



Department of
Parks and Wildlife



CORPORATE POLICY STATEMENT NO. 50

PLANNING FOR DEWATERING AFFECTING THE SWAN CANNING DEVELOPMENT CONTROL AREA

March 2017

1. OBJECTIVE

The objective of this policy is to ensure that dewatering associated with land use, development, and other permitted works, acts and activities in or affecting the Swan Canning Development Control Area (DCA):

- do not result in further water quality degradation of the Swan Canning river system, and where possible, improve the situation; and
- protect and enhance the ecological health, community benefits and amenity of the river system.

2. SCOPE

This policy provides direction and guidance regarding how the Department of Parks and Wildlife (the department) assesses development and permit applications involving dewatering in accordance with the *Swan and Canning Rivers Management Act 2006* (SCRM Act) and the *Swan and Canning Rivers Management Regulations 2007* (SCRM Regulations). It also provides direction and guidance regarding how the department provides advice on: proposed development and land use changes in accordance with the Metropolitan Region Scheme (MRS); water management plans and strategies prepared in accordance with *Better Urban Water Management* (WAPC, 2008); and dewatering management plans prepared as conditions of approval. This includes proposals in and adjacent to the DCA as well as those that may not immediately adjoin the DCA but that may affect waters in the Swan Canning river system through surface and/or groundwater connections.

This policy provides guidance to proponents and other decision-making authorities regarding the department's position in relation to dewatering. It recognises and refers to other relevant State government policies and provides additional guidance relevant to the Swan Canning river system.

In this policy, the Swan Canning river system means the Swan, Canning, Helena, Southern and Avon (to Moondyne Brook) rivers and includes the adjacent and nearby land areas within the DCA.

All guidance documents identified in this policy should be taken to refer to the most current published version.

3. CONTEXT

Dewatering, the process of removing groundwater from an aquifer to lower the water table, particularly during construction and development, is a widespread practice in areas with a shallow groundwater table such as many areas of the Swan Canning catchment.

Construction dewatering usually involves the pumping or draining of groundwater from construction sites to lower the water table and enable subsurface excavation for foundations, sewerage, elevator shafts, car parking, swimming pools or other below ground infrastructure. Dewatering can also involve pumping or draining of surface water, such as ponded water from rainfall events.

Post-development continuous dewatering of below-ground structures (e.g. basements, car parks, traffic tunnels etc.) may also occur, though is less common in new buildings due to advances in development design and construction methods.

Unless dewatering is managed appropriately, dewatering and disposal of the extracted groundwater, or tailwater, can have harmful effects on the environment and waterways. Depending on previous land uses and the soil and groundwater characteristics of a site, dewatering can lead to environmental issues such as:

- mobilisation of nutrients and contaminants from groundwater;
- mobilisation of acidity, arsenic, heavy metals or nutrients from draining or disturbing acid sulfate soils;
- depletion of oxygen levels in receiving waters;
- excessive changes to water levels or flows in nearby groundwater dependent ecosystems, wetlands and waterways; and
- odour, discolouration, turbidity and sedimentation in waterways.

Dewatering also has the potential to affect nearby water supply sources such as bores, wells or surface water through lowering of the water table, intrusion of salinity, acidity and/or mobilisation of contaminants.

Dewatering can be difficult to manage. There is often a high degree of unpredictability regarding groundwater extraction rates and water quality. Treatment of dewatering effluent can be difficult on sites with space constraints, especially when the rate of discharge is high and there are elevated levels of nutrients or contaminants in the water. Once dewatering starts, slowing or stopping the pumping to address issues that may arise can sometimes be impractical, costly or unsafe. Dewatering requirements should therefore be considered early-on in the planning process.

High volumes and rates of dewatering discharged to the river can cause abnormal changes to the natural flow regime and supply surplus nutrient concentrations and loads to the river. The Swan Canning river system is under pressure from high nutrient levels, which lead to algal growth, low oxygen levels, fish kills and loss of biodiversity. Mismanagement of dewatering discharge can lead to high costs for the community, including the financial, environmental and social costs of mitigating nutrient mobilisation to estuaries and rivers.

The department is committed to ensuring that the Swan Canning river system is adequately protected from the direct and indirect environmental impacts of dewatering activities, while recognising that best management practice for dewatering can be challenging and complex.

The department will have due regard for the *Swan Canning River Protection Strategy* and its subsidiary documents, such as the *Land and Waterway Use Plan* (in preparation) and *Swan River System Landscape Description* (Swan River Trust, 1997) when assessing proposals made under the SCRM Act.

4. LEGISLATION

Under section 70 of the SCRM Act all development in the DCA is subject to approval and control. The term 'development' includes: physical development; any material change of use of land or waters; and any act or activities defined as development under the SCRM Regulations.

In undertaking its statutory planning role, the department typically assesses and provides advice and recommendations to the Minister for Environment regarding development in the DCA. The CEO of the department is authorised to approve certain classes of development in the DCA under section 85. The CEO is also responsible for approving other works, acts and activities declared not to constitute development or controlled for Riverpark and DCA protection under the SCRM Regulations, under a permit.

In performing its statutory planning functions, the department assesses and provides advice and recommendations to the Western Australian Planning Commission (WAPC) and local governments on a range of land use, subdivision and development proposals adjoining and affecting the DCA. These proposals are subject to control under the MRS and are prepared in accordance with the *Planning and Development Act 2005*. The department assesses and provides advice on development applications prepared in accordance with Clause 30A of the MRS under delegated authority of the Swan River Trust.

In performing its statutory planning functions, the department also assesses and provides advice to other agencies, including the Metropolitan Redevelopment Authority, on dewatering proposals which may impact on waters within the DCA.

5. POLICY

In undertaking its statutory planning roles and functions under the SCRM Act and MRS the department will:

Justification and site context

5.1 Require applications to demonstrate the necessity for the dewatering and provide site-specific details including:

- previous land uses and potential for soil or groundwater contamination;
- groundwater quality and levels;
- soil types and hydrogeology;
- ecological, resource, recreational or amenity values near the dewatering site or any planned discharge point;
- proposed dewatering, treatment and disposal methods, including the location and area required for any associated infrastructure;
- dewatering commencement date, duration, frequency, flow rate and volume; and
- profile and radial extent of the cone of depression (i.e. watertable draw down area).

The need for dewatering and management of the associated tailwater has the potential to affect development design and extent of below-ground infrastructure and should be considered early-on in the planning process. Where relevant, preliminary information addressing dewatering should be incorporated into any water management plan or strategy prepared in accordance with *Better Urban Water Management* (WAPC, 2008), commensurate with the scale and nature of the planning proposal. Where multiple sites within the same locale are dewatering, consideration will be given to the cumulative impacts of the activity when assessing new proposals.

Tailwater discharge

5.2 Only support discharge of dewatering tailwater to the river system, either directly or indirectly (e.g. via a stormwater drain), where it has been demonstrated that:

- dewatering has been minimised through development design and/or construction methodology, for example by limiting subsurface excavations or using impermeable membranes around below-ground structures;
- on-site and alternative tailwater disposal options have been utilised individually or in concert to the fullest extent practicable, including but not limited to:
 - a) groundwater recharge (e.g. infiltration, re-injection);
 - b) re-use (e.g. irrigation, dust control, wash-down);
 - c) storage and evaporation;
 - d) sewer; and
 - e) off-site transport, storage and disposal;

provided the water quality is suitable for its intended use (on-site treatment may be required) and other relevant approvals have been received, including but not limited to the Department of Health, local government or sewerage service provider; and
- water quality of the groundwater and tailwater discharge (pre-and post-treatment) are monitored and the tailwater discharged to the river (directly or indirectly through a stormwater drain) meets the relevant indicative criteria provided in Appendix 1.

Alternative discharge criteria may be proposed by the proponent for assessment, supported by a detailed site-specific management framework and baseline data, in accordance with the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC & ARMCANZ, 2000).

5.3 Only support the use of mixing zones as a last resort for the management of controlled discharges of soluble, non-bioaccumulatory toxicants whose impacts are primarily related to their concentration where:

- effective discharge controls are applied that minimise both the concentration and total mass of contaminants, combined with in situ dilution and treatment;
- impacts are effectively contained within the mixing zone;
- the combined size of the zones is small; and
- the values and uses of the broader river system are not compromised.

Removal of accumulated contaminants in sediments in any mixing zone is likely to be required. The use of mixing zones will not be supported for managing the discharge of nutrients, bio-accumulatory or particulate substances.

Management and monitoring

- 5.4 Where relevant, recommend the preparation and implementation of a management and monitoring plan, that addresses how the dewatering is to be managed to ensure protection of the ecological health, community benefit and amenity value of the river system. The plan should address the provisions of this policy and include proposed contingency measures in the event that the discharge criteria are not met.

For physical and chemical stressors, the median of the test site data should be compared with the discharge criteria (except if the concentration is high enough to cause acute toxicity). For toxicants, the 95th percentile of the test site data should be compared with the discharge criteria (except if the concentration is high enough to cause acute toxicity).

If test values are less than the trigger values presented in Appendix 1, there is a low risk of adverse biological effects and no further action is required, except for regular monitoring.

If test values are higher than the trigger values, there is an increased risk that adverse biological effects will occur, and management/remedial action or further ecosystem specific investigation is required.

The department may require dewatering discharge to cease immediately if test results in the receiving environment indicate deterioration of water quality or deleterious impacts on ecology.

- 5.5 Require water quality monitoring to be undertaken in accordance with the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC & ARMCANZ, 2000) and the Department of Water's standard operating procedures for water sampling.

Acid sulfate soils and contaminated sites

- 5.6 Recommend that dewatering is managed to avoid environmental impacts from the disturbance of acid sulfate soils. The WAPC's *Acid Sulfate Soils Planning Guidelines* identify matters that need to be addressed at various stages of the planning process to ensure that the subdivision and development of land containing acid sulfate soils is planned and managed to avoid potential adverse effects on the natural and built environment. The Department of Environment Regulation (DER) also has guidelines to assist with the identification, investigation and management of soil and water in acid sulfate soil landscapes.
- 5.7 Recommend that land use constraints such as elevated nutrient or contaminant levels are addressed by proponents when dewatering is proposed, regardless of the site's classification under the *Contaminated Sites Act 2003*.

Adequate site investigations are to be undertaken before dewatering commences to determine the appropriate water quality management measures for the site and to establish whether previous land use practices have resulted in soil, groundwater or surface water contamination. Sites that are suspected to be contaminated or are found to be contaminated should be reported to the DER in accordance with the requirements of the *Contaminated Sites Act 2003*. Subsequent remediation of the site may be required prior to land use changes or development being considered.

Continuous post-development dewatering

- 5.8 Require applications that include continuous post-development dewatering to provide information addressing the provisions of this policy proportionate to the level of risk associated with the proposal. Wherever possible, continuous post-development dewatering should be avoided or minimised through development design and construction methods.
- 5.9 Where continuous dewatering is proposed, recommend groundwater be treated (either at the inflow or at the outlet) prior to discharge to the surface water system. The treatment proposed should be suitable for the contaminants and/or nutrients present or expected in the groundwater.

6. POLICY IMPLEMENTATION STRATEGIES

To implement this policy the department will:

Swan River Trust

- 6.1 Consult with the Swan River Trust when assessing proposals under Part 5 of the SCRM Act and preparing strategic documents and corporate policies and guidelines.
- 6.2 Implement delegated powers from the Swan River Trust under the Metropolitan Region Scheme.
- 6.3 Keep the Swan River Trust informed of development, including permitted works, acts and activities approved within the DCA.

Planning authorities (Department of Planning, local governments and redevelopment authorities)

- 6.4 Regularly consult with relevant planning authorities when providing advice on planning proposals and assessing development and other permitted works, acts and activities in and around the DCA.

Referral agencies

- 6.5 Ensure there is a clear understanding of the role of referral agencies, how their advice will be considered in assessing proposals and 'clearing' conditions of approval.

Assessment of proposals

- 6.6 Seek appropriate advice when assessing proposals. Advice may be sought from planning authorities, referral agencies, contractors, consultants, or other stakeholders and from the department's specialist branches and regional locations. Where expertise is available from within the department it will be utilised prior to seeking advice from external parties.
- 6.7 Ensure relevant staff, contractors and consultants have the necessary qualifications, skills and expertise when assessing planning and development proposals.

6.8 Maintain records of discussions, advice and decisions when undertaking the department's statutory planning roles with respect to the SCRM Act in accordance with the *State Records Act 2000*.

7. CUSTODIAN

Director Rivers and Estuaries.

8. PUBLICATION

This policy will be made available on the department's website and intranet.

9. KEY WORDS

Swan, Canning, river, Development Control Area, dewatering, construction dewatering, continuous dewatering, tailwater, water quality, discharge criteria, mixing zone, dewatering management plan, trigger value, acid sulfate soil, contaminated site.

10. REVIEW

Further reviews will be at the discretion of the Director General, with a review undertaken after five years from the date it is signed.

11. SWAN RIVER TRUST ENDORSEMENT

Endorsed by



Hamish Beck
CHAIRMAN

Date: 7 March 2017

12. DIRECTOR GENERAL APPROVAL

Approved by



Jim Sharp
DIRECTOR GENERAL

Effective date: 7 March 2017

INDICATIVE DISCHARGE CRITERIA

The following trigger values are to be used to assess water quality for dewatering operations involving the discharge of tailwater to the river system either directly or through a stormwater drain. Trigger values are concentrations or indicators that, if exceeded, indicate a potential environmental problem and so 'trigger' a management response.

Parameter	Trigger value
Nutrients	Default trigger values for physical and chemical stressors for south-west Australia for slightly disturbed ecosystems identified in ANZECC & ARMCANZ 2000 ¹ (Table 3.3.6)
Total iron	>1.0 mg/L ²
Total aluminium	>0.15 mg/L ²
All other toxicants	Default trigger values for toxicants at 95% level of protection identified in ANZECC & ARMCANZ 2000 ¹ (Table 3.4.1). In the absence of estuarine guidelines, the lowest of either the freshwater or marine guideline levels should be applied
pH	Should remain within the range 6.5 to 8.5 and within 1 pH unit of the receiving environment ²
Odours and colours	No objectionable odours or visible colour changes in the receiving waters ^{2,3}
Floatable matter	No visible floating oil, grease, scum, litter or other objectionable material ³ . No discharge of flocculent or floc formation in the receiving environment ²
Settleable matter	No deposits which adversely affect the recreation or ecosystem values of the receiving waters ³
Turbidity	Not to vary more than 10% from the background level (in the receiving environment) or cause a visible reduction in light penetration of receiving waters ³
Temperature	Not to vary more than 2°C from the background level (in the receiving environment) ^{2,3,4}
Salinity	Not to vary more than 10% from the background level in the receiving environment (concentrations less than the receiving environment are generally acceptable if unlikely to cause detrimental impacts) ^{2,3,4}
Dissolved Oxygen	Default trigger values for physical and chemical stressors for south-west Australia for slightly disturbed ecosystems identified in ANZECC & ARMCANZ 2000 (Table 3.3.6)
Chlorophyll-a	Default trigger values for physical and chemical stressors for south-west Australia for slightly disturbed ecosystems identified in ANZECC & ARMCANZ 2000 (Table 3.3.6)
Phytoplankton	Interim phytoplankton trigger values for microalgae ⁵
Pathogens	As per NHMRC 2008 ⁶

1. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC & ARMCANZ, 2000)
2. *Treatment and management of soil and water in acid sulfate soil landscapes* (DER, 2015)
3. Derived from *SRT/DE6 Dewatering* (SRT, 2001)
4. The weekly physical-chemical profiles of the Swan Canning river system are available from the website <https://www.dpaw.wa.gov.au/management/swan-canning-riverpark/ecosystem-health-and-management> and can be used (on the advice of the department) to establish the 'background levels' referred to for temperature and salinity.
5. Set by the department in consultation with the Department of Water and Health and reviewed annually. Available upon request.
6. *Guidelines for Managing Risks in Recreational Water* (NHMRC, 2008)