

# SWAN RIVER TRUST

## Guidelines for dewatering activities in the Swan Coastal Plain

Waterways Guidelines  
No 7  
August 1994





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# PART 1

## REASON FOR THE GUIDELINES

A wide variety of activities in the Perth Metropolitan area affect the water quality of the Swan and Canning Rivers through their inputs to the rivers via stormwater drainage. Dewatering activities in the Swan Coastal Plain can significantly affect the water quality of the rivers especially when the discharge of contaminated groundwater enters the existing drainage network. Discharges can affect water quality and the rivers' plant and animal life (biota) in a number of ways:

- Poor quality groundwater from dewatering operations can result in low dissolved oxygen levels (usually less than 50% saturation), which can cause stress to fish and other aquatic animals.
- Discharges from dewatering operations can have high concentrations of suspended solids (turbidity) and discolouration which can have a number of adverse effects on plants and animals. These include physical abrasion or clogging of organisms, especially of their sensitive surfaces such as gills. Deposition of sediment on the river bottom can inhibit spawning in some species of fish and interfere with benthic (bottom dwelling) organisms. In some instances, the concentration of suspended colloidal (clayey) materials will not settle and can reduce the amount of light penetrating the water, resulting in decreased photosynthetic activity by plants such as seagrasses, thus affecting plant growth.
- Depending on the previous history of a site, the groundwater may be contaminated with nutrients, heavy metals or other toxic substances. Nutrients feed plant growth and contribute to the occurrence and intensity of algal blooms in the river. Toxic substances discharged into the river enter the food chain and can affect breeding in animal populations and accumulate in fish and other edible species above health limits for human consumption.

The Swan River Trust receives numerous complaints each year about dewatering operations causing discolouration and turbidity in the receiving water body. Most dewatering practices in the Swan Coastal Plain discharge to rivers via the extensive stormwater drainage network. The Swan River Trust has adopted these Guidelines in order to manage future dewatering activities where the discharge enters the Swan or Canning Rivers either directly or via the drainage system. These Guidelines will affect government agencies, industries and individuals responsible for dewatering discharges, and may lead to additional cost to contain or treat the water prior to disposal.

Dewatering discharge cannot be licensed under Part V of the Environmental Protection Act (1986) because the sites are not prescribed premises under the definition of that Act. The Guidelines do not cover development of a previously known contaminated site, which may be required to be referred to the Department of Environmental Protection for assessment.

The purpose of the Guidelines is to establish a basis for attaining and maintaining a level of water quality sufficient to protect the identified environmental values of the waters and biota of the Swan and Canning Rivers. Water quality criteria have been developed in order to achieve this. The Swan River Trust will require all dewatering sites discharging into drainage that enters

the rivers to meet the water quality criteria set out in these Guidelines. Unlike Schedule 7 of the EPA Bulletin 103 where specific water quality criteria are defined for the maintenance and preservation of the aquatic ecosystem, these guidelines refer to the acceptable quality of wastewater being discharged.

## PART II

### DEFINITIONS

#### CRITERIA

The scientific yardstick upon which a decision or judgement may be made concerning the wastewater being discharged and its impact on the environmental value of the rivers

#### BACKGROUND LEVEL

The level of water quality (measured in a manner and at the location specified by the Trust) in the surface waters outside the influence of the waste discharge.

#### GROUNDWATER

The water beneath the land surface which is contained in aquifers subject to the dewatering operation.

#### GUIDELINE AREA

The area in which these Guidelines shall be observed.

#### SURFACE WATERS

The surface waters of the guideline area including any river, stream, creek, canal, open drain, swamp, channel, lake, lagoon, tidal waters, natural or artificial watercourse, excluding lagoons or pondage used exclusively for the purpose of waste treatment.

#### RECEIVING WATERS

The Swan and Canning Rivers which may receive wastes.

#### WASTEWATER

Water carrying waste materials (dissolved or suspended) which is discharged, emitted or deposited in the environment in such volume, constituency or manner that it may cause an alteration of the waterways.

#### TOXICANT

A substance which is poisonous to living things.

#### MIXING ZONE

An area for the mixing of wastes with the receiving waters.

#### ENVIRONMENTAL VALUE

Environmental value of the rivers can be defined as a designated use of a specified part of the environment which requires protection from the effects of wastewater discharges, emission and deposits.

## PART III

### GUIDELINE AREA

The Guidelines apply to all surface waters within the catchments of the Swan and Canning Rivers that are connected to the waters (rivers and estuaries) within the Swan River Trust Management Area (see Figure 1 on page 4).

## PART IV

### GUIDELINES

Any operation that extracts groundwater and discharges the wastewater into surface drainage that connects to the Swan and Canning river system should comply with these Guidelines.

Discharged wastewaters shall meet the water quality criteria in Part V of the Guidelines. It is the responsibility of the occupier, land owner and or the developer to ensure that the discharged wastewaters meet the water quality criteria and to take measures to prevent pollution or degradation of the receiving water body to the satisfaction of the Trust. Variance from the water quality criteria must be approved by the Swan River Trust in writing prior to the commencement of the operation.

Where dewatering discharges do not meet the water quality criteria, the developer/occupier shall treat the wastewaters to the satisfaction of the Trust prior to discharge to surface drainage connecting to the river.

An inspector from the Swan River Trust may direct any dewatering operation to cease, if in the opinion of the Trust or its officers the guidelines have been breached.

## PART V

### WATER QUALITY CRITERIA

INDICATOR	CRITERIA
<b>Dissolved oxygen</b>	The concentration of dissolved oxygen in the wastewater shall not be less than 4.5 mg/L or 45% saturation (which ever is higher).
<b>pH</b>	Wastewater discharges shall not cause the background pH range in the receiving waters to vary by more than + 1.0 units nor fall outside the range of 5 - 9.
<b>Temperature</b>	Wastewater discharges shall not cause the water temperature in the mixing zone to vary by more than 1°C from background temperatures in the receiving waters.

#### Nutrients

Wastewater discharges shall not add nutrient substances or other growth stimulants in quantities sufficient to cause excessive or nuisance algal or other aquatic plant growth in the receiving waters. The levels of nitrogen and phosphorus in the wastewater discharge shall not exceed the following concentrations:-

Total Phosphorus - 0.5 mg/L  
Total Nitrogen - 5.0 mg/L

#### Suspended Solids

Wastewater discharges shall be treated to reduce the suspended solids concentration to less than 80 mg/L.

#### Odours and Colours

Wastewater discharges shall not produce objectionable odours or colours in the receiving waters.

#### Floatable Matter

Wastewater discharges shall not cause visible floating oil, foam, grease, scum, litter, or other objectionable matter in the receiving waters.

#### Settleable Matter

Wastewater discharges shall not cause the deposition of settleable matter which may adversely affect the visual, recreational and ecological values of the receiving waters.

#### Salinity

The wastewater discharge shall not cause the salinity of the water in the mixing zone to vary by more than 10% from the background salinity levels in the receiving water.

#### Toxicants

The operator shall be required to undertake toxicity analysis of the discharge wastes. The level of toxicants shall not exceed the desirable concentrations in the ANZECC\* guidelines for the protection of aquatic ecosystems. (However in applying these guidelines, the rate of dilution and dispersion of toxicants shall be considered).

\*Australian and New Zealand Environment and Conservation Council

mg : milligram  
L : litre

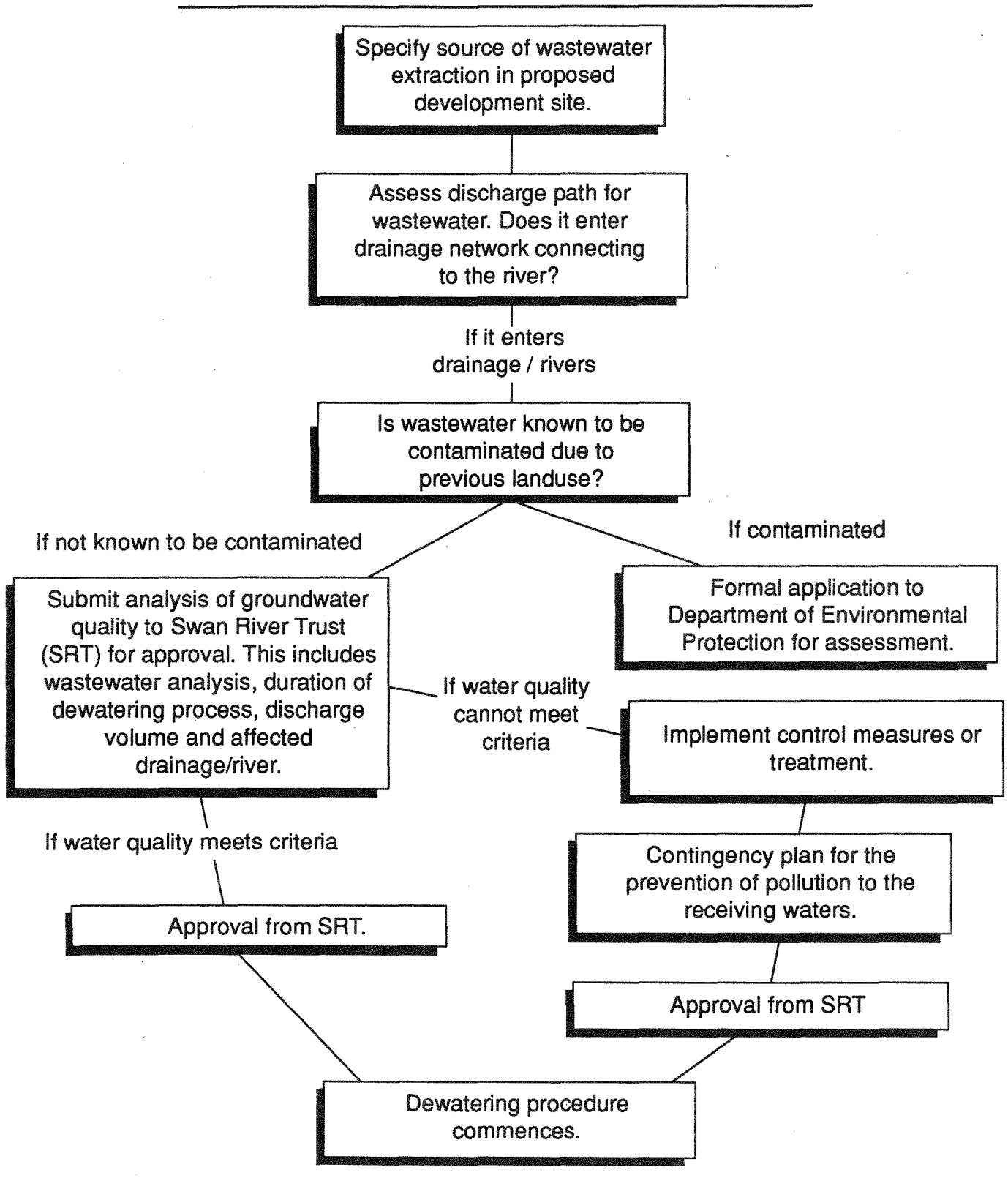
# PART VI

## DEWATERING PROCEDURE

The general principle of the Guidelines is to assist planners, engineers and developers to prepare contingency plans for any dewatering procedures on development sites. Developers should be made aware of the Guidelines when applying for a building licence from the Local Government Authority. This will ensure that such activities will be taken into consideration during the initial planning stage.

The landowner, developer or any person responsible for site dewatering operations shall ensure that the extracted groundwater discharge to surface complies with the Guidelines. An analytical report of the groundwater quality shall be forwarded to the Trust for approval prior to commencement. The time frame for this process is two weeks to allow close consultation with the approval agency.

The flow chart shows the consultative procedure between the proponent and the Swan River Trust when dealing with specific dewatering activity in the Swan Coastal Plain.



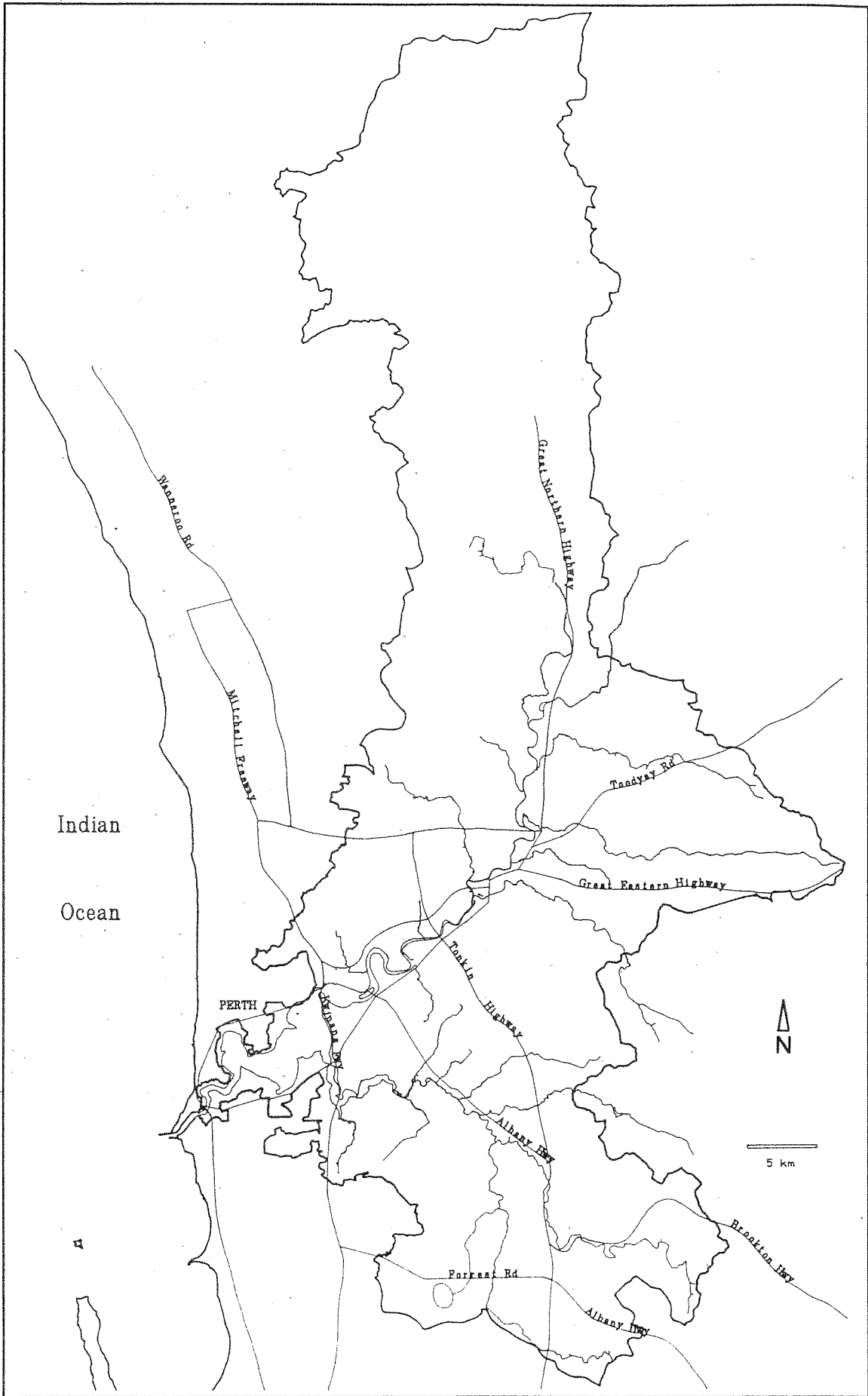


Figure 1: The guideline area.



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## FURTHER READING

Australian and New Zealand Environment and Conservation Council (1992) *Australian water quality guidelines for fresh and marine waters*.

Department of Conservation and Environment (1981) *Water quality criteria for marine and estuarine waters of Western Australia*. Department of Conservation and Environment, Western Australia, Bulletin No 103.

Environmental Protection Authority, Victoria (1981) *Draft State Environment Protection Policy: the surface waters of the western metropolitan region*. EPA Victoria W-31A.

Government of Victoria (1975) *State Environment Protection Policy*. Victorian Government Gazette No 25.

Government of Victoria (1988) *State Environment Protection Policy - Waters of Victoria*. Victorian Government Gazette No S 13.

State Pollution Control Commission, New South Wales (1990) *Water quality criteria for New South Wales*. Discussion paper for State Pollution Control Commission.

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## RELATED POLICY

Swan River Trust (1993) *Swan River Trust Policies, Development DE6 (Dewatering policy)*.

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## WASTEWATER ANALYSIS LABORATORIES

Chemistry Centre of Western Australia 125 Hay Street, East Perth, WA 6004  
Phone: (09) 325 5544 Fax: (09) 325 7767

or any National Association of Testing Authorities (NATA) registered wastewater laboratory.  
Check in the Yellow Pages under Wastewater Analysis.

Prepared by S Wong

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## **GUIDELINES IN THIS SERIES**

1. Local government and waterways management - considerations in the planning and management of land near waterways.
2. Guidelines for the preparation of foreshore management plans - a guide for proponents (Swan River Trust).
3. Guidelines for the development of a waterways protection precinct (in preparation).
4. Guidelines for residential wastewater disposal (in preparation).
5. Guidelines for the preparation of foreshore management plans in waterways management areas - a guide for proponents.
6. Guidelines for the preparation of waterways management planning documents - a guide for community groups, local government and the community.