Coastal water quality, Adelaide's port waterways

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Background

Adelaide's Port waterways comprise the Barker Inlet and the Port River Estuary. The Barker Inlet is a nationally significant wetland, and both waterways are important to Adelaide residents for recreational and scenic values. A Dolphin Sanctuary has been proclaimed in these waterways.

Historically, a range of pollutants has been discharged to the waterways, although nutrients (nitrogen and phosphorus) are of most concern, being associated with the loss of seagrass and mangroves. Elevated nutrient levels are causing seasonal growths of macroalgae (sea lettuce) and toxic algal blooms such as 'red tides' (dinoflaggelate blooms).

There have been considerable efforts to reduce pollutant discharges to the waterways over the past ten years, including the closure and upgrade of polluting industries. These include the relocation of a treated sewage discharge from the inner Port River - part of the Port waterways - to the upgraded Bolivar Wastewater Treatment Plant (WWTP).

Current efforts

With support from the Natural Heritage Trust's Coastal Catchments Initiative, the South Australian Environment Protection Authority (SAEPA) is developing a Water Quality Improvement Plan (WQIP) to reduce nutrient discharges to these waterways. An assessment of all inputs to the waterway has confirmed that two point sources, Penrice Soda Products and the Bolivar WWTP, account for most of the nutrient inputs (see table 1).

Table 1: Current and proposed loads for nutrient sources to the Port Waterways

Pollutant Source	Current load (t/yr)		Target load for 2015 (t/yr)		Required load reduction	
	N	**P**	**N**	**P**	**N**	**P**
Industrial point sources						
Penrice Soda Products	820	0.7	200	0.7	-76%	0%
Bolivar WWTP (SA Water)	596	248	100	40	-83%	-84%
Total point sources	**1416**	**249**	**300**	**41**	**-79%**	**-84%**
Land based diffuse sources						
Groundwater	10	0.25	10	0.25	0%	0%
Atmospheric deposition	32	2	32	2	0%	0%
Local stormwater discharges	2	0.2	2	0.2	0%	0%
Catchment Discharges:						
– Dry Creek	34	8.5	34	8.5	0%	0%
– Barker Wetlands	7	3	7	3	0%	0%
– Little Para	6.1	1.4	6.1	1.4	0%	0%
– Range & Magazine Wetlands	2.5	1	2.5	1	0%	0%
– Helps Road Drain	nd	nd	nd	nd	0%	0%
Marine sources	52	11	52	11	0%	0%
West Lakes outfall	100	10	100	10	0%	0%
Internal loading (sediments)						
Total current and target loads	**1662**	**286**	**546**	**78**	**-67%**	**-73%**

Note: N = nitrogen, P = phosphorus
Source: South Australian EPA Draft Water Quality Improvement Plan for Adelaide's Port Waterways.

Comprehensive water quality modelling has quantified the load reductions needed to prevent the impacts of these point source discharges, and has identified reductions in the order of 80 per cent are required from these sources. At this time reductions from other sources, such as land-based or marine sources, are considered cost-ineffective or impractical.

Improvement projects

The SAEPA is negotiating with Penrice Soda Products and SA Water to develop plans to reduce nutrient discharges from their plants. The complexity of this process and the time needed to develop and implement reductions from these sources is considerable, however at this time:

- SA Water is developing improvement projects for its Bolivar WWTP as part of an overall strategy for all Adelaide metropolitan wastewater treatment plants. They are committed to their plants not causing environmental harm and are exploring interim actions to reduce their environmental impacts while the capital works program is being developed. Wastewater re-use is an option that has a number of other benefits for the Adelaide community and the potential for this is being explored with the Natural Resource Management Boards; and
- Penrice Soda Products has committed to reduce its nitrogen discharge to 575 tonnes by 2010. They have agreed that this target should be enforced through their discharge licence with the SAEPA. They have also agreed to aim to reduce their discharge to 200 tonnes of nitrogen by 2015, although cost-effective technology to allow this is not yet available. In the meantime

they will maintain an active role in seeking to adapt emerging nitrogen reduction technologies to their process and pursuing incremental reductions of nitrogen discharge from the site.

These commitments ensure that at least an 18 per cent reduction in nitrogen discharges will be achieved during the five-year period of the Water Quality Improvement Plan. Though unquantified at this stage, greater reductions will be achieved implementing the capital works program being developed for the Bolivar WWTP in the future.