

## 2.4 Funding, policy, regulatory and enforcement practices

### 2.4.2 Point source regulation of stormwater discharges and enforcement activities

#### Description

##### Point source regulation

Regulation of specific commercial and industrial premises (e.g. automotive industries, nurseries, landfills, waste recycling facilities, etc.) is a widely used technique to minimise stormwater and groundwater pollution. Such premises are typically licensed by a government agency, with their activities controlled through legally enforceable licence conditions that are regularly checked by enforcement officers who audit the premises. These officers also provide guidance, training and, if necessary, perform an enforcement role.

Control of *point sources* of stormwater pollution is generally easier than controlling diffuse sources (e.g. runoff from roads and rural land uses), and more rewarding on a cost-benefit basis. A well-managed point source regulation program should be a priority of agencies that are responsible for managing stormwater and groundwater quality.

##### Enforcement activities

Enforcement is another cost-effective regulatory tool for the management of stormwater and groundwater quality. This BMP uses enforcement of State legislation or local laws to modify behaviour that has the potential to pollute stormwater or groundwater. Legislation is often passed and enforced to address specific forms of pollution (e.g. cigarette butts) or control high-risk activities (e.g. specific industrial facilities). Consequences of enforcement activities to a polluter can include the payment of a fine, the payment of clean-up costs, being unable to legally operate a business, and, in extreme cases, imprisonment. Enforcement is primarily an economic disincentive that is designed to influence people's behaviour.

#### Applicability

##### Point source regulation

Point source regulation is a BMP that is highly applicable to all urban areas in Western Australia where:

- The basic regulatory framework is provided under the *Environmental Protection Act 1986*. However, licensing/registration under the *Environmental Protection Act* is for large industry/prescribed premises only. Currently there are no provisions under local law to register or license small to medium-sized enterprises.
- There is a clear need for improved environmental management of small to medium-sized commercial and industrial premises (SRT, 1999). For example, the Swan-Canning Industry Survey Report (WRC, 2000) undertook a survey and risk assessment of light industrial premises in the Swan-Canning region in 1997 and 1998. It involved more than 550 premises. These were effectively unregulated premises, as approximately 95% of the 2,000 – 2,500 industrial premises in Perth are not regulated by a licensing/registration instrument that aims to implement environmental controls. Accordingly, they are not routinely inspected by government regulators, nor are they subject to specific licence conditions with respect to environmental management. The overall conclusion of the Swan-Canning Industry Survey Report was 'because of the large number of premises and generally poor environmental

management practices, light industry also presents a significant pollution risk. This arises from the cumulative impact of small discharges and the potential for accidents to cause serious pollution’.

The Swan-Canning Industry Survey Report (WRC, 2000) gives an indication of which small to medium-sized industrial premises pose a risk to the health of the Swan-Canning system. The survey identified the following proportion of premises as being of ‘medium risk’ to the Swan-Canning: 29% of audited pool suppliers, 30% of automotive industries, 36% of vehicle depots, 19% of engineering/manufacturing type industries and 17% of recyclers. The equivalent figures for ‘high risk’ were: 14% of audited vehicle depots, 3% of automotive industries, and 1% of chemical/pesticide premises.

Some local governments in Western Australia (e.g. the City of Canning, City of Bayswater, Town of Kwinana, Town of Vincent and others) have expressed an interest in using delegated powers under the *Environmental Protection Act 1986* to regulate small to medium-sized industry in their region (i.e. undertake training, audits and enforcement activities) in response to rising expectations from their ratepayers that these premises should improve their environmental performance. Regulations under this Act (gazetted on 12 March 2004) provide local authorities with the regulatory tools they need to fully undertake a point source regulation program that targets small to medium-sized industry. In addition, discussions are occurring between local and State government authorities to determine the best way to fund such programs.

The Swan-Canning Cleanup Program Action Plan (SRT, 1999) also recommends that local governments in the Swan-Canning region need to take more responsibility for promoting pollution prevention in light industrial premises by encouraging the use of best practice environmental management via training and auditing. In addition, the plan recommends that local governments should be able to recover the cost of regulating light industry according to the principle of ‘polluter pays’ (SRT, 1999).

The Swan-Canning Cleanup Program Action Plan (SRT, 1999) also highlighted the following *industrial site management practices* that determine the level of pollution risk a premises poses to the surface and groundwater resources of the Swan-Canning region:

- emergency management practices in response to events such as accidental spills;
- illicit practices or poor housekeeping, resulting in pollutant discharges to surface or groundwaters;
- storage practices, i.e. where there is no bunding of chemical storage areas;
- waste management, i.e. the extent to which solid and liquid wastes contaminate stormwater and groundwater; and
- stormwater management.

*Commercial premises* highlighted by the Swan-Canning Cleanup Program Action Plan (SRT, 1999) as requiring improved management included retail establishments, car yards, nurseries, medical and business offices, churches, government offices and museums. Some of these may require regulation through a licensing instrument in the Swan-Canning region (e.g. nurseries, due to the potential to generate excessive loads of nutrients), while others may only need regular education.

## Enforcement activities

Enforcement of relevant legislation is also an option that is widely applicable to Western Australia. However, enforcement programs typically *follow* major educational initiatives. For example, an ‘on-the-spot fine’ enforcement program that targets littering in the central business district of Perth would normally follow an intensive education exercise, and an evaluation process that demonstrates levels of people’s awareness are high but significant behavioural change has not occurred.

Areas of stormwater and groundwater quality management where enforcement has the most potential include:

- littering;
- illegal dumping of wastes in locations where water bodies may be affected;
- stormwater management on building sites;
- car washing on the street;
- feeding of birds in water bodies where eutrophication is a problem;
- liquid and solid waste discharges from vessels; and
- discharges to stormwater or groundwater from commercial and industrial premises.

For enforcement strategies to work in this context, the regulatory instruments must be simple to use (e.g. on-the-spot fines, where court proceedings only occur if fines are challenged by the recipients) and the magnitude of the fines must be suitable deterrents. For example, if it costs \$300 per residential building site to implement sound erosion and sediment controls, the on-the-spot fine for failing to take reasonable and practical measures to minimise the risk of sediment being discharged to stormwater would need to be significantly in excess of \$300 to provide a strong incentive to comply.

The Unauthorised Discharge Regulations 2004 have recently been enacted under the *Environmental Protection Act 1986* in Western Australia (see <[www.slp.wa.gov.au/statutes/av.nsf/doi](http://www.slp.wa.gov.au/statutes/av.nsf/doi)> or telephone (08) 9321 7688). These regulations include an on-the-spot infringement notice system for minor pollution offences. These powers can be delegated to local government officers. The new on-the-spot fines currently carry a penalty of \$250 to \$500, which increases to \$5,000 if the matter proceeds to court. The fines apply to commercial and industrial premises and cover the discharge of substances to stormwater or groundwater. These substances include hydrocarbons, solvents, degreaser detergent, dust, engine coolant, food waste, laundry waste, pesticides, paint, dyes, acids, alkali, sediment, sewage and substances containing heavy metals (Raine, 2004).

## Recommended Practices

### Point source regulation

In some jurisdictions, several tiers of licensing are used (e.g. ‘licences’ for high risk premises and ‘permits’ for low risk premises). The tiers are distinguished by the cost of annual licence/permit fees, the frequency of inspections/audits, and the tailoring of licence/permit conditions. In addition, financial incentives are often provided for premises that exceed the minimum stormwater management requirements as set out in the licence/permit (e.g. a ‘green licensing system’ that allows businesses with excellent environmental performance to pay a reduced annual licence fee and gain positive publicity).

Determining which premises should be regulated via a licence/permit should involve a risk assessment that considers current environmental management practices of various premises types, potential risks to stormwater and groundwater quality, and potential risks to the health of water bodies.

Ideally, costs of running a best practice point source regulation program should be recovered on a ‘polluter pays basis’. That is, the program should be cost neutral to the regulator, with all revenue being raised through licence/permit application fees, annual licence/permit fees and prosecutions for breaches of environmental regulations.

## Enforcement activities

Common examples of laws to prevent or minimise specific forms of stormwater pollution include those that:

- Encourage builders to minimise the discharge of sediment, litter and wash-waters from building sites.
- Discourage illegal dumping of wastes (e.g. waste oil, domestic solid waste).
- Encourage pet owners in public areas to correctly dispose of their pets' waste.
- Discourage the illegal connection of sewage and other wastewaters to the stormwater drainage network.
- Discourage littering in public places.
- Discourage the discharge of commercial or industrial wastes to stormwater (or groundwater).

Some less common examples reported by Taylor and Wong (2002c) include laws that aim to:

- Encourage xeriscaping. For example, the City of Albuquerque in New Mexico, US, has a Water Conservation Ordinance that requires xeriscaping on new developments and works in partnership with a rebate system to encourage the conversion of existing turfed areas to resource sensitive alternatives (Lehner *et al.*, 1999).
- Discourage the feeding of birds in and around water bodies. For example, the Hopatcong Borough in New Jersey, US prohibits the feeding of geese in and around their lake systems as a measure to improve water quality (Lehner *et al.*, 1999).



Figure 1. Department of Environment, Pollution Response Unit testing of an industrial site. (Photograph: Department of Environment.)

Enforcement of environmental management standards on premises that are regulated by a licensing instrument typically occurs via State legislation (e.g. the *Environmental Protection Act 1986*), although the power to enforce this legislation may be delegated to trained and authorised local government officers.

## Benefits and Effectiveness

### Point source regulation

The primary benefits of running a point source regulatory program are:

- The ability to prevent or minimise pollution at the source.
- The ability to run the program on a polluter pays basis (i.e. at no cost to the wider community).
- The ability to provide economic incentives for those premises whose performance exceeds minimum regulatory standards.

- The ability to easily identify and remove major sources of pollution (e.g. wastewater from industrial plants being illegally discharged to stormwater or groundwater).
- The opportunity to build a constructive partnership between the regulator and the operators through regular education, auditing, the development of site-specific licence conditions, and performance reporting.
- The requirements set out in licence/permit conditions are not voluntary (i.e. a breach of conditions may be followed by enforcement).
- New environmental management technology, new knowledge about risks to the receiving environment and new management/political priorities can be incorporated in the program (e.g. newly identified risks can be addressed via modified audit checklists, amended licence/permit conditions, updated industry guidelines, new training materials, etc.).

While the licensing of industrial and commercial premises is a common form of environmental management in urban areas, Taylor and Wong (2000c) report that few agencies have evaluated and reported the *effectiveness* of the approach for stormwater quality improvement (e.g. reductions in pollutant loads due to regulation).

Some case studies however give an indication of the potential of the BMP. The Clean Bay Business Program in Palo Alto, California, is a good example of a program where impressive outcomes were achieved in terms of behavioural change (see the Examples / Case studies section below for details).

In a literature review involving non-structural measures for stormwater quality improvement, Taylor and Wong (2002c) concluded that a best practice, small industry licensing program that includes regular inspections, education, incentives and disincentives should be able to deliver levels of compliance with stormwater-related requirements of approximately 90% - 95%. They also concluded that such licensing programs could be some of the most effective non-structural BMPs for improving stormwater quality and the health of water bodies.

## Enforcement activities

The primary benefits associated with using enforcement measures to influence behaviour include the following:

- It sends a strong message that government is serious about minimising stormwater and groundwater pollution.
- It can be a powerful educational instrument.
- It uses an economic driver to promote behavioural change.
- It implements the 'polluter pays' principle.
- It is flexible, in that enforcement strategies can be quickly adjusted to respond to new issues and priorities.

The potential effectiveness of enforcement campaigns is perhaps best demonstrated by studies involving erosion and sediment control programs. There is strong evidence to suggest a well-designed, strict and sustained enforcement program that complements an educational campaign is essential in order to substantially increase the performance of erosion and sediment control on construction sites (Taylor and Wong, 2002c). For example:

- Lehner *et al.* (1999) concluded from a review of 100 stormwater-related case studies in the US that ‘communities reiterate the need to develop the financial resources and authority necessary to *enforce* standards and maintenance of stormwater controls before a problem or violation occurs’ (p. 5-7) and ‘programs with high accountability [e.g. enforcement elements] often reduce pollutant loadings by 50% or greater’ (p. 1-2).
- Lehner *et al.* (1999) also concluded in relation to erosion and sediment control programs that ‘whatever the education program however, they have not proven successful without the accompanying teeth of enforcement’ (p. 5-13).
- The necessity for strong enforcement has also been stressed by experienced Australian erosion and sediment control project officers and managers (e.g. Gaudry and Geier, 2000) and overseas (e.g. Fritz, 2002). Fritz (2002), a stormwater manager from Chattanooga, US, commented on the importance of enforcement in successful erosion and sediment control programs, saying ‘it is very important to point out that education and awareness [alone] does not lead to compliance. There must be an incentive for compliance to work. This can be either positive (monetary savings, awards) or negative (regulatory intervention)’.
- Findings from case studies reported in Taylor and Wong (2002c) indicate that citywide erosion and sediment control programs with strong and *sustained* educational and enforcement elements may represent the best performing non-structural BMP for the control of stormwater pollution from industry. Lehner *et al.* (1999) also concluded ‘from the [100 US] case studies, it appears that, even more than with respect to other industries, education and enforcement can achieve measurable stormwater pollution reduction’ (p. 5-13).

Achieving and maintaining high levels of compliance with erosion and sediment control requirements on a citywide basis is difficult. Based on Australian and overseas data, Taylor and Wong (2002c) estimate that best practice erosion and sediment control programs should be able to achieve a 20% - 30% increase in compliance levels in the first few years (based on a typical baseline compliance level of 20% - 30%), and achieve a 60% - 70% increase from baseline levels over a decade<sup>20</sup>. In addition, compliant sites can be expected to reduce the average load of total suspended solids (TSS) in stormwater during the construction phase by approximately 60% on average.

Consequently, the overall TSS pollutant removal efficiency of citywide erosion and sediment control programs that include strong town planning, enforcement and educational elements is approximately 12% - 14% in the short term (e.g. one to three years) and 36% - 42% over a decade. These percentages represent an approximate reduction in the average load of TSS in stormwater leaving construction/building sites over the life span of the construction phase (see Taylor and Wong, 2002c for more details).

Erosion and sediment control case study information summarised in Taylor and Wong (2002c) highlights the need for *sustained* levels of enforcement (as compliance levels can quickly drop after a short-term enforcement campaign has finished) and programs that seek improvement over the *long term* (e.g. a decade). An important consequence of this finding is that program managers in Australia should ensure that erosion and sediment control programs are self-funding or have a secure funding base.

## Challenges

The primary challenge associated with using *point source regulation* is the difficulty that may be encountered when first *establishing* the regulatory framework (i.e. the necessary delegations under the

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<sup>20</sup> Phrased another way, average compliance levels for erosion and sediment control on building/construction sites can be expected to rise from approximately 20% - 30% (at the start) to 50% (after a few years), then up to 90% (after a decade) as a result of such programs.



*Environmental Protection Act 1986* and practical regulatory tools such as the on-the-spot fining provisions of the Unauthorised Discharge Regulations 2004) and funding mechanism. Local government agencies may be cautious about accepting delegations to regulate small to medium-sized industry, unless it can be done on a cost-neutral basis. Some local authorities may not wish to undertake such a program, as they might consider it to be a State government responsibility.

The primary challenge associated with *enforcement activities* is the risk of a negative reaction from some stakeholders when an enforcement program begins, particularly if there are some ‘teething troubles’ during the beginning of the campaign (e.g. inconsistent interpretation of the law by enforcement officers, enforcement agencies not leading by example). During this early period, strong managerial and political commitment is often needed to ensure the program proceeds and becomes successful.

Another challenge with the use of enforcement is the magnitude of penalties (e.g. on-the-spot fines issued under the Unauthorised Discharge Regulations 2004). The size of the penalty must be proportional to the offence and the cost of compliance, yet not be perceived as a ‘revenue raising exercise’. A careful balance must be achieved - a balance that will subtly change over time. In some cases, the enforcement agency may have limited power to alter the magnitude of the fines (e.g. where powers are delegated to local government by the State).

## Cost

### Point source regulation

In a literature review involving non-structural measures for stormwater quality improvement, Taylor and Wong (2002c) concluded that point source regulatory programs involving small to medium-sized businesses may cost \$287 - \$1,204 per premises per year to run, with a typical Australian local government-managed program costing in the order of \$480 per premises per year.

However, these programs can be structured to be cost-neutral to the regulatory agency. That is, the revenue from licences, prosecutions and cost-recovery following incidents should cover the regulator’s expenses. In some cases, additional expenditure is incurred by regulatory agencies, particularly when the magnitude of licence fees is set by another tier of government. For example, as a local government regulator, the Brisbane City Council in Queensland administers devolved provisions of State environmental legislation and regulates approximately 2,600 – 3,000 potentially polluting small to medium-sized premises (Taylor, 2002). In 2002, Council collected approximately \$1.2 million in environmental licence fees but spent approximately \$1.44 million (20% more) on these regulatory activities to deliver a standard of service that meets the expectations of the community (Taylor, 2002).

Indicative costing information is also available from the Auckland Regional Council in New Zealand, which has run an Industrial Pollution Prevention Program since 1998. The program includes regulation, education and auditing components and cost approximately NZ\$350,000 to run in 2000-01. This level of funding enabled more than 400 premises to be audited (Sturrock, 2002).

### Enforcement activities

In terms of enforcement, the primary costs to the enforcement agency include:

- staff time by enforcement officers (e.g. enforcement officers need to be trained, maintain a presence in the field, resolve disputes, process warnings/infringement notices, collect evidence for major prosecutions, etc.);
- legal costs (e.g. to manage hearings or prosecutions that are resolved in court); and

- associated educational initiatives (e.g. the provision of information to ensure that the target audience know how to comply with regulations and avoid enforcement action).

Costing figures are also available for regional or citywide erosion and sediment control programs with a strong enforcement element (see Taylor and Wong, 2002c). The cost of running such programs in Australia ranges from \$0.19 - \$0.51 per capita per year, and averages \$0.32 per capita per year (where 'per capita' refers to the residential population of the area affected by the program).

## Additional Information

Discussions are continuing between local government and State government in Western Australia on the best way to regulate small to medium-sized commercial/industrial premises. Changes to regulations have been enacted and funding mechanisms are being explored. When planning to implement a point source regulation program at the local government level, it is recommended that consultation occur with the Department of Environment to gain the latest information on these initiatives.

Once a best practice point source regulation program is in operation, regulatory agencies may wish to consider an advanced water quality management technique, namely to implement a pollutant trading scheme for a given receiving water. These systems operate by:

- Setting a sustainable load of pollutants for the receiving waters based on scientific studies (e.g. average annual loads for TN and TP).
- Setting discharge standards on regulated industry to reflect the receiving water's sustainable pollutant loads.
- Allowing regulated industries that can reduce their pollutant discharge loads below minimum standards to gain an economic advantage by selling their 'excess discharge credits'. For example, these credits may be bought by a new industry that wants to start discharging some pollutants into the receiving waters, or an industry that finds it more economical to buy these credits than upgrade its own on-site stormwater treatment technology to reduce its discharge loads by similar amounts to meet licence conditions.

Such pollutant trading schemes operate for all sources of water pollution, whether they are stormwater or wastewater.

Enforcement of regulations is usually considered an option of last resort, although experience around the world has demonstrated that it is often needed and is highly effective at managing stormwater-related behaviour in some contexts. If an enforcement program is to be used, the regulatory agency should demonstrate that less litigious alternatives (e.g. education) have been attempted but found to be insufficient. Agencies need to have a sound monitoring and evaluation program to monitor the effectiveness of education programs. For guidelines on how to plan and undertake an evaluation process, see Taylor and Wong (2002d).

## Examples / Case Studies

### Point Source Regulation - Clean Bay Business Program, Palo Alto, California

A good overseas case study involves the Clean Bay Business Program in Palo Alto, California, (reported in Aponte Clarke and Stoner, 2000, and Lehner *et al.*, 1999). Vehicle service facilities (e.g. petrol stations) were regulated through licensing, education, inspections and the provision of incentives for good performance (e.g. attaining the status of a Clean Bay Business, which allowed businesses to access free advertising).



When premises were first inspected under the program in 1992, only 4% of 318 facilities complied with regulations relating to discharges to stormwater and sewer. By the end of 1992, this percentage had risen to 41% and by 1998 it had risen to 94%. In addition, violations of regulations that specifically protect *stormwater* drains fell by 90% between 1992 and 1995. The program also found and eliminated 78 direct discharges to stormwater (e.g. wash-water discharges).

The cost of running the Clean Bay Business Program for each business in 1998 was US\$300 for the first year, followed by an annual fee of US\$150. The cost of running the program for the regulator in Palo Alto was not available.

## Enforcement Program - Brisbane City Council, Queensland

Brisbane City Council is Australia's largest local authority. It has a population of approximately 864,000 and a focus on erosion and sediment control. A multi-dimensional Erosion and Sediment Control Action Plan has been implemented and progressively refined since the late 1990s. The 2001 version of the City's Action Plan included 55 discrete actions/projects to improve erosion and sediment control and minimise the loads of sediment entering the City's creeks, river and bay (Taylor and Wong, 2002c).

The typical annual cost to implement the Erosion and Sediment Control Action Plan in 2001 was approximately \$265,000, including costs associated with employing an Erosion and Sediment Control Officer to undertake assessment of developments, administration of the Action Plan, development of educational products, delivery of training, annual auditing and delivery of intensive media campaigns. The additional cost of enforcement has been a substantial component of the overall cost in recent years (e.g. employment of four full-time enforcement officers). However, by 2001, all of Brisbane's erosion and sediment control activities had become effectively self-funding, as a result of revenue generated through enforcement activities.

Since 1996, erosion and sediment control audits have been regularly undertaken in Brisbane to measure the degree of compliance with legislation by different sectors of the development industry. In early 1999, the widespread use of on-the-spot fines was added to the City's erosion and sediment control strategy, after several years of relying primarily on education. These fines were relatively minor and were primarily intended to be an appropriate enforcement tool for small residential building sites.

For residential building sites in Brisbane, 22.5% of sites audited prior to introducing on-the-spot fines in early 1999 complied with relevant environmental legislation (a weighted average over two audits, involving a total of 54 randomly selected sites). After the introduction and use of on-the-spot fines, the equivalent percentage had increased to 38.8% (a weighted average over four audits, involving a total of 122 randomly selected sites). Over the same period, compliance rates on larger development sites in the City (where small, on-the-spot fines did not act as a significant motivator) fell by 3% - 7% (Brisbane City Council, 2002).

## References and Further Information

- Aponte Clarke, G. and Stoner, N. 2000, 'Stormwater Strategies – The Economic Advantage', *Stormwater 2000-2001 On-line Journal*. Cited at <[www.forester.net/sw\\_0101\\_stormwater.html](http://www.forester.net/sw_0101_stormwater.html)>.
- Brisbane City Council 2002, *Brisbane City Erosion and Sediment Control Compliance Audit # 9 - February 2002*, Brisbane City Council, Brisbane, Queensland. Cited in Taylor and Wong (2002c).
- Curnow, R.C., Spehr, K.L. and Casey D. 2002, 'Keeping it Clean: Latest Developments in Changing Littering Behaviour', *Proceedings of West Australian Local Government Association Conference - Innovation & Integration: Partners in Sustainable Waste Management*, 1-4 October 2002, Perth, Western Australia.

- Fritz, J.D. 2002, Pers. comm., Water Quality Coordinator, City of Chattanooga, Tennessee. Cited in Taylor and Wong (2002c).
- Gaudry, S. and Geier, P. 2000, 'Keep the Soil on the Site Project: A South Creek Project', in *Erosion and Sediment Control, Proceedings of the First South Creek Conference*, Hackney, P.A. (ed), University of Western Sydney. Cited at <[www.uws.edu.au/seewrt/research/publications/scrkpapers/gaudry.pdf](http://www.uws.edu.au/seewrt/research/publications/scrkpapers/gaudry.pdf)>.
- Lehner, P.H., Aponte Clarke, G.P., Cameron, D.M. and Frank, A.G. 1999, *Stormwater Strategies: Community Responses to Run-off Pollution*, Natural Resources Defence Council, New York, New York. Cited at <[www.nrdc.org/water/pollution/storm/stoinx.asp](http://www.nrdc.org/water/pollution/storm/stoinx.asp)>.
- Raine, K. 2004, Ken Raine, Manager, Response and Audit, Department of Environment, internal Department of Environment article (7 April 2004).
- Sturrock, C. 2002, Pers. comm., Senior Pollution Control Officer, Auckland Regional Council, New Zealand. Cited in Taylor and Wong (2002c).
- Swan River Trust 1999, *Swan-Canning Cleanup Program - Action Plan, An Action Plan to Clean Up the Swan-Canning Rivers and Estuary*, Swan River Trust, Perth, Western Australia.
- Taylor, A.C. and Wong, T.H.F. 2002c, *Non-structural Stormwater Quality Best Management Practices - A Literature Review of Their Value and Life-cycle Costs*, Technical Report No. 02/13, Cooperative Research Centre for Catchment Hydrology, Melbourne, Victoria. Available via <[www.catchment.crc.org.au](http://www.catchment.crc.org.au)> and <[www.clearwater.asn.au/infoexchange.cfm](http://www.clearwater.asn.au/infoexchange.cfm)>.
- Taylor, A.C. and Wong, T.H.F. 2002d, *Non-structural Stormwater Quality Best Management Practices - Guidelines for Monitoring and Evaluation*, Working Paper No. 02/6, Cooperative Research Centre for Catchment Hydrology, Melbourne, Victoria. Available via <[www.catchment.crc.org.au](http://www.catchment.crc.org.au)>.
- Taylor, M. 2001 & 2002, Pers. comm., Program Officer - Pollution Prevention, Environmental Protection Section, Brisbane City Council, Queensland. Cited in Taylor and Wong (2002c).
- Water and Rivers Commission 2000, *Swan-Canning Industry Survey Report - Pilot Survey Findings*, Water and Rivers Commission, Perth, Western Australia.