased reuse in the Angle Vale area • Glenelg to Parklands reuse project—increasing the volume of reuse from Glenelg by using wastewater for irrigating Adelaide parklands • Southern urban reuse project) —increasing the volume of reuse from Christies Beach WWTP • Christies Beach WWTP—install new treatment module plus retrofit existing modules for improved biological nutrient reduction • Glenelg WWTP—improve treatment process for wastewater to be used in reuse project (tertiary treatment) • Bolivar WWTP—improve treatment process for wastewater to be used in reuse project - decommissioning Christies Beach sludge drying lagoons (adjacent Onkaparinga Estuary) • improve the ocean outfall at Christies Beach WWTP by increasing the discharge area via 	<ul style="list-style-type: none"> • 29% • 8% • 23% 	<ul style="list-style-type: none"> • 35% • 28% (up to 48% in the summer months) • 65% (contingent on a number of factors including sustainability assessment, urban growth and private enterprise development)

Objectives	Strategies and targets	Actions	Specific projects (0–5 years)	Current reuse	Proposed reuse at end of project
		<p>first phase of the EIP to identify areas for further improvement</p> <ul style="list-style-type: none"> construct desalination plant to ensure availability of potable water supply to Adelaide—ensure that brine from the desalination plant has minimal impact on receiving environment 	<p>dissipaters and extension of discharge pipeline</p> <ul style="list-style-type: none"> ex-gratia payments to NRM boards, identification of specific investments, investigations and projects construct desalination plant to ensure availability of potable water supply for Adelaide. 		

Table 4 Department for the Environment and Natural Resources and Coast Protection Board—Living Coast Strategy and water quality

Objectives	Strategies	Actions	Comment/water quality benefits
<ul style="list-style-type: none"> to control pollution for our coastal, estuarine and marine environments 	<ul style="list-style-type: none"> conduct risk assessments reduce pollution from land sources <p>The recommended actions (opposite) are now part of the AMLR NRM Board Plan. The actions are necessary to achieve satisfactory marine water quality</p> <ul style="list-style-type: none"> improve environmental management of aquaculture manage ballast water and oil spills control sea dumping control dredging 	<ul style="list-style-type: none"> identify and prioritise risks to the coastal, estuarine and marine environments from pollution implement the findings from the Adelaide Coastal Waters Study minimise high nutrient effluent discharge to the marine and estuarine environment from major WWTPs increase the use of recycled effluent and reduce marine discharges through continuing partnerships between Department for Water, other government agencies, local councils, CSIRO and industry actively encourage regional NRM Boards and local government to develop integrated water quality and stormwater management strategies implement strategies to reduce diffuse pollution of watercourses and stormwater drains discharging into marine waters implement Water Proofing Adelaide strategy, which will provide a strategic blueprint for water resource management in the Adelaide region for the next 25 years develop codes of practice linked to the Environment Protection (Water Quality) Policy 1993 to address the management of diffuse pollution sources and improve stormwater quality continue investigations into the environmental impact of aquaculture activities and ensure environmental considerations are paramount in assessing new aquaculture ventures require the aquaculture industry to monitor and, where necessary, modify existing farm practices support implementation of the Australian Ballast Water Management Guidelines at the state level 	<p>Refer Adelaide's Living Beaches Strategy below.</p>

Objectives	Strategies	Actions	Comment/water quality benefits
		<ul style="list-style-type: none"> • review and expand the Ballast Water Decision Support System and incorporate into state legislation as necessary • endeavour to ensure that all tankers entering South Australian waters meet the highest international standards of construction and operations • ensure that all costs from oil spills, including environmental rehabilitation and monitoring, are met by those responsible • subject to the Commonwealth adopting Annex IV (the Prevention of Pollution by Sewage from Ships) ahead of international ratification, adopt the Annex in the <i>Protection of Marine Waters (Prevention of Pollution from Ships) Act 1987</i> • give the EPA effective and necessary authority to protect gulf waters from pollution • review and proclaim the <i>Environment Protection (Sea Dumping) Act 1984</i> • negotiate with the Commonwealth to bring coastal waters within the control of the South Australian Government by demonstrating compliance with the London Protocol • control dredging to reduce impact on the marine environment • refer Adelaide's Living Beaches Strategy below 	
Living Coast Strategy—General objectives, strategies and actions			
Objectives	Strategies	Actions	Comment/water quality benefits
<ul style="list-style-type: none"> • to provide a legislative and policy framework for ecologically sustainable development and use of our coastal, estuarine and marine 	<ul style="list-style-type: none"> • develop and implement new coast and marine legislation • develop a marine planning framework 	<ul style="list-style-type: none"> • develop coast and marine legislation, which establishes a coast and marine authority to assist with the integrated, multiple-use management of the coast and marine environment by providing specialist management, understanding and knowledge • use the Marine Planning Framework to strengthen and integrate coastal and marine planning for sustainable use of marine resources and related activities 	

Objectives	Strategies	Actions	Comment/water quality benefits
<p>environments</p> <ul style="list-style-type: none"> • to conserve and safeguard the natural and cultural heritage of our coastal, estuarine and marine environments • to protect our coastal, estuarine and marine environmental assets • to improve understanding of our coastal, estuarine and marine environments • to develop and maintain partnerships between state and local governments, community and industry 	<ul style="list-style-type: none"> • ensure linkages with the Planning Strategy for South Australia and State Natural Resource Management Plan • develop an Estuaries Policy • facilitate integration of coast, estuarine and marine resource management legislation • maintain effective inter-governmental relations • establish effective conservation strategies • develop and implement marine plans • establish Marine Protected Areas • establish the Adelaide Dolphin Sanctuary • improve protection of threatened and rare species • protect fish breeding grounds • protect and manage coastal wetlands 	<ul style="list-style-type: none"> • in consultation with stakeholders, develop statutory Marine Plans, covering the marine bio-regions of South Australia, that establish zones based on particular environmental values, and set out objectives and strategies to ensure activities within each zone are compatible with those values • incorporate marine objectives from Marine Plans into the Planning Strategy for South Australia and the State NRM Plan thereby reinforcing the role of these documents in the coastal and marine zone • develop an Estuaries Policy that identifies issues, objectives and principles and recommends actions for the management and conservation of estuaries in South Australia • ensure planning or actions that occur under marine resource management legislation have regard to Marine Plans • promote inter-governmental relations to underpin the Living Coast Strategy and support integrated planning and management • assess the conservation significance of coastal, estuarine and marine habitats and the status of the management arrangements for these habitats • improve the process for the regular review and assessment of the ecological status of coastal, estuarine and marine environments through the government's State of Environment (SoE) Reporting • test the concept of marine planning through the release of a pilot Spencer Gulf Marine Plan for public consultation • identify areas of ecological significance through the development of Marine Plans based upon marine bioregions • protect representative areas of ecological significance as multiple-use Marine Protected Areas (MPA) under the South Australian Representative System of Marine Protected Areas (SARSMPA) program • protect critical habitats for fisheries management • protect marine areas of regional significance 	

Objectives	Strategies	Actions	Comment/water quality benefits
	<ul style="list-style-type: none"> • protect significant coastal habitats • provide formal legislative protection • develop and implement new biodiversity legislation • rehabilitate degraded habitat • manage coastal pest plants • manage marine pest species and aquatic animal disease emergencies • maintain effective partnerships with Indigenous communities • facilitate compliance with relevant Indigenous heritage legislation • protect maritime heritage assets • develop a strategic vision for coastal development • protect coastal assets • establish effective development controls 	<ul style="list-style-type: none"> • create by statute a dolphin sanctuary in the Port River and Barker Inlet with the primary aims of protecting dolphins and improving the quality of this environment • develop a list of threatened, rare and vulnerable marine species for legislative protection • cooperate with the Commonwealth and other states to develop and implement threatened species recovery plans for priority species • identify and protect important fish breeding grounds in conjunction with the fishing industry • develop operational policies and management plans for the conservation of important coastal, estuarine and marine wetlands in South Australia • investigate the addition of representative areas of coastal habitats to South Australia's protected areas system • form partnerships with local government and communities to better manage coastal habitats such as coastal dunes and cliff-top habitats • amend the <i>Crown Lands Act 1929</i> to provide for single ministerial responsibility for care, control and management of Crown lands and improve efficiency and effectiveness in administering and managing the marine, coastal and riverfront Crown holdings • strengthen provisions under the Crown Lands Act 1929 to enable effective management of Crown lands with significant conservation values • develop legislative arrangements for the protection and management of MPAs under the SRSMPA • regularly review penalties for the destruction of coastal and marine native vegetation • develop a biodiversity conservation act for South Australia 	

Objectives	Strategies	Actions	Comment/water quality benefits
	<ul style="list-style-type: none"> • establish effective management of coastal lands • increase knowledge to inform decision making • monitor and share information • raise community awareness and education • establish management responsibilities between state and local governments • maintain partnerships and joint responsibility • promote support and ownership across the community 	<ul style="list-style-type: none"> • develop a state biodiversity strategy, which encompasses coastal, estuarine, and marine biodiversity • incorporate coastal, estuarine and marine rehabilitation into NRM Plans focusing on priority areas • address the spread of coastal pest plants and identify measures to prevent new species from establishing • lead the implementation of the Australian Ballast Water Management Strategy at the state level • lead the development of port environmental management plans • encourage the undertaking of surveys of South Australia's major ports and marinas and assessment of the risks associated with shipping to and from these ports as the basis for development of port environmental management plans • develop and implement coordinated national management arrangements at state level for barrier control, emergency response and management of existing pest species • develop and support community and stakeholder groups to assist as an early warning system to report marine pest incursions • formalise local response plans based on the <i>National Introduced Marine Pest Response Plan</i> and local emergency management practices • raise awareness of the risks and consequences of marine pest incursions • develop the research capabilities in the state to provide information on the management and eradication of existing and potential marine pest species to South Australian waters • revise the State Response Plan for management of aquatic animal diseases to include a greater number of species in surveillance programs and to support research to identify and control pathogens of aquatic animals 	

Objectives	Strategies	Actions	Comment/water quality benefits
		<ul style="list-style-type: none"> • review effectiveness of aquaculture stock recovery plans and escape minimisation plans • investigate environmental risks arising from the escape of farmed species including the potential for introduction of exotic pests and diseases • maintain effective communications with Indigenous communities and relevant heritage committees to support ongoing partnerships to protect sites of significance • provide advice to enable recognition and protection of Indigenous heritage and to promote best practice management of Indigenous heritage sites • locate and maintain mooring buoys at significant sites to prevent damage to cultural and natural heritage • develop a clear strategic vision for the state on coastal planning and development • identify quality landscapes on the coast at risk of development • protect landscape qualities and amenity values through appropriate policies in Development Plans through the Plan Amendment Reports process • determine risks to South Australia's coastal assets from physical changes through surveys and monitoring programs • undertake a risk assessment of coastal hazards such as coastal erosion, flooding, cliff collapse and coastal acid sulfate soils • develop a coast protection strategy for the whole of the South Australian coast • in conjunction with local government and the Commonwealth, develop a clear policy for government to manage sea level change • establish principles for development in coastal acid sulfate soils areas to guide coastal development 	

Objectives	Strategies	Actions	Comment/water quality benefits
		<ul style="list-style-type: none"> • provide technical advice to support property owners in developing coastal protection strategies for at-risk properties • provide technical advice and assistance to local government to manage coastal erosion and public access to coastal areas • review the Adelaide Metropolitan Coast Protection Strategy • manage erosion risks to Adelaide metropolitan coastal assets by maintaining beach replenishment and using structures to slow littoral drift • ensure coastal zoning is undertaken with regard to the vision for coastal areas, including ecological, social and economic values • provide for an authority with greater powers of direction over coastal and marine development • ensure adequate compliance controls for local councils and the state government to deal effectively with planning and coastal development • implement an environmentally responsible framework for coastal and marine tourism development management by both the private sector and government • amend the Crown Lands Act 1929 to provide for single ministerial responsibility for care control and management of Crown lands and improve administration and management of marine, coastal and riverfront Crown holdings • assist NRM Boards to address the protection of coastal and estuarine assets • develop a mechanism to fund integrated research programs to support the broader management and planning agenda for the state's coastal, estuarine and marine environments • develop a mechanism to build the state's marine conservation specific research programs and to fund programs that assess the current status and integrated function of South Australia's marine biodiversity • endorse the ongoing development of Marine Innovation SA (MISA) as a whole of government strategy for focusing marine and aquatic research and 	

Objectives	Strategies	Actions	Comment/water quality benefits
		<p>development capability in the state towards the sustainable development and conservation of marine and aquatic resources and the environments on which they depend</p> <ul style="list-style-type: none"> • develop the state's research and development capability in coastal, estuarine and marine environmental research through support for MISA and other programs • develop mechanisms to fund capacity building to adequately describe marine species and ecosystems, evaluate threatened status of marine species and coordinate threatened marine species recovery planning • regularly review coastal, estuarine and marine aspects in the government's high-level strategic GreenPrint SA, which illustrates major policy commitments • identify indicators and assessment methodologies to enable effective monitoring and reporting of the ecological, social and economic changes in the coastal, estuarine and marine environment for SoE Reporting • develop the state's research capacity to assess and monitor the performance of MPAs and the impacts of resource use on marine ecology • engage non-government organisations and the broader community on ReefWatch, 'Feral or in Peril' and other marine ecosystem monitoring programs in South Australian waters • investigate the development of an integrated system for the collection, storage, analysis and synthesis of all coastal, estuarine and marine data collected by agencies and organisations, including publicly funded research, and develop systems for management and access • Support the Coast and Marine Education Framework to encourage community responsibility and stewardship of the marine environment through education • develop the state's marine education capability in coastal, estuarine and marine conservation through support for interpretive programs 	

Objectives	Strategies	Actions	Comment/water quality benefits
		<ul style="list-style-type: none"> • develop individual users' codes of conduct to encourage tourists and other recreational users to adopt environmentally friendly and safety conscious behaviour in all state waters and to promote sensitive and responsible use of coastal, estuarine and marine environments • revamp the EPA's Stormwater Pollution Prevention codes of practice into a consolidated stormwater code with associate guidelines for specific industries as initiatives to reduce stormwater pollution • review management and funding responsibilities for coastal management during the development of the new Coast and Marine Act • once agreement is reached on allocation of responsibilities, support South Australian coastal councils in exercising their responsibilities through their developing regional and local coastal strategies to guide management of the coastal areas in their jurisdictions • provide opportunities for encouraging community and industry involvement in decision making on local environment issues to encourage a greater sense of responsibility, understanding and 'ownership' of coastal, estuarine marine environment decisions • maintain partnerships with coastal, estuarine and marine environment users such as ReefWatch, WaterWatch and FishWatch 	
Adelaide's Living Beaches Strategy			
Objectives	Strategies	Actions	Comment/water quality benefit
<ul style="list-style-type: none"> • to protect the coast from erosion, damage, deterioration, pollution and misuse • to conserve the variety of all life forms and to 	<ul style="list-style-type: none"> • continue beach replenishment • recycle sand more effectively using sand slurry pumping and pipelines 	<ul style="list-style-type: none"> • continue the existing program of beach replenishment, placing 160,000 m³ of sand each year at strategic locations on southern and central beaches to maintain the sandy foreshore, build up dune buffers, and protect coastal infrastructure, including: <ul style="list-style-type: none"> – redistributing existing sand dune supplies that have built up in the last half century, in order to protect development and maintain beach width 	<ul style="list-style-type: none"> • Situation remains the same as at present • more efficient sand management will reduce costs but any benefits to

Objectives	Strategies	Actions	Comment/water quality benefits
<p>ensure that the productivity, stability and resilience of ecosystems are maintained. Where there are threats of serious or irreversible environmental damage, lack of scientific certainty is not to be used as a reason for postponing measures to prevent environmental degradation</p> <ul style="list-style-type: none"> to restore any part of the coast which has been subjected to erosion, damage, deterioration, pollution or misuse to develop any part of the coast for the purpose of aesthetic improvement, or for the purpose of rendering that part of the coast more appropriate for the use of enjoyment of those who may resort thereto 	<ul style="list-style-type: none"> add coarse sand from external sources build coastal structures in critical locations integrate sand bypassing at harbours with beach management continue seagrass rehabilitation investigations 	<p>from Kingston Park to North Haven</p> <ul style="list-style-type: none"> educate the community on the value of recently created dunes as source of sand rather than just for conservation and biodiversity finalise offshore sand investigations at North Haven, Section Bank, Port Stanvac and Moana existing sand supplies will be recycled more effectively using sand slurry pumping and pipelines, which will minimise the need for trucks to cart sand along beaches and suburban roads coarser, more stable sand will be added to the system from external sources such as Mount Compass to tackle the ongoing loss of dune volume and beach width caused by sea level rise and other factors structures such as groynes and offshore breakwaters may be used in a few critical locations to slow the northerly drift of sand, including: <ul style="list-style-type: none"> possibly construction of five low-profile offshore breakwaters by 2010. assess benefit of using breakwaters at critical locations elsewhere integrating sand bypass requirements at harbours with the beach replenishment program will result in more effective recycling of sand and reduced harbour management costs. 	<p>water quality need to be demonstrated</p> <ul style="list-style-type: none"> this should also result a reduced replenishment requirement with a corresponding reduction in disturbance and in turbidity levels increased seagrass will stabilise sediments, reducing re-suspension and turbidity, particularly during storm events.

Objectives	Strategies	Actions	Comment/water quality benefits
<ul style="list-style-type: none"> • to provide for fair, orderly and ecologically sustainable use and development • to carry out research or to contribute towards research, into matters relating to the protection, restoration or development of the coast • to promote the enhancement of knowledge and expertise for coastal resource management and planning • to promote the sharing of responsibility for resource management and planning between the different spheres of government, the community and industry in the state. 			

Table 5 City of Salisbury 'City Plan—Sustainable Futures'

Objectives	Strategies	Actions
<p>Sustaining our environment:</p> <ul style="list-style-type: none"> • conserve and promote biodiversity, natural habitats and open spaces • minimise waste generation and effectively manage the collection, recycling and disposal of public waste • develop opportunities for the sustainable use of resources • reduce greenhouse gas emissions • facilitate and encourage development that incorporates sustainability principles • enhance the amenity of the city through street and open space urban design and landscaping 	<ul style="list-style-type: none"> • native species biodiversity in the city • source area of native vegetation under active management or alternatively vegetation survey as part of biodiversity study and measure area established as part of biodiversity strategy • ecological footprint of the city or percentage diversion of waste from landfill. • level of CO₂ emissions for the city • level of corporate greenhouse gases (GHG) emissions • volume of recycled water produced and utilised in the city 	<ul style="list-style-type: none"> • no net reduction in native species (extent or condition). • to reduce the ecological footprint of the city by 30% by 2050 • percentage waste diversion from landfill to be a minimum of 60% by 2010 • to achieve zero GHG emissions growth on the 1994–95 levels for the city • reduce corporate GHG emissions by 20% from the 1997–98 levels by 2010 and move towards carbon neutrality • increase volume of recycled water to 8 GL per annum by 2010
Sustaining our environment: An environmental and climate change strategy 2007		
Objectives	Strategies	Actions
<ul style="list-style-type: none"> • integration of the triple bottom line, ensuring that the way we govern is driving the transition to a sustainable future by integrating social, environmental and economic factors in decision-making processes • recognising council plays an important part in solving the global challenges of sustainability by taking a 'whole of council' approach to ensure there is a common focus towards sustainability in both strategic policy and planning, and day-to-day operational activities 	<ul style="list-style-type: none"> • council to lead by example in reducing overall waste production, increase recycling opportunities and reduce amount of waste going to landfill. • investigate opportunities for further waste reduction, increased recycling opportunities and responsible waste disposal in residential, commercial and industrial development. • develop partnerships with business and government agencies to develop and promote innovative ways to assist companies in reducing 	<ul style="list-style-type: none"> • percentage waste diverted from landfill to be a minimum of 60% by 2010 • no net reduction in native species or natural habitat (extent or condition) by 2010 • increase the volume of water recycled water produced by council to 2.5 GL by 2010

Objectives	Strategies	Actions
<ul style="list-style-type: none"> • value and protect our environment and ensure the sustainable management and use of natural resources. Recognise that all life has intrinsic value, and ecological processes and biological diversity are part of the irreplaceable life support system upon which a sustainable future depends • plan and provide urban development that reduces our ecological footprint and enhances quality of life by reducing waste, energy and non-renewable resource consumption while simultaneously improving community wellbeing • support communities to fully participate in achieving a sustainable future. Provide for broad community participation, encourage collaboration and partnering between individuals, the community, business and all levels of government. • assist businesses to benefit from and contribute to sustainability. Recognising that a strong and productive economy builds upon and is supported by a healthy environment and society • ensure inter-generational equity by taking into account all the long-term benefits and costs of our actions, or lack of actions on the community, environment and economy <p>Policy directions that impact the ACWQIP include:</p> <ul style="list-style-type: none"> • waste reduction: <ul style="list-style-type: none"> – to reduce overall waste generation and waste going to landfill 	<p>resource use and waste as well as promoting recycling</p> <ul style="list-style-type: none"> • encourage and educate the community to make informed choices to minimise overall waste generation, increase recycling and reduce waste going to landfill • council to implement best practice in provision and sustainable management of landscapes, open space and recreation areas • investigate opportunities to increase biodiversity and access to open space and recreation areas via landuse planning controls and guidelines. • develop and foster partnerships with relevant stakeholders and government authorities to encourage ecotourism to promote habitats of high biodiversity value and recreational opportunities • continue to promote community awareness and education about the benefits of conserving and participating in biodiversity projects throughout the city • council to continue to develop the aquifer storage and recovery (ASR) and wetland programs, and promote the use of recycled water in council operations wherever viable and apply best practice in reducing overall water demand in the maintenance of landscapes and reserves • promote the benefits of best practice water and natural resource management in all forms of urban development both during construction and over the life of the development 	

Objectives	Strategies	Actions
<ul style="list-style-type: none"> – encourage resource recovery, reuse and recycling opportunities • biodiversity and open space: <ul style="list-style-type: none"> – conserve and promote biodiversity, natural habitat and open space – provide sustainable open space and recreation facilities. • natural resource management: <ul style="list-style-type: none"> – promote integrated water management via the harvesting, recycling and reuse of stormwater – encourage and promote sustainable land management practices including soils, rivers, coastal and marine ecosystems. 	<ul style="list-style-type: none"> • encourage partnerships with government and private sector to promote the use of recycled water, more efficient water usage as well as reducing the environmental impacts of businesses on natural systems • continue to support and encourage programs that raise awareness about recycled water and best practice natural resource management 	
Salisbury Annual Plan (2008–09)		
Objectives	Strategies	Actions
<p>Budget details for 2008–09 that impact the ACWQIP include:</p> <ul style="list-style-type: none"> • water management: <ul style="list-style-type: none"> – management of stormwater to protect property from flooding – recycling – reduction in pollution of the Barker Inlet – improved natural environment. • parks and landscapes: <ul style="list-style-type: none"> – maintain and improve the city’s open space 	<ul style="list-style-type: none"> • drainage infrastructure maintenance • water systems: <ul style="list-style-type: none"> – implementation of the Integrated Water Cycle Management Plan for the City. • water business unit: <ul style="list-style-type: none"> – maintenance and operation of aquifer storage and recovery systems. • foreshore protection: <ul style="list-style-type: none"> – seaweed removal along St Kilda foreshore. • wetland management: 	<ul style="list-style-type: none"> • maintain trash racks at less than 25% full of trash. There are 13,000 Side Entry Pits and Junction Boxes. Pits are serviced on a 10-year cycle. • underground pipes are subject to ongoing inspection but the majority of clearing work is initiated by system failure during storms. • open drains are inspected annually • manage Projects under the Water Proofing Northern Adelaide (WNA) initiative • oversee Water Business Unit activities • manage the Watershed interpretive facility at Greenfields

Objectives	Strategies	Actions
<ul style="list-style-type: none"> • waste management: <ul style="list-style-type: none"> – collection and disposal of waste in an environmentally sustainable manner. 	<ul style="list-style-type: none"> – maintenance of wetlands and habitat reserves. 	<ul style="list-style-type: none"> • flood mitigation planning • water quality management • environmental education/management • resource management • 8 operational ASR schemes and 3 under construction. • 18 operational groundwater bores • 12 surface monitoring sites • 18 groundwater monitoring sites • sale of 1.05 GL/annum of recycled water • seaweed removal as required • 30 wetlands with a total area exceeding 290 hectares
Water management—part of Waterproofing Northern Adelaide		
Objectives	Strategies	Actions
Water management	<ul style="list-style-type: none"> • aquifer storage and recovery • stormwater harvest and recovery • recycled water project • be stormwater smart–Pollution Prevention Project: <ul style="list-style-type: none"> – reduce the level of pollution entering the stormwater system and impacting on water quality in watercourses including Little Para River, Dry Creek, Barker Inlet and the coastal environment – develop a close working relationship with industry, commercial premises, mobile contractors, horticulturalists and shopping 	<ul style="list-style-type: none"> • use ASR to store water cleaned and filtered from wetlands • recycled water used to irrigate sports fields and turf areas • eliminate the flow of polluted stormwater into Barker Inlet • provide cheaper water to local industry and other users • providing recycled water to homes and local businesses within the northern suburbs • work with small to medium sized business to improve their business practices in order to comply with legislation and reduce the impact on the environment.

Objectives	Strategies	Actions
	<p>centre management to increase knowledge on stormwater issues, and develop strategies to prevent pollution of our waterways</p> <ul style="list-style-type: none"> – create a more environmentally aware community that understands the importance of preventing stormwater pollution, and avoid practices that lead to pollution entering our waterways via the stormwater system – raise awareness about stormwater issues among local government staff to prevent council activities contributing to pollution of our waterways – provide assistance to industry regarding compliance with the environmental laws, policies and regulations. 	

Table 6 City of Charles Sturt Community Plan 2007

Objectives	Strategies	Actions
<ul style="list-style-type: none"> A city which values, protects and enhances the natural environment 	<ul style="list-style-type: none"> protect and restore the city's biodiversity, natural ecosystems and water courses encourage our community to better manage their impact on the environment promote ecologically sustainable urban development within the city reduce the environmental impact of council's operations 	<ul style="list-style-type: none"> protect and expand native flora and fauna with an emphasis on functioning ecosystems and vegetation corridors protect and enhance the coast promote understanding and appreciation of the value of natural areas promote and advocate for the protection and rehabilitation of inland waters encourage energy efficiency and GHG emission reductions across the community encourage water consumption reduction among the community promote waste reduction encourage and support individual action through council programs and facilities encourage our community and stakeholders to work towards a common sustainable future investigate opportunities for financial incentives to support environmental initiatives ensure development controls reflect the principles of ecological sustainable development (ESD) encourage WSUD in all new developments investigate and implement sustainable stormwater management practices that reduce discharge into Gulf St Vincent plan for climate change

Objectives	Strategies	Actions
		<ul style="list-style-type: none"> • integrate environmental considerations into council planning, operational and reporting processes • reduce council's energy demand and subsequent greenhouse gas emissions • reduce council's water consumption
City of Charles Sturt Corporate Business Plan 2007–08		
Objectives	Strategies	Actions
<p>Of the community drivers listed in the Corporate Business Plan and Budget, the ones that are relevant to the ACWQIP are:</p> <ul style="list-style-type: none"> • provide services that support and respond to community needs • improve the community's infrastructure • create high quality public places and spaces. 		<ul style="list-style-type: none"> • further developing the urban stormwater master plan (USMP) including preparation of flood plain maps for all catchments within the city • establish an organisational environmental sustainability vision for the city • specific commitments by council to rehabilitate roads through road reconstruction and road reseal programs and upgrading street lighting and traffic management works totalling \$9.1 m; stormwater drainage, pump station upgrade and gross pollutant trap work totalling \$5 m; footpath construction works of \$2.5 m • continuing to develop stormwater master plans (SMPs) for the remaining stormwater catchments within the city • completing design and public consultation for the Port Road stormwater upgrade works and commencing construction works • managing the flooding risk within the city in accordance with accepted flood mitigation standards • facilitating the reuse of stormwater, improving the quality of stormwater and reducing the environmental impact of stormwater discharge

Objectives	Strategies	Actions
		<ul style="list-style-type: none"> • developing WSUD for projects where possible to facilitate water recycling and aquifer storage • developing a management plan for the River Torrens Linear Park • reviewing and ongoing implementation of council's Coastal Management Plan • continuing to implement water reduction initiatives using a variety of techniques within the framework of the revised open space strategy, including installation of upgraded irrigation systems and sustainable landscapes • continuing maintenance on the coast including installation of drift net fencing, coastal streetscapes and weed control along the foreshore • constructing the approved coast park path between Henley Sailing Club and council's southern boundary subject to state government funding • continuing to liaise with the Coast Protection Board on the management of sand along our foreshore • constructing the River Torrens Linear Park/Seaview Road underpass in accordance with the agreed design
City of Charles Sturt Policy		
Objectives	Strategies	Actions
<p>Environmental Sustainability Policy</p> <p>Key objectives relevant to the ACWQIP include:</p> <ul style="list-style-type: none"> • improving our environment • compliance with all regulatory requirements • continual improvement 		<ul style="list-style-type: none"> • protect and, where possible, enhance the quality of our natural environment by employing environmental best practice in managing our open space, waterways, coast and biodiversity • ensure that all operations and activities carried out by and on behalf of council, comply with or exceed all statutory

Objectives	Strategies	Actions
<ul style="list-style-type: none"> • waste minimisation • pollution avoidance • water conservation 		<p>environmental requirements</p> <ul style="list-style-type: none"> • make continual, measurable progress in our environmental performance whilst maintaining the city's economic viability • reduce overall consumption of materials and resources within council and minimise the generation of waste • minimise council's release of any pollutant that may cause environmental damage to air, water or land including noise pollution • manage chemicals in a way that avoids or minimises adverse environmental effects • minimise demand for potable water by promoting water reuse, WSUD, and effective water demand management practices • investigate suitable water reducing technologies • reduced turfed areas by planting drought tolerant species and increasing mulched tree areas • investigate aquifer recharge and reuse projects in line with council's urban stormwater management plan and stormwater recycling/retention/detention
City of Charles Sturt Port Road Stormwater Management Plan		
Objectives	Strategies	Actions
<ul style="list-style-type: none"> • minimise flooding • maximise the reuse of stormwater • improve the quality of stormwater being discharged to West Lakes and the sea. 		<ul style="list-style-type: none"> • design and construct a new stormwater system along the central median strip of Port Road • enable injection of 0.6 GL per annum of stormwater into the tertiary aquifer • reduce suspended solids by 80%

Objectives	Strategies	Actions
		<ul style="list-style-type: none"> • reduce biological and nutrient load by 60% <p>In addition:</p> <ul style="list-style-type: none"> • stormwater management plans for catchment areas • Street Smart River Clean Project: <ul style="list-style-type: none"> – stormwater pollution prevention program. • street sweeping program—currently every six weeks: <ul style="list-style-type: none"> – review of street sweeping regime to focus on streets with high numbers of deciduous trees. • Cheltenham Racecourse Project

Table 7 Port Adelaide–Enfield Council Annual Business Plan 2007–08

Objectives	Strategies	Actions
Goals relevant to the ACWQIP include Goal 6 (also included in the City Plan 2004–09): <ul style="list-style-type: none"> environment 	<ul style="list-style-type: none"> a city where the sustainable natural and built environment is managed, protected, enhanced and enjoyed by the community 	<ul style="list-style-type: none"> sustainable land management practices management of open natural spaces, parks, reserves in the city, to preserve habitat biodiversity reduced levels of consumption and efficient use of natural resources (fuels, water soil, and biodiversity) and increased use of renewable energy sources the achievement of healthy waterways and water-based habitats in the city, including marine, coastal and wetland areas governments leading by example in environmental management practices
Port Adelaide–Enfield Council Annual Business Plan 2007–08: Stormwater drainage construction		
Objectives	Strategies	Actions
<ul style="list-style-type: none"> develop a rolling three-year works program for the construction of roads, footpaths and drainage 	<ul style="list-style-type: none"> construct stormwater drainage infrastructure to ensure a level of protection to properties against flooding to acceptable engineering standards 	<ul style="list-style-type: none"> undertake the construction of stormwater drainage and flood control systems undertake the construction of gross pollutant traps undertake the upgrading of stormwater pumping stations where required undertake catchment review studies undertake the construction of bridge structures
Port Adelaide–Enfield Council Annual Business Plan 2007–08: Stormwater drainage maintenance		
Objectives	Strategies	Actions
<ul style="list-style-type: none"> maintain footpaths, roads, drainage, open space, recreational facilities and traffic management controls 	<ul style="list-style-type: none"> the stormwater drainage network must be cleaned, repaired and inspected regularly to maintain efficient stormwater disposal and to improve quality of the stormwater being discharged into the sea 	<ul style="list-style-type: none"> undertake the cleaning of concrete and earth open channels undertake the repair of concrete and earth open channels

Objectives	Strategies	Actions
		<ul style="list-style-type: none"> • ensure the underground pipe network is clean • undertake repairs to the underground pipe network where required • ensure trash racks are cleaned after rainfall events • undertake investigations on drainage catchments • ensure regular cleaning and maintenance e of stormwater pumping stations
Port Adelaide–Enfield Council Annual Business Plan 2007–08: Environmental management and sustainability		
Objectives	Strategies	Actions
<ul style="list-style-type: none"> • educate industry and the community about environmental issues and the requirements of environment protection legislation 	<ul style="list-style-type: none"> • the management and protection of the environment for the benefit of human health and ecological sustainability 	<ul style="list-style-type: none"> • provide improved water quality • provide improved air quality • reduce the impact of pollution on coastal/marine environments
Port Adelaide-Enfield Council Annual Business Plan 2007–08: Health services–water catchments		
Objectives	Strategies	Actions
<ul style="list-style-type: none"> • educate industry and the community about environmental issues and the requirements of environmental legislation 	<ul style="list-style-type: none"> • improve workplace practices and industries understanding of environmental management resulting in improved stormwater quality discharging to the Port River and Barker Inlet estuary 	<ul style="list-style-type: none"> • perform onsite environment review process with business and industry in the city • maintain environment review data for the purpose of setting strategic direction and program evaluation • create, develop and maintain education resource materials targeted at improving the environmental performance of business and industry • undertake process evaluation of program aims and objectives

Port Adelaide–Enfield Council Annual Business Plan 2007–08: Street Care–Street cleaning		
Objectives	Strategies	Actions
<ul style="list-style-type: none"> quality community assets and infrastructure that supports our economic, social and environmental goals 	<ul style="list-style-type: none"> minimise the amount of debris entering the stormwater system from the road network 	<ul style="list-style-type: none"> ensure that all kerbed streets are swept in conjunction with the established grass cutting program to remove grass and debris from gutters undertake the removal of rubbish that builds up in the gutters ensure the removal of illegally dumped rubbish and debris from the road reserve area in a prompt manner
Port Adelaide–Enfield Council Annual Business Plan 2007–08: Foreshore–Capital		
Objectives	Strategies	Actions
<ul style="list-style-type: none"> prepare a rolling three-year works program for the development of public open space and recreational facilities 	<ul style="list-style-type: none"> the city enjoys a coastline spanning from Semaphore South through to Outer Harbor and the Port River. Maintain and develop existing coastline passive recreation areas. 	<ul style="list-style-type: none"> manage the design and installation of new irrigation systems manage the design and implementation of landscaped areas undertake the construction of new paths and roads undertake the construction and installation of other items such as park furniture, retaining walls, lighting, boardwalks, barbecues, etc manage the revegetation and weed control of the coastal dune system

Port Adelaide–Enfield Council Environment Strategic Plan 2003–06

Objectives	Strategies	Actions
<p>Objectives from the Environment Strategic Plan 2003–06 relevant to the ACWQIP include:</p> <ul style="list-style-type: none"> • the maximisation of water conservation and reuse in the city, by all sectors • the reduction of waste generation and disposal in the region • the active and sustainable management of the city’s catchments, water bodies and water-dependent ecosystem • the sustainable management of terrestrial and marine biodiversity in the city • the integrated management of the city’s coastal resources and wetland ecosystems • the preventive and proactive management of the potential risks of the effects of climate change in the city’s coastal and estuarine areas. 	<ul style="list-style-type: none"> • ensure council’s involvement in inter-governmental planning and policy development for water conservation • develop council mechanisms to assist and promote water conservation and reuse by use of incentives, planning instruments, or promotion/education • ensure maximum water conservation benefits from council’s infrastructure planning • develop an integrated council waste management strategy and policies regarding domestic, commercial, and hazardous waste minimisation and disposal • ensure the appropriate master planning, strategic siting, and management of resource recovery and waste transfer facilities and waste transfer stations in the city • ensure a cost-effective waste collection and disposal service is provided by council to ratepayers • development of a council urban stormwater master plan—to inform and guide management planning and programs for flood and water quality protection • provide educational and site management advice and training to industries in the city regarding preventing stormwater pollution • ensure appropriate investigation and management of groundwater resources in the city • preparation and implementation of a biodiversity study and resulting biodiversity management strategy for the city 	<ul style="list-style-type: none"> • develop integrated regional water conservation strategies and targets, in liaison with the Adelaide and Mount Lofty Ranges Natural Resource Management Board, SA Water, state government agencies, and natural resource management groups. • prepare a council sustainable water management policy, and related information kit and guidelines, for adoption by council • incorporate water conservation policies into council’s development plan, via the section 30 review process • collaborate with the state government’s water conservation partnership project regarding the development and implementation of water conservation projects • participate in the inter-governmental review of grey water reuse guidelines and policies • investigate the benefits of harvesting stormwater collected in the city’s wetlands, and facilitate commercialisation opportunities • identify and implement aquifer storage and recovery facilities wherever feasible • scope, design and undertake the preparation of a waste management strategy, to inform and guide council’s waste management programs and projects for the next three years. • collaborate and have input into discussions and planning with state government and land management authorities in regard to the development of waste recovery facilities in the city.

Objectives	Strategies	Actions
	<ul style="list-style-type: none"> • development and implementation of a council coastal and wetlands strategy and management plan, to ensure best practice management and monitoring of the city's coastal assets. • ensure council's planning policies are reviewed and updated with reference to marine and aquaculture provisions. • contribute to regional and state government forums and planning projects regarding the city's coastal areas • ensure pro-active risk assessments and management planning is undertaken regarding the risks associated with the effects of climate change in order to ensure protection of property, and the natural environment. 	<ul style="list-style-type: none"> • investigate options for facilitating the provision of commercial and industrial waste recycling programs, in liaison with the EPA • investigate the opportunities to expand council's recycling program to include all types of plastics • investigate the costs and benefits of alternative uses of the city's green and organic wastes, in liaison with the local business sector. • investigate options for collection and disposal of hazardous domestic and household waste, including oils, batteries, paints and pesticides • the development and implementation of a comprehensive hydrology, topography, and water quality study regarding surface catchments and receiving watercourses in the city, in collaboration with the AMLR NRM Board and DPLG. • the ongoing strategic implementation of the Street Smart River Clean pollution prevention project, jointly funded by the AMLR NRM Board and council to address pollution from industrial premises, and to work with industry to improve environmental management practices • develop a project to survey and risk assess septic tanks in the city, to be supported by education programs and policy development. • develop an inter-agency project to audit aquifer status and profile, and identify current use of groundwater in the region via domestic and commercial bores—to be supported by a risk management and education program.

Objectives	Strategies	Actions
		<ul style="list-style-type: none"> • develop a biodiversity management strategy that will: <ul style="list-style-type: none"> – identify and protect/manage habitats and species of conservation significance; – increase and protect habitat diversity – provide corridors for wildlife migratory routes, particularly for birds – identify essential buffers between natural and urban/industrial areas – re-establish indigenous flora and fauna wherever possible, and control and manage introduced and pest species – recommend areas for mangrove and samphire accession – improve amenity and recreational tourism values – maximise community participation, and educational/research opportunities – ensure management guidelines are developed regarding local and state agency works programs in sensitive areas, or areas mandated by treaty or statutory responsibilities – ensure integration with NRM and other biodiversity frameworks at regional and state level – identify council policy development needs and criteria regarding urban planning and its impacts on biodiversity. • prepare a coast and wetlands strategy, in liaison with state government agencies and the community • review council's development plan regarding land and

Objectives	Strategies	Actions
		<ul style="list-style-type: none"> • marine based aquaculture developments, in light of new SA Aquaculture Act 2001 • consult with the state government regarding the development of a dolphin sanctuary for the Port River estuary, as part of an overall view to broader marine protected area classification for the barker inlet and port river estuary • participate actively in the Barker Inlet and Port Estuary Committee, to drive the development and implementation of the Barker Inlet and Port Estuary Management Plan • develop and implement the flood protection and risk management study and resulting management strategies, in conjunction with the federal and state governments. • prepare planning and engineering policies and procedures, in response to the study

Table 8 City of Onkaparinga Water Futures—Draft Water Management Strategy

Objectives	Strategies	Actions
<ul style="list-style-type: none"> • to conserve water • to protect water quality (surface and groundwater) • to reduce reliance on water resources from the River Murray • to protect water dependent ecosystems, including coastal and marine environments • to promote economic development opportunities 	<p>1 Provide leadership in sustainable water management</p> <p>Targets:</p> <ul style="list-style-type: none"> • City wide: <ul style="list-style-type: none"> – by 2010 Stage 1 of Water Proofing the South is completed and the associated wastewater and stormwater storage and reuse targets are achieved. • Corporate: <ul style="list-style-type: none"> – reduce quantity of mains water used by the organisation by 20% on 2005–06 levels by 2013. <p>2 Maximise the reuse of wastewater, rainwater, stormwater and grey water</p> <p>Targets:</p> <ul style="list-style-type: none"> • Water Proofing the South Stage 1 by 2010: <ul style="list-style-type: none"> – provide an additional 3.8 GL of stormwater and wastewater for reuse purposes: <ul style="list-style-type: none"> ▪ increase the amount of urban water reuse by 1,141 ML ▪ increase the amount of water reuse by the food and wine industry by 1,800 ML ▪ increase treated wastewater and stormwater storage capacity by 1,159 ML ▪ achieve a 923 ML saving from water efficiency measures. 	<ul style="list-style-type: none"> • implement Water Proofing the South (WPS) Stage 1 projects • coordinate the delivery of WPS Stage 1 by 2010 • identify and secure government and private sector funding for Water Proofing the South Stage 2 • establish a City of Onkaparinga climate change fund to implement water and climate change strategies • advocate for local impacts of the proposed desalination plant at Port Stanvac to be comprehensively assessed as part of the project's assessment process • implement the City of Onkaparinga's <i>Drought Response Plan, Turf and Open Space Irrigation Management Plan 2007</i> to ensure irrigation standards are maintained while mains water is reduced • investigate the options for the trading of council's water licences and allocations, where such trading is consistent with the objectives of water futures • develop and commence a program to retrofit council buildings, facilities and equipment with water efficiency and water harvesting and reuse devices • incorporate water efficiency and water harvesting and reuse measures in the design, construction and maintenance of council's existing and new infrastructure and assets • incorporate water harvesting and reuse features in council's parks, reserves and streetscape upgrades • clarify council's rights to harvest stormwater under the

Objectives	Strategies	Actions
	<p>3 Promote water sensitive development</p> <p>Targets:</p> <ul style="list-style-type: none"> By 2013 all new developments provide stormwater management systems that optimise the capture and reuse of stormwater. <p>4 Minimise polluting discharge to watercourses and water dependent ecosystems and maintain environmental flows.</p> <p>Targets:</p> <ul style="list-style-type: none"> Water quality standards are maintained (targets were reviewed on the release of the Adelaide Coastal Waters Study). <p>5 Manage stormwater to protect and minimise risk to property, infrastructure and public health and safety</p> <p>Targets:</p> <ul style="list-style-type: none"> By 2013 all high priority flood mapping and flood risk assessment studies are completed. <p>6 Promote opportunities for water industry development in the city</p> <p>Targets:</p> <ul style="list-style-type: none"> Achieve the Southern Adelaide Economic Development Board’s Strategic Framework targets relevant to environmental industries. <p>7 Engage communities in water resource management</p> <p>Target:</p> <ul style="list-style-type: none"> Increase community knowledge and understanding of water resource management issues. 	<p>western Mount Lofty Ranges Water Allocation Plan</p> <ul style="list-style-type: none"> identify priority water harvesting and reuse projects to include in WPS Stage 2 establish aquifer storage and retrieval schemes in the city work with developers, and state and federal government agencies to identify stormwater reuse opportunities lobby the state government to streamline approval processes for household grey water reuse continue to work with the AMLR NRM Board to maximise the reuse of region’s water resources ensure salinity considerations are factored into the assessment of water reuse options participate in metropolitan WSUD projects develop infrastructure design standards which reflect sustainable water management objectives investigate opportunities to amend the development plan to promote WSUD outcomes for new developments as part of the section 30 review explore opportunities to showcase to developers and the public WSUD technologies and approaches investigate opportunities for developer contributions towards stormwater capture and reuse initiatives actively engage in the planning and investigations undertaken by the state government for the proposed desalination plant to ensure the environmental impacts of brine discharge on the marine environment are minimised ensure all council operations and services comply with the Environment Protection Water Quality Policy 2003

Objectives	Strategies	Actions
		<p>and relevant codes of practice</p> <ul style="list-style-type: none"> • incorporate environmental flow considerations in all council operations and services that have a potential impact on watercourses • work with the AMLR NRM Board to ensure environmental flows in the region are maintained, including for: <ul style="list-style-type: none"> – Onkaparinga River and Estuary – Christies Creek – Field River – Willunga Basin watercourses. • work with Flinders University to investigate the appropriateness of using treated wastewater (Class B) to supplement environmental flows in the Onkaparinga River (WPS Stage 1 initiative) • ensure water quality opportunities are investigated as part of new infrastructure installations • implement and review the stormwater management scoping study • complete flood modelling and mapping of major watercourses • complete hydraulic analysis of existing drainage networks • meet flood protection service standards along major watercourses • continue master planning for stormwater management that integrates flood mitigation, water harvesting and water quality considerations • incorporate climate change considerations in design and construction of stormwater management infrastructure

Objectives	Strategies	Actions
		<ul style="list-style-type: none"> • lobby the state government for consistent guidelines and requirements regarding flood protection levels taking into account climate change projections • establish a water industry procurement program for the city in collaboration with the Water Industry Alliance • develop and promote the carbon park initiative for water related businesses and institutions • work with industry and the business sector to: <ul style="list-style-type: none"> – increase the supply of skills in water technology and efficiency – increase investment and employment in environmental and water industries. • investigate and advocate for local renewable energy generation opportunities to meet the energy needs for the proposed desalination plant • pursue opportunities to maximise the economic benefits for the proposed desalination plant • work with the AMLR NRM Board to engage the community in line with directions outlined in their Natural Resources Management Plan. • work with communities to identify and secure community water grants funded to support local community action • engage the community in implementation, ongoing and review of water futures • coordinate community engagement across the range of water management projects • maintain a water futures element in the City of Onkaparinga’s website

Objectives	Strategies	Actions
		<ul style="list-style-type: none"> work with government agencies to assist residents and businesses reduce mains water consumption including via the retrofitting of water saving technologies, and water efficient landscaping and garden design.
City of Onkaparinga Draft Climate Change Strategy		
Objectives	Strategies	Actions
<ul style="list-style-type: none"> to ensure that the City of Onkaparinga is prepared for and resilient to climate change to reduce greenhouse gas emissions to provide community leadership in responding to climate change 	<ol style="list-style-type: none"> Provide leadership (leadership, advocate, owner/custodian, service provider) Target: <ul style="list-style-type: none"> Achieve carbon neutrality for the organisation by 2013. Prepare for change and manage uncertainty (leadership, owner/custodian, regulator, part funder and information provider) Target: <ul style="list-style-type: none"> By 2013 a comprehensive vulnerability assessment for the City of Onkaparinga has been completed in cooperation with the state government. protect resources and ecosystems (leadership, owner/custodian, regulator, part funder) Targets: <ul style="list-style-type: none"> By 2013 comprehensive plans are in place to help ecosystems and species adapt to climate change. Build knowledge and support action (leadership, advocate, initiator/facilitator, information provider). 	<ul style="list-style-type: none"> implement the Assessing Climate Change Risk Foundation Project to ensure climate change risks relevant to council operations, assets and services are minimised facilitate a partnership with the AMLR NRM Board, state and federal agencies, and research institutions to undertake a comprehensive vulnerability assessment for the city include climate change considerations in the section 30 review of the City of Onkaparinga development plan review the City of Onkaparinga bushfire and emergency management plans to incorporate climate change considerations advocate for a statewide review of flood protection standards and hydrological modelling as detailed in South Australia's <i>Greenhouse Strategy Tackling Climate Change</i> advocate for a statewide assessment of the vulnerability of the state's key infrastructure to climate change, including impacts on buildings, transport networks and coastal infrastructure. maintain the City of Onkaparinga Climate Change Science Panel as an annual forum to provide advice to

Objectives	Strategies	Actions
	<p>Targets:</p> <ul style="list-style-type: none"> • By 2013 community understanding of climate change impacts and responses has increased. <p>5 protect community health and wellbeing (leadership, advocate, part funder, information provider)</p> <p>6 create a low emission city (leadership, advocate, initiator/facilitator, information provider, regulator, part funder, service provider and owner custodian).</p>	<ul style="list-style-type: none"> • the council and community on the most current scientific research • recommend to the Local Government Association that they establish a Climate Change Scientific Panel to provide advice to the local governments sector on the most current scientific research and evidence regarding climate change and appropriate local responses • implement the Local Biodiversity and Carbon Offset Foundation Project to identify opportunities to use local plantings to offset the organisation’s greenhouse emissions • implement the Biodiversity Modelling Foundation Project to help identify the adaptation need of local fauna and flora and implications for native vegetation management • work with the Local Government Association and other council to investigate the feasibility of establishing a local government voluntary carbon offset scheme that can be registered under the South Australian climate change legislation • implement priority recommendations from City of Onkaparinga Climate Change Impacts on Coastal Lands Report 2007 including: <ul style="list-style-type: none"> – working with the Coast Protection Board to review coastal protection of infrastructure and amenity at Christies Beach – reviewing reinforcement at cliff base north and south of Snapper Point and maintaining an annual area audit – creating an accurate high resolution digital map of the Onkaparinga floodplain as the first step in

Objectives	Strategies	Actions
		<p>detailing vulnerability assessment of the area</p> <ul style="list-style-type: none"> – reviewing coastal and flood protection to the backshore and low bluff between Wattle Avenue, Aldinga and the Aldinga boat ramp – managing Ochre Coastal Reserve to mitigate erosion and gully impacts <ul style="list-style-type: none"> • continue to work with the AMLR NRM Board to develop and implement natural resource management plans and initiatives that ensure local ecosystems and resources are well adapted to climate change • maintain environmental grants initiative to support community action • continue to provide a waste and recycling service that supports waste minimisation encourages the reuse and recycling of waste • continue the Sustainability Now initiative to support community leadership in sustainability action • hold a community climate change forum every six months to monitor the implementation of the climate change strategy and action plan • create a Community Action for Climate Change section on the City of Onkaparinga website that promotes community achievements in responding to climate change and include community initiatives in council's publications • monitor community understanding of climate change, its local impacts and Council's role as part of community perception surveys.

Table 9 Mitcham City Council 2008–2012 Strategic Plan

Objectives	Strategies	Actions
<ul style="list-style-type: none"> environmental sustainability 	<ul style="list-style-type: none"> sustainable development: urban development that enhances environmental, social and cultural well-being biodiversity protection: protect and enhanced natural habitats and ecosystems conservation of natural resources: sustainable management and efficient use of natural resources and energy waste minimisation: cost-effective waste management that maximises social and environmental benefits 	<ul style="list-style-type: none"> built environment: promote development that is excellent in design and environmental performance accessible city: utilise a range of urban design, infrastructure and transport management activities to improve community access to services and facilities vibrant streetscapes: ensure streetscapes are attractive, functional and sustainable local character and heritage: maintain and enhance local character and heritage of the built and natural environment open space: ensure there is sufficient accessible open space that meets a range of community and environmental needs integrated stormwater management: renew, maintain and upgrade stormwater infrastructure to protect the community, enhance the natural environment and conserve water resources biodiversity corridors: expand areas of indigenous vegetation in council reserves, and enhance waterways, linear reserves and vegetation corridors native vegetation, pest plants and animals: seek partnerships to preserve and enhance remnant vegetation and control pest plants and animals reduce greenhouse emissions: promote and implement cost-effective measures to mitigate and offset greenhouse emissions climate change response: plan for and respond to climate

Objectives	Strategies	Actions
		<p>change and its impacts on our community</p> <ul style="list-style-type: none"> • secure water and energy supplies: advocate for and undertake water and energy reduction and the development of alternative supplies • reduce waste: promote and practice waste minimisation and maximise resource recovery, reuse and recycling • waste collection: effectively plan and manage the collection, recycling and disposal of council and community waste • pollution prevention: undertake educational, enforcement and regulatory activities to minimise pollution

Mitcham City Council Public and Environmental Health Management Plan

Objectives	Strategies	Actions
<ul style="list-style-type: none"> • reduce pollution at source before it enters the aquatic systems • enhance the quality of aquatic systems by reducing the concentration of key pollutants to appropriate levels • maximise stormwater reuse, minimise stormwater runoff 	<ul style="list-style-type: none"> • education on catchment issues for industry, small business and the local community • investigate and respond to illegal discharge of wastewater into the aquatic system • installation of rubbish traps at stormwater inlets and regular cleaning of these traps • enforce legislative provisions in response to pollution incidents • encourage and explore opportunities to identify stormwater recycling processes • investigate and implement, as appropriate, localised WSUD measure, including stormwater retention 	<ul style="list-style-type: none"> • council is supporting the Marion and Mitcham Environmental Education Project (funding ended June 2008) • council investigates and contributes to a register for specific water pollution incidents • council liaises with AMLR NRM Board regarding installation of traps • council cleans all stormwater inlets three times a year • Authorised Council Officers cooperate with EPA in enforcing the Environment Protection Act 1993 • council is benchmarking its own operations against EPA stormwater codes of practice

Objectives	Strategies	Actions
	<ul style="list-style-type: none"> reduce the amount of impervious surface treatments on private properties 	<ul style="list-style-type: none"> council's Residential Development Plan Amendment Report includes provisions regarding stormwater retention for major and minor events
Mitcham City Council Water Management Action Plan 2004–2009—Actions implemented since the base year		
Objectives	Strategies	Actions
<p>Water consumption goals (objectives)</p> <p>Corporate (council) goal:</p> <ul style="list-style-type: none"> to improve water use efficiency 20% by 2013 (based on 1996–97 levels). Efficiency to be measured by kilolitres per hectare (parks and gardens), and kilolitres per square metre (buildings) <p>Community goal:</p> <ul style="list-style-type: none"> to improve water use efficiency by 20% by 2013 (based on 1996–97 levels). Efficiency to be measured by kilolitres per capita. It must be noted for this goal success will depend largely on leadership from state government <p>Water quality goals (objectives)</p> <p>Corporate (council) goal:</p> <ul style="list-style-type: none"> to implement 60 points from the ICLEI Corporate Water Quality 'Action Cards' by 2010 <p>Community goal:</p> <ul style="list-style-type: none"> to implement 60 points from the ICLEI Corporate Water Quality 'Action Cards' by 2010 	<ul style="list-style-type: none"> improve water efficiency improve water quality habitat improvement 	<ul style="list-style-type: none"> harvesting rainwater for street tree watering reusing rainwater for toilet flushing aquifer storage and recovery (ASR) sewer mining research planting drought tolerant species on council land soil conditioning and mulching watering regimes and 'Micromet' the rainwater reuse rebate: a community incentive project native plant guides: educating residents about water efficient plants planning controls to promote WSUD researching barriers to water conservation and reuse review and amend corporate policies and procedures ensure minimal risk of pollution to waterways Urrbrae Wetland: A unique community education resource Marion and Mitcham environmental education project (funding ended June 2008) <ul style="list-style-type: none"> – aim was to educate and promote responsible

Objectives	Strategies	Actions
		<p>catchment management practices.</p> <ul style="list-style-type: none"> • enforcement of Environment Protection (Water Quality) Policy • household chemical collection days • community based water quality improvement programs: <ul style="list-style-type: none"> – Gutter Guardians – Waterwatch – Urban Forests Biodiversity Program – Our Patch – Weed Alert. • landholder assistance scheme • watercourse restoration • Sturt River Linear Park project

Mitcham City Council Water Management Action Plan 2004–2009—Action plan to achieve water quality goals

Objectives	Strategies	Actions
<p>Water quality goals (objectives)</p> <p>Corporate (council) goal:</p> <ul style="list-style-type: none"> • to implement 60 points from the ICLEI Corporate Water Quality ‘Action Cards’ by 2010 <p>Community goal</p> <ul style="list-style-type: none"> • to implement 60 points from the ICLEI Corporate Water Quality ‘Action Cards’ by 2010 	<ul style="list-style-type: none"> • erosion control to minimise sedimentation and suspended solids/turbidity • pollution prevention and waste minimisation 	<ul style="list-style-type: none"> • ensure erosion management controls are identified and implemented for all council managed construction projects with potential for release of sediment to stormwater • incorporate general erosion and sediment control management plan requirements into council tenders and documents for construction works undertaken by contractors • continue to review and amend Standard Work Methods to prevent stormwater pollution through construction and horticulture activities

Objectives	Strategies	Actions
		<ul style="list-style-type: none"> • identify and assess erosion sites on minor watercourses • prioritise erosion remediation program for minor watercourses • implement staged erosion remediation works program • continue education through the Marion and Mitcham Environmental Education Project for developers and contractors working on housing construction sites, based on Environment Protection (Water Quality) Policy requirements. • include a requirement for the preparation of erosion and sediment control plans with all subdivision planning permits • continue enforcement of Environment Protection (Water Quality) Policy, prohibiting sediment laden runoff from leaving a construction site • continue to conduct regular field audits of construction works to ensure stormwater pollution prevention measures are in place • continue restoration of degraded riparian environments through the removal of exotics, bank stabilisation and revegetation with Indigenous plants, with a medium-term focus on Minno Creek • train staff on the impacts of fertiliser and herbicide use and on ways to prevent pollution from these sources • work with KESAB to collect and collate data on the quantity and type of litter trapped in gross pollutant traps (GPTs) for use in education and awareness raising • review GPT maintenance regime to optimise efficiency of the litter trap device installed

Objectives	Strategies	Actions
		<ul style="list-style-type: none"> • review the level of maintenance to street litter bins to prevent overflow into nearby drains • reduce litter and improve recycling rates by introduction of a three-bin system as alternative to recycle crates • respond to high cigarette butt litter areas by liaising with select businesses on the installation of cigarette bins • continue installation of signs at public open spaces on the collection and appropriate disposal of dog faeces • using latest community research methods, review effectiveness of local signage laws on public land to deter the dumping of rubbish • produce a chemical spill action plan and train staff working in the environment who may affect stormwater through daily operations • continually review herbicide, pesticide and fertiliser use and trial new techniques and treatments to reduce applied chemical use, particularly along concrete kerb and near watercourses • fulfill the requirements of trade waste licence for wastewater discharge at the depot • continue monitoring for leachate from disused landfill sites at Eden Hills and Lynton to prevent contamination of surrounding soil and water bodies, both surface and ground • during street sweeping tender renewal process, review trends on the amount of organic debris collated from street sweeping and side entry pits in order to review effectiveness of street sweeping and pit cleaning schedules

Objectives	Strategies	Actions
		<ul style="list-style-type: none"> • review and amend council's contract conditions and internal standard work methods and purchase vacuum return system to capture water runoff and ensure no water enters stormwater system from these activities • continue to develop and implement procedures to deal with environmental incidents and complaints from council activities • following implementation of three-bin waste collection system, work with ZeroWaste SA and/or KESAB to review recycling and green waste participation rates • continue enforcement of Local Government Act 1999 prohibition on the illegal dumping of rubbish on public land • include tips on minimising chemical and fertiliser use in water-efficient garden guide for residents • continue developing land management plans with landholders to assist with good land management techniques, including weed control and minimising herbicide and fertiliser use • support and promote local nurseries which supply local Indigenous plants • continue enforcement of Dog and Cat Management Act prohibition on leaving dog faeces in public spaces • install bins for dog faeces at identified problem areas of open space • facilitate connection to sewer in all parts of the city where sewer lines are available • continue council's biennial chemical collection days and seek funding from ZeroWaste SA to support the chemical collection days • maintain publicity campaigns for the chemical collection days