

# **Environment Protection Act 2017**

## **ENVIRONMENT REFERENCE STANDARD**

No. S245 Gazette 26 May 2021,  
as amended by Environment Reference Standard No. S158 Gazette 29 March 2022

This document is a consolidated version of the Environment Reference Standard prepared by EPA in March 2022 in accordance with s.16F of the *Subordinate Legislation Act 1994*.  
It is not an Authorised version of the Environment Reference Standard.

### **Table of Contents**

#### **PART 1—PRELIMINARY**

- 1 Preamble
- 2 Purpose
- 3 Commencement
- 4 Definitions

#### **PART 2—AMBIENT AIR**

- 5 Environmental values
  - Table 2.1: Environmental values of the ambient air environment
- 6 Indicators and objectives
  - Table 2.2: Indicators and objectives for the ambient air environment

#### **PART 3—AMBIENT SOUND**

- 7 Environmental values
  - Table 3.1: Environmental values of the ambient sound environment
- 8 Land use categories
  - Table 3.2: Land use categories for the ambient sound environment
- 9 Indicators and objectives
  - Table 3.3: Indicators and objectives for the ambient sound environment

#### **PART 4—LAND**

- 10 Environmental values
  - Table 4.1: Environmental values of the land environment
- 11 Land use categories
  - Table 4.2: Environmental values that apply to the land use categories
- 12 Indicators and objectives
  - Table 4.3: Indicators and objectives for the land environment

#### **PART 5—WATER**

##### **DIVISION 1—ALL WATERS**

- 13 Environmental values of waters

Table 5.1: Environmental values of waters

#### DIVISION 2—GROUNDWATER

14 Segments

Table 5.2: Groundwater segments

15 Environmental values

Table 5.3: Environmental values that apply to the groundwater segments

16 Indicators and objectives

Table 5.4: Indicators and objectives for groundwater

#### DIVISION 3—SURFACE WATERS

17 Segments

Figure 1: Surface water geographic regions

18 Environmental values

Table 5.5: Environmental values of inland waters

Table 5.6: Environmental values of marine and estuarine waters

19 Indicators and objectives

Table 5.7: Indicators and objectives for surface waters

Table 5.8: Rivers and streams—Indicators and objectives

Table 5.9: Rivers and streams—Biological indicators and objectives

Table 5.10: Wetlands (Lakes subsegment)—Physical and chemical indicators and objectives

Table 5.11: Wetlands (Lakes subsegment)—Biological indicators and objectives

Table 5.12: Estuaries—Indicators and objectives

Table 5.13: Port Phillip Bay—Indicators and objectives

Table 5.14: Western Port—Indicators and objectives

Table 5.15: Corner Inlet—Indicators and objectives

Table 5.16: Gippsland Lakes—Indicators and objectives

Table 5.17: Open Coasts—Indicators and objectives

Table 5.18: Weight of evidence toxicant risk scoring system

Table 5.19: Water-based recreation—Classification matrix for long-term microbial indicators and objectives

Table 5.20: Water-based recreation—Short term indicators and objectives

Table 5.21: Marine pollutant load objectives

#### ENDNOTES

## Part 1—Preliminary

### 1 Preamble

This environment reference standard (ERS) is made under section 93 of the **Environment Protection Act 2017** (the Act). It sets out the environmental values of the ambient air, ambient sound, land and water environments that are sought to be achieved or maintained in Victoria and standards to support those values.

Environmental values are the uses, attributes and functions of the environment that Victorians value. Some examples are water that is safe to drink; air quality that sustains life, health and wellbeing; land that is suitable for production of food; and an ambient sound environment that supports sleep at night.

Standards for the environmental values are comprised of objectives for supporting different uses of the environment and indicators that can be measured to determine whether those objectives are being met. The indicators and objectives provide a basis for assessment and reporting on environmental conditions in Victoria. By providing a benchmark for comparing desired outcomes to the actual state of the environment they enable an understanding of the current condition of the environment and a basis for assessing actual and potential risks to environmental values. The science-based framework in this ERS supports the legal framework for the Environment Protection Authority (EPA), the Victorian government, local government, businesses and communities to work together to protect and rehabilitate Victoria's environment.

This ERS is not a compliance standard. Its primary function is to provide an environmental assessment and reporting benchmark. However, the Act specifically requires EPA to consider the environmental values in this ERS when deciding whether or not to issue development, operating and pilot project licences, when reviewing operating licences and when deciding whether or not to issue development and operating licence exemptions and specified prescribed permits.

The Act provides for the ERS to be taken into account by a range of other decision makers, including the Minister when deciding whether to recommend the making of regulations and compliance codes under the Act and deciding whether to declare an issue of environmental concern; environmental auditors when carrying out their functions including conducting audits; and the Victorian Civil and Administrative Tribunal (VCAT) when reviewing decisions under the Act and certain other Victorian Acts. The ERS is referred to, and given significance, in a number of Victorian Acts. For example, the **Planning and Environment Act 1987** allows for responsible authorities to consider the ERS when deciding on planning permit applications.

The ambient air, ambient sound, land and water (both groundwater and surface water) environments are addressed in separate Parts of this ERS. Each of those Parts sets out the relevant environmental values, indicators and objectives for that element of the environment. Although this ERS contains environmental values for each element of the environment in separate Parts, the different elements of the environment can impact each other and the interactions between them need to be considered.

Some of the environmental values, indicators and objectives set out in this ERS apply to all of Victoria, whilst others apply to defined areas. If not otherwise specified, the environmental values, indicators and objectives apply to the whole of Victoria.

All places in Victoria exist on the traditional country of Aboriginal Victorians. As recognised in the **Constitution Act 1975**, Aboriginal people have a unique status as the descendants of Australia's first peoples and a spiritual, social, cultural and economic relationship with their traditional lands and waters within Victoria. This ERS should be understood in this context.

## 2 Purpose

- (1) The purpose of this ERS is to support the protection of human health and the environment from pollution and waste by providing benchmarks to be used to assess and report on environmental conditions in the whole or any part of Victoria.
- (2) This ERS seeks to achieve this purpose by—
  - (a) identifying environmental values to be achieved or maintained in the whole or any part of Victoria; and
  - (b) specifying indicators and objectives to be used to measure, determine or assess whether those environmental values are being achieved, maintained or threatened.

### Notes

1. Not all environmental values set out in this ERS have indicators and objectives.
2. Some indicators and objectives incorporate parts of national environment protection measures (NEPM) in accordance with section 96(2) of the Act.

## 3 Commencement

This ERS comes into operation on 1 July 2021.

## 4 Definitions

In this ERS—

**Act** means the **Environment Protection Act 2017**;

**ADWG** means the *Australian Drinking Water Guidelines Paper 6—National Water Quality Management Strategy*, published by the National Health and Medical Research Council, Natural Resource Management Ministerial Council, Commonwealth of Australia in 2011, as in force from time to time;

**ambient air environment** means the external air environment, it does not include the air environment inside buildings or structures;

**ambient sound environment** means the external sound environment, it does not include the sound environment inside buildings or structures, but does include vibration;

**ANZG** means the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*, published by the Australian and New Zealand Governments and Australian State and Territory Governments in 2018, as in force from time to time;

**Aquatic reserves** is a segment of surface waters and means surface waters that are in—

- (a) nature conservation reserves reserved for public purposes or the conservation of their natural values under the **Crown Land (Reserves) Act 1978**;
- (b) State Wildlife Reserves under the **Wildlife Act 1975**;
- (c) reference areas proclaimed under the **Reference Areas Act 1978**;
- (d) areas set out in Schedules 2, 4, 7 and 8 to the **National Parks Act 1975**; and
- (e) fisheries reserves declared under section 88 of the **Fisheries Act 1995**;

**aquifer** has the same meaning as in the **Water Act 1989**;

### Note

**Aquifer** in the **Water Act 1989** means a geological structure or formation or an artificial land fill permeated or capable of being permeated permanently or intermittently with water.

***aquifer yield*** is a measure of how much (volume) and how quickly (time) water flows under pressure or can be pumped from an aquifer;

***AUSRIVAS*** means the Australian Rivers Assessment System, which consists of a predictive mathematical model for comparing the similarity of the invertebrate community of a sampled site to minimally disturbed reference sites;

***A-weighted sound pressure level*** means sound pressure level measured using the A-frequency weighting devised to attempt to represent the human response to sound and its variation with frequency, in the typical range of magnitude for environmental noise levels, as specified in Australian/New Zealand Standard AS/NZS IEC 61672.1:2019 Electroacoustics—Sound level meters, Part 1: Specifications;

***background level***, in relation to the land environment, means the level or range of levels of an indicator (measured in geologically similar land containing a measurable level of that indicator), outside the influence of any waste or contaminant;

***background water quality level*** means the level or range of levels of an indicator in waters or in aquatic ecosystems, outside the influence of any waste or contaminant containing a measurable level of that indicator;

***band*** means the division of the Observed / Expected (O/E) scores from AUSRIVAS models into different levels of biological condition;

***drinking water*** has the same meaning as in the **Safe Drinking Water Act 2003**;

**Note**

***Drinking water*** in the **Safe Drinking Water Act 2003** means water that is intended for human consumption or for purposes connected with human consumption, such as the preparation of food or the making of ice for consumption or for the preservation of unpackaged food, whether or not the water is used for other purposes.

***environmental value*** has the same meaning as in the Act;

**Note**

***Environmental value*** in the Act means a use, an attribute or a function of the environment;

***EPT*** means Ephemeroptera, Plecoptera and Trichoptera, which are pollution sensitive invertebrate orders commonly used as indicators;

***fish*** has the same meaning as in the **Fisheries Act 1995**;

***floodplain*** means an area of land that is subject to inundation by floods up to, and including, the largest probable flood event;

***Food Standards Code*** means the Australia New Zealand Food Standards Code made under section 92 of the Food Standards Australia New Zealand Act 1991 of the Commonwealth, as in force from time to time;

***groundwater*** has the same meaning as in the **Water Act 1989**;

**Note**

***Groundwater*** in the **Water Act 1989** means any water occurring in or obtained from an aquifer and includes any matter dissolved or suspended in any such water.

***high water*** means the highest astronomical tide which is the highest level that can be predicted to occur under average meteorological conditions and any combination of

astronomical conditions, and is derived from tide predictions that incorporate observed rates of sea level rise using the current tidal datum epoch;

**indicator** means a parameter or marker that can be measured and used to do one or more of the following—

- (a) provide insight into the state of the environment or human health;
- (b) assess and report on whether an environmental value is being achieved or maintained;
- (c) identify and assess risks to the environmental values from pollution and waste;

**Examples**

Chemicals in the air (such as nitrogen dioxide, sulfur dioxide, carbon monoxide and particles); soil composition (such as pH, sulfates and heavy metal contaminants); water quality indicators (such as suspended solids, nitrogen, phosphorus and salinity); and biological indicators (including macro-invertebrates).

**inland waters** means surface waters of Victoria other than marine and estuarine waters;

**$L_{Aeq}$**  means equivalent continuous A-weighted sound pressure level and is the value of the A-weighted sound pressure level of a continuous steady sound that has the same acoustic energy as a given time-varying A-weighted sound pressure level when determined over the same measurement time interval;

**land environment** includes—

- (a) soil, fill, rock, weathered rock and sand; and
- (b) the vapour and liquids within interstitial space, in the unsaturated zone of the items set out in paragraph (a); and
- (c) sub-aqueous sediment;

**landfill cell** means a compartment within a landfill site in which waste is deposited and enclosed by cover material;

**line of evidence** means the information for an indicator or set of indicators used to monitor, assess or manage water or sediment quality;

**load** means the mass per unit time of an indicator;

**N/A** means not applicable;

**natural areas** means national parks, state parks, state forests, nature conservation reserves, wildlife reserves and environmentally significant areas and landscapes outside metropolitan Melbourne that are identified in a planning scheme;

**NEPM (AAQ)** means the National Environment Protection (Ambient Air Quality) Measure made under section 14 of the **National Environment Protection Council (Victoria) Act 1995** and the equivalent legislation of the participating jurisdictions, as in force from time to time;

**NEPM (ASC)** means the National Environment Protection (Assessment of Site Contamination) Measure 1999 made under section 14 of the **National Environment Protection Council (Victoria) Act 1995** and the equivalent legislation of the participating jurisdictions, as in force from time to time;

**objective** means the level, load, concentration, amount, benchmark or character of an indicator against which the achievement, maintenance of, or risk to, an environmental value is assessed;

**outdoor  $L_{Aeq}$**  means  $L_{Aeq}$  measured outdoors at a point that is not affected by the reflection of sound on any surface other than the ground (free field measurement);

**particles as  $PM_{2.5}$**  means particulate matter with an equivalent aerodynamic diameter of 2.5 micrometres or less;

**particles as  $PM_{10}$**  means particulate matter with an equivalent aerodynamic diameter of 10 micrometres or less;

**planning zone** means a land use planning zone within a planning scheme approved under the **Planning and Environment Act 1987**;

**potable mineral water supply** means groundwater that is safe to drink and in its natural state contains carbon dioxide and other soluble matter in sufficient concentration to cause effervescence;

**potable water supply (acceptable)** means groundwater with a TDS of between 601 and 1200 mg/L;

**potable water supply (desirable)** means groundwater with a TDS of between 0 and 600 mg/L;

**ppm** means parts per million by volume;

**precinct structure plan** has the same meaning as in the **Planning and Environment Act 1987**;

**primary contact recreation** means an activity in which the whole human body or face and trunk are frequently immersed, or the face is frequently wet by spray, and where it is likely that some water will be swallowed or inhaled, or come into contact with ears, nasal passages, mucous membranes or cuts in the skin;

**receiving waters** means the waters which receive discharges from wastewater or stormwater, including surface waters which receive discharges from groundwater;

#### **Examples**

Rivers, lakes, estuaries, marine and coastal areas and groundwater.

**Recreational Water Guidelines** means the *Guidelines for Managing Risks in Recreational Water*, published by the National Health and Medical Research Council in 2008, as in force from time to time;

**reference sites** are sites within segments that characterise background water quality levels, desirable conditions or the best available sites in that segment;

**sanitary inspection** means a search for, and evaluation of, existing and potential microbiological hazards that could affect the safe use of a stretch of water for water-based recreation;

**secondary contact recreation** means an activity where the human limbs are regularly wet and in which greater contact (including swallowing water) is unusual (such as boating, fishing, wading), and includes occasional and inadvertent immersion through slipping or being swept into the water by a wave;

**segment** means a geographic area or feature of the water environment that has common environmental conditions and natural characteristics (such as levels of TDS for groundwater);

**Examples**

Wetlands, lakes and estuaries.

**SIGNAL2** means Stream Invertebrate Grade Number – Average Level, which is an index of water pollution based on pollution tolerance sources;

**special water supply catchment area** has the same meaning as in the **Catchment and Land Protection Act 1994**;

**stormwater** means surface run-off from rain and storm events that enters the drainage system;

**surface water** means waters other than groundwater;

**Examples**

River, stream, billabong, lake, tidal water, estuary, marine and coastal water.

**TDS** means total dissolved solids and is a measure of salinity;

**TSS** means total suspended solids and is a measure of turbidity;

**Victorian Wetland Inventory** means the Victorian Wetland Inventory, published by the Department of Environment, Land, Water & Planning, as in force from time to time;

**VLAKES** means the Victorian lakes macroinvertebrate index set out in the *Environmental Quality Guidelines for Victorian Lakes* (EPA publication 1302), published by the EPA in 2010, as in force from time to time;

**waste** has the same meaning as in the Act;

**water dependent ecosystems and species** means any water environment from small to large, from pond to ocean, in which plants and animals interact with the chemical and physical features of the environment;

**Note**

**Water dependent ecosystems and species** has the same meaning as **aquatic ecosystems** in the ANZG.

**water quality** means the physical, chemical and biological characteristics of water and the measure of its condition relative to the requirements for one or more biotic species or to any human need or purpose;

**waters** has the same meaning as in the Act;

**waterway** has the same meaning as in the **Water Act 1989**;

**weight of evidence** means a process to collect, analyse and evaluate a combination of different qualitative, semi-quantitative or quantitative lines of evidence to make an overall assessment of water or sediment quality and its associated management;

**µg/m<sup>3</sup>** in relation to air, means microgram per cubic metre referenced to a temperature of 0 degrees Celsius and an absolute pressure of 101.325 kilopascals.



## Part 2—Ambient Air

### 5 Environmental values

The environmental values of the ambient air environment are set out in column 1 of Table 2.1 and described in column 2 of Table 2.1 and apply to the whole of Victoria.

**Table 2.1: Environmental values of the ambient air environment**

<b>Column 1</b> <b>Environmental value</b>	<b>Column 2</b> <b>Description of environmental value</b>
Life, health and well-being of humans	Air quality that sustains life, health and well-being of humans
Life, health and well-being of other forms of life, including the protection of ecosystems and biodiversity	Air quality that sustains life, health and well-being of other forms of life, including the protection of ecosystems and biodiversity
Local amenity and aesthetic enjoyment	Air quality that supports lifestyle, recreation and leisure
Visibility	Air quality with low levels of particulate matter and very good visible range
The useful life and aesthetic appearance of buildings, structures, property and materials	Air quality that does not cause physical and structural damage to buildings, structures, property and materials
Climate systems that are consistent with human development, the life, health and well-being of humans, and the protection of ecosystems and biodiversity	Air quality that is not undermined, or at risk, by a warming and drying climate together with increasing population and economic growth

### 6 Indicators and objectives

(1) For the ambient air environment—

- (a) the indicators are set out in column 1 of Table 2.2; and
- (b) subject to paragraph (c), the objectives are the maximum concentrations or minimum visual distance set out in column 2 of Table 2.2, when averaged over the time periods set out in column 3 of Table 2.2; and
- (c) a qualitative objective for odour is set out in column 2 of Table 2.2.

(2) For the purposes of the indicators and objectives for the ambient air environment, where applicable—

- (a) if indicator levels are consistently lower than the corresponding objective, monitoring of that indicator may not be required;
- (b) the objective for visibility-reducing particles is determined by the light-scattering properties of the ambient air environment at relative humidities of less than 70 per cent;
- (c) the concentration for an objective is the arithmetic mean concentration;
- (d) in column 3 of Table 2.2—
  - (i) **1 hour** means the clock hour average;
  - (ii) **8 hour** means a rolling 8 hour average based on 1 hour averages;
  - (iii) **1 day** means a calendar day average;

- (iv) **1 year** means a calendar year average;
- (v) averaging periods of 8 hours or less must be referenced by the end time of the averaging period to determine the calendar day to which the averaging periods are assigned;
- (vi) when calculating and reporting 8 hour averages, the first rolling average in a calendar day ends at 1 a.m. and includes hours from the previous calendar day.

**Table 2.2: Indicators and objectives for the ambient air environment**

Column 1 Indicators	Column 2 Objectives	Column 3 Averaging period
Carbon monoxide (maximum concentration)	9.0 ppm	8 hours
Nitrogen dioxide (maximum concentration)	0.08 ppm	1 hour
	0.015 ppm	1 year
Photochemical oxidants (as ozone) (maximum concentration)		
	0.06 ppm	8 hours
Sulfur dioxide (maximum concentration)	0.075 ppm	1 hour
	0.02 ppm	1 day
Lead (maximum concentration)	0.50 µg/m <sup>3</sup>	1 year
Particles as PM <sub>10</sub> (maximum concentration)	50 µg/m <sup>3</sup>	1 day
	20 µg/m <sup>3</sup>	1 year
Particles as PM <sub>2.5</sub> (maximum concentration)	25 µg/m <sup>3</sup>	1 day
	8 µg/m <sup>3</sup>	1 year
Visibility reducing particles (minimum visual distance)	20 km	1 hour
Odour	An air environment that is free from offensive odours from commercial, industrial, trade and domestic activities	N/A

**Note**

The objective and averaging period for the indicators of carbon monoxide, nitrogen dioxide, photochemical oxidants, sulfur dioxide, lead, particles as PM<sub>10</sub> and particles as PM<sub>2.5</sub> are the standards in the NEPM (AAQ), with more stringent objectives for PM<sub>10</sub> (1 year averaging period), ozone (8 hour averaging period) and, until 1 January 2025, sulfur dioxide (1 hour averaging period).

## Part 3—Ambient Sound

### 7 Environmental values

The environmental values of the ambient sound environment are set out in column 1 of Table 3.1 and described in column 2 of Table 3.1.

**Table 3.1: Environmental values of the ambient sound environment**

<b>Column 1</b> <b>Environmental value</b>	<b>Column 2</b> <b>Description of environmental value</b>
Sleep during the night	An ambient sound environment that supports sleep at night
Domestic and recreational activities	An ambient sound environment that supports recreational and domestic activities in a residential setting
Normal conversation	An ambient sound environment that allows for a normal conversation indoors without the need to raise voices
Child learning and development	An ambient sound environment that supports cognitive development and learning in children
Human tranquillity and enjoyment outdoors in natural areas	An ambient sound environment that allows for the appreciation and enjoyment of the environment for its natural condition and the restorative benefits of tranquil soundscapes in natural areas
Musical entertainment	An ambient sound environment that recognises the community's demand for a wide range of musical entertainment

### 8 Land use categories

For the purposes of this Part of the ERS, the land use categories—

- (a) provide a framework for assessing the ambient sound environment over a period of time; and
- (b) are set out in column 1 of Table 3.2; and
- (c) are generally described in column 2 of Table 3.2; and
- (d) other than Category V, are more specifically described in column 3 of Table 3.2 by reference to the planning zones they comprise.

**Table 3.2: Land use categories for the ambient sound environment**

<b>Column 1 Land use category</b>	<b>Column 2 General description</b>	<b>Column 3 Planning Zones</b>
Category I	An urban form with distinctive features or characteristics of taller buildings, high commercial and residential intensity and high site coverage.	Industrial Zone 1 (IN1Z) Industrial Zone 2 (IN2Z) Port Zone (PZ) Road 1 Zone (RDZ1) Capital City Zone (CCZ) Docklands Zone (DZ)
Category II	Medium rise building form with a strong urban or commercial character. Typically contains mixed land uses including activity centres and larger consolidated sites, and an active public realm.	Industrial Zone 3 (IN3Z) Commercial 1 Zone (C1Z) Commercial 2 Zone (C2Z) Commercial 3 Zone (C3Z) Activity Centre Zone (ACZ) Mixed Use Zone (MUZ) Road 2 Zone (RDZ2)
Category III	Lower rise building form including lower density residential development and detached housing typical of suburban residential settings or in towns of district or regional significance.	Residential Growth Zone (RGZ) General Residential Zone (GRZ) Neighbourhood Residential Zone (NRZ) Urban Floodway Zone (UFZ) Public Park and Recreation Zone (PPRZ) Urban Growth Zone (UGZ)
Category IV	Lower density or sparse populations with settlements that include smaller hamlets, villages and small towns that are generally unsuited for further expansion. Land uses include primary industry and farming.	Low Density Residential Zone (LDRZ) Township Zone (TZ) Rural Living Zone (RLZ) Green Wedge A Zone (GWAZ) Rural Conservation Zone (RCZ) Public Conservation and Resource Zone (PCRZ) Green Wedge Zone (GWZ) Farming Zone (FZ) Rural Activity Zone (RAZ)
Category V	Unique combinations of landscape, biodiversity and geodiversity. These natural areas typically provide undisturbed species habitat and enable people to see and interact with native vegetation and wildlife.	Natural areas are classified as land within Category V irrespective of the planning zones that apply to that land.
Category I, II, III or IV depending on surrounding land uses and the intent of the specific planning zone (which may have a diversity of uses) as specified in a schedule to the planning zone		Comprehensive Development Zone (CDZ) Priority Development Zone (PDZ) Special Use Zone (SUZ) Public Use Zone (PUZ)

**Note**

Urban Growth Zone (UGZ) is a Category III land use until the relevant precinct structure plan is adopted, at which time the approved land uses will determine the land use category.

## 9 Indicators and objectives

- (1) For the ambient sound environment, for each land use category—
  - (a) the indicators are set out in column 2 of Table 3.3; and
  - (b) the objectives are set out in column 3 of Table 3.3.
- (2) For land that is classified as Category V, the qualitative indicator and objective set out for Category V in Table 3.3 apply irrespective of the planning zones that apply to that land.

### Note

The objectives for each land use category are typical ambient sound level values and are neither noise limits nor noise design criteria.

**Table 3.3: Indicators and objectives for the ambient sound environment**

Column 1 Land use category	Column 2 Indicators	Column 3 Objectives
Category I	Outdoor $L_{Aeq,8h}$ from 10 p.m. to 6 a.m.	55 dB(A)
	Outdoor $L_{Aeq,16h}$ from 6 a.m. to 10 p.m.	60 dB(A)
Category II	Outdoor $L_{Aeq,8h}$ from 10 p.m. to 6 a.m.	50 dB(A)
	Outdoor $L_{Aeq,16h}$ from 6 a.m. to 10 p.m.	55 dB(A)
Category III	Outdoor $L_{Aeq,8h}$ from 10 p.m. to 6 a.m.	40 dB(A)
	Outdoor $L_{Aeq,16h}$ from 6 a.m. to 10 p.m.	50 dB(A)
Category IV	Outdoor $L_{Aeq,8h}$ from 10 p.m. to 6 a.m.	35 dB(A)
	Outdoor $L_{Aeq,16h}$ from 6 a.m. to 10 p.m.	40 dB(A)
Category V	Qualitative	A sound quality that is conducive to human tranquillity and enjoyment having regard to the ambient natural soundscape

## Part 4—Land

### 10 Environmental values

- (1) The environmental values of the land environment are set out in column 1 of Table 4.1 and described in column 2 of Table 4.1.
- (2) Subject to subclause (3), the environmental values applicable to the parts of Victoria in the land use categories set out in clause 11 are marked by a tick in Table 4.2.
- (3) An environmental value of the land environment may not apply to a site if—
  - (a) the background level of an indicator is greater than the relevant objective set out in Table 4.3; or
  - (b) the achievement or maintenance of the environmental value is impracticable due to one or more characteristics of the site.

**Table 4.1: Environmental values of the land environment**

<b>Column 1</b> <b>Environmental value</b>	<b>Column 2</b> <b>Description of environmental value</b>
Land dependent ecosystems and species	Land quality that is suitable to protect soil health and the integrity and biodiversity of natural ecosystems, modified ecosystems and highly modified ecosystems
Human health	Land quality that is suitable for the specific land use and safe for the human use of that land
Buildings and structures	Land quality that is not corrosive to buildings, structures, property and materials
Aesthetics	Aesthetic issues do not adversely impact the use of land. Aesthetic issues include the quantity, type and distribution of foreign material or odours in relation to the specific land use and its sensitivity
Production of food, flora and fibre	Land quality that is suitable for the safe human consumption of food, flora and fibre and that does not adversely affect produce quality or yield

### 11 Land use categories

For the purposes of this Part of the ERS, the land use categories are set out below and the applicable environmental values are set out in Table 4.2—

- (a) *Parks and Reserves*, including national parks, state parks, state forests, nature conservation reserves and wildlife reserves;
- (b) *Agricultural*, including rural areas involved in agricultural or horticultural practices;
- (c) *Sensitive use*, including land used for residential use, a child care centre, pre-school, or primary school, being either:
  - (i) *high density*, where development makes maximum use of available land space and there is minimal access to soil; or
  - (ii) *other (lower density)*, where there is generally substantial access to soil;

- (d) *Recreation / Open space*, including general open space and public recreation areas;
- (e) *Commercial*, including land used for commercial and business activities, other than land within the Industrial category set out in paragraph (f);
- (f) *Industrial*, including land used for utilities and industrial activities.

**Table 4.2: Environmental values that apply to the land use categories**

		Parks and reserves	Agricultural	Sensitive use		Recreation / Open space	Commercial	Industrial
				High density	Other (lower density)			
Land dependent ecosystems and species	Natural ecosystems	✓						
	Modified ecosystems	✓	✓		✓	✓		
	Highly modified ecosystems		✓	✓	✓	✓	✓	✓
Human health		✓	✓	✓	✓	✓	✓	✓
Buildings and structures		✓	✓	✓	✓	✓	✓	✓
Aesthetics		✓		✓	✓	✓	✓	
Production of food, flora and fibre		✓	✓		✓			

## 12 Indicators and objectives

For the land environment, for each environmental value—

- (a) the indicators are set out in column 2 of Table 4.3; and
- (b) the objectives are set out in column 3 of Table 4.3.



**Table 4.3: Indicators and objectives for the land environment**

<b>Column 1 Environmental value</b>	<b>Column 2 Indicators</b>	<b>Column 3 Objectives</b>
Land dependent ecosystems and species	Inorganic and organic contaminants set out in Appendix A of Schedule B2 of the NEPM (ASC) and any other contaminants present at the site as determined by the current use or site history assessed in accordance with the NEPM (ASC)	The objective for each indicator is the ecological investigation or screening level in the NEPM (ASC), unless— (a) there is no such investigation or screening level; or (b) due to site specific characteristics the more appropriate objective is: (i) the level derived using the risk assessment methodology described in the NEPM (ASC); or (ii) the background level determined in accordance with section 36 of the Act, in which case the objective for the indicator is (i) or (ii), as applicable.
Human health	Inorganic and organic contaminants set out in Appendix A of Schedule B2 of the NEPM (ASC), and any other contaminants present at the site as determined by the current use or site history assessed in accordance with the NEPM (ASC)	The objective for each indicator is the health investigation or screening level in the NEPM (ASC), unless— (a) there is no such investigation or screening level; or (b) due to site specific characteristics the more appropriate objective is: (i) the level derived using the risk assessment methodology described in the NEPM (ASC); or (ii) the background level determined in accordance with section 36 of the Act, in which case the objective for the indicator is (i) or (ii), as applicable.
Buildings and structures	pH, sulfate, chloride, redox potential, salinity or any chemical substance or waste that may have a detrimental impact on the structural integrity of buildings or other structures	Land that is not corrosive to or otherwise adversely affecting the integrity of structures or building materials
Aesthetics	Any chemical substance or waste that may be offensive to the senses	Land that is not offensive to the senses of human beings
Production of food, flora and fibre	Inorganic and organic contaminants set out in Appendix A of Schedule B2 of the NEPM (ASC) and any other contaminants present at the site as determined by the site history assessed in accordance with the NEPM (ASC)	The levels specified in the Food Standards Code detected in any food, flora or fibre produced at the site. Levels that do not adversely affect produce quality or yield

## Part 5—Water

### Division 1—All waters

#### 13 Environmental values of waters

- (1) The environmental values of waters are set out in column 1 of Table 5.1 and described in column 2 of Table 5.1.

##### Note

The specific environmental values that apply to groundwater and surface water and to their various segments are set out in clauses 15 and 18 respectively.

- (2) Environmental values do not apply to waters in any of the following—
- (a) constructed—
    - (i) stormwater drains;
    - (ii) agricultural drains;
    - (iii) irrigation channels and drains;
    - (iv) wetlands;
    - (v) landfill cells;
  - (b) waste and wastewater treatment systems;
  - (c) reticulated water supply distribution systems;
  - (d) off-stream private dams;
  - (e) water tanks.

**Table 5.1: Environmental values of waters**

<b>Column 1</b> <b>Environmental value</b>	<b>Column 2</b> <b>Description of environmental value</b>
Water dependent ecosystems and species	Water quality that is suitable to protect the integrity and biodiversity of water dependent ecosystems. This integrity and biodiversity includes— <ul style="list-style-type: none"><li>the integrity of riparian vegetation as it contributes to the health of water dependent ecosystems and bank stability;</li><li>groundwater quality that does not adversely affect surface water ecosystems;</li><li>groundwater quality that does not adversely affect natural ecosystems that require access to groundwater to meet all or some of their water requirements on a permanent or intermittent basis to maintain their communities of organisms, ecological processes and ecosystem services. This includes wetlands, rivers and streams reliant on groundwater baseflow, some terrestrial vegetation and some estuarine and near-shore marine systems, stygofauna and troglofauna;</li><li>maintenance of fish passage.</li></ul>
Human consumption after appropriate treatment	Surface water quality that is suitable for use by drinking water suppliers for delivery, after appropriate treatment, to consumers of drinking water.  Surface water quality that is suitable for use by the Wonthaggi desalinisation plant.

<b>Column 1</b> <b>Environmental value</b>	<b>Column 2</b> <b>Description of environmental value</b>
Potable water supply	Groundwater quality that is suitable for raw or potable water supply
Potable mineral water supply	Groundwater quality that is suitable for drinking and, in its natural state, contains soluble minerals and natural gases causing effervescence
Agriculture and irrigation	Water quality that is suitable for agricultural activities such as stock watering and irrigation, as well as a range of other uses such as the irrigation of domestic gardens, commercial agriculture, parks and golf courses
Human consumption of aquatic foods	Surface water quality that is suitable to support the availability and safe human consumption of fish and any other aquatic plant, algae or invertebrate from natural populations, commercial and recreational catch
Aquaculture	Surface water quality that is suitable for the production of fish and any other aquatic plant, algae or invertebrate for human consumption via aquaculture
Industrial and commercial use	Water quality that is suitable for industrial and commercial use
Water-based recreation	Water quality that is suitable for primary contact recreation (for example swimming, diving, water skiing, caving and spas), secondary contact recreation (for example boating and fishing) and for aesthetic enjoyment
Traditional Owner cultural values	Water quality that protects the cultural values of Traditional Owners, having recognised primary responsibility for protecting the values of water for cultural needs, to ensure that Traditional Owner cultural practices can continue. Values may include traditional aquaculture, fishing, harvesting, cultivation of freshwater and marine foods, fish, grasses, medicines and filtration of water holes.
Navigation and shipping	Surface water quality that is suitable for the transportation of passengers and cargo by ship and for harbour facilities
Buildings and structures	Groundwater quality that is not corrosive to buildings, structures, property and materials
Geothermal properties	Groundwater quality that will not affect the natural thermal capacity (including temperature) of the groundwater

## Division 2—Groundwater

### 14 Segments

The seven segments of groundwater are set out in Table 5.2 and are defined by the background water quality level of TDS in the groundwater.

**Table 5.2: Groundwater segments**

Segment	A1	A2	B	C	D	E	F
TDS range (mg/L)	0-600	601-1,200	1,201-3,100	3,101-5,400	5,401-7,100	7,101-10,000	>10,001

### 15 Environmental values

- (1) Subject to subclause (2), the environmental values that apply to each segment of groundwater in Victoria are marked by a tick in Table 5.3.
- (2) An environmental value may not apply to groundwater if—
  - (a) there is insufficient aquifer yield to sustain the environmental value, having regard to variations within the aquifer and reasonable bore development techniques to improve yield; or
  - (b) the application of that groundwater, such as for irrigation, may be a risk to the environmental values of land or the broader environment due to the soil properties; or
  - (c) the background water quality level exceeds (or is less than, in the case of indicators such as pH, dissolved oxygen and many biological indicators) the relevant objective specified in Table 5.4 and as a result the environmental value cannot be achieved.

**Table 5.3: Environmental values that apply to the groundwater segments**

Environmental value	Segment (TDS mg/l)						
	A1 (0-600)	A2 (601-1,200)	B (1,201-3,100)	C (3,101-5,400)	D (5,401-7,100)	E (7,101-10,000)	F (>10,000)
Water dependent ecosystems and species	✓	✓	✓	✓	✓	✓	✓
Potable water supply (desirable)	✓						
Potable water supply (acceptable)		✓					
Potable mineral water supply	✓	✓	✓	✓			
Agriculture and irrigation (irrigation)	✓	✓	✓				

Environmental value	Segment (TDS mg/l)						
	A1 (0-600)	A2 (601-1,200)	B (1,201-3,100)	C (3,101-5,400)	D (5,401-7,100)	E (7,101-10,000)	F (>10,000)
Agriculture and irrigation (stock watering)	✓	✓	✓	✓	✓	✓	
Industrial and commercial use	✓	✓	✓	✓	✓		
Water-based recreation (primary contact recreation)	✓	✓	✓	✓	✓	✓	✓
Traditional Owner cultural values	✓	✓	✓	✓	✓	✓	✓
Buildings and structures	✓	✓	✓	✓	✓	✓	✓
Geothermal properties	✓	✓	✓	✓	✓	✓	✓

## 16 Indicators and objectives

- (1) Subject to subclause (2), for groundwater—
  - (a) the indicators are set out in column 2 of Table 5.4; and
  - (b) the objectives are set out in column 3 of Table 5.4.
- (2) In the following circumstances, the background water quality level is the objective for an indicator—
  - (a) the objective is not able to be attained due to the background water quality level of that indicator; or
  - (b) the background water quality level better protects the environmental values than the objective specified in Table 5.4.

### Note

Subclause (2)(b) ensures the natural characteristics of groundwater are protected where they differ from the objectives but are not degraded by human activities.

- (3) In the circumstances set out in subclause (2)(b), if the background water quality level is:
  - (a) lower than an objective specified as an upper limit in Table 5.4, the background water quality level is the default objective; or
  - (b) higher than an objective specified as a lower limit in Table 5.4 (for example, dissolved oxygen), the background water quality level is the default objective.

**Table 5.4: Indicators and objectives for groundwater**

<b>Column 1 Environmental value</b>	<b>Column 2 Indicators</b>	<b>Column 3 Objectives</b>
Water dependent ecosystems and species (in surface waters)	For groundwater that discharges to surface water, the indicators are the indicators applicable to the relevant surface water as specified in Division 3 of Part 5 of this ERS	The level that ensures the groundwater does not affect receiving waters to the extent that the level of any indicator in the receiving waters: (a) exceeds the level of that indicator (if specified as an upper limit); or (b) is less than the level of that indicator (if specified as a lower limit), specified for surface water in Division 3 of Part 5 of this ERS.
Water dependent ecosystems and species (in subterranean waters with a hydrogeological setting conducive to the presence of troglofauna and stygofauna)	Indicators that are relevant to the subterranean species of troglofauna and stygofauna, which may include TSS, salinity, toxicants in water, toxicants in sediment and dissolved oxygen	The level that ensures the groundwater quality does not adversely affect the troglofauna and stygofauna that depend on the groundwater
Potable water supply	Indicators specified in the ADWG	Health-related guideline value for each indicator specified in the ADWG. Aesthetic guideline value for each indicator specified in the ADWG.
Potable mineral water supply	Indicators specified in the ADWG	Health guideline values for each indicator specified in the ADWG. Aesthetic guideline values for each indicator set out in the ADWG.
Agriculture and irrigation (irrigation)	Indicators specified for irrigation and water for general on-farm use in the ANZG	Level of that indicator specified in the ANZG
Agriculture and irrigation (stock watering)	Indicators specified for livestock drinking water quality in the ANZG	Level of that indicator specified in the ANZG
Industrial and commercial	Indicators specific to the particular industrial or commercial activity and their use of water	Groundwater quality that is suitable for its industrial or commercial use
Water-based recreation	<i>E. coli</i>	10 <i>E. coli</i> /100mL (if no human faecal contamination sources identified) 0 <i>E. coli</i> /100mL (if human faecal contamination sources identified)

<b>Column 1 Environmental value</b>	<b>Column 2 Indicators</b>	<b>Column 3 Objectives</b>
	Chemical hazards, aesthetic effects	Level of indicators (where specified) and descriptions in applicable guidance, in the Recreational Water Guidelines
Buildings and structures	pH, sulphate, chloride, redox potential, salinity or any chemical substance or waste that may have a detrimental impact on the structural integrity of buildings or other structures	Groundwater that is not corrosive to or otherwise adversely affecting structures or building
Geothermal	Temperature between 30 and 70 degrees Celsius	Geothermal properties of groundwater to be maintained for current and future users of the resource

### Division 3—Surface waters

#### 17 Segments

- (1) For the purposes of this ERS, surface waters in Victoria comprise the Aquatic reserves (as defined in clause 4) and the following types of surface waters—
  - (a) *Rivers and streams* comprising the following segments (but not including the rivers and streams within the Aquatic reserves segment)—
    - (i) *Highlands segment* comprising the mountain river and stream reaches in the Upper Murray, Mitta Mitta, Kiewa, Ovens, Goulburn, Yarra, Latrobe, Thomson, Macalister, Mitchell, Tambo and Snowy basins, being the mountain river and stream reaches in the generally alpine and sub-alpine environments above 1,000 metres in altitude;
    - (ii) *Uplands A segment* comprising the river and stream reaches of the following (which are generally above 400 metres in altitude but also including some coastal areas)—
      - (A) Wilsons Promontory, Strzelecki Ranges, and uplands of the East Gippsland basin;
      - (B) uplands of the Upper Murray and Kiewa basins;
      - (C) the Grampians;
      - (D) uplands of the Upper Thomson, Latrobe, South Gippsland, Bunyip and Yarra basins;
      - (E) uplands of the Upper Goulburn (part) and Broken basins;
    - (iii) *Uplands B segment* comprising the river and stream reaches of the following (which are generally above 400 metres in altitude)—
      - (A) Otway Ranges;
      - (B) uplands of southern draining basins - East Gippsland, Snowy, Tambo and Mitchell;
      - (C) uplands of northern draining basins – Ovens, Broken and Goulburn (part);
    - (iv) *Central Foothills and Coastal Plains segment* comprising the river and stream reaches of the following (the central foothills are generally above 200 metres in altitude and the coastal plains are below 200 metres in altitude, but do not include the river and stream reaches in the Urban segment)—
      - (A) lowlands of the Barwon, Moorabool, Werribee and Maribyrnong basins and the Curdies and Gellibrand Rivers;
      - (B) lowlands of the Yarra, South Gippsland, Bunyip, Latrobe, Thomson, Mitchell, Tambo and Snowy basins;
      - (C) uplands of the Moorabool, Werribee, Maribyrnong, Campaspe, Loddon Avoca, Wimmera and Hopkins basins;
      - (D) foothills of the Ovens, Broken and Goulburn basins;
    - (v) *Urban segment* comprising the areas within the urban growth boundary for Metropolitan Melbourne (as shown on the metropolitan fringe planning schemes set out in section 46AA of the **Planning and Environment Act 1987**), including Dandenong Creek, the tributaries of the Yarra, Maribyrnong and Werribee Rivers, and the current developed



areas in the Mornington Peninsula and Western Port catchments, but not including—

- (A) the Yarra, Maribyrnong and Werribee Rivers which are included in the Central Foothills and Coastal Plains segment; or
  - (B) the undeveloped urban land in the Urban Growth Zones and Low Density Urban Residential Zone in the metropolitan fringe planning schemes, as set out in the Victoria Planning Provisions which are included in the Central Foothills and Coastal Plains segment;
- (vi) *Murray and Western Plains segment* comprising the river and stream reaches of the following (which are generally below 200 metres in altitude)—
- (A) lowlands of the Kiewa, Ovens, and Goulburn basins;
  - (B) lowlands of the Campaspe, Loddon, Avoca, Wimmera and Mallee basins;
  - (C) lowlands of the Glenelg, Hopkins, Portland and Corangamite and Millicent Coast basins.
- (b) *Wetlands* comprising the surface waters in alpine bogs, large open lakes, inland hyper-saline lakes, floodplains and billabongs, swamps and mudflats (but not including marine and estuarine wetlands, wetlands within the Aquatic reserves segment or constructed stormwater wetlands) and comprising the following segments—
- (i) *Lakes segment* comprising the areas defined in the Victorian Wetland Inventory as “lacustrine”;
  - (ii) *Swamps segment* comprising the areas defined in the Victorian Wetland Inventory as “palustrine” (swamps, marshes, meadows).
- (c) *Estuarine* comprising the following segments—
- (i) *Estuaries segment* comprising the surface waters that have substantial variation in salinity due to mixing of marine and fresh waters and are at least 1 kilometre long or have lagoonal lengths of at least 300 metres (and including the riparian, animal and plant communities affected by the waters of the estuary), and—
    - (A) including tributary estuaries that flow into Corner Inlet, Gippsland Lakes, Western Port and Port Phillip Bay; but
    - (B) not including the Gippsland Lakes and Hobsons Bay subsegments and the predominately marine waters of Port Phillip Bay, Western Port and Corner Inlet segments or estuaries within the Aquatic reserves segment;
  - (ii) *Gippsland Lakes segment* comprising the surface waters bounded by the entrance to Gippsland Lakes and the shores of the following subsegments (but not including marine waters within the Aquatic reserves segment)—
    - (A) *Lake Wellington* - the surface waters of Lake Wellington and McLennans Strait;
    - (B) *Lake Victoria* - the surface waters bounded by Lake King in the east and the entrance to McLennans Strait in the west;
    - (C) *Lake King* - the surface waters bounded by the Exchange and Lake Victoria subsegments;

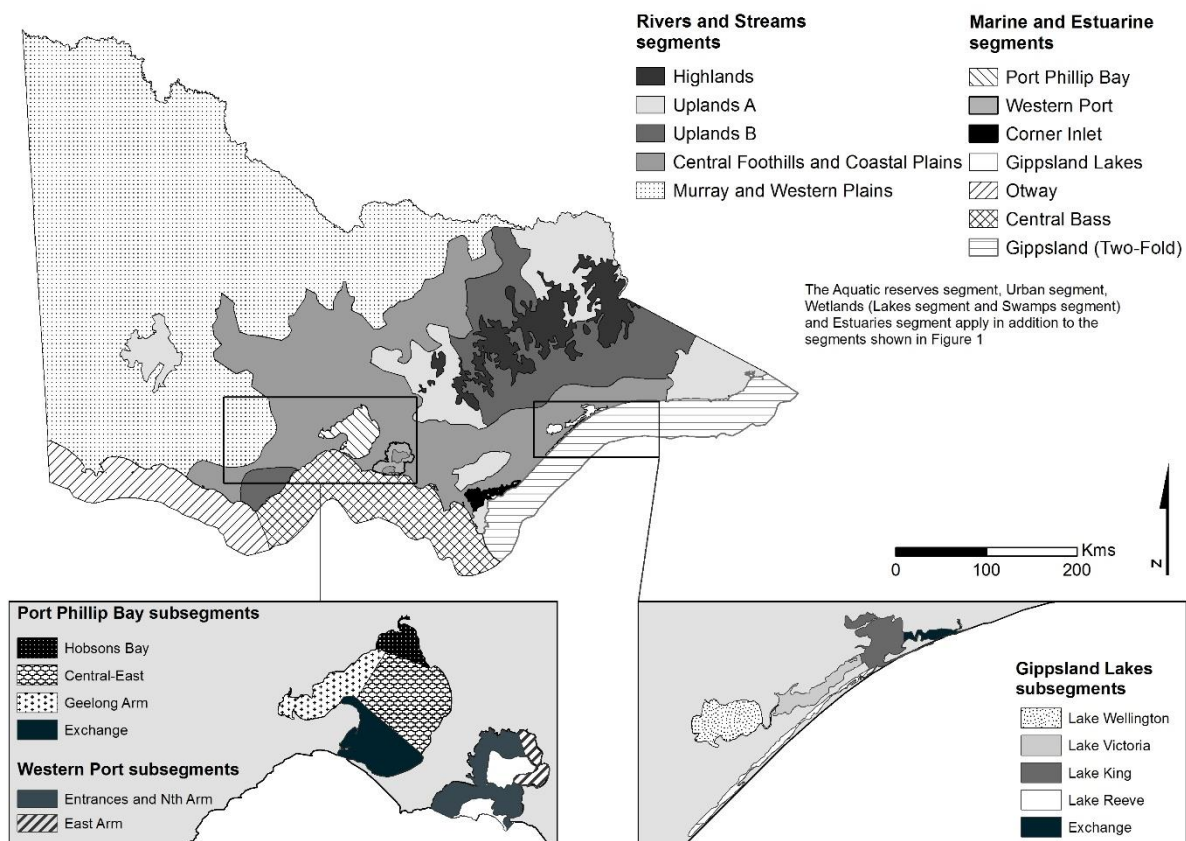
- (D) *Lake Reeve* - the surface waters bounded by the entrance to Lake Victoria;
  - (E) *Exchange* - the surface waters bounded by the entrance to Gippsland Lakes and the entrance to Lake King in the west.
- (d) *Marine* comprising—
- (i) *Port Phillip Bay segment* comprising the surface water bounded by high water and the Port Phillip Bay heads and comprising the following four subsegments (but not including marine waters within the Aquatic reserves segment)—
    - (A) *Hobsons Bay* - the surface waters in the northern section of Port Phillip Bay bounded by Point Cook, Ricketts Point and the entrance to the Yarra River, that are directly influenced by outflows from the Yarra River and urban stormwater;
    - (B) *Central-East* - the surface waters of the central section of Port Phillip Bay extending from Point Cook and Ricketts Point in the north, to Mt Martha and Point Richards in the south;
    - (C) *Geelong Arm* - the surface waters of the Werribee coastal zone extending 5 kilometres offshore from Point Cook and south to Point Richards and encompassing the Geelong Arm;
    - (D) *Exchange* - the surface waters of the section of Port Phillip Bay extending south from Point Richards and Mt Martha to Port Phillip Heads;
  - (ii) *Western Port segment* comprising the surface waters bounded by high water of Western Port shores and the western and eastern entrances to Bass Strait and comprising the following subsegments (but not including marine waters within the Aquatic reserves segment)—
    - (A) *Entrances and North Arm* - the surface waters of the section of the bay bounded by the western (West Head to Point Grant) and eastern (Cape Woolamai) entrances to Bass Strait and the boundaries of the East Arm;
    - (B) *East Arm* - the surface waters of the section of the bay bounded in the west by Tooradin (Pelican Point and Palmer Point), and in the south east by Corinella (Stockyard Point to Settlement Point);
  - (iii) *Corner Inlet segment* comprising the surface waters bounded by high water of the Corner Inlet shores (including coastal islands) and the entrances to Bass Strait (but not including marine waters within the Aquatic reserves segment);
  - (iv) *Open Coast segment* comprising the surface waters of the territorial seas adjacent to the coasts of Victoria bounded by high water and the New South Wales and South Australian borders and extending 12 nautical miles seaward, and including the following subsegments that are based upon the Integrated Marine and Coastal Regionalisation of Australia bioregions in Victoria (but not including marine waters within the Aquatic reserves segment)—
    - (A) *Otway* - the surface waters of the open coast bounded by the South Australian state border and Cape Otway; and extending 12 nautical miles seaward from high water;

- (B) *Central Bass Strait* - the surface waters of the open coast bounded by Cape Otway and Wilsons Promontory and extending 12 nautical miles seaward from high water;
- (C) *Gippsland (Two-Fold)* – the surface waters of the open coast bounded by Wilsons Promontory and the New South Wales border and extending 12 nautical miles seaward from high water.
- (2) For the purpose of this ERS, surface waters are divided into the geographic regions specified in Figure 1.

**Note**

The spatial layers for the surface water geographic regions are available on the DataVic website (<https://discover.data.vic.gov.au/dataset/environment-reference-standard-waters-segments>).

**Figure 1: Surface water geographic regions**



## 18 Environmental values

- (1) Subject to subclauses (2) to (5), the environmental values that apply to—
- inland waters are marked by a tick in Table 5.5; and
  - marine and estuarine waters are marked by a tick in Table 5.6.

- (2) The environmental value of water dependent ecosystems and species applies to surface water at one of the following three levels of protection— largely unmodified; slightly to moderately modified; or highly modified.
- (3) An environmental value does not apply to particular surface waters if the background water quality level exceeds (or is less than, in the case of indicators such as pH, dissolved oxygen and many biological indicators) the relevant objective and as a result the environmental value cannot be achieved or maintained.

**Table 5.5: Environmental values of inland waters**

Environmental values	Segment	Aquatic reserves	Rivers and Streams						Wetlands
		Aquatic reserves	Highlands	Uplands A	Uplands B	Central Foothills and Coastal Plains	Urban	Murray and Western Plains	Lakes and Swamps
Water dependent ecosystems and species that are:	<i>Largely unmodified</i>	✓	✓	✓	✓				
	<i>Slightly to moderately modified</i>					✓		✓	✓
	<i>Highly modified</i>						✓		
Human consumption after appropriate treatment		✓ if water is sourced for supply— <ul style="list-style-type: none"> <li>in a special water supply catchment area set out in Schedule 5 of the <b>Catchment and Land Protection Act 1994</b>; or</li> <li>in accordance with the <b>Safe Drinking Water Act 2003</b>.</li> </ul>							
Agriculture and irrigation			✓	✓	✓	✓	✓	✓	✓
Human consumption of aquatic foods		✓	✓	✓	✓	✓	✓	✓	✓
Aquaculture		✓ if the environmental quality is suitable and an aquaculture licence has been approved in accordance with the <b>Fisheries Act 1995</b>							
Industrial and commercial				✓	✓	✓	✓	✓	
Water based recreation (primary contact)		✓	✓	✓	✓	✓	✓	✓	✓
Water-based recreation (secondary contact)		✓	✓	✓	✓	✓	✓	✓	✓
Water-based recreation (aesthetic enjoyment)		✓	✓	✓	✓	✓	✓	✓	✓
Traditional Owner cultural values		✓	✓	✓	✓	✓	✓	✓	✓
Navigation and shipping									

**Table 5.6: Environmental values of marine and estuarine waters**

Environmental value	Segment	Aquatic reserves	Marine and Estuarine															
		Aquatic reserves	Estuaries	Port Phillip Bay				Western Port		Corner Inlet	Gippsland Lakes					Open Coast		
	Subsegment			Hobsons Bay	Central -East	Geelong Arm	Exchange	Entrances and North Arm	East Arm		Lake Wellington	Lake Victoria	Lake King	Lake Reeve	Exchange	Otway	Central Bass Strait	Gippsland (Two-Fold)
Water dependent ecosystems and species that are:	Largely unmodified	✓			✓		✓	✓								✓	✓	✓
	Slightly to moderately modified		✓	✓		✓			✓	✓	✓	✓	✓	✓				
	Highly modified																	
Human consumption after appropriate treatment																	✓	
Agriculture and irrigation																		
Human consumption of aquatic foods		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Aquaculture		✓ if the environmental quality is suitable and an aquaculture licence has been issued under the <b>Fisheries Act 1995</b>																
Industrial and commercial			✓	✓	✓	✓	✓	✓	✓	✓						✓		✓
Water-based recreation (primary contact)		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Water-based recreation (secondary contact)		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Water-based recreation (aesthetic enjoyment)		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Traditional Owner cultural values		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Navigation and shipping		✓	✓	✓	✓	✓	✓	✓		✓				✓	✓	✓	✓	✓

## 19 Indicators and objectives

- (1) Subject to subclause (2), for surface waters—
  - (a) the indicators are set out in column 2 of Table 5.7; and
  - (b) the objectives are set out in column 3 of Table 5.7; and
  - (c) in the geographic areas set out in column 1 of Table 5.21, additional objectives for marine pollutant load are set out in column 3 of Table 5.21 for the indicators set out in column 2 of Table 5.21.

### Note

For each Aquatic reserve, the applicable indicators are the indicators specified for the segment that the Aquatic reserve is geographically located within.

- (2) The background water quality level is the objective for an indicator in the Aquatic reserves segment and in the following circumstances—
  - (a) the objective is not able to be attained due to the background water quality levels of that indicator; or
  - (b) the background water quality level better protects the environmental values than the objective specified in Table 5.7.

### Note

Clause 2(b) ensures the natural characteristics of surface waters are protected where they differ from the objectives but are not degraded by human activities.

- (3) In the circumstances set out in subclause (2)(b), if the background water quality level is:
  - (a) lower than an objective specified as an upper limit in Tables 5.8 to 5.18, the background water quality level is the default objective; and
  - (b) higher than an environmental quality objective specified as a lower limit in Tables 5.8 to 5.18 (for example, dissolved oxygen), the background water quality level is the default objective.
- (4) For the purposes of Tables 5.8 to 5.18, where referenced, the following apply—
  - (a) 75th / 25th percentiles must be calculated for a minimum of 11 data points collected from monitoring over one year;
  - (b) for toxicants in water, “% Species” refers to the “% Species Protection” values set out in the ANZG. Unless otherwise stated, the level that must be used to determine the objectives is—
    - (i) 99% for largely unmodified aquatic ecosystems;
    - (ii) 95% for slightly to moderately modified ecosystems;
    - (iii) 90% for highly modified aquatic ecosystems;
    - (iv) toxicants which are bioaccumulative must adopt the next level of protection higher than the level of protection set out for toxicants in water;
  - (c) for toxicants in sediment, “DGV” and “GV-high” refer to sediment values set out in the ANZG;
  - (d) R75 and R25 means that a single objective value could not be specified due to a lack of data or variability of data collected in a segment and, for these areas,

the objective must be calculated as the 75th percentile and 25th percentile of the data collected at a reference site.

**Table 5.7: Indicators and objectives for surface waters**

<b>Column 1 Environmental value</b>	<b>Column 2 Indicators</b>	<b>Column 3 Objectives</b>
Water dependent ecosystems and species	For the relevant segment, the indicators are specified in the following Tables— <ul style="list-style-type: none"> <li>• Rivers and streams (six segments) in Tables 5.8 and 5.9</li> <li>• Lakes in Tables 5.10 and 5.11</li> <li>• Estuaries in Table 5.12</li> <li>• Port Phillip Bay in Table 5.13</li> <li>• Western Port in Table 5.14</li> <li>• Corner Inlet in Table 5.15</li> <li>• Gippsland Lakes in Table 5.16</li> <li>• Open Coasts in Table 5.17</li> </ul>	For the relevant segment, the level of indicators specified in the following Tables— <ul style="list-style-type: none"> <li>• Rivers and streams (six segments) in Tables 5.8 and 5.9</li> <li>• Lakes in Tables 5.10 and 5.11</li> <li>• Estuaries in Table 5.12</li> <li>• Port Phillip Bay in Table 5.13</li> <li>• Western Port in Table 5.14</li> <li>• Corner Inlet in Table 5.15</li> <li>• Gippsland Lakes in Table 5.16</li> <li>• Open Coasts in Table 5.17</li> </ul>
	The cover, extent and condition of seagrasses in Gippsland Lakes, Western Port, Corner Inlet and Port Phillip Bay	The level of nutrients and sediments supports the maintenance or improvement of the current cover, extent and condition of seagrasses, within the bounds of natural variation
	The frequency, duration or spatial extent of harmful algal blooms in marine and estuarine waters	The level of nutrients, particularly nitrogen and phosphorus, do not cause an increase in the frequency, duration or spatial extent of harmful algal blooms
	The indicators for sediment quality in rivers and streams, wetlands, estuaries and marine waters set out in the 'Indicator or segment' column in Table 5.18	The level that achieves a low risk score as set out in the last column (Ranking 1 – low risk) of Table 5.18. Objectives are determined using the weight of evidence toxicant risk scoring system in Table 5.18.
Human consumption after appropriate treatment	Indicators specified in the ADWG	Health-related guideline value for each indicator specified in the ADWG
Agriculture and irrigation (irrigation)	Indicators specified for irrigation and water for general on-farm use in the ANZG	Level of the indicators specified in the ANZG
Agriculture and irrigation (stock watering)	Indicators specified for livestock drinking water quality in the ANZG	Level of the indicators specified in the ANZG
Human consumption of aquatic foods	For the relevant segment, the indicators are specified in the following Tables— <ul style="list-style-type: none"> <li>• Rivers and streams (six segments) in Tables 5.8 and 5.9</li> </ul>	For the relevant segment, the level of indicators specified in the following Tables—

Column 1 Environmental value	Column 2 Indicators	Column 3 Objectives
	<ul style="list-style-type: none"> <li>Lakes in Tables 5.10 and 5.11</li> <li>Estuaries in Table 5.12</li> <li>Port Phillip Bay in Table 5.13</li> <li>Western Port in Table 5.14</li> <li>Corner Inlet in Table 5.15</li> <li>Gippsland Lakes in Table 5.16</li> <li>Open Coasts in Table 5.17</li> </ul>	<ul style="list-style-type: none"> <li>Rivers and streams (six segments) in Tables 5.8 and 5.9</li> <li>Lakes in Tables 5.10 and 5.11</li> <li>Estuaries in Table 5.12</li> <li>Port Phillip Bay in Table 5.13</li> <li>Western Port in Table 5.14</li> <li>Corner Inlet in Table 5.15</li> <li>Gippsland Lakes in Table 5.16</li> <li>Open Coasts in Table 5.17</li> </ul>
	Indicators specified for metal contaminants, non-metal contaminants, natural toxicants, and mercury in Schedule 19 (Maximum levels of contaminants and natural toxicants) of the Food Standards Code	Level of the indicators in the tissue of aquaculture species specified in Schedule 19 (Maximum levels of contaminants and natural toxicants) of the Food Standards Code.
Aquaculture	Faecal (thermotolerant) coliforms (median from 5 samples)	14 orgs/100mL
	Physical and chemical stressors	<p>Guideline values specified for physical and chemical stressors for aquaculture in the ANZG.</p> <p>If an objective is not specified in the ANZG for a physical and chemical stressor for aquaculture, the objective for that indicator is the physical and chemical stressor objective specified for the environmental value of water dependent ecosystems.</p>
	Toxicants	<p>Guidelines values specified for toxicants for aquaculture in the ANZG.</p> <p>If an objective is not specified in the ANZG for a toxicant for aquaculture, the objective for that indicator is the toxicant objective specified for the environmental value of water dependent ecosystems.</p>
	Off-flavour compounds	ANZG values specified for off-flavour compounds in water found to cause tainting of the flesh of fish and other aquatic organisms
	Indicators specified for metal contaminants, non-metal contaminants, natural toxicants, and mercury in Schedule 19 (Maximum levels of contaminants and natural toxicants) of the Food Standards Code	Levels of the indicators in the tissue of aquaculture species specified in Schedule 19 (Maximum levels of contaminants and natural toxicants) of the Food Standards Code
Industrial and commercial use	Indicators specific to the particular industrial or commercial activity and their use of water	Water quality suitable for its industrial or commercial use.



Column 1 Environmental value	Column 2 Indicators	Column 3 Objectives
Water-based recreation	<p><i>E. coli</i>, enterococci</p> <p><b>Note</b></p> <p>For freshwater either <i>E. coli</i> or enterococci can be used, but for marine and estuarine water only enterococci can be used.</p>	<p>Short term and long term site specific microbial water quality objectives, derived from a risk assessment approach following industry best practice and guidance published or approved by EPA.</p> <p>If there are no such site specific microbial water quality objectives—</p> <p>(a) for long term assessment the microbial water quality objectives are specified in Table 5.19.</p> <p><b>Note</b></p> <p>For primary contact, the long term objective is the water quality grades of “very good”, “good” or “fair”. For secondary contact, a microbial assessment category must be no greater than as specified in column D in Table 5.19.</p> <p>(b) for short term assessment the microbial water quality objectives are specified in Table 5.20.</p>
	Harmful algae, chemical hazards, aesthetic effects	Level of indicators (where specified) and descriptions in applicable guidance, in the Recreational Water Guidelines
Traditional Owner cultural values	Indicators must be developed in consultation with Traditional Owners and may be informed by the process identified in the ANZG for determining cultural and spiritual values	Objectives must be developed in consultation with Traditional Owners and may be informed by the process identified in the ANZG for determining cultural and spiritual values
Navigation and shipping	Sediment	The rate of sedimentation and quality of sediment does not reach levels that would make dredging such a high-risk activity that navigation and shipping could be prevented from occurring

**Table 5.8: Rivers and streams—Indicators and objectives**

SEGMENT	INDICATOR									
	Total phosphorus (µg/L)	Total nitrogen (µg/L)	Dissolved oxygen (percent saturation)		Turbidity (NTU)	Electrical conductivity (µS/cm @ 25°C)	pH (pH units)		Toxicants in water	Toxicants in sediment
	75 <sup>th</sup> percentile	75 <sup>th</sup> percentile	25 <sup>th</sup> percentile	Maximum	75 <sup>th</sup> percentile	75 <sup>th</sup> percentile	25 <sup>th</sup> percentile	75 <sup>th</sup> percentile	% protection	
<b>Highlands (Largely unmodified)</b>										
Streams above 1000 m altitude	≤20	≤150	≥85	130	≤3	≤30	≥5.9	≤6.9	95	DGV
<b>Uplands A (Largely unmodified)</b>										
Wilsons Promontory, Strzelecki Ranges, and East Gippsland basin	≤30	≤520	≥90	130	≤10	≤200	≥6.6	≤7.6	95	DGV
Upper Murray and Kiewa basins	≤30	≤470	≥90	130	≤10	≤100	≥6.5	≤7.5	95	DGV
The Grampians	≤35	≤370	≥80	130	≤5	≤200	≥5.4	≤7.0	95	DGV
Upper Thomson, Latrobe, South Gippsland, Bunyip and Yarra basins	≤35	≤900	≥80	130	≤15	≤100	≥6.4	≤7.6	95	DGV
Upper Goulburn (part) and Broken basins	≤25	≤550	≥90	130	≤10	≤100	≥6.4	≤7.4	95	DGV

<b>Uplands B (<i>Largely unmodified</i>)</b>										
Otway Ranges	≤25	≤650	≥85	130	≤10	≤200	≥6.5	≤7.5	95	DGV
Uplands of southern draining basins - East Gippsland, Snowy, Tambo and Mitchell	≤25	≤350	≥90	130	≤10	≤100	≥6.7	≤7.7	95	DGV
Uplands of northern draining basins – Ovens, Broken and Goulburn (part)	≤25	≤400	≥85	130	≤10	≤50	≥6.4	≤7.4	95	DGV
<b>Central Foothills and Coastal Plains (<i>Slightly to moderately modified</i>)</b>										
Lowlands of Barwon, Moorabool, Werribee and Maribyrnong basins and the Curdies and Gellibrand Rivers	≤60	≤1,100	≥70	130	≤25	≤2,000	≥6.8	≤8.0	95	DGV
Lowlands of Yarra, South Gippsland, Bunyip, Latrobe, Thomson, Mitchell, Tambo and Snowy basins	≤55	≤1100	≥75	130	≤25	≤250	≥6.7	≤7.7	95	DGV
Uplands of Moorabool, Werribee, Maribyrnong, Campaspe, Loddon Avoca, Wimmera and Hopkins basins.	≤55	≤1,050	≥70	130	≤15	≤2,000	≥6.8	≤8.0	95	DGV
Foothills of Ovens, Broken and Goulburn basins	≤50	≤800	≥70	130	≤20	≤250	≥6.4	≤7.4	95	DGV
<b>Urban (<i>Highly modified</i>)</b>										
Tributaries of Werribee and Maribyrnong Rivers	≤110	≤1,200	≥60	130	≤30	≤3,000	≥6.5	≤8.2	90	DGV
Lowlands of Dandenong Creek, Mornington Peninsula, Western Port catchment and tributaries of the Yarra River	≤110	≤1,300	≥70	130	≤35	≤500	≥6.4	≤7.9	90	DGV

<b>Murray and Western Plains (<i>Slightly to moderately modified</i>)</b>										
Lowlands of Kiewa, Ovens and Goulburn basins	≤55	≤800	≥75	130	≤25	≤500	≥6.4	≤7.5	95	DGV
Lowlands of Campaspe, Loddon, Avoca, Wimmera and Mallee basins	≤50	≤900	≥65	130	≤40	≤2,000	≥6.8	≤7.8	95	DGV
Lowlands of Glenelg, Hopkins, Portland and Corangamite and Millicent Coast basins	≤55	≤1,000	≥65	130	≤20	≤2,000	≥7.0	≤8.0	95	DGV

### **Note**

Within the Urban segment, the objectives set out in Table 5.9 apply to all rivers and streams, except for the areas of the Yarra, Maribyrnong and Werribee rivers which apply the objectives of the Central Foothills and Coastal Plains segment.

**Table 5.9: Rivers and streams—Biological indicators and objectives**

SEGMENT	Season	Habitat	INDICATOR			
			EPT	SIGNAL2	Number of macroinvertebrate families	AUSRIVAS
						Band
Highlands	Summer	R	9	6.1	17	N/A
		E	6	5	14	N/A
		ER	9	5.2	21	A
Uplands A	Autumn	R	8	5.6	19	A
		E	6	4.5	17	A
		ER	10	5.1	26	N/A
	Spring	R	7	5.6	17	A
		E	5	4.7	17	A
		ER	10	5.1	25	N/A
Uplands B	Autumn	R	7	5.2	18	A
		E	N/A	3.8	15	A
		ER	9	4.6	28	N/A
	Spring	R	8	5.5	18	A
		E	6	4.2	17	A
		ER	10	4.9	28	N/A
Central Foothills and Coastal Plains	Autumn	R	5	4.5	16	A
		E	N/A	3.4	17	A
		ER	6	4.0	27	N/A
	Spring	R	5	4.5	16	A
		E	N/A	3.4	20	A
		ER	7	4.2	27	N/A
Urban	Autumn	R	4	3.9	13	B
		E	1	3.1	14	B
		ER	4	3.7	22	N/A
	Spring	R	3	4.2	13	B
		E	3	3.2	16	B
		ER	3	3.8	22	B
Murray and Western Plains	Autumn	E	N/A	3.3	18	A
		ER	5	3.9	25	A
	Spring	R	N/A	4.4	14	N/A
		E	N/A	3.2	17	A
		ER	6	3.8	24	N/A

**Note**

In Table 5.9, **R** means riffle, **E** means edge and **ER** means combined riffle and edge.

**Table 5.10: Wetlands (Lakes subsegment)—Physical and chemical indicators and objectives**

Wetland Type	Sub-type	INDICATOR							
		pH range	Dissolved oxygen range (% saturation)	Electrical conductivity ( $\mu\text{Scm}^{-1}$ )	Turbidity (NTU)	Total nitrogen ( $\mu\text{g/L}$ )	Total phosphorus ( $\mu\text{g/L}$ )	Toxicants in water	Toxicants in sediment
		Min – Max	Min – Max	75 <sup>th</sup> percentile	75 <sup>th</sup> percentile	75 <sup>th</sup> percentile	75 <sup>th</sup> percentile	% protection	
Riverine	Flow-through	6.5-8.5	80-120	1,500	5	500	30	95	DGV
	Terminal	6.5-8.5	80-120	N/A	15	1,500	100		
	Floodplain	6.5-8.5	80-120	N/A	15	1,500	100		
Coastal dune	Eastern	6-7.5	80-120	1,500	5	500	30	95	DGV
	Western	6.5-8.5	80-120	1,500	5	500	30		
Deep inland	Fresh	6.5-8.5	80-120	1,500	5	500	30	95	DGV
	Saline	6.5-8.5	80-120	N/A	5	500	30		
Shallow inland	With outflow	6.5-8.5	80-120	N/A	15	1,500	100	95	DGV
	Closed	N/A	N/A	N/A	N/A	N/A	N/A		

**Table 5.11: Wetlands (Lakes subsegment)—Biological indicators and objectives**

Wetland Type	Sub-type	INDICATOR		
		Number of macroinvertebrate families	VLAKES	Chlorophyll-a (µg/L)
Riverine	Flow-through	15	4.7	5
	Terminal	15	4.3	N/A
	Floodplain	15	4.3	N/A
Coastal dune	Eastern	15	4.7	5
	Western	15	4.7	5
Deep (>5m) inland	Fresh	15	4.3	5
	Saline	N/A	N/A	5
Shallow (<5m) inland	With an outflow	15	4.3	N/A
	Closed	N/A	N/A	N/A

**Table 5.12: Estuaries—Indicators and objectives**

SEGMENT	INDICATOR								
	pH (pH units)	Dissolved oxygen (surface) (% saturation)	Dissolved oxygen (bottom) (% saturation)	Total phosphorus (µg/L)	Total nitrogen (µg/L)	Turbidity (NTU)	Chlorophyll- a (µg/L)	Toxicants in water	Toxicants in sediment
	25 <sup>th</sup> -75 <sup>th</sup> percentile	25 <sup>th</sup> percentile - max	25 <sup>th</sup> percentile - max	75 <sup>th</sup> percentile	75 <sup>th</sup> percentile	75 <sup>th</sup> percentile	75 <sup>th</sup> percentile	% protection	
Estuaries	7.0-8.0	80-130	30-130	90	1,000	10	3	95	DGV

**Table 5.13: Port Phillip Bay—Indicators and objectives**

SUBSEGMENT	Surface / Bottom	INDICATOR											
		Total phosphorus (µg/L)	Total nitrogen (µg/L)	Dissolved oxygen (% saturation)	Chlorophyll-a (µg/L)	Dissolved inorganic phosphorus (µg/L)	Dissolved inorganic nitrogen (µg/L)	TSS (mg/L)	Salinity (PSU)	Light attenuation (m <sup>-1</sup> )	pH	Toxicants in water	Toxicants in sediment
		75 <sup>th</sup> percentile	75 <sup>th</sup> percentile	25 <sup>th</sup> percentile - max	75 <sup>th</sup> percentile	75 <sup>th</sup> percentile	75 <sup>th</sup> percentile	75 <sup>th</sup> percentile	25 <sup>th</sup> – 75 <sup>th</sup> percentile	75 <sup>th</sup> percentile	25 <sup>th</sup> – 75 <sup>th</sup> percentile	% protection	
Hobsons Bay	Surface	100	300	95-130	4	70	50	5	34-37	0.5	7.5-8.5	95	DGV
	Bottom	N/A	N/A	80-130	N/A	N/A	N/A	N/A	N/A	N/A	7.5-8.5	95	DGV
Central-East	Surface	70	150	95-130	1.5	50	10	3	35-37	0.3	7.5-8.5	99	DGV
	Bottom	N/A	N/A	80-130	N/A	N/A	N/A	N/A	N/A	N/A	7.5-8.5	99	DGV
Geelong Arm	Surface	100	300	95-130	3	70	20	5	35-38	0.4	7.5-8.5	95	DGV
Exchange	Surface	50	150	N/A	1	30	10	2	35-36	0.3	7.5-8.5	99	DGV

**Table 5.14: Western Port—Indicators and objectives**

SUBSEGMENT	INDICATOR											
	Total phosphorus (µg/L)	Total nitrogen (µg/L)	Dissolved oxygen (% saturation)	Chl-a (µg/L)	Dissolved inorganic phosphorus (µg/L)	Dissolved inorganic nitrogen (µg/L)	TSS (mg/L)	Salinity (PSU)	Light attenuation (m <sup>-1</sup> )	pH	Toxicants in water	Toxicants in sediment
	75 <sup>th</sup> percentile	75 <sup>th</sup> percentile	25 <sup>th</sup> percentile - max	75 <sup>th</sup> percentile	75 <sup>th</sup> percentile	75 <sup>th</sup> percentile	75 <sup>th</sup> percentile	25 <sup>th</sup> – 75 <sup>th</sup> percentile	75 <sup>th</sup> percentile	25 <sup>th</sup> – 75 <sup>th</sup> percentile	% protection	
Entrances and North Arm	10	150	95-130	2	5	10	5	34-36	0.5	7.5-8.5	99	DGV
East Arm	50	350	95-130	4	5	30	30	32-36	1.5	7.5-8.5	95	DGV



**Table 5.15: Corner Inlet—Indicators and objectives**

SUBSEGMENT	INDICATOR											
	Total phosphorus (µg/L)	Total nitrogen (µg/L)	Dissolved oxygen (% saturation)	Chlorophyll-a (µg/L)	Dissolved inorganic phosphorus (µg/L)	Dissolved inorganic nitrogen (µg/L)	TSS (mg/L)	Salinity (PSU)	Light attenuation (m <sup>-1</sup> )	pH	Toxicants in water	Toxicants in sediment
	75 <sup>th</sup> percentile	75 <sup>th</sup> percentile	25 <sup>th</sup> percentile - max	75 <sup>th</sup> percentile	75 <sup>th</sup> percentile	75 <sup>th</sup> percentile	75 <sup>th</sup> percentile	25 <sup>th</sup> – 75 <sup>th</sup> percentile	75 <sup>th</sup> percentile	25 <sup>th</sup> – 75 <sup>th</sup> percentile	% protection	
Corner Inlet	20	R75	90-130	R75	R75	R75	R75	R75	R75	7.0-8.0	95	DGV

**Table 5.16: Gippsland Lakes—Indicators and objectives**

SUBSEGMENT	Surface / Bottom	INDICATORS												
		Total phosphorus (µg/L)	Total nitrogen (µg/L)	Dissolved oxygen (% saturation)	Chl-a (µg/L)	Dissolved inorganic phosphorus (µg/L)	Dissolved inorganic nitrogen (µg/L)	TSS (mg/L)	Salinity (PSU)		Light attenuation (m <sup>-1</sup> )	pH	Toxicants in water	Toxicants in sediment
		75 <sup>th</sup> percentile	75 <sup>th</sup> percentile	25 <sup>th</sup> percentile - max	75 <sup>th</sup> percentile	75 <sup>th</sup> percentile	75 <sup>th</sup> percentile	75 <sup>th</sup> percentile	25 <sup>th</sup> percentile	75 <sup>th</sup> percentile	75 <sup>th</sup> percentile	25 <sup>th</sup> - 75 <sup>th</sup> percentile	% protection	
Lake Wellington	Surface	120	1,000	95-130	25	15	15	30	NA	15	2.5	7.5-8.5	95	DGV
Lake Victoria	Surface	90	600	95-130	20	20	10	10	15	25	1.5	7.5-8.5	95	DGV
	Bottom	110	600	50-130	15	50	50	10	21	28	N/A	N/A	95	DGV
Lake King	Surface	50	500	95-130	10	10	10	5	20	30	0.7	7.5-8.5	95	DGV
	Bottom	70	500	50-130	5	30	100	5	25	30	N/A	N/A	95	DGV
Lake Reeve	Surface	R75	R75	R25-R75	R75	R75	R75	R75	R25	R75	R75	R25-R75	95	DGV
Exchange	Surface	50	500	95-130	10	10	10	5	20	30	0.6	7.5-8.5	95	DGV
	Bottom	30	300	80-130	5	15	40	10	30	35	N/A	N/A	95	DGV

**Table 5.17: Open Coasts—Indicators and objectives**

SUBSEGMENT	Surface / Bottom	INDICATOR											
		Total phosphorus (µg/L)	Total nitrogen (µg/L)	Dissolved oxygen (% saturation)	Chl-a (µg/L)	Phosphate (µg/L)	Nitrate (µg/L)	TSS (mg/L)	Salinity (PSU)	Light attenuation (m <sup>-1</sup> )	pH	Toxicants in water	Toxicants in sediment
		75 <sup>th</sup> percentile	75 <sup>th</sup> percentile	25 <sup>th</sup> percentile - max	75 <sup>th</sup> percentile	75 <sup>th</sup> percentile	75 <sup>th</sup> percentile	75 <sup>th</sup> percentile	25 <sup>th</sup> – 75 <sup>th</sup> percentile	75 <sup>th</sup> percentile	25 <sup>th</sup> – 75 <sup>th</sup> percentile	% protection	
Otway	Surface	R75	R75	R25-75	0.5	30	60	R75	35-36	R75	7.5-8.5	99	DGV
	Bottom	R75	R75	R25-75	N/A	40	400	R75	N/A	N/A	7.5-8.5	99	DGV
Central Bass Strait	Surface	R75	R75	R25-75	0.6	30	60	R75	35-36	R75	7.5-8.5	99	DGV
	Bottom	R75	R75	R25-75	N/A	50	250	R75	N/A	N/A	7.5-8.5	99	DGV
Gippsland (Two-Fold)	Surface	R75	R75	R25-75	0.7	30	90	R75	35-36	R75	7.5-8.5	99	DGV
	Bottom	R75	R75	R25-75	N/A	70	670	R75	N/A	N/A	7.5-8.5	99	DGV

**Table 5.18: Weight of evidence toxicant risk scoring system**

Line of evidence	Indicator or segment	Ranking		
		3 - high risk	2 - medium risk	1 - low risk
Chemistry	Toxicants in water	Concentration of test values does not meet 90% species protection levels	Concentration of test values exceeds 95% species protection levels but meets 90% species protection levels	Concentration of test values meets 95% species protection levels
	Toxicants in sediment	Concentration of test values > GV-high	Concentration of test values > DGV but < GV-high	Concentration of test values < DGV
	Toxicants in pore water	Concentration of test values does not meet 90% species protection levels	Concentration of test values exceeds 95% species protection levels but meets 90% species protection levels	Concentration of test values meets 95% species protection levels
Ecotoxicity	Sediment and / or water	Significant difference (P<0.05) and >50% effect versus control	Significant difference (P<0.05) and 20-50% effect versus control	No significant difference (P<0.05) and <20% effect versus control
Ecology	Rivers and streams	AUSRIVAS band C SIGNAL >0.5 below objectives	AUSRIVAS band B SIGNAL <0.5 below objectives	AUSRIVAS band A Meets SIGNAL objectives
	Wetlands	VLAKES index >0.5 below objectives	VLAKES index <0.5 below objectives	VLAKES index meets objectives
	Marine and Estuaries	Significant and high effects on abundance or diversity	Significant and moderate effects on abundance or diversity	No significant effects on abundance or diversity
Bioaccumulation		Significant difference (P<0.05) and >3x control	Significant difference (P<0.05) and >3x control	Not significantly different from control
Biomarkers		Significantly different from control and high effect size	Significantly different from control and moderate effect size	Not significantly different from control
Other lines of evidence		Significantly difference from control and high effect size	Significantly different from control and moderate effect size	Not significantly different from control
Weight of evidence assessment		High risk of significant adverse effects	Medium risk of adverse effects	Low risk of adverse effects – meets objectives for the protection of environmental values

**Table 5.19: Water-based recreation—Classification matrix for long-term microbial indicators and objectives**

		Microbial Assessment Category (95th percentile (Hazen method))				
		A	B	C	D	E
Freshwater		≤ 130 <i>E. coli</i> /100 mL	130 - 260 <i>E. coli</i> /100 mL	261 - 550 <i>E. coli</i> /100 mL	551 - 5500 <i>E. coli</i> /100 mL	> 5500 <i>E. coli</i> /100 mL
Freshwater, Marine, Estuarine		≤ 40 enterococci/100 mL	40 – 200 enterococci/100 mL	201 - 500 enterococci/100 mL	501-5000 enterococci/100 mL	> 5000 enterococci/100 mL
Sanitary Inspection Category	Very Low	Very Good	Very Good	Follow-up	Follow-up	Follow-up
	Low	Very Good	Good	Follow-up	Follow-up	
	Moderate	Good	Good	Poor	Poor	
	High	Good	Fair	Poor	Very Poor	
	Very High	Follow-up	Follow-up	Poor	Very Poor	

**Notes**

1. For long term assessment for water-based recreation (primary contact and secondary contact), a rolling water quality data set with a minimum number of 60 samples must be developed and maintained. The microbial assessment category must be assessed in both general weather (a range of weather conditions) and dry weather conditions
2. For long term assessment for primary contact water-based recreation, data must be collected during periods of high recreational use and a sanitary inspection at a site is required.
3. Site-specific microbial long term objectives may be used if a “follow-up”, “poor” or “very poor” long term water quality grade is determined. Site-specific objectives must be derived from a risk assessment approach, following industry best practice and guidance published or approved by EPA.

**Table 5.20: Water-based recreation—Short term indicators and objectives**

<i>E. coli</i> (orgs/100mL) Freshwater	Enterococci (orgs/100mL) Marine, estuarine and freshwater
Consecutive sample: ≤ 260	Consecutive sample: ≤ 200
Single sample: ≤ 550	Single sample: ≤ 500

**Notes**

1. For short term assessment for primary contact water-based recreation, data must be single samples regularly collected during periods of high recreational use.
2. Microbial water quality objectives must be assessed against only dry weather water quality data if warning about risk to water quality from stormwater pollution following rain is communicated to the public by—

- (i) daily water quality forecasting; and
  - (ii) permanent signs warning of risk after stormwater pollution.
3. Site-specific short term objectives may be derived from a risk assessment approach, following industry best practice and guidance published or approved by EPA to reflect potential health outcomes.

**Table 5.21: Marine pollutant load objectives**

<b>Column 1 Geographic area</b>	<b>Column 2 Indicator</b>	<b>Column 3 Objective (annual average)</b>
Lake Wellington	Total phosphorus	100 tonnes
Corner Inlet (excluding Nooramunga Marine and Coastal Park)	Total nitrogen	90 tonnes
	Total phosphorus	16 tonnes
	TSS	1,800 tonnes
Nooramunga Marine and Coastal Park	Total nitrogen	68 tonnes
	Total phosphorus	6 tonnes
	TSS	1,730 tonnes
Port Phillip Bay	Total nitrogen from surrounding waterways	1,500 to 2,200 tonnes
	Nitrogen from the Western Treatment Plant	3,100 tonnes (based on a rolling 3 year average)
	Total nitrogen from the Yarra and Maribyrnong Rivers	Contribution of total nitrogen load not to exceed 70 % of total annual average load from all surrounding waterways
	TSS from surrounding waterways	60,000 to 70,000 tonnes
	TSS from the Yarra and Maribyrnong Rivers	Contribution of TSS load not to exceed 70 % of annual average load from all surrounding waterways
Western Port	TSS	28,000 tonnes

## Endnotes

### Table of Applied, Adopted or Incorporated Matter

ERS provision	Title of applied, adopted or incorporated document	Matter in applied, adopted or incorporated document
Clause 4, definition of <b>A-weighted sound pressure level</b> , and Table 3.3	Australian/New Zealand Standard AS/NZS IEC 61672.1:2019 Electroacoustics—Sound level meters, published by Standards Australia and Standards New Zealand in 2019	Part 1: Specifications
Clause 4, definition of <b>Victorian Wetland Inventory</b> , and clause 17	Victorian Wetland Inventory, published by the Department of Environment, Land, Water and Planning (available on the webpage <a href="https://discover.data.vic.gov.au/dataset/victorian-wetland-inventory-current">discover.data.vic.gov.au/dataset/victorian-wetland-inventory-current</a> )	Areas defined as ‘lacustrine’ and ‘palustrine’
Clause 4, definition of <b>VLAKES</b> , and Tables 5.11 and 5.18	<i>Environmental Quality Guidelines for Victorian Lakes</i> , published by EPA in 2010 (EPA publication 1302)	The whole
Table 4.3	National Environment Protection (Assessment of Site Contamination) Measure 1999 made under section 14 of the <b>National Environment Protection Council (Victoria) Act 1995</b> and the equivalent legislation of the participating jurisdictions	Volume 1: Schedule A and Schedule B Volume 2: Schedule B1 Volume 3: Schedule B2 Volume 5: Schedule B4 Volume 6: Schedule B5a Volume 7: Schedule B5b Volume 8: Schedule B5c Volumes 10-19: Schedule B7
Tables 4.3 and 5.7	Australia New Zealand Food Standards Code made under section 92 of the Food Standards Australia New Zealand Act 1991 of the Commonwealth	Schedule 19 (Maximum levels of contaminants and natural toxicants)
Tables 5.4 and 5.7	<i>Australian Drinking Water Guidelines Paper 6: National Water Quality Management Strategy</i> , published by the National Health and Medical Research Council, National Resource Management Ministerial Council, Commonwealth of Australia in 2011	Chapters 5 and 6 and Table 10.6 (Guideline values for physical and chemical characteristics) in Chapter 10
Tables 5.4 and 5.7	<i>Australian and New Zealand Guidelines for Fresh and Marine Water Quality</i> , published by the Australian and New Zealand Governments and Australian State and Territory Governments in 2018 (available on the webpage <a href="http://www.waterquality.gov.au/anz-guidelines">www.waterquality.gov.au/anz-guidelines</a> )	The sections and parts of the <i>Australian and New Zealand Guidelines for Fresh and Marine Water Quality</i> on the following webpages: <a href="http://www.waterquality.gov.au/anz-guidelines/guideline-values/default/primary-industries">www.waterquality.gov.au/anz-guidelines/guideline-values/default/primary-industries</a>

		<a href="http://www.waterquality.gov.au/anz-guidelines/resources/key-concepts/level-of-protection">www.waterquality.gov.au/anz-guidelines/resources/key-concepts/level-of-protection</a> <a href="http://www.waterquality.gov.au/anz-guidelines/guideline-values/default/sediment-quality-toxicants">www.waterquality.gov.au/anz-guidelines/guideline-values/default/sediment-quality-toxicants</a> <a href="http://www.waterquality.gov.au/anz-guidelines/guideline-values/derive/cultural-values">www.waterquality.gov.au/anz-guidelines/guideline-values/derive/cultural-values</a>
Tables 5.4 and 5.7	<i>Guidelines for Managing Risks in Recreational Water</i> , published by the National Health and Medical Research Council in 2008	Chapters 6, 7, 9, 10 and Appendix 1