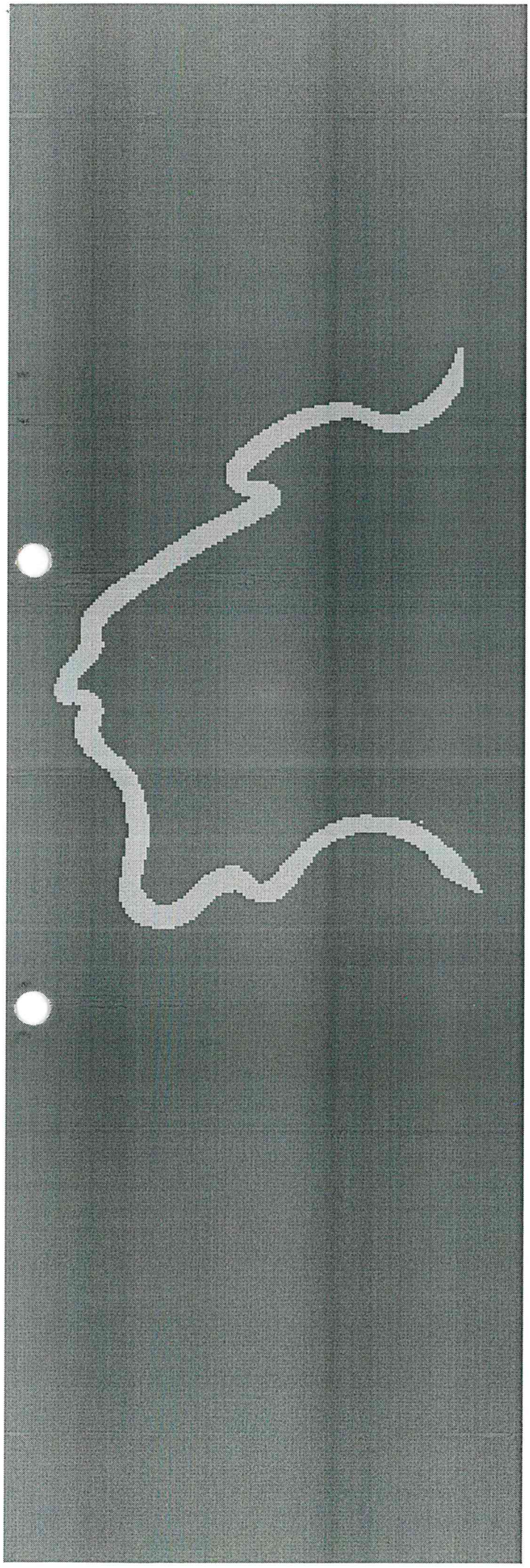

Environmental Protection Authority

Guidance for the Assessment of Environmental Factors

(in accordance with the Environmental Protection Act 1986)

Management of Surface Run-off from Industrial and Commercial Sites

No. 26

Draft Guidance

March 1999

Western Australia

FOREWORD

The Environmental Protection Authority (EPA) is an independent statutory authority and is the key provider of independent environmental advice to Government.

The EPA's objectives are to protect the environment and to prevent, control and abate pollution. The EPA aims to achieve some of this through the development of Guidance Statements for the environmental impact assessment (EIA) of proposals.

This document is one in a series being issued by the EPA to assist proponents, consultants and the public generally to gain additional information about the EPA's thinking in relation to aspects of EIA process. This series provides the basis for EPA's evaluation of and advice on development proposals subject to EIA. The Guidance Statements are only a small part of the overall process of achieving an environmentally acceptable proposal. Consistent with the notions of continuous environmental improvement and adaptive environmental management, the EPA expects proponents to take all reasonable and practicable measures to protect the environment and to use this Guidance as a minimum requirement rather than a maximum.

The guidance and management criteria presented in sections 3 and 4 of the document will be used by the EPA in considering any industrial or commercial proposal with the potential to cause stormwater runoff pollution.

This document has the status "Draft", which means that it has been endorsed by the EPA for release for "stakeholder review" for four weeks.

I am pleased to release this document and encourage you to comment on it.

Bernard Bowen
CHAIRMAN
ENVIRONMENTAL PROTECTION AUTHORITY

22 March 1999

ENVIRONMENTAL PROTECTION AUTHORITY
GUIDANCE FOR THE ASSESSMENT OF ENVIRONMENTAL FACTORS

DRAFT GUIDANCE No. 26: MANAGEMENT OF SURFACE RUNOFF FROM INDUSTRIAL AND COMMERCIAL SITES

How to comment on this document

This document is released for Stakeholder comment for a period of 4 weeks. Your comments are welcome.

Please send your comments by 19 April 1999 to:

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Table of Contents

Guidance Statement No. 26

Guidance Statement for the Management of Surface Runoff from Industrial and Commercial Sites

Key Words: stormwater, runoff, industrial site

1 PURPOSE

The purpose of this Guidance Statement is to provide guidance to proponents submitting proposals for environmental impact assessment with respect to:

(a) protection of the environment as defined by the *Environmental Protection Act 1986* (the Act) with a focus on the protection of water resources from stormwater runoff carrying pollutants;

(b) addressing the factor of groundwater and surface water contamination caused by stormwater runoff from industrial and commercial premises, hereafter referred to collectively as "industrial sites"; and

(c) the need to present to proponents who have proposals subject to environmental impact assessment (EIA) and to the general public, the Environmental Protection Authority's (EPA) position on discharges to the environment.

2 INTRODUCTION

Many land uses have the potential to impact on both the water quality and quantity of receiving waterbodies. Land uses adjacent to wetlands, estuaries and watercourses and groundwater recharge areas have the potential to degrade water quality through the export of pollutants, particularly nutrients and sediments, transported directly into a groundwater aquifer or as part of the surface runoff. High nutrient and pollutant levels contribute to excessive algal growth, species death, increased turbidity, an accumulation of toxins in the sediments of water bodies and may also impact on fringing vegetation.

Industrial or commercial sites which contain hazardous substances can pose risks to the environment. Stormwater runoff from these developments can carry pollutants off-site and eventually introduce them to groundwater and/or surface waters, including the marine environment.

The volume of stormwater runoff generated on a site also poses other risks to the environment, such as flooding, erosion and alteration of environmental flow regimes, which in turn have the potential to impact on fringing and aquatic floral and faunal communities.

As defined by the *Environmental Protection Act 1986*, the EPA's primary goal is to protect the environment. Pollutant-carrying stormwater runoff is a direct threat to the environment and it is therefore necessary to establish guidelines for the management of this runoff.

The EPA has identified a number environmentally significant areas that should be conserved and has defined these as having "highest conservation value". A summary of the areas with highest conservation value is provided in Part 2 of the EPA's *Draft Guidelines for Environment and Planning* , and includes areas of:

- lands in the conservation estate;
- native remnant vegetation;
- wetlands;
- watercourses and rivers;
- estuaries and inlets;
- coastline and near-shore areas;
- public water source areas; and
- catchments with special requirements;

and areas adjacent to any of the above.

Specific management advice regarding possible impacts, including surface runoff, on these areas is also provided in the *Draft Guidelines for Environment and Planning.*

Proposals for which surface runoff may impact on these areas of high conservation value usually involve the management of the following issues:

- potential export of contaminants into receiving water bodies and associated catchments;
- maintenance of the integrity, functions and environmental values of the natural drainage systems; and
- minimising the impact of surface runoff on surface and groundwater hydrology.

The EPA has established the following principles to ensure the on-going protection of groundwater and surface water resources:

- water resources for public supply need protection in perpetuity;
- pollution, nutrient enrichment and degradation of water resources should be avoided;
- Declared Catchment Areas and Water Reserves should be protected from contamination from inappropriate land-uses; and
- ground and surface waters should be protected for:
  - public and private supply,
  - protection of ecosystems, and
  - conservation/protection of native vegetation, profusion of ecosystems and wetlands, especially in or adjacent to groundwater supply areas, within proclaimed catchments, and downstream of dams and pipehead dams should be supported.

The Water and Rivers Commission should be contacted for information regarding the proximity of an industrial site with respect to protected surface and groundwater resources, such as Declared Catchment Areas or Water Reserves. Water and Rivers Commission, for the purposes of written and/or telephone contact, is located at:

Hyatt Centre, Level 2

3 Plain Street
EAST PERTH WA 6004
Telephone: (08) 9278 0300

3 GUIDANCE FOR THE MANAGEMENT OF SURFACE RUNOFF FROM INDUSTRIAL AND COMMERCIAL SITES

3.1 The Environmental Objective

The objective of this Guidance Statement is to ensure that receiving waterbodies are protected from contamination by providing assessment guidance for the management of surface run-off from industrial and commercial sites.

The following statements provide general guidance to assist proponents in managing the environmental effects of stormwater. Section 3.4 provides specific reference to numerical criteria that will be used by the EPA as a guide to it forming a judgement about the environmental acceptability of proposed stormwater management measures.

3.2 General Guidance to Prevent and Minimise Contaminated Stormwater Runoff

(a) Stormwater management plans

A stormwater management plan should be prepared as part of a development proposal and, following implementation, should be regularly reviewed and updated as necessary. This plan may form part of an overall site drainage management plan.

Stormwater management plans should:

- identify potential sources of stormwater on the site, including water flowing onto the site from other sources;
- specify measures to minimise the generation of stormwater (eg diversion drains, bunding);
- identify likely contamination sources of stormwater (eg vehicle parking areas, fuel storages, processing areas) and specify measures for minimising contamination of stormwater (eg spill management plan);
- consider and specify measures for separating "clean" stormwater (eg from roofs) from water potentially contaminated by site activities (eg stormwater from process areas, materials storage) to minimise the volume of water requiring treatment and disposal;
- specify how stormwater will be treated and to what quality, and where/how it will be disposed of (this will include consideration of likely volumes to be treated and disposed of); and
- identify potential impacts of stormwater handling, treatment and disposal methods on surface water and groundwater and how these impacts will be prevented or minimised. Both quality (eg potential pollutants) and volume (eg flooding potential) impacts need to be addressed.

(b) Spill prevention and response

Environmentally hazardous materials which may contaminate stormwater if spilled on site (eg solid or liquid chemicals, fuels, oils) should be appropriately stored such that in the event of any spillage, the material is contained and isolated from the stormwater drainage system to enable clean-up.

In particular, liquid chemicals and fuels should be stored within low permeability (of 10^{-9} metres per second or less) compound(s) designed to contain not less than 110% of the volume of the largest storage vessel or inter-connected system, and at least 25% of the total volume of substances stored in the compound.

Likewise process areas which have the potential to generate contaminated stormwater should be isolated from the general stormwater drainage system to enable treatment and/or disposal of any contaminated runoff.

Other aspects of site operations that need to be addressed with respect to spill management are:

- materials handling and transport on site;
- fuel storage (including underground tanks) and refuelling facilities;
- other materials transfer facilities, such as pipework and valving and tanker loading/unloading areas; and
- drains and sumps.

(c) Vehicle and equipment washdown

Many industrial premises have the need to wash vehicles and/or equipment to remove oils, greases and general dirt.

A washdown pad is ideally designed to collect all water and residue in a collection sump, incorporating a fully sealed and well drained surface, together with impervious bunding to prevent the loss of water from the washdown pad.

The height of barrier bunding and area of sealed surface will depend on:

- size of machinery being washed down;
- the amount of water used at any one time; and
- the rate at which water can be drained away.

Bunding and drainage should be installed to prevent surface stormwater runoff from entering the washdown bay and associated sumps thus reducing the need to treat or store excess water. Simple removable covers over the drainage points that prevent the collection of stormwater during rain events, are effective and inexpensive.

Washdown areas need to be equipped with oil/water separators, where necessary gross solids traps and/or sediment traps (where necessary), and provisions to prevent the discharge of solvent or detergent contaminated waters to the environment.

The DEP's Washdown Guidelines should be consulted for further information regarding pollution prevention measures appropriate to washdown bays. These Guidelines are available from the DEP's Licensing Branch.

3.3 General Guidance on Discharge of Contaminated Stormwater

(a) No discharges of contaminated stormwater to watercourses or waterbodies

As a general rule, watercourses and waterbodies should receive no contaminated surface water runoff from adjacent developments. Contaminated stormwater refers to stormwater which has come into contact with pollutants such as oils & grease, petroleum hydrocarbons, process wastes or materials, spills, sediments, gross solids/litter etc, and is carrying or potentially carrying such material.

Land where sheet-flow of surface water is experienced is not recommended for intensive land use activities. Also, land uses with the potential to export contaminants should not be located:

- near waterbodies;
- on soil types which have a low capacity to retain nutrients;
- in areas of high water table;
- wetlands; and
- areas of high conservation value.

Where such land uses already exist, stormwater should be treated to remove pollutants.

As a general guide, the minimum recommended set backs from waterbodies and watercourses that should be followed are:

Recommended separation distances *

wetlands	50 metres or 1 metre AHD higher than the furthest extent of the wetland vegetation, whichever is the largest (minimum dryland buffer).
watercourses and rivers (on private land)	watercourses with permanent water - 50 metres seasonally flowing watercourses - 30 metres watercourses which flow in response to specific rain events - 10 metres

Reference: EPA, 1997, *Draft Guidelines for Environment and Planning*

*Note: These numbers assume the EPA's recommended separation distances for intensive land-uses and septic tanks (as provided in the EPA's *Draft Guidelines for Environment and Planning*) are applied. Greater buffer widths will be required where these distances are reduced.

Where this Guidance is not relevant, or in the absence of EPA or DEP advice on set back distances, advice should be sought from the Water and Rivers Commission.

(b) All contaminated stormwater to be retained on-site and treated prior to discharge

The EPA's general requirement is that all contaminated stormwater be disposed of on-site to the extent that a 1 in 10 year storm event of 72 hour duration is retained for three to seven days. In other cases, the 1 in 10 year criterion could be relaxed where it can be demonstrated that the target storm events at the particular location are of lesser intensity. However in areas subject to cyclonic activity, the criteria are likely to be more stringent (eg 1 in 100 year Average Recurrence Interval) to address the higher seasonal rainfall experienced. In such areas, the effects may be compounded by the potential for a combination of high rainfall and high tides/storm surges.

Where specific retention basins are required to manage stormwater, the size of the basin will vary depending on site conditions (soil types and infiltration rates) and subdivision design. The use of water sensitive urban design techniques should be considered which enhance localised on-site disposal at the individual premises level, reduce run-off and require smaller basins to be built.

The EPA recommends that stormwater retention basins should not be located in foreshore or conservation reserves. If drainage basins are located in proximity to a foreshore reserve they should incorporate nutrient-fixing vegetation and/or soils.

The EPA recommends the use of stormwater wherever possible (eg for washdown water or process make-up water, irrigation of gardens) provided measures are taken to ensure flooding (on or off-site) or other adverse impacts do not occur as a result of the capture and use of this water.

Treatment options for stormwater will be based on:

- the nature of pollutants in the stormwater; and
- the quality required to ensure the final disposal option is environmentally acceptable, or, alternatively,
- the quality required to enable use on-site.

For example:

(a) Discharge to sewer would need to meet the sewer discharge criteria set by the Water Corporation or, if a Local Government Authority sewerage system, the requirements of the relevant Local Government Authority.

(b) Final discharge to the environment (including irrigation) should take into consideration the following factors:

  (I) erosion prevention and control measures; and

  (ii) beneficial use of receiving environment and associated water quality criteria. (Refer to section 4.2 for reference documents for environmental acceptability criteria).

3.4 Assessment Guidance

The proponent shall identify how their proposal will comply with the Guidance Statement.

When assessing proposals with the potential to cause stormwater runoff pollution, the EPA will apply the following complementary tests:

(a) have all reasonable and practicable measures been taken to minimise the potential impact on the environment; and

(b) are the potential environmental impacts within environmentally acceptable limits, standards or criteria.

The specific criteria that will be used by the EPA to guide it in the assessment of projects subject to this Guidance Statement are:

- Draft Western Australian Water Quality Guidelines for Fresh and Marine Waters; Bulletin 711, Environmental Protection Authority, October 1993.
- Australian Water Quality Guidelines for Fresh and Marine Waters, ANZECC, November 1992.
- Australian Drinking Water Guidelines, ARMCANZ, NHMRC, 1995.

The following resource documents provide further assistance on managing stormwater impacts:

- Guidelines for Groundwater Protection in Australia, ARMCANZ, ANZECC, September 1995.

  This document provides guidance on the development of groundwater protection plans and strategies.

- A Manual for Managing Urban Stormwater Quality in Western Australia, WRC, August 1998.

  This document defines and describes in practical terms Best Management Practices (BMP) to reduce nutrient inputs to stormwater drainage schemes (eg constructed wetlands), and provides guidelines for the incorporation of water sensitive design principles into urban planning and design. It is intended to apply to both future development and redevelopments.

- Water Sensitive Urban Design (residential) Design Guidelines for the Perth Metropolitan Region, Whelans and Halpern Glick Maunsell in association with Thompson Palmer, 1993.

  These Guidelines mainly focus on the management of urban stormwater to achieve water sensitive design, and describe relevant planning and management practices and outline the planning process required to achieve this. Whilst these Guidelines primarily apply to residential development in the Perth metropolitan region, the principles have Statewide application.

4 MANAGEMENT SYSTEM

An Environmental Management System is an essential requirement for the successful management of surface run-off from industrial sites.

The proponent shall demonstrate that there is in place an environmental management system which includes the following elements:

1. An environmental policy and a corporate commitment to it;
2. Mechanisms or processes to ensure:
   - 2.1 planning to meet environmental requirements;
   - 2.2 implementation and operation of actions to meet environmental requirements;

2.3 measurement and evaluation of environmental performance; and

3. Review and improvement of environmental outcomes.

5 APPLICATION

5.1 Area

This Guidance Statement applies to all applications for new commercial and industrial sites (industrial parks, as well as individual premises) throughout Western Australia where stormwater runoff requires environmental management.

5.2 Duration and review

(To be inserted when the final Guidance is released)

6 RESPONSIBILITIES

6.1 Environmental Protection Authority Responsibilities

The EPA will apply this Guidance Statement when assessing any proposals for industrial and commercial sites.

6.2 Department of Environmental Protection Responsibilities

The DEP will assist the EPA in applying this Guidance Statement in environmental impact assessment and in conducting its functions under Part V of the *Environmental Protection Act 1986*.

6.3 Proponent Responsibilities

Where proponents demonstrate to the EPA that the requirements of this Guidance Statement are accountably and enforceably incorporated into proposals, the assessment of such proposals is likely to be assisted.

7 DEFINITIONS AND ABBREVIATIONS

The following technical terms and abbreviations are used in this document:

AHD means Australian Height Datum (equivalent to the low water mark at Fremantle + 0.756m)

ANZECC	means Australian & New Zealand Environment and Conservation Council
Best Management Practices	means, in general terms, the best practical method in use to achieve management objectives
Contaminated Site	means a site at which hazardous substances occur in soil or groundwater at concentrations above background levels and where assessment indicates it poses, or has the potential to pose, an unacceptable risk to human health or the environment.
DEP	means Department of Environmental Protection
EIA	means environmental impact assessment
EPA	means Environmental Protection Authority
Guidance	means for achieving desired environmental outcomes
Industrial Site	means any site where industrial or commercial activities are undertaken or are proposed to be undertaken, irrespective of zoning or existing land use, and includes individual premises, but excludes contaminated sites.
NHMRC	National Health and Medical Research Council
Runoff	means controlled or uncontrolled flow of stormwater
Objective (water quality)	means a numerical concentration limit or narrative statement that has been established to support and protect the designated uses of water at a specified site
Standard (water quality)	means an objective that is recognised in enforceable environmental control laws of a level of government
Stormwater	means any water generated by rainfall
Waterbody	for the purpose of this Guidance Statement means any lake, reservoir, wetland, estuary, inlet, aquifer and underground water, and associated beds and banks thereof
Watercourse	for the purpose of this Guidance Statement means any river, creek stream or brook whether artificially altered or not, in which water flows or is contained whether permanently, intermittently or occasionally, together with the bed and banks thereof.
Water Sensitive Urban Design	describes an approach to urban planning and design, which allows water resource management objectives (which focus on water quality, quantity and conservation) plus broader environmental and social objectives to be considered, and incorporated as explicit design objectives and criteria.
WRC	means Water and Rivers Commission

8 LIMITATIONS

This Guidance Statement has been prepared by the Environmental Protection Authority to assist proponents and the public. While it represents the contemporary views of the Environmental Protection Authority, each proposal which comes before the Environmental Protection Authority for environmental impact assessment will be judged on its merits. Proponents who wish to deviate from the Guidance provided in this document should, therefore provide justification for the proposed departure.

9 REFERENCES

Australian & New Zealand Environment & Conservation Council, November 1992. Australian Water Quality Guidelines for Fresh and Marine Waters. ANZECC, Canberra, ACT.

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Water and Rivers Commission, 1998. A Manual for Managing Urban Stormwater Quality in Western Australia. WRC, Perth, WA.

Index	**Draft Guidance** **March 1999** Preliminary Guidance Interim Guidance Guidance
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Acknowledgments	The EPA acknowledges the assistance of Michael A Wallace in preparing this Guidance Statement
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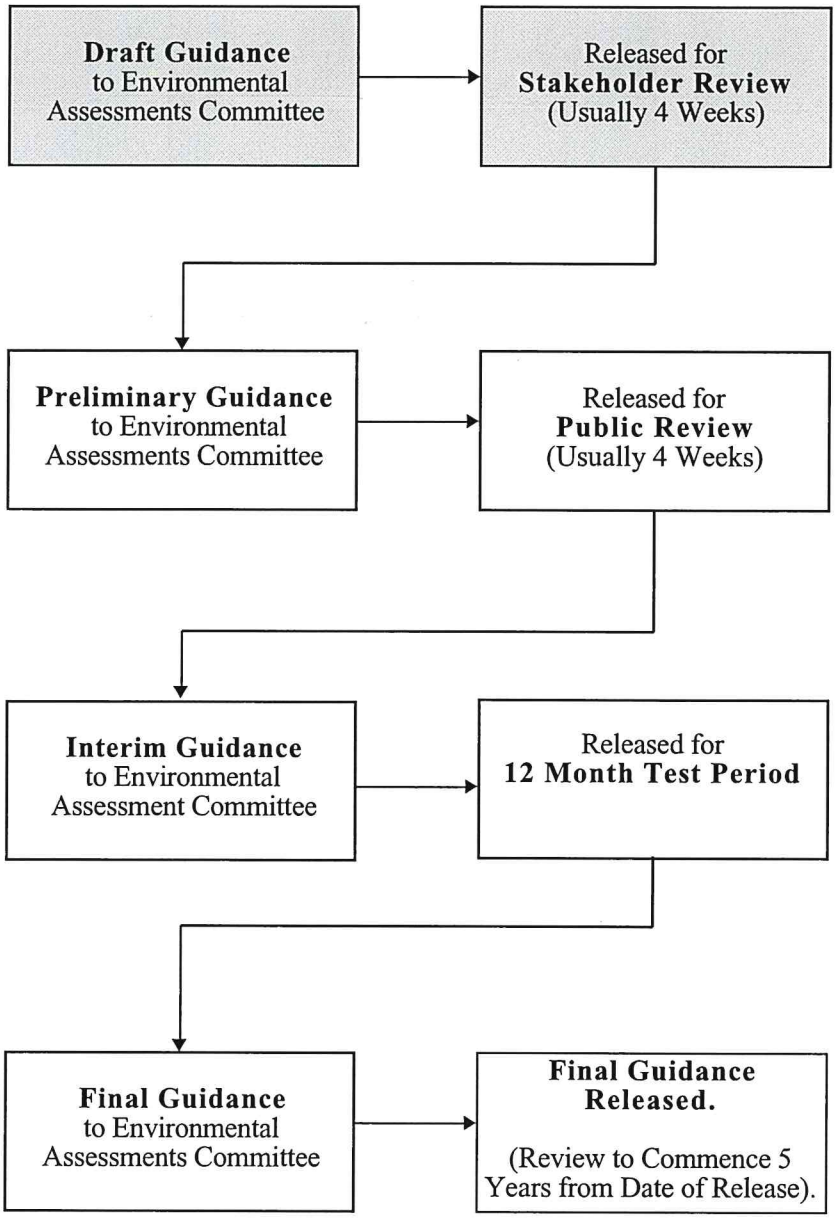
Appendix 1

Guidance for the Assessment of Environmental Factors Flow Diagram



Note: Shaded areas denotes those parts of the process completed