# GREAT BARRIER REEF MARINE PARK AUTHORITY

# POLICY

## SEWAGE DISCHARGES FROM MARINE OUTFALLS TO THE GREAT BARRIER REEF MARINE PARK

**Purpose**: To minimise the potential impact of treated sewage discharges from marine outfalls on the Great Barrier Reef Marine Park.

**Scope:** The Great Barrier Reef Marine Park Authority (GBRMPA) has responsibility for regulating structures and the discharge of treated sewage from marine outfalls within the Great Barrier Reef Marine Park (Marine Park). This Policy has been developed in consultation with the Queensland Government and is complementary with the State policy where it applies to the discharge of treated sewage via marine outfalls to the Marine Park.

### 1. Guiding Principles

1.1. The installation and operation of a marine outfall in the Marine Park requires *permission* from the GBRMPA.

1.2. New marine outfalls may be considered if all other options for the management of treated sewage discharges have been investigated and the use or maintenance of a marine outfall is the most prudent and feasible option.

1.3. If a marine outfall is permitted, it must be constructed and operated in a manner that minimises the potential deleterious impact on the aquatic ecosystems of the Marine Park and be consistent with this Policy.

1.4. The GBRMPA recognises that the appropriate use of reclaimed water and the use of nutrient reduction treatment technologies can significantly reduce the load of nutrients released to the Marine Park. Furthermore, in cooperation with the Queensland Government, the GBRMPA seeks to ensure that all effluent reuse is conducted in an *ecologically sustainable* manner, and in accordance with the Queensland Water Recycling Strategy and the Queensland Guidelines for the Safe Use of Recycled Water.

1.5. The GBRMPA supports and encourages initiatives where sewage treatment plants (STP) within and adjacent to the Marine Park are upgraded in accordance with the 'Wastewater Discharges to Coastal Waters' policy for nutrient removal in the State Coastal Management Plan – Queensland's Coastal Policy.

1.6. The GBRMPA encourages the use of non-chemical disinfection methods for treated sewage discharges prior to its release via marine outfalls to the Marine Park.

## 2. Environmental Impact Assessment

2.1. Applications for a *permission* to operate a marine outfall and/or to discharge treated sewage into the Marine Park will be assessed against Regulation 74(5) of the *Great Barrier Reef Marine Park Regulations 1983* and any future regulation that specifies the application of a nutrient load-based approach.

2.2. Load-based permissions will contain:

i. A maximum load of Total Nitrogen and Total Phosphorus that can be discharged into the Marine Park in a given time period (e.g. annual or month) (assessed on a case by case basis);
ii. Maximum concentration limits to address acute impacts (assessed on a case by case basis); and
iii. A requirement to monitor and report on the load of nutrients and the volume of sewage discharged into the Marine Park.

2.3. Load- based permissions will require application of an Environmental Management Charge as set out in the Regulations.

2.4. Applications will be considered on a site-specific basis, and the assessment will also take into account reuse opportunities, the proximity of sensitive environments, hydrodynamics, and criteria for the protection of aquatic ecosystems in accordance with the ANZECC Water Quality Management Guidelines 2000. A *permission* may include a requirement for environmental monitoring of the receiving environment by the permittee.

2.5. After considering the matters in 2.2 and 2.4, the maximum load of Total Nitrogen and Total Phosphorus that can be discharged via the marine outfall into the Marine Park will be calculated using the allowed volume of sewage discharge to the Marine Park and tertiary equivalent nutrient concentrations of 5 mg/L Total Nitrogen and 1 mg/L Total Phosphorus.

2.6. Marine outfalls should not be constructed:

i. Within 50 metres of a permitted mooring or anchorage; or
ii. Within 1000 metres of aquaculture operations, or an area regularly used for swimming or other water-based activities, unless it can be demonstrated that there will be no adverse impacts on the operation or activities; or
iii. Within 1000 metres of *sensitive environments*, unless it can be demonstrated that there will be no adverse impacts on the protection of aquatic ecosystems.

2.7. For a marine outfall to be approved the GBRMPA will require that:

i. The outfall structure be of a design which optimises diffusion and dispersal; and
ii. The design of the system includes consideration of water depth (deep water is preferred i.e. greater than 10 metres), current velocity, tidal range and proximity to reefs or other *sensitive environments*.

## 3. Permit Matters

3.1 The STP must be under the control of a *qualified operator*.

3.2 All permittees must provide an *Environmental Impact Management Plan* for the operation and management of the STP, including monitoring and contingency

arrangements. It will be a condition on the *permission* that the STP is operated in accordance with its E*nvironmental Impact Management Plan*.

3.3 In the event of contingencies outside of permitted activities, such as operational failures or the discharge of sewage via an existing marine outfall during wet weather conditions that preclude effluent reuse, the operator must comply with their *Environmental Impact Management Plan* and notify the GBRMPA of the incident within 24 hours.

3.4 Where practicable, the monitoring and reporting requirements specified in the permit conditions will be complementary with the Queensland Government to avoid duplication of effort by operators.

3.5 The removal of an existing marine outfall requires *permission* for works in the Marine Park, if the removal is not a condition of an existing marine outfall permit.

# BACKGROUND

## SEWAGE DISCHARGES FROM MARINE OUTFALLS TO THE GREAT BARRIER REEF MARINE PARK

### 1 Preface

The purpose of this Policy is to minimise the potential environmental impacts associated with the discharge of treated sewage via marine outfalls to the Marine Park. The quality of water entering the Marine Park is declining (GBRMPA, 2001) and effective management of the discharge of treated sewage via marine outfalls to the Marine Park will assist in halting and reversing this decline.

Whilst this Policy deals with the discharge of sewage effluent from marine outfalls, the GBRMPA also recognises that the operation of many land-based STPs adjacent to the Marine Park may result in indirect discharges of sewage into the Marine Park. Given that the GBRMPA does not have the regulatory authority to manage these STP discharges on Queensland islands, the GBRMPA seeks to work cooperatively with the Queensland Government in addressing potential environmental impacts on the Marine Park arising from the operation of these STPs.

### 2 Existing Policy

In 1991 the GBRMPA developed the policy *Sewage Discharges from Marine Outfalls into the Great Barrier Reef Marine Park*. This policy set out requirements for a *permission* to discharge treated sewage into the Marine Park and required that effluent discharges meet tertiary[1] or tertiary equivalent[2] standards of treatment by 1 January 1996. Due to compliance difficulties, the *MPA* agreed (5 December 1997) to extend the due date for implementation of tertiary or tertiary equivalent effluent treatment standard to 30 June 1998. The second phase of this policy decision required that operators upgrade their sewage treatment plant to tertiary treatment standard, as defined in the *Great Barrier Reef Marine Park Regulations 1983*, by 1 March 2002 (*MPA* 169/13). Of the six operators discharging to the Marine Park, four opted for full effluent reuse, while the remaining two have generally complied with *MPA* direction in relation to their marine discharge.

As an incentive for operators to meet the tertiary standard, the policy included the introduction of an Environmental Management Charge (EMC) for the discharge of sewage via an outfall into the Marine Park. The EMC stated that a flat fee was to be applied to all discharges, and if the sewage was treated to standard less than tertiary, operators incurred an EMC based on a load-based calculation (concentration x volume).

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[1] The tertiary standard at this time was defined as: the parameters outlined in Regulation 135(2) of the *Great Barrier Reef Marine Park Regulations 1983* and Total Nitrogen less than 4mg/l; Total Phosphorus less than 1 mg/l; oil and grease less than 10 milligrams per litre and the discharge must not produce any slick or visual evidence of oil or grease; and disinfection by methods other than chlorination must be considered in cases where concern exists regarding impact on the environment of disinfection by-products.

[2] The tertiary equivalent standard was when not more than 5% of the annual volume of effluent generated was discharged into the Marine Park at a land based outfall and it met the secondary treatment criteria that was outlined in the Regulations.

## 3 Environmental impact of sewage effluent discharged into the marine environment

Discharges of sewage to the marine environment have the potential to cause:

- *Eutrophication* of coastal waters due to chronic inputs of nutrients and organic matter;
- Impacts associated with the accumulation of toxicants such as heavy metals in marine organisms and sediments;
- Changes to the species composition of marine communities to higher abundances of species that are tolerant to pollution; and
- Long-term degradation of *sensitive environments* such as coral communities and seagrass meadows by chronic exposure to sewage effluent.

The environmental impacts of sewage discharges vary depending on volume, pre-treatment of effluent, effluent dispersal characteristics and location of the effluent discharge point. Further discussion of the effects of sewage discharges on the marine environment is included in Waterhouse and Johnson (Water, August 2002).

The GBRMPA has jurisdiction over marine outfalls located within the Marine Park and any land based facilities on Commonwealth islands within the Marine Park. In the Great Barrier Reef catchment, the majority of sewage effluent from coastal settlements is discharged to waterways upstream of the Marine Park but the discharge still has the potential to impact on the Marine Park. Most of these facilities (those with a capacity greater than 21 *equivalent persons)* are licensed by the Queensland Environmental Protection Agency (EPA). Smaller systems are regulated by the Department of Local Government and Planning (DLGP) and local government and need to conform to standards as set out in the *Plumbing and Drainage Act 2002*. In some locations, for example coastal sandy soils, effluent seepage from these smaller systems, particularly those that only provide primary effluent treatment, may not provide the level of effluent treatment necessary to protect the receiving waters of the Marine Park. Furthermore, for land irrigation, the absorption capacity of the receiving environment and soil characteristics must be considered to minimise potential deleterious impacts on the marine environment as a result of effluent discharge, seepage through groundwater, and/or runoff from irrigation areas. The GBRMPA seeks to work cooperatively with the Queensland Government in managing these situations.

Ongoing discussion with the Queensland Government, industry and stakeholders has highlighted the need for a more flexible approach to sewage management in the Marine Park. In particular, standards that allow for seasonal fluctuations in weather and effluent generation and that take into account the capacity of the receiving environment to accept these discharges. It is therefore proposed to adopt a load-based approach, with the benefits of such an approach including improved environmental outcomes, encouragement of continual improvement, provision of ongoing reuse opportunities, greater management flexibility and further reinforcement of the approach that the Queensland Government is proposing. It is proposed that the load-based approach will be reinforced with a complementary load-based calculation for the EMC, which will act as a financial incentive to encourage minimisation of nutrient loads to the Marine Park from marine outfalls, and consequently, to encourage effluent reuse. Potential changes to EMC

will be the subject of future consultation with stakeholders.

## 4 Other GBRMPA Policies

The GBRMPA has Policies on Environmental Impact Management and Structures.

## 5 Legislation, Regulations, Policies and Codes of Practice

The discharge of treated sewage via marine outfalls into the Marine Park must only proceed after the required approvals from all relevant agencies (including QEPA, QDLGP) are obtained. Relevant legislation includes (but is not limited to):

Commonwealth

*Great Barrier Reef Marine Park Act 1975*

The objective of this Act is to make provision for the establishment, control, care and development of a marine park in the Great Barrier Reef Region. Section 38B outlines that under a zoning plan a zone may be used for a particular purpose with the *permission* of the GBRMPA.

*Great Barrier Reef Marine Park Regulations 1983*

Regulation 135 defines the effluent standard applied in this Policy. The criteria for the consideration of applications for *permission* to discharge treated sewage via marine outfalls into the Marine Park are set out under Regulation 74(5) and Regulation 90 for unzoned areas. Regulation 159 outlines the Environmental Management Charge payable by the holder of *permission* for the operation of a marine outfall to discharge treated sewage effluent via marine outfalls into the Marine Park.

*ANZECC Water Quality Management Guidelines 2000*

These Guidelines provide trigger levels for the protection of aquatic environments, including tropical estuarine and marine environments.

*Environment Protection and Biodiversity Conservation Act 1999*

New sewage discharge outfalls that will have or are likely to have a significant impact on a matter of national environmental significance should be referred to the Australian Government Department of the Environment and Heritage to determine if the action requires consideration under this legislation (website address - www.deh.gov.au/epbc).

Queensland

*Plumbing and Drainage Act 2002 (DLGP)*

This Act provides the regulatory framework for the management of sewerage facilities with a capacity of 20 or less *equivalent persons.* The technical requirements and effluent criteria are defined in the On-site Sewerage Code.

*Environmental Protection Act 1994*

Under the *Environment Protection Act 1994*, an Environmental License or Approval is

required from the EPA for an environmentally relevant activity (ERA). The *Environmental Protection Regulation 1998* defines that a sewage facility with a capacity of 21 or more *equivalent persons* is an ERA. The *Environmental Protection (Water) Policy 1997* specifies the environmental management requirements for wastewater releases to surface water, such as outfall specifications and characteristics of the receiving aquatic environment.

*Water Act 2000 (DNRM)*

This Act provides the regulatory framework for the provision of sewerage services in Queensland and prohibits the discharge of certain substances into a sewerage system.

*Integrated Planning Act 1997*

This Act controls most new development activities within Local Government boundaries through its Integrated Development Assessment System (IDAS) and Local Government Planning Schemes. This system considers potential impacts on the environment, local infrastructure and neighbouring properties, during both construction and operational phases. Development approvals may be required for a material change of use (assessment for an ERA), material change of use (assessment against a planning scheme) or operational works (assessment against a planning scheme).

*Marine Parks Act 1982*

Under this Act, the *Marine Parks Regulations 1990* make it an offence to discharge waste into a State Marine Park unless a *permission* is held in accordance with the purpose of a zone or designated area outlined in a zoning plan.

*State Coastal Management Plan 2001 (EPA)*

For coastal waters where nutrients have been identified as a problem, it is set out that sewage treatment facilities discharging into these coastal waters should include appropriate nutrient removal by 2005 (discharge from islands) or 2010 (discharge from the mainland). *Note*: The GBRMPA has identified inshore areas from Port Douglas to Gladstone as an area of high risk from the impact of nutrients and suggested the need for significant reductions in nutrient discharges from the Daintree River in the north to the Burnett River in the south (Haynes 2001; GBRMPA 2001).

## 6 Definitions and Glossary

*Environmental Impact Management Plan* means a plan, which includes identification of potential environmental impacts, how activities will be managed to reduce these impacts, a monitoring program, emergency response plans, and any relevant issue-based plans, as approved by the GBRMPA.

*Ecologically sustainable* (development) means using, conserving and enhancing the community's resources so that the ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased.

*Eutrophication* means an environmental adverse perturbation caused by an excess rate of supply of organic matter, including primary production (Crouzet *et al*. 1999).

*Equivalent person* means the number of persons who would contribute the same quantity and/or quality of domestic sewage as the establishment or industry being considered.

*MPA* means the Great Barrier Reef Marine Park Authority as established under the *Great Barrier Reef Marine Park Act 1975*.

*Permission* means a permission granted by the GBRMPA under the *Great Barrier Reef Marine Park Regulations 1983* to discharge sewage from a marine outfall into the Marine Park.

*Qualified operator* means an operator that has obtained a certificate in operation for STPs from a Queensland TAFE College, or equivalent training or experience as approved by the GBRMPA.

*Sensitive environments* are areas that contain populations or assemblages of organisms, or habitats, that are considered to have significant conservation and/or cultural heritage values. Examples may include Dugong Protection Areas, fish spawning aggregation sites, seagrass beds, breeding areas, and diverse, rare or very old coral assemblages.

## 7 Consultation

This Policy has been developed in consultation with representatives from Government agencies (Environmental Protection Agency, Department of Natural Resources and Mines, Department of Local Government and Planning), the Australian Government's Department of the Environment and Heritage, Queensland Local Government representatives, the Local Government Association of Queensland, the Queensland Water Directorate and other interested stakeholders. In developing this Policy the GBRMPA also sought public comment for a period of 8 weeks and received a total of 15 submissions in response to this request. The Policy has been reviewed and updated in response to the submissions.

## 8 References

ANZECC, (2000). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*, National Water Quality Management Strategy, 'Australia and New Zealand Environment and Conservation Council' and 'Agriculture and Resource Management Council of Australia and New Zealand'.

GBRMPA (2001). Great Barrier Reef Catchment Water Quality Action Plan. Great Barrier Reef Marine Park Authority, Townsville.

Haynes, D. (2001) (ed). Great Barrier Reef Water Quality: Current Issues. Great Barrier Reef Marine Park Authority, Townsville.

Waterhouse, J. and Johnson, J. (2002). Sewage Discharges in the Great Barrier Reef Region.

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