Impact Assessment

Proposed Environment Reference Standard

Department of Environment, Land, Water and Planning (DELWP)

Environment Protection Authority Victoria (EPA)

This Impact Assessment assesses the proposed Environment Reference Standard (ERS) - a legislative instrument that may be made under the *Environment Protection Act 2017*. The Impact Assessment has been prepared in accordance with the requirements of the *Environment Protection Act 2017*, the *Subordinate Legislation Act 1994* and the *Victorian Guide to Regulation*.

The Impact Assessment has been prepared to facilitate public consultation on the proposed ERS. A copy of the proposed ERS is available from <https://engage.vic.gov.au/new-environmental-laws/subordinate-legislation>.

Public comments or submissions are invited on the proposed ERS. Submissions are considered public documents and may be published unless the submission clearly indicates the submission is confidential.

Please submit comments or submissions by no later than 31 October 2019, to:

[sublegreform@epa.vic.gov.au](mailto:sublegreform@epa.vic.gov.au) or to:

EPA Victoria

Attention: Director of Policy and Regulation

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# Glossary

|  |  |
| --- | --- |
| Acronym | Full name |
| ACT | Australian Capital Territory |
| ANZ | Australia New Zealand |
| AS/NZS | Australian/New Zealand Standard |
| dB | Decibel |
| °C | Degrees Celsius |
| CES | Chief Environmental Scientist |
| CIS | Comprehensive Impact Statement |
| Cm | Centimetre |
| CMA | Catchment Management Authority |
| CO | Carbon monoxide |
| CSIRO | Commonwealth Scientific and Industrial Research Organisation |
| DELWP | Department of Environment, Land, Water and Planning |
| EES | Environment Effects Statement |
| EIL | Ecological Investigation Level |
| EPA | Environment Protection Authority (Victoria) |
| EP Act | Environment Protection Act 2017 (as amended) |
| EP Act 2018 | Environment Protection (Amendment) Act 2018 |
| EP Act 2017 | Environment Protection Act 2017 |
| EP Act 1970 | Environment Protection Act 1970 |
| EP Regulations | Proposed Environment Protection Regulations |
| ERS | Environment Reference Standard |
| EU | European Union |
| FAO | Food and Agriculture Organization of the United Nations |
| FSANZ | Food Safety Australia New Zealand |
| GED | General Environmental Duty |
| HIL | Health Investigation Level |
| HSL | Health Screening Level |
| IMP | Impact Management Plan |
| Km | Kilometre |
| LOAEL | Lowest-observed-adverse-effect level |
| MAC | Ministerial Advisory Committee |
| MAV | Municipal Association of Victoria |
| MER | Monitoring, Evaluation and Reporting |
| mg/L | Milligrams per litre |
| ML | Maximum Level |
| MTPF Act | Major Transport Projects Facilitation Act 2009 |
| NEPC | National Environment Protection Council |
| NEPM | National Environment Protection Measure |
| NEPM (AAQ) | National Environment Protection (Ambient Air Quality) Measure |
| NEPM (ASC) | National Environment Protection (Assessment of Site Contamination) Measure |
| NERG | Noise External Reference Group |
| NIRV | Noise from Industry in Regional Victoria |
| NO2 | Nitrogen dioxide |
| NOEL | No-observed-effect level |
| Noise Protocol | Proposed Noise Limit and Assessment Protocol for the control of noise from commercial, industrial and trade premises and entertainment venues |
| NSW | New South Wales |
| NT | Northern Territory |
| NZ DOC | New Zealand Department of Conservation |
| O3 | Ozone |
| OMLI | Obligations of Managers of Land or Infrastructure |
| OPMF | Organisational Performance Management Framework |
| P&E Act | Planning and Environment Act 1987 |
| PM | Particulate matter |
| PM2.5 | Particulate matter less than 2.5 micrometres |
| PM10 | Particulate matter less than 10 micrometres |
| QLD | Queensland |
| RA | Responsible Authority |
| RIS | Regulatory Impact Statement |
| SA | South Australia |
| SAP | Science Advisory Panel |
| SEPP | State Environment Protection Policy |
| SEPP (AAQ) | State Environment Protection Policy (Ambient Air Quality) |
| SEPP (AQM) | State Environment Protection Policy (Air Quality Management) |
| SEPP (N-1) | State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade) |
| SEPP (N-2) | State Environment Protection Policy (Control of Music Noise from Public Premises) |
| SEPP (PMCL) | State Environment Protection Policy (Prevention and Management of Contamination of Land) |
| SEPP (Waters) | State Environment Protection Policy (Waters) |
| SEPP (WoV) | State Environment Protection Policy (Waters of Victoria) |
| SLA | Subordinate Legislation Act 1994 |
| SO2 | Sulfur dioxide |
| SSD | Species Sensitive Distribution |
| TDS | Total Dissolved Solids |
| µg | Microgram |
| µg/L | Microgram per litre |
| µg/m3 | Microgram per cubic metre |
| µm | Micrometre |
| µS/cm | Microsiemens per centimetre |
| VAGO | Victorian Auditor-General’s Office |
| VCAT | Victorian Civil and Administrative Tribunal |
| VGR | Victorian Guide to Regulation |
| WA | Western Australia |
| WHO | World Health Organization |
| WMP | Waste Management Policy |

This is the impact assessment for the proposed Environment Reference Standard (ERS), made in accordance with section 95(1) of the *Environment Protection Act 2017*,as amended by the *Environment Protection Amendment Act 2018*. The impact assessment is prepared in accordance with the *Subordinate Legislation Act 1994* and the *Victorian Guide to Regulation*, as applicable.

# Note on terminology

The impact assessment uses the following terminology:

* References to the ***Environment Reference Standard (or ERS)*** are references to the subordinate legislative instrument described in section 93 of the *Environment Protection Act 2017* (as amended). The Environment Reference Standard is a single instrument containing a consolidated set of standards.
* References to the ***ERS standards***, or simply to ***the standards***, are general references to the environmental values, indicators and objectives for elements of the environment, and areas of Victoria, that are contained within the ERS. References to the standards may also refer to the standards contained in current Victorian statutory policies, which are known as State Environment Protection Policies (SEPPs). The impact assessment uses this term generally. Depending on the context, it may refer to all the standards within the ERS or a SEPP, or it may refer to a particular set of standards, for example, the standards for the air environment.

The terms environmental value, indicator, and objective used in the ERS to describe ERS standards correspond to the terms beneficial use, environmental indicator and environmental quality objective as used in SEPPs – as shown in Table 1. The meaning of the corresponding terms is the same, with the terminology used in the ERS updated to align with more contemporary usage.

To avoid confusion that may be caused by switching between two sets of terms when describing the standards in the proposed ERS and the standards in current SEPPs, the impact assessment will refer only to the new terms: environmental values, indicators and objectives. For ease of reading, the impact assessment will generally use these terms even when referring to the standards in the context of the current SEPPs.

Table 1 - ERS and SEPP terminology

|  |  |  |  |
| --- | --- | --- | --- |
| Instrument | Term for a use, attribute or function of the environment | Term for the quality or substance used as a metric to assess the use, attribute or function | Term for the character, level, concentration or amount of an indicator used to assess the use, attribute or function |
| ERS | Environmental value | Indicator | Objective |
| SEPPs | Beneficial use | Environmental indicator | Environmental quality objective |

The meanings of the terms environmental value, indicator and objective are explained further in Chapter 2.

# Executive summary

## Introduction

In 2016, the independent Inquiry into the Environment Protection Authority (EPA) found that comprehensive reform of Victoria’s approach to environment protection was required and recommended a comprehensive overhaul of the *Environment Protection Act 1970*. One of the EPA Inquiry’s further recommendations was that the existing environment protection statutory policy framework – consisting of State Environment Protection Policies (SEPPs) and Waste Management Policies (WMPs) – be deconstructed into separate fit-for-purpose instruments and the creation of a new standalone instrument for environmental standards, which would allow them to be more easily updated.

The government supported most of the EPA Inquiry’s recommendations. In 2017-18 the government implemented its response through two phases of legislative reform. The *Environment Protection Act 2017* modernises the EPA’s corporate governance and strengthens its status as a science-based regulator. *The Environment Protection Amendment Act 2018* introduces a new legislative framework for environment protection in Victoria. It amends the *Environment Protection Act 2017* and repeals the *Environment Protection Act 1970*. It is intended that the *Environment Protection Act 2017* (as amended by the *Environment Protection Amendment Act 2018*) will come into full effect from 1 July 2020. Hereafter it will be referred to as the EP Act.

The EP Act includes provision for a new stand-alone subordinate instrument called an Environment Reference Standard (ERS). The purpose of the ERS is to set out the environmental standards that the environment protection legislative framework, broadly speaking, seeks to achieve or maintain.

### Elements of an Environment Reference Standard

The EP Act allows that an ERS may be made on the recommendation of the Minister. It states that an ERS is used to assess and report on environmental conditions - and must identify environmental values that specify the environmental condition and uses of the environment to be achieved or maintained - in the whole or any part of Victoria.[[1]](#footnote-2) An ERS is therefore an environmental benchmark. It describes certain valued attributes of Victoria’s environment that are sought be achieved or maintained, and the conditions that support, or are used to assess, those attributes.

The essential elements of an ERS are described in section 93 of the EP Act.

An ERS must identify **environmental values**. The EP Act defines an environmental value as “a use, an attribute or a function of the environment.” Environmental values express qualities associated with the environment that the Victorian community values and wants to achieve or maintain.

An ERS must state the **area(s) of Victoria to which it relates**. It may apply to the whole or part of Victoria, and its environmental values may also apply to the whole or part of the state. An ERS must also specify the elements of the environment to which it relates. Elements of the environment may include, but are not limited to, air, land, noise and water (inland water, groundwater and marine) environments. The ERS must clearly define which environmental values apply for each area and element of the environment.

An ERS also specifies the **indicators** and **objectives** to be used to assess whether environmental values are being achieved, maintained, or may be threatened, in a specified area:

* An **indicator** is a quality or substance that has been selected as a metric to assess an environmental value.
* An **objective** is the character, level, concentration or amount of an indicator that is used to assess an environmental value in an area. Objectives may be quantitative or qualitative. Objectives may describe conditions that achieve or maintain an environmental value, or they may describe conditions where an environmental value may be threatened, and where further assessment may be required.

### Preparation of an impact assessment

Section 95(1) of the EP Act requires that an impact assessment for the proposed ERS is prepared. The impact assessment must accord with applicable requirements of the *Subordinate Legislation Act 1994* (SLA) and the *Victorian Guide to Regulation* (VGR). Independent advice from the Commissioner for Better Regulation as to the adequacy of the impact assessment and must also be obtained and considered. The Commissioner for Better Regulation has considered the impact assessment and the Commissioner’s letter is included at Appendix A.

Section 12D of the SLA requires that the Minister must ensure that a human rights certificate is prepared respect of the proposed ERS. The Minister has prepared a draft human rights certificate, which finds that in the Minister’s opinion the proposed ERS does not limit any human right set out in the Victorian Charter of Human Rights and Responsibilities. The draft human rights certificate is included at Appendix B.

Section 95(2) of the EP Act requires that when determining whether to recommend whether an ERS should be made, the Minister must take the principles of environment protection contained in Part 2.3 of the EP Act into account. An outline of how the principles of environment protection relate to the ERS is provided at Appendix C.

The *Climate Change Act 2017* requires that the Minister must have regard to climate change in making the decision to recommend that an ERS be made, amended, or revoked. An outline of how climate change is relevant to the decision to recommend making the ERS is provided at Appendix D.

### Review and update of an ERS

It is intended that creating a stand-alone instrument for environmental standards will simplify the process for their review, enabling them to be kept up to date more easily.

The EP Act requires that an ERS must be reviewed within a 10-year review period, however this is a maximum limit. Reviews or updates of an ERS, or to particular standards, may be undertaken at more frequent periods, or on an *ad hoc* basis.

## Assessing the impact of the ERS

This impact assessment seeks to describe the impacts that can be attributed to the proposed ERS[[2]](#footnote-3) in the context of the environment protection framework. To do this, the impacts of the ERS are compared to a base case. The base case used in this impact assessment is the anticipated future state from 1 July 2020 where the EP Act takes full effect, along with the proposed Environment Protection Regulations (EP Regulations). The impact of the ERS is the incremental impact on circumstances or outcomes that is anticipated from the introduction of the ERS, compared to the base case.

### ERS problem statement

The ERS addresses the key problem relating to information about the state of the environment; that a lack of clear and authoritative scientific standards for reporting and decision-making increases the level of uncertainty and inconsistency, while decreasing transparency, effective communication and coordination.

Decisions affecting the environment need to be made by regulators, organisations and individuals. Without an ERS in Victoria, these actors would need to make decisions informed by other standards. It is likely that these actors would look to previous standards or to standards in other jurisdictions or set by international bodies. However, other standards are not always consistent with each other and may not be appropriate in the Victorian context.

If other standards were to be used ad hoc, this would increase uncertainty and inconsistency in the way standards are used, and potentially decrease transparency about regulatory decisions. This decreases the confidence in decision-making and increases the risk that inappropriate decisions are made.

In addition, the complexity of the environment and the subjectivity with which it is valued can make it difficult to effectively communicate about the environment and coordinate action. In the absence of the ERS it would be more difficult to communicate and coordinate action regarding the environment in a consistent way between regulators, organisations and individuals.

### Purpose and objectives

Section 2 of the proposed ERS sets out its purpose:

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

The objectives of the proposed ERS (as described in this impact assessment) are:

1. To promote a shared understanding of environmental value;
2. To improve assessment and reporting on environmental conditions;
3. To ensure that relevant environmental regulatory decisions are informed by appropriate, consistent scientific reference information.

## The proposed ERS standards and methods used to prepare the standards

The proposed ERS is a single, stand-alone legislative instrument. It contains environmental values, indicators and objectives for four ‘elements of the environment’: air, land, noise and water. For each element of the environment, the ERS specifies the area or areas of Victoria that the particular standards apply.

During 2018-19, the EPA and the Department of Environment, Land, Water and Planning (DELWP) undertook an assessment process to identify and propose standards for inclusion in the ERS. Due to the short timeframe to prepare the proposed ERS, and the range of periods since existing environmental standards were last reviewed, it was determined that the proposed ERS would adopt relevant standards from current statutory policies, or new standards identified through current reviews, where these were sufficiently developed.

To inform the development of the proposed ERS prior to its release for the formal public consultation period, EPA and DELWP undertook significant preliminary stakeholder consultation and engagement between August 2018 and July 2019.

To provide further scientific assessment of the standards included in the proposed ERS, in February 2019, DELWP and the EPA formally requested Victoria’s Chief Environmental Scientist (CES), Dr. Andrea Hinwood, to undertake an assessment of the underpinnings of the standards. The CES found that, overall, the processes used to select environmental values, indicators and objectives were appropriate, and the processes to develop indicators and objectives were comprehensive. The CES also considers that most standards are underpinned by scientific evidence that is objectives, peer-reviewed and based on national and international best practice. The CES made a range of findings and recommendations, including recommendations concerning future review of the standards – these are reproduced at Appendix E.

### ERS standards for air

The proposed ERS adopts all the environmental values from the SEPP (Ambient Air Quality) - SEPP (AAQ) – with slight changes to wording, but not to meaning. The proposed ERS also includes the additional environmental value for climate systems that is included in SEPP (Air Quality Management) – SEPP (AQM). The SEPP (AAQ) environmental values were originally developed through a consultative process for an earlier Victorian policy known as SEPP (The Air Environment) 1981, while the climate systems environmental value was introduced when SEPP (AQM) was revised in 2001.

The proposed ERS also adopts all the indicators and objectives from SEPP (AAQ) without change. These standards implement the standards of the National Environment Protection Measure (Ambient Air Quality) - NEPM (AAQ) - with some modifications. The rationale for adopting the SEPP (AAQ) standards without change is because they are the most relevant standards at the present time, based on current evidence.

In addition, the proposed ERS also includes a qualitative objective for odour, which is newly proposed for the ERS. Odour is proposed for inclusion as it allows the ERS to present a fuller description of the characteristics of the ambient air environment that are considered to achieve or maintain the environmental values.

The proposed ERS indicators and objectives for the air environment, and the instrument in which they were first introduced, are presented in Table 2.

Table 2- proposed ERS air indicators and objectives

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Indicator** | **Objective** | **Averaging period** | **Max. exceedances** | **First introduced** |
| Carbon monoxide (max. concentration) | 9.0 ppm | 8 hours | 1 day a year | NEPM (AAQ) 1998 |
| Nitrogen dioxide (max. concentration) | 0.12 ppm | 1 hour | 1 day a year | NEPM (AAQ) 1998 |
| 0.03 ppm | 1 year | None | NEPM (AAQ) 1998 |
| Photochemical oxidants (as ozone) (max. concentration) | 0.10 ppm | 1 hour | 1 day a year | NEPM (AAQ) 1998 |
| 0.08 ppm | 4 hours | 1 day a year | NEPM (AAQ) 1998 |
| Sulphur dioxide (max. concentration) | 0.20 ppm | 1 hour | 1 day a year | NEPM (AAQ) 1998 |
| 0.08 ppm | 1 day | 1 day a year | NEPM (AAQ) 1998 |
| 0.02 ppm | 1 year | None | NEPM (AAQ) 1998 |
| Lead (max. concentration) | 0.50 µg/m3 | 1 year | None | NEPM (AAQ) 1998 |
| Particulate matter as PM10 (max. concentration) | 50 µg/m3 | 1 day | None | NEPM (AAQ) Variation 2015 |
| 20 µg/m3 | 1 year | None | SEPP (AAQ) Variation 2016 |
| Particulate matter as PM2.5 (max. concentration) | 25 µg/m3 | 1 day | None | NEPM (AAQ) Variation 2015 |
| 8 µg/m3 | 1 year | None | NEPM (AAQ) Variation 2015 |
| Visibility-reducing particles | 20 km | 1 hour | 3 days a year | SEPP (AAQ) 1999 |
| Qualitative | N/A | An air environment that is free from offensive odours from commercial, industrial, trade and domestic activities | N/A | Newly-proposed |

Victoria is currently leading a national review of the NEPM (AAQ) standards for sulfur dioxide, nitrogen dioxide and ozone with a view to update the standards to reflect contemporary scientific evidence for these pollutants. The National Environment Protection Council (NEPC) have published a notice of intention to vary NEPM (AAQ) and it is anticipated that NEPM (AAQ) will be updated in 2020. The Victorian government will consider further changes to the ERS once the NEPM is updated.

### ERS standards for land

The environmental values in the proposed ERS are adopted from SEPP (Prevention and Management of Contamination of Land) - SEPP (PMCL) - which has included these environmental values since it was introduced in 2002.

The proposed land use categories, indicators and objectives for land are also based on the indicators and objectives contained within the SEPP (PMCL). The wording of the indicators in the proposed ERS has been updated from SEPP (PMCL) to aid clarity, but it does not change their meaning. Minor changes have also been made to objectives – mainly to aid clarity and to align the objectives as presented in the ERS with the provisions of the EP Act.

As with SEPP (PMCL), the proposed ERS indicators and objectives are related to, and refer to, the standards of the NEPM Assessment of Site Contamination - NEPM (ASC) - or to standards derived using the methodologies it prescribes. Likewise, it also refers to standards in the Food Standards Australia New Zealand, Food Standards Code (Food Standards Code). Some standards are described qualitatively as the application of the standards for the land environment may depend on site-specific or subjective characteristics or uses, for example aesthetic considerations. The environmental values, indicators ad objectives for the land environment are presented in Table 3.

Table 3- proposed standards for the land environment

|  |  |  |
| --- | --- | --- |
| Environmental value | Indicators | Objectives |
| Maintenance of ecosystems | Inorganic and organic contaminants listed 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) for each indicator, 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 listed 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) for each indicator, unless—  (a) there is no such investigation or screening level; or  (b) due to site specific characteristics the more appropriate objective is:   * + - 1. (i) the level derived using the risk assessment methodology described in the NEPM(ASC); or       2. 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 & 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 and flora and fibre | Inorganic and organic contaminants listed 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. |

### ERS standards for noise

The proposed ERS adopts the three environmental values contained within the SEPP (Control of Noise from Industry, Commerce and Trade - SEPP (N-1) and SEPP (Control of Music Noise from Public Premises (N-2)), plus two additional environmental values that were identified through a 2014-18 review of these SEPPs. The proposed environmental values for noise are:

* Sleep during the night;
* Domestic and recreational activities
* Normal conversation
* Child learning and development;
* Human tranquillity and enjoyment in natural areas

The proposed ERS also includes new indicators and objectives, which in contrast to the noise SEPPs, provide a means of characterising the environmental values with respect to the ambient acoustic environment. The proposed ERS relates the indicators and objectives to areas of Victoria through the use of five land use categories, which are comprised of land use planning zones with similar characteristics.

The proposed indicators and objectives for each land use category are presented in Table 4. They have been developed by the EPA to in accordance with current scientific knowledge of the noise levels that characterise the maintenance of the environmental values, and above which there is an increased risk of impact to human health. They are consistent with the scientific basis that underpins the noise SEPPs and the proposed EP Regulations.

Table 4 - proposed indicators and objectives for the acoustic environment

|  |  |  |
| --- | --- | --- |
| Land Use Category | Indicator | Objective |
| Category I | Outdoor LAeq,8h from 10 p.m. to 6 a.m.​  Outdoor LAeq,16h from 6 a.m. to 10 p.m. | 55 dB​ (A)  60 dB​ (A) |
| Category II | Outdoor LAeq,8h from 10 p.m. to 6 a.m.​  Outdoor LAeq,16h from 6 a.m. to 10 p.m. | 50 dB​ (A)  55 dB​ (A) |
| Category III | Outdoor LAeq,8h from 10 p.m. to 6 a.m.​  Outdoor LAeq,16h from 6 a.m. to 10 p.m. | 40 dB​ (A)  50 dB​ (A) |
| Category IV | Outdoor LAeq,8h from 10 p.m. to 6 a.m.​  Outdoor LAeq,16h from 6 a.m. to 10 p.m. | 35 dB​ (A)  40 dB​ (A) |
| Category V | Qualitative | An acoustic quality that is conducive to human tranquillity and enjoyment having regard to the ambient natural soundscape. |

### ERS standards for water

The proposed ERS derives the environmental values, segments, indicators and objectives surface waters and groundwater from SEPP (Waters), with only minor changes. SEPP (Waters) was introduced in October 2018 following a thorough review, which involved extensive consultation and engagement with stakeholders, and a detailed review of environmental values, segments, indicators and objectives, which was overseen by an independent expert Science Advisory Panel (SAP). The ERS does not include other aspects of SEPP (Waters), such as rules and obligations, and measures for the management of risks, as these are outside the scope of an ERS. Where applicable, these obligations are addressed through the General Environmental Duty (supplemented with guidelines), with higher order risks (for example, waste discharge from vessels, clean-up of non-aqueous phase liquid, waste discharge to aquifer, etc), addressed through provisions of the proposed EP Regulations.

The proposed ERS adopts 13 of the 14 environmental values from SEPP (Waters). It is proposed that the SEPP (Waters) environmental value for cultural and spiritual values is not included in the ERS as it is considered that in achieving or maintaining the objectives for other environmental values (for example water dependent ecosystems and species, water-based recreation, and traditional owner cultural values) would also be maintained.

The proposed ERS applies environmental values to segments consistent with SEPP (Waters). It does not include the SEPP (Waters) exclusions to environmental values in certain locations because these relate, in SEPP (Waters), to a framework of obligations for managing surface waters, including placing restrictions on some activities, which is not the intended purpose of an ERS. However, like SEPP (Waters), the proposed ERS does not apply environmental values to surface waters in artificial assets, or where an environmental value cannot be achieved due to the background water quality level.

The proposed ERS adopts almost all the indicators and objectives from SEPP (Waters), noting however, that:

* While the proposed ERS retains pollutant load targets (renamed as marine pollutant load objectives), it does not include the SEPP (Waters) target dates for attaining the targets/objectives, as these are out of scope for the ERS; and
* All the proposed ERS indicators and objectives for the environmental value of potable mineral water supply refer to indicators and guideline values specified in the Australian Drinking Water Guidelines, and it does not refer to values specified in the Food Standards Code. The change is proposed to make these standards consistent with other indicators and objectives for water supply and consumption in the ERS.

## Intended operation and impact

Corresponding to the three ERS objectives identified above, the impact assessment describes three ways in which the ERS is intended to operate. The impact assessment assesses the impact of the ERS for each of these.

### 1. To communicate effectively about environmental issues

The most general way in which the ERS can be used are to promote a shared understanding between government, community and other stakeholders about what is valued in the environment. This shared understanding provides a foundation for effective communication about important environmental issues by, and between, different stakeholders.

As a legislative instrument of the EP Act, the ERS represents a public declaration about the desired state of the environment, which can be harnessed by the EPA and other government organisations in their engagement with individuals, communities, business and industry, regulators and other parts of government.

The ERS provides a source of information that may assist communities to engage more meaningfully in environmental debates, which is an important principle of environmental justice. Similarly, it may assist communities in their efforts to draw attention to particular issues of environmental and public health concern. By reference to the ERS, communities can demonstrate where an environmental value may be threatened. This can help the community to raise awareness about the issue, to facilitate public debate, and to advocate for change.

For business and industry, the ERS provides a broad means of demonstrating – to the community and consumers – that the organisation understands environmental value and undertakes good practice environmental management.

#### Impact

The impact of the ERS as a means of promoting a shared understanding of, and of communicating about environmental issues depends on the extent to which it comes to be utilised for these purposes. It will certainly be used as a tool by the EPA to communicate with communities and government, including other regulators. To this extent it will provide a benefit to the EPA. Without the ERS, the environment protection framework will not have an extant set of Victorian Government-endorsed standards that can be employed for this function. And while there are many sources of environmental information available, there are no other readily-available and consolidated standards that could perform the same function to the same extent.

The ERS may provide a moderate benefit to communities, local government and other government entities wishing to draw attention to an environmental issue, again to the extent that it is utilised for this purpose. Without the ERS, communities and others would need to invest time and effort to locate and refer to other studies, reports, and sources of information to provide a referential basis for awareness-raising efforts. And while some sources may be scientifically robust, others may be unreliable, biased, or not suitable to be applied in the local area. No alternative environmental reference would have the authority that is possessed by the ERS due to its status as a legislative instrument. Use of the ERS enables stakeholders to focus more energy on the issue of concern and avoids search costs associated with debating and defining the characteristics of particular environmental issues.

The ERS may provide a moderate marketing benefit to business and industry where it is able to use the ERS to better demonstrate its environmental credentials to environmentally-focussed consumers.

### 2. To assess and report on environmental conditions

The ERS is intended to be a benchmark that can be used to produce information about whether valued aspects of air, land, acoustic and water environments are being achieved or maintained, or may be threatened. It is intended that this information, assessed and reported at appropriate time-scales, will support high quality policy advice and well-informed environmental management activities. It is also intended that this information will be made accessible to the public, and communicated clearly, through digital media and other sources, so that the public can make well-informed decisions about their use and enjoyment of the environment. The ERS meets a community expectation that these functions are informed by clear, reliable, relevant scientific benchmarks.

The ERS does not specify that it must be used for any particular assessment and reporting function. However, it is anticipated that the ERS will underpin a range of environmental condition assessment and reporting activities undertaken by the EPA, DELWP, partner government agencies, and other entities such as the Commissioner for Environmental Sustainability. Foremost among these are activities that refer to SEPPs standards currently.

#### Impact

The ERS provides a clear, authoritative and accessible benchmark against which environmental conditions may be assessed and reported. The key benefits of an ERS for assessment and reporting are:

**Efficiency** – The ERS are a robust set of ready-made standards that can be adopted, and quickly and easily applied, for assessment and reporting function where comparison of environmental conditions to environmental values is relevant. This avoids the need for new standards to be developed, or alternative standards to be located, for each new, relevant activity. Without an ERS, considerable time and resources may be required to develop or decide on alternative standards.

**Consistency** - The ERS standards will continue to apply (until they are updated), and for as long as the ERS is in effect. For assessment and reporting functions that utilise the ERS, the standards provide a constant reference for reporting over time. Without an ERS to provide an authoritative, stable reference, such consistency is less likely to be achieved.

**Transparency** – The ERS is a reference that is available to all Victorians. It makes clear the environmental conditions that are considered to achieve, maintain, or pose a potential threat to, environmental values. This allows everyone to be informed of the standards against which relevant assessment and reporting activities will be based. Without an ERS, the basis for assessment and reporting is likely to be more difficult for Victorians to ascertain.

There are no additional assessment and reporting costs attributable to the ERS - the ERS itself does not introduce any new assessment and reporting activities, nor will its introduction necessarily result in new activities being undertaken. There could be resourcing costs for government if it chose to undertake new reporting dedicated to communicating the state of the environment in relation to ERS standards, if this reporting was additional to all existing reporting activities. However, this should not be attributed to the ERS, as such a decision is not a direct consequence of its introduction.

Due to the efficiency with which the ERS may be adopted, described above, there may be a reduced overall cost to assessment and reporting activities.

### 3. To inform the provision of environment protection advice and decision making

The ERS provides information about the environmental conditions needed to support an environmental value, and the conditions where an environmental value may be threatened. Through reference to the ERS, the potential effects of an activity on environmental values are brought in to focus, which allows them to be more carefully considered in providing environment protection advice or recommendations, and in making decisions. Use of the ERS in this way supports clear, transparent and consistent advisory and decision-making functions, which benefits everyone – the regulator, the regulated, and the wider community. The ERS is not a compliance standard. There is no direct requirement for a duty holder to protect, uphold, meet or achieve the standards it describes. It simply provides an authoritative, scientifically-informed benchmark that may be factored into decisions where consideration of such a benchmark may be important, relevant or helpful.

There are statutory requirements for an ERS to be considered when making various decisions:

* By the Minister for the Environment, when deciding whether to make a Regulation under the EP Act, or a compliance code, or when deciding whether to declare an issue to be an issue on environmental concern;
* By the EPA when determining whether to issue a development licence, operating licence or pilot project licence under the EP Act. The proposed EP Regulations also require an ERS to be considered by the EPA or a council in relation to issuing a permit or permit exemption for certain prescribed activities;
* By environmental auditors when carrying out their functions;
* By the Victorian Civil and Administrative Tribunal (VCAT) when reviewing certain decisions under the EP Act and other acts; and
* By project proponents preparing an impact management plan or a comprehensive impact statement under the *Major Transport Projects Facilitation Act 2009*

The ERS may also be considered by the Responsible Authority when considering an application for a planning permit under the *Planning and Environment Act 1987*. In addition, the ERS is intended to be used routinely to support the EPA’s advisory and functions.

#### Impact

The ERS does not impose any additional direct regulatory requirement on a decision. The differences in indirect regulatory burden of decisions that have been informed by consideration of the ERS, compared to the base case, will depend on the alternative scientific reference information that might be employed. This will vary depending on the context of the decision-making situation and the aspect of the environment that is being considered, and it may result in either an increased or reduced indirect burden, compared to the base case. On average, across the range of regulatory decisions, the impact on a regulated party of decisions made with reference to the ERS, compared to decisions made under the base case is roughly equivalent, with little net impact.

One of the key benefits of an ERS is its authority. The ERS is a legislative instrument, which elevates the status of the standards it contains. The authority of the ERS supports several interrelated benefits:

**Clarity** – The introduction of an ERS provides certainty about the standards that will or should be referenced when seeking to understand the desired environmental state. The ERS sets out the standards transparently, which allows all stakeholders to know equally what the standards are, and to have confidence that they are the standards that will be used to inform relevant advice and decisions. Without an ERS, the standards that might be referenced to characterise the desired state of the environment are less certain.

**Consistency** – The ERS provides a stable set of benchmarks that will be applied consistently over time. This improves the consistency of advice provided and is an input that supports more regular, predictable decision-making. Without an ERS, there may be greater variability in decision-making and less stability, which may reduce stakeholder confidence in the fairness and transparency of decision-making processes.

**Quality** – The ERS ensures that decisions are informed by an appropriate, scientifically-derived set of standards that are relevant to local conditions. Without an ERS, there can be less confidence that relevant standards will always be considered. In fact, it is likely that some parties to a dispute may seek to propose inappropriate benchmarks.

**Efficiency** – Reference to the ERS is quick and simple. In general, it requires relatively little commitment in terms of time, labour, research and analysis, or expense. Without an ERS there may be considerable costs involved with researching, interpreting and debating the standards that should be referenced for each new situation.

**Confidence** – The legislative status of the ERS, and the methods used to develop the ERS standards, tends to promote public confidence in the instrument. In turn, this instils confidence that decisions informed by the ERS have been informed by reference to appropriate standards. This makes a modest yet important contribution to the public’s overall confidence in the appropriateness and effectiveness of the environment protection framework. Public confidence is an intangible asset. Greater confidence and trust in decision-making processes may contribute to an increase in overall public behaviour that is consistent with, and willingness of the public generally to act in ways that are consistent with, the purposes and objectives of the framework. Without an ERS, no other alternative standards are likely to instil comparable confidence, which may contribute to comparatively fewer actions that are consistent with the framework.

## Monitoring, evaluation and reporting (MER) requirements

### MER to evaluate the performance of the ERS

MER will evaluate the performance of the ERS in relation to its stated objectives. The ERS objectives will be evaluated through the assessment of a set of key evaluation questions and a set of quantitative and qualitative indicators will be developed to evaluate these questions. The indicators will be grounded in the EPA’s organisational performance management framework and data will be collected through performance information data sources connected to that framework.

The EPA will be primarily responsible for MER of the ERS, including data collection and analysis.

### MER for continuous improvement of the ERS standards

Monitoring and evaluation will be undertaken to understand the appropriateness of ERS standards and inform their continual improvement. The MER activities will be embedded into EPA’s overarching Environmental Monitoring and Assessment Framework.

### Future Review of the ERS standards

The EPA will publish a MER plan for the ERS in 2021. The plan will describe the EPA’s proposed approach to evaluating the performance of the ERS and will also describe its approach to future review of the ERS standards. The plan will reflect consideration of the recommendations and the proposed review process suggested by the CES (refer to Appendix E), and these will be incorporated into the plan as appropriate, consistent with EPA’s assessment of priorities in 2021.

The plan will include an indicative timeline for future review of priority ERS standards and supporting guidance.

# Chapter 1 - Background

## Reform of Victoria’s environment protection legislative framework

In 2015, the Victorian Government established a Ministerial Advisory Committee (MAC) to undertake an independent Inquiry into the Environment Protection Authority (the EPA Inquiry). The MAC was asked to consider a set of issues including: the scope of EPA’s role in public health, environment protection and environmental justice; the appropriateness of its governance and funding arrangements, and the scope and adequacy of its statutory powers.[[3]](#footnote-4)

The EPA Inquiry found that comprehensive reform of Victoria’s approach to environment protection was required. The final report of the EPA Inquiry,[[4]](#footnote-5) which was provided to government in 2016, recommended fundamental changes to modernise the environment protection legislative framework and enable the EPA to address current and future environmental challenges. Its first recommendation – Recommendation 5.1 – was that government undertake a comprehensive overhaul of the *Environment Protection Act 1970* (EP Act 1970).

The government supported the recommendation and implemented this and other EPA Inquiry recommendations through two phases of legislative reform during 2017-18:

The ***Environment Protection Act 2017*** (EP Act 2017)[[5]](#footnote-6) modernises the EPA’s corporate governance and strengthens its status as a science-based regulator. It creates a new objective of the EPA to protect human health and the environment by reducing the harmful effects of pollution and waste.

The ***Environment Protection Amendment Act 2018*** (EP Act 2018)[[6]](#footnote-7) amends the EP Act 2017 and repeals the EP Act 1970. It is intended that from 1 July 2020 most provisions of the EP Act 2018 will take legal effect (as amendments to the EP Act 2017) and the EP Act 1970 will cease to have legal effect.

The EP Act 2018 introduces a new legislative framework for environmental protection in Victoria. It includes a new approach to environmental issues, focusing on preventing waste and pollution impacts rather than managing those impacts after they have occurred. The legislation will enhance the protection of Victoria’s environment and human health through a more proportionate, risk-based environment protection framework that includes:

* a preventative approach through a General Environmental Duty;
* a tiered system of EPA permissions to support risk-based and proportionate regulatory oversight;
* significant reforms to contaminated land and waste management;
* increased maximum penalties;
* requirements for more environmental information to be publicly available; and
* modernising and strengthening EPA’s compliance and enforcement powers.

It is intended that from 1 July 2020 there will be a single Act in effect – the EP Act 2017 (as amended by the provisions of the EP Act 2018). Hereafter this single Act will be referred to as the EP Act.

### Environment protection subordinate legislative reform

The EPA Inquiry also found that the EP Act 1970 statutory policy framework - consisting of State Environment Protection Policies (SEPPs) and Waste Management Policies (WMPs)[[7]](#footnote-8) – was overly complex, difficult to understand and to update, which unnecessarily limits Victoria’s ability to respond to environmental challenges.

A key element of most SEPPs are environmental standards, which set out the beneficial uses of the environment that the SEPP seeks to protect, and the environmental conditions needed to protect beneficial uses – as described in Figure 1. The EPA Inquiry observed that environmental standards “need to be framed and in a format that is capable of being kept up-to-date and that can be clearly communicated and understood by industry, practitioners and key decision makers. They also need to be interpreted to the community – to build confidence in the system.”[[8]](#footnote-9)

The EPA Inquiry recommended deconstructing the SEPPs and WMPs and splitting their component parts into separate fit-for-purpose instruments. It proposed creating a new standalone instrument for environmental standards, separate from other aspects of the statutory policies. The EPA Inquiry recommendation 15.1 was to:

Replace state environment protection policies and waste management policies with a simplified approach to standard setting that allows for timely review and updating of standalone elements, including:

1. overarching policy settings to be established by the Department of Environment, Land, Water and Planning; and
2. technical standards to be determined by EPA.

The government supported recommendation 15.1. It committed to consider models to set outcomes-based standards through the legislative reform process.

The EP Act’s provision for an ERS delivers on the government’s commitment to create a simplified approach to standard setting. The ERS is a stand-alone subordinate legislative instrument setting out the environmental standards that the environment protection legislative framework, broadly speaking, seeks to achieve or maintain.

Other aspects and functions of SEPPs, such as the definition of roles, responsibilities and compliance obligations, are dealt with separately by the new environment protection legislative framework. Risks are addressed primarily through the operation of the General Environmental Duty and other duties. Residual risk management and control is exercised through other subordinate legislative instruments such as Regulations, Obligations of Managers of Land or Infrastructure (OMLIs) and Guidance.

The ERS, and the standards it contains, must be understood in the context of its intended operation within the new environment protection framework. While an ERS corresponds to the standard-setting part of SEPPs, it does not simply transpose the functions of the SEPPs standards. And while the proposed ERS proposed to take effect on 1 July 2020 mostly adopts the standards from most current SEPPs, this is because these are considered to be the most relevant, fit-for-purpose standards available for the new instrument. Within the new environment protection framework, the primary role of ERS standards will be to provide a benchmark or reference statement of desired environmental outcomes, rather than a statutory policy commitment to protect environmental standards through direct compliance obligations. This will be described in the impact assessment.

**State Environment Protection Policies**

SEPPs are a central piece of the environment protection statutory policy framework to which the extant *Environment Protection Act 1970* gives effect. They will continue to have force until 1 July 2020, with some SEPP clauses retained for a further two years to aid transition to the new environment protection framework.

SEPPs set out a framework for protecting and improving the quality of aspects of Victoria’s environment. SEPPs generally set out environmental standards that the policy seeks to protect. These identify beneficial uses of the environment that are sought to be protected, and in most cases set environmental quality objectives and indicators, which identify the environmental conditions to be used to assess whether the environmental quality protects beneficial uses.

SEPPs also set out arrangements for protecting beneficial uses, for example by defining roles and responsibilities, rules for decision makers, and compliance obligations on industry and others.

In some cases, SEPPs give effect to National Environment Protection Measures intended to deliver these outcomes.

There are six SEPPs currently in effect in Victoria:

* SEPP (Ambient Air Quality)
* SEPP (Air Quality Management)
* SEPP (Prevention and Management of Contamination of Land)
* SEPP (Control of noise from commerce, industry and trade)
* SEPP (Control of music noise from public premises)
* SEPP (Waters)

SEPPs with standards that are relevant to the proposed ERS are further described in Chapter 4.

Figure 1 - State Environment Protection Policies

# Chapter 2 – Requirements and making of an ERS

An ERS is a subordinate legislative instrument of the EP Act, which may be made on the recommendation of the Minister. The EP Act declares that an ERS is used to assess and report on environmental conditions - and must identify environmental values that specify the environmental condition and uses of the environment to be achieved or maintained - in the whole or any part of Victoria.[[9]](#footnote-10) [[10]](#footnote-11) An ERS is therefore an environmental benchmark. It describes certain valued attributes of Victoria’s environment that are sought be achieved or maintained, and the conditions that support, or are used to assess, those attributes.

## Required elements of an ERS

The essential elements of an ERS are described in section 93 of the EP Act.

An ERS must identify **environmental values**. The EP Act defines an environmental value as “a use, an attribute or a function of the environment.”[[11]](#footnote-12) Environmental values express qualities associated with the environment that the Victorian community values and wants to achieve or maintain. They may be qualities possessed by the environment, or outcomes or activities that are important for human health, or cultural or economic well-being. Examples of environmental values include water quality that supports water dependent ecosystems and species, or an acoustic environment that supports sleep during the night.

An ERS must state the **area(s) of Victoria to which it relates**. It may apply to the whole or part of Victoria, and its environmental values may also apply to the whole or part of the state. An ERS must also specify the elements of the environment to which it relates. Elements of the environment may include, but are not limited to, air, land, noise and water (inland water, groundwater and marine) environments – the EP Act does not further define the meaning of elements of the environment. The ERS must clearly define which environmental values apply for each area and element of the environment.

An ERS also specifies the **indicators** and **objectives** to be used to assess whether environmental values are being achieved, maintained, or may be threatened, in a specified area:

* An **indicator** is a quality or substance that has been selected as a metric to assess an environmental value. For example, “total phosphorus” may be used as an indicator for water quality, or “equivalent continuous sound pressure level” may be used as an indicator for noise.
* An **objective** is the character, level, concentration or amount of an indicator that is used to assess an environmental value in an area, for example, a concentration of “≤35 micrograms per litre” is an objective for the indicator “total phosphorus”, which is one indicator of the conditions that support the environmental value of “water dependent ecosystems and species” in certain rivers and streams. Objectives may be quantitative, as just described, or qualitative, describing more subjective characteristics. Objectives may describe conditions that achieve or maintain an environmental value, or they may describe conditions where an environmental value may be threatened, and where further assessment may be required.

Section 93(4) identifies four general types of indicators or objectives that an ERS may specify. The Explanatory Memorandum for the *Environment Protection Amendment Bill 2018* provides an outline of the meaning of these indicators, and is reproduced below:

* **ambient environmental quality pollutant measures**—i.e. the general or desirable concentration or limit of a pollutant in the environment, for example the desirable maximum level of noise to provide for uninterrupted sleep or the maximum level of *E. coli* in water to ensure it is safe for swimming;
* **ambient environmental quality ecological measures**—i.e. the general concentration of selected biota (which are indicative of ecosystem health) in the environment;
* **measures of human health or the health of other species**—for example, the concentration of lead in blood; and/or
* **targets for emissions of pollutants**—i.e. the desired maximum volume of emissions of a certain pollutant into a defined area over a defined period of time, for example, tonnes of nitrogen to Port Phillip Bay in a year, or tonnes of carbon dioxide to the Victorian air-shed in a year.[[12]](#footnote-13)

The four types of indicators or objectives do not represent an exhaustive list of indicators or objectives that may be included in an ERS.

An ERS is intended to provide a benefit by providing clarity about the characterisation or evaluation of certain environmental values, which can underpin a range of uses, as will be described in this impact assessment. However, an ERS should not be interpreted as placing limits on what are regarded as valued aspects of the environment, or desired environmental outcomes. An ERS is neither an exhaustive list of environmental values, indicators or objectives, nor should important aspects of the environment that are not treated in an ERS be regarded as of lesser value. An ERS simply provides a robust basis for assessment of environmental values that are within its chosen scope.

## Making an ERS

### Preparation of an impact assessment

Section 95(1) of the EP Act requires that, before recommending the making of an ERS, the Minister must ensure that an impact assessment for the proposed ERS is prepared, which must contain:

1. the objectives and purposes of the standard;
2. a description of the methods used to prepare the standard;
3. any indicators and objectives for measuring whether environmental values are being achieved or maintained, other than those specified in the standard, that were considered during the preparation of the standard;
4. a description of the monitoring, evaluation and reporting requirements of the standard; and
5. a description of the intended operation and impact of the standard.

For draft subordinate legislative instruments, the *Subordinate Legislation Act 1994* (SLA)[[13]](#footnote-14) generally requires the preparation of a Regulatory Impact Statement (RIS), which has specified content as set out in the SLA. For an ERS, an impact assessment is prepared instead, with the content just described. The key differences between an impact assessment and a RIS are that an impact assessment does not consider feasible options other than an ERS for achieving the objectives of the instrument; nor does an impact assessment undertake an assessment of the economic costs and benefits of an ERS (or of other feasible options). The analysis in an impact assessment is focussed on describing and explaining the ERS only, and is tailored to descriptive and scientific or technical nature of the instrument.

In general, other SLA requirements for legislative instruments do apply to an impact assessment. Notably, this means that an impact assessment must accord with the requirements of the *Victorian Guide to Regulation* (VGR),[[14]](#footnote-15) to the extent that it is applicable. Also, independent advice from the Commissioner for Better Regulation as to the adequacy of the impact assessment and must also be obtained and considered.

Advice on the adequacy of the impact assessment from the Commissioner for Better Regulation has been obtained and considered.

The Commissioner’s letter is included at Appendix A.

### Draft Human Rights Certificate

Section 12D of the SLA requires that the Minister must ensure that a human rights certificate is prepared respect of the proposed ERS. The Minister has prepared a draft human rights certificate, which finds that in the Minister’s opinion the proposed ERS does not limit any human right set out in the Victorian Charter of Human Rights and Responsibilities.

The draft human rights certificate is included at Appendix B.

### The Principles of Environment Protection

Section 95(2) of the EP Act requires that when determining whether to recommend whether an ERS should be made, the Minister must take the principles of environment protection contained in Part 2.3 of the EP Act into account.

An outline of how the principles of environment protection relate to the ERS is provided at Appendix C.

### Consideration of Climate Change

The *Climate Change Act* 2017 requires that the Minister must have regard to climate change in making the decision to recommend that an ERS be made, amended, or revoked.*[[15]](#footnote-16)* The Minister must have regard to both the potential impacts of climate change relevant to the decision, and the potential contribution to the state's greenhouse gas emissions of the decision.

An outline of how climate change is relevant to the decision to recommend making the ERS is provided at Appendix D.

## Review and update of an ERS

It is intended that creating a stand-alone instrument for environmental standards will simplify the process for their review, enabling them to be kept up to date more easily.

The EP Act requires that an ERS must be reviewed within a 10-year review period. Before this period expires the Minister must publish a notice of review of the ERS and invite public comments and submissions. After considering comments and submissions, the Minister must decide whether to:

1. retain the ERS without amendment;
2. retain the ERS with amendments;
3. replace the ERS; or
4. revoke the ERS.

The 10-year review period is a maximum limit. Reviews or updates of an ERS, or to particular standards, may be undertaken at more frequent periods, or on an *ad hoc* basis.

An impact assessment must be prepared if the Minister decides to replace the ERS. However, if the Minister considers that a proposed change to an ERS would not impose a significant impact on a sector of the public, the Minister may grant an exemption from the requirement to undertake an impact assessment.

### Incorporation of existing matters into an ERS

Section 96 of the EP Act allows that an ERS adopt any matter from existing codes, standards or other sources, either with or without modification – the EP Act seeks not to limit the scope of matters that may be brought into an ERS. An ERS may adopt a matter from another source that is in force currently or refer to a matter that may change from time to time. Through this mechanism, an ERS can mirror changes to external standards as they are periodically updated by the authorities with responsibility for those standards. This provides an efficient means for an ERS to keep pace with advances to scientific knowledge.

One potentially important source of external standards is National Environment Protection Measures (NEPMs), which are legislative instruments that describe national objectives designed to assist in protecting or managing particular aspects of the environment – as described in Figure 3. As a member of the National Environment Protection Council (NEPC), Victoria takes part in the development of NEPMs and decides whether and how a NEPM will be implemented in Victoria, which may be partly through incorporation into an ERS. The EP Act specifically allows an ERS to incorporate the whole or any part of a NEPM.

The proposed ERS includes a range of incorporated matters. These are set out in a “Table of Applied, Adopted or Incorporated Matter” at the end of the ERS.

**National Environment Protection Measures**

Victoria is a member of the NEPC, along with other state and territory governments and the Commonwealth. A primary function of the NEPC is to make NEPMs, which are legislative instruments that describe national objectives designed to assist in protecting or managing particular aspects of the environment. While environment protection law is generally regarded as a state power under the Commonwealth Constitution, NEPMs enable aspects of the environment to be protected or managed in a consistent way across Australian jurisdictions.

NEPMs are made by NEPC Ministers and are implemented separately by each jurisdiction. It is up to each jurisdiction to determine which NEPMs are implemented, and how they are implemented. To date, Victoria has implemented NEPMs through SEPPs and WMPs.

There are seven current NEPMs:

* Air Toxics;
* Ambient Air Quality;
* Assessment of Site Contamination;
* Diesel Vehicle Emissions;
* Movement of Controlled Waste;
* National Pollutant Inventory; and
* Used Packaging.

Refer to the NEPC website - [www.nepc.gov.au](http://www.nepc.gov.au) - for further information.

Some proposed standards in the draft ERS relate to standards contained in the NEPMs for Ambient Air Quality and Assessment of Site Contamination. The proposed ERS directly incorporates certain standards from the NEPM for the Assessment of Site Contamination, which means they would update automatically as the NEPM is updated. The proposed ERS derives (but does not incorporate in the legal sense) certain standards from the NEPM for Ambient Air Quality – these will not update automatically. This is described in Chapter 4.

Figure 2 - National Environment Protection Measures

## This Impact Assessment

In accordance with section 95(1) of the EP Act, this impact assessment will describe the ERS, as follows:

**Chapter 3** describes the ***purpose and objectives*** of the proposed ERS. It presents the problem to which the proposed ERS responds, describes the ERS purpose statement, identifies three ERS objectives, and describes the base case scenario that is used to assess the impacts of the proposed ERS.

**Chapter 4** describes the ***proposed ERS standards and methods of preparation***. It describes the process undertaken during 2018-19 to identify which standards should be included in the proposed ERS. The process included stakeholder consultation and an assessment of the proposed standards by Victoria’s Chief Environmental Scientist (CES). It then describes the standards contained in the proposed ERS, which includes standards for air, land, noise and water environments. It also describes the methods used to develop these standards. Where relevant, the chapter also considers other indicators and objectives that were considered during development of the standards.

**Chapter 5** describes the ***intended operation and impact*** of the ERS. The chapter identifies three categories of intended operation of the ERS, which correspond to the three ERS objectives identified in chapter 3. The chapter considers the impact of the ERS, compared to the base case, for each of these categories.

**Chapter 6** describes the ***monitoring, evaluation and reporting requirements*** of the standard. It describes the approach that will be undertaken to assess the performance of the ERS with regard to its objectives and intended operation. It describes also the approach that will be undertaken to ensure continuous improvement of the standards.

# Chapter 3 - Purpose and objectives

## Problem definition

### Overarching problem

The overarching problem to which the environment protection legislative framework responds is the risk of harms to human health and the environment caused by pollution and waste. The EP Act seeks to prevent harm from arising through a duties-based framework, including the General Environmental Duty (GED) and other duties and obligations, that is focussed on the elimination, minimisation or management of risk. Legislative instruments such as the proposed Environment Protection Regulations (EP Regulations)[[16]](#footnote-17) seek to provide more prescriptive controls and specificity where it is considered necessary to address risks that are not sufficiently controlled through the EP Act – refer to the RIS for the proposed EP Regulations for a detailed consideration of these residual risks.[[17]](#footnote-18)

### Assessing the impact of the ERS – the base case

The impact assessment seeks to describe the impacts, both benefits and costs, that can be attributed to the introduction and use of the proposed ERS.[[18]](#footnote-19) To do this, the impacts of the ERS must be compared to an alternative scenario where an ERS is not introduced. This alternative scenario is known as the base case.

The base case to be used in this impact assessment is the anticipated future state from 1 July 2020 where the EP Act, as amended, takes full effect. The proposed EP Regulations, which are being developed concurrently, are also taken to form part of the base case. The base case scenario describes the circumstances and outcomes that are expected to arise if the EP Act and proposed EP Regulations were to take effect without the ERS. The impact of the ERS is the incremental impact on circumstances or outcomes that is anticipated from the introduction of the ERS, compared to the base case.

The base case world is one in which the activities that an ERS supports - such as assessment and reporting on environment conditions, and regulatory decision making - would still occur. But without recourse to an ERS, reference to a range of alternative standards would be required. While current community and regulator knowledge of standards under the current environment protection framework is reasonably strong, in the base case world this knowledge is expected to become more noisy over time. These consequences of a base case world are described in Chapter 4.

### ERS problem statement

The ERS addresses the key problem relating to information about the state of the environment; that a lack of clear and authoritative scientific standards for reporting and decision-making increases the level of uncertainty and inconsistency, while decreasing transparency, effective communication and coordination.

Decisions affecting the environment need to be made by regulators, organisations and individuals. Without an ERS in Victoria, these actors would need to make decisions informed by other standards. It is likely that these actors would look to previous standards or to standards in other jurisdictions or set by international bodies. However, other standards are not always consistent with each other and may not be appropriate in the Victorian context.

If other standards were to be used *ad hoc*, this would increase uncertainty and inconsistency in the way standards are used, and potentially decrease transparency about regulatory decisions. This decreases the confidence in decision-making and increases the risk that inappropriate decisions are made.

In addition, the complexity of the environment and the subjectivity with which it is valued can make it difficult to effectively communicate about the environment and coordinate action. In the absence of the ERS it would be more difficult to communicate and coordinate action regarding the environment in a consistent way between regulators, organisations and individuals.

This then is the case for action for the ERS. As a standalone legislative instrument, it provides a clear and transparent benchmark. It would help inform decisions in a range of prescribed circumstances under the Act, while its versatility allows that it could be used in an open-ended range of situations where access to rigorous environmental reference information may be beneficial.

## Purpose of the proposed ERS

The purpose of the proposed ERS is stated in the proposed ERS section 2:

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

All Victorians place value on certain uses, attributes or functions of the environment (environmental values), whether it be the maintenance of air quality that supports human health and wellbeing, or an acoustic environment that is conducive to normal domestic and recreational activities. While Victorians have diverse interests and priorities, and use the environment in different ways, there are a core set of environmental values that could be considered essential or are otherwise widely held by the community. The ERS identifies, brings together and describes these environmental values in a clear, accessible way. They express the community’s desired state of the environment - the overall environmental outcomes we aim to achieve or maintain.

The ERS also provides the means for assessing whether these values are being achieved, maintained or threatened. Indicators identify what will be used to assess the environmental value, while objectives describe the environmental conditions that indicate whether the value may be achieved, maintained or threatened in a given location. There are many potential references or sources of scientific information from which standards could be derived that describe these conditions. These include specific local or regional scientific studies, national and international standards. The ERS draws on current scientific knowledge to define the indicators and objectives that are appropriate and relevant for characterising the environmental values of Victorian environments. By defining indicators and objectives in the ERS, they become authoritative standards, which enables them to be employed as a benchmark in support of the objectives of the ERS.

## Objectives of the proposed ERS

The objectives of the proposed ERS are:

1. **To promote a shared understanding of environmental value.** The ERS provides a clear statement of the aspects of the environment that the community values, and a measurable, scientific definition of the environmental conditions that reveal the presence of these values, or a potential threat to these values, in a given context. The ERS brings a degree of conceptual order to highly complex and dynamic environmental systems, which enables desired environmental outcomes to be easily understood by, and communicated between, government, the community and other stakeholders. Use of the ERS encourages a mutually shared understanding of environmental value by a range of parties.
2. **To improve assessment and reporting on environmental conditions**. The ERS provides a benchmark for comparing desired outcomes to the actual state of the environment. It offers a meaningful, comprehensible way of understanding the current condition of the environment and of assessing actual and potential threats to environmental values. Reporting against appropriate benchmarks improves transparency about the state of the environment and supports better-informed environmental management activities. Provision of reliable information to the community about environmental conditions and threats also empowers the community to make well-informed private decisions about how they interact with the environment, for example, whether to go swimming. The ERS ensures, and provides the public with assurance, that the provision of environmental information is underpinned by robust science.
3. **To ensure that relevant environmental regulatory decisions are informed by appropriate, consistent scientific reference information.** The ERS describes the conditions that support an environmental value or that may place that value under threat. It is an authoritative reference that can be used to inform assessment of the potential impacts or threats posed by an activity, when providing regulatory advice or making regulatory decisions. The EP Act specifies a range of situations where the ERS either must or may be taken into account, but its use is by no means limited to these situations. The ERS provides support for high-quality, consistent advisory and decision-making functions.

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# Chapter 4 – proposed ERS standards and methods used to prepare the standards

## Introduction

This chapter describes the standards that are included in the proposed ERS and the methods by which the standards were developed.

### Overview

The proposed ERS is a single, stand-alone legislative instrument. It contains environmental values, indicators and objectives (collectively referred to as ‘standards’) for four ‘elements of the environment’: air, land, noise and water. For each element of the environment, the ERS specifies the area or areas of Victoria that the particular standards apply.

### Identification of proposed ERS standards

During 2018-19, the EPA and the Department of Environment, Land, Water and Planning (DELWP) undertook an assessment process to identify and propose standards for inclusion in the ERS. Due to the short timeframe to prepare the proposed ERS and other subordinate instruments, it was determined that initiating new public review processes to develop wholly new standards - including external scientific reviews to develop indicators and objectives - was not feasible. Furthermore, for the elements of the environment where the Victorian Government or the NEPC had either recently completed a multi-year review (water), or where review was ongoing (noise, and some air standards), setting aside those reviews to initiate new review processes was considered to not be appropriate. It was therefore determined that the proposed ERS would either adopt relevant standards from current statutory policies, or new standards identified through current reviews, where these were sufficiently developed.

As noted in Chapter 1, in the current environment protection framework, environmental values, indicators and objectives are incorporated as part of the six extant SEPPs. These are outlined in Table 5 below. SEPPs will cease to have formal legal status when the new environment protection framework takes full effect from 1 July 2020, though they will continue to contribute to the state of knowledge around environmental standards and environmental management.

Table 5 - SEPP descriptions

|  |  |
| --- | --- |
| SEPP | Description |
| SEPP (Ambient Air Quality)[[19]](#footnote-20)  SEPP (AAQ) | * describes air quality standards and monitoring arrangements for common, widespread air pollutants * first introduced in 1999, based on the National Environment Protection (Ambient Air Quality) Measure - NEPM (AAQ) * following national review of standards for particulate matter, SEPP (AAQ) standards for those indicators were updated in 2016 * a national review is ongoing of standards for nitrogen dioxide, sulfur dioxide and ozone. The review is being led by Victoria |
| SEPP (Air Quality Management)[[20]](#footnote-21)  SEPP (AQM) | * establishes a framework for managing emissions of air pollutants and achieving air quality objectives * in effect since 2001 |
| SEPP (Prevention and Management of Contamination of Land)[[21]](#footnote-22)  SEPP (PMCL) | * describes measures for the prevention of land contamination, and management of contaminated land * first introduced in 2002, based primarily on the National Environment Protection (Assessment of Site Contamination) Measure – NEPM (ASC) * following a national review, some standards were updated in 2013 |
| SEPP (Control of Noise from Commerce, Industry and Trade)[[22]](#footnote-23)  SEPP (N-1) | * prescribes noise limits for commercial, industrial and trade premises within the Melbourne metropolitan area * introduced in 1989 and last varied in 2001 * a review of noise SEPPs (SEPP (N-1) and SEPP (N-2)) was begun in 2014. Relevant work from the review will be reflected in the proposed EP Regulations and a proposed Noise Protocol, along with the ERS |
| SEPP (Control of Music Noise from Public Premises)[[23]](#footnote-24)  SEPP (N-2) | * prescribes noise limits to music from within public premises * introduced in 1989 and last varied in 1999 * a review of noise SEPPs (SEPP (N-1) and SEPP (N-2)) was begun in 2014. Relevant work from the review will be reflected in the proposed EP Regulations and a proposed Noise Protocol, along with the ERS |
| SEPP (Waters)[[24]](#footnote-25) | * describes standards for the protection of surface waters and groundwaters, and rules and obligations for their protection * introduced in October 2018 following an extensive review * replaces two previous SEPPs: SEPP (Waters of Victoria), its five regional Schedules, and SEPP (Groundwaters of Victoria) |

EPA assessed the SEPPs and identified standards that were suitable for, and consistent with, the purpose and intended operation of the ERS. These standards (but not non-standards aspects of these SEPPs) were selected to form the basis of standards adopted in the proposed ERS. Generally, most standards from most SEPPs have been included in the proposed ERS, noting however that:

* While the proposed ERS standards for the noise environment were informed by current noise SEPPs and the review of these SEPPs, the proposed ERS standards for noise are a substantially new reference tool that applies to assessment of the ambient acoustic environment, as described in this chapter.
* The standards of SEPP (AQM) are intended to limit and manage emissions of air pollutants including toxic or carcinogenic substances. These standards are not proposed for inclusion in the ERS as they need review. The indicators and objectives (substances and design criteria) in SEPP (AQM) are proposed to be included in alternative instruments, including the proposed EP Regulations and guidance, where greater control can be exercised over emissions of those pollutants.

This chapter will describe the methods used to prepare the proposed ERS standards by describing the methods used to prepare the standards when they were originally developed. This mainly entails describing the SEPP standards review processes, or where SEPP standards originate in NEPMs, describing national standards review processes. The chapter also outlines recommended priorities for future reviews of ERS standards, as is further described below.

### ERS consultation

To inform the development of the proposed ERS prior to its release for the formal public consultation period, EPA and DELWP undertook significant preliminary consultation and engagement between August 2018 and July 2019. Multiple consultations were undertaken with thematic working groups for air, contaminated land, noise and water stakeholders. These included representatives from peak bodies, industry and environmental groups, auditors (for the contaminated land working group) and representatives from the Victorian community. Consultation also occurred through direct engagement with peak bodies and subject matter experts, and with parts of the Victorian Government anticipated to be interested in, or involved in, the intended operation of the ERS. Table 6 provides an overview of the consultation activities undertaken.

Consultation with stakeholders focussed on both the standards proposed for inclusion in the proposed ERS, and the scope of its intended operation. Through the engagement process the views of stakeholders were able to inform the proposed ERS from early in its development, which has enabled potential instrument design and implementation risks to be identified early and addressed. The process has also assisted with the identification and prioritisation of future guidance requirements to support the instrument.

Feedback received during consultation was broadly supportive of the concept of an ERS, although there was some concern that the nature of the ERS as an expression of desired outcomes, rather than an instrument creating firm obligations, could limit its benefits. There was general feedback that, given the extent of changes from the current framework to the proposed future framework, there was a need to for further clarity about how the ERS is intended to operate in practice, in particular how it would relate to direct regulatory aspects of the new framework. A related view was that to clarify its functions, the ERS may need to be supplemented by guidance. There was support for the potential benefits or the ERS as a benchmark for assessment and monitoring purposes.

Table 6 - Consultation activities on the ERS

|  |  |
| --- | --- |
| No. | Consultation activities |
| 1. | Two half-day workshops open to all local governments, organised in partnership with the Municipal Association of Victoria (MAV) to enable more detailed feedback on proposals, particularly those most relevant to local government. Over 70 participants were in attendance. |
| 2. | Thematic stakeholder workshop discussions covering:   * air * contaminated land * noise * water   Workshops were held four times for each thematic group between October 2018 and June 2019. Representatives were present from industry, local government, community members and environment groups, water corporations and practitioners. The ERS was also discussed as part of thematic stakeholder working groups established for permissioning and waste. |
| 3. | Stakeholder working group discussions with EPA’s:   * community reference group * strategic advisory group * business reference group * water industry reference group |
| 4. | Direct feedback received through the EPA engagement mailbox. |
| 5. | EPA ‘Open House’ series held across the state in November 2018 and February/March 2019, providing an opportunity for face-to-face discussions on the transformation of the EPA, including the ERS. |
| 6. | Engagement with all government departments, and relevant statutory authorities and agencies. |

### ERS standards assessment by the Chief Environmental Scientist

To provide further scientific assessment of the standards included in the proposed ERS, in February 2019, DELWP and the EPA formally requested Victoria’s Chief Environmental Scientist (CES), Dr. Andrea Hinwood, to undertake an assessment of the underpinnings of the standards. The CES was requested to make recommendations concerning:

1. the appropriateness of the standards for inclusion in the draft ERS, having regard to the ERS’ intended operation;
2. issues of concern with regard to the standards or their application; and where appropriate
3. future reviews of the standards (such as prioritising and phasing standards for review including key considerations when undertaking future reviews).

The CES has undertaken this assessment [[25]](#footnote-26) and found that, overall, the processes used to select environmental values, indicators and objectives were appropriate, and the processes to develop indicators and objectives were comprehensive. The CES also considers that most standards are underpinned by scientific evidence that is objectives, peer-reviewed and based on national and international best practice. The CES made a range of findings and recommendations. The findings and recommendations of the CES concerning particular standards are described in this chapter. The CES’ recommendations and proposed process for a program of work to support future review of the ERS standards are considered in chapter 6.

The CES’ assessment is reproduced at Appendix E.

## ERS standards for air

### Overview of ERS standards for air

The proposed ERS adopts all the environmental values[[26]](#footnote-27), indicators and objectives contained in the SEPP (Ambient Air Quality) - SEPP (AAQ) - unchanged.[[27]](#footnote-28) The standards in SEPP (AAQ) implement the standards of the Ambient Air Quality - National Environment Protection Measure (NEPM (AAQ)),[[28]](#footnote-29) with some modifications.

The rationale for adopting the SEPP (AAQ) standards without change is because they are the most relevant standards at the present time, based on current evidence – noting also that the objectives for certain existing standards are the subject of a current national review, as described below. The ERS does not include other aspects of SEPP (AAQ), such as monitoring and reporting requirements and methods, as these are outside the scope of an ERS.[[29]](#footnote-30) Monitoring and reporting is undertaken as part of Victoria’s direct commitments to the NEPM (AAQ), to which it is a signatory, and reports on an annual basis.

The proposed ERS also adopts the additional environmental value for climate systems that is contained in the SEPP (Air Quality Management) – SEPP (AQM).[[30]](#footnote-31) It does not include other aspects of SEPP (AQM), such as substances and design criteria, as these need review – refer to the recommendations of the Chief Environmental Scientist, reproduced below.[[31]](#footnote-32)

The proposed ERS also adopts a new, qualitative objective with respect to odour.

#### Environmental values

The proposed ERS has six environmental values of air, which apply to Victoria’s ambient air environment.[[32]](#footnote-33) The environmental values apply to the whole state of Victoria, like the environmental values in SEPP (AAQ). State-wide environmental values are appropriate given that the objectives relate to desired outcomes for ambient air quality, which is generally considered at a broad scale and sought to be applied equitably at that scale. The environmental values are shown in Table 7.

Table 7 - Environmental values of the ambient air environment

|  |  |
| --- | --- |
| Environmental value | Description of environmental value |
| 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. |

#### Indicators and objectives

The proposed ERS has nine indicators, comprising eight indicator pollutants and a qualitative indicator associated with the odour objective. These collectively support the environmental values. The indicators were chosen as they are widely spread in the air environment and arise from many sources. They are considered to largely describe general air quality as they are commonly measured as ambient air quality standards internationally or because they are indicators about which the community express concern.

Objectives are set for each indicator. Except for visibility and odour, these describe the maximum concentration of the indicator - determined over an averaging period, and with maximum exceedances - that will achieve or maintain the environmental values. For visibility a distance objective is used. For odour a qualitative objective is used. Indicators and objectives are presented in Table 8 below.

Table 8 - Indictors and objectives for air

|  |  |  |  |
| --- | --- | --- | --- |
| **Indicators** | **Objectives** | **Averaging period** | **Maximum exceedances** |
| Carbon monoxide (maximum concentration) | 9.0 ppm[[33]](#footnote-34) | 8 hours | 1 day a year |
| Nitrogen dioxide (maximum concentration) | 0.12 ppm | 1 hour | 1 day a year |
| 0.03 ppm | 1 year | None |
| Photochemical oxidants (as ozone) (maximum concentration) | 0.10 ppm | 1 hour | 1 day a year |
| 0.08 ppm | 4 hours | 1 day a year |
| Sulfur dioxide (maximum concentration) | 0.20 ppm | 1 hour | 1 day a year |
| 0.08 ppm | 1 day | 1 day a year |
| 0.02 ppm | 1 year | None |
| Lead (maximum concentration) | 0.50 µg/m3 [[34]](#footnote-35) | 1 year | None |
| Particles as PM10 (maximum concentration) | 50 µg/m3 | 1 day | None |
| 20 µg/m3 | 1 year | None |
| Particles as PM2.5 (maximum concentration) | 25 µg/m3 | 1 day | None |
| 8 µg/m3 | 1 year | None |
| Visibility-reducing particles | 20 km | 1 hour | 3 days a year |
| Qualitative | An air environment that is free from offensive odours from commercial, industrial, trade and domestic activities | N/A | N/A |

**Averaging period**: The averaging period is the period of time over which the indicator pollutant must not exceed the objective for the objective to be achieved or maintained (noting maximum exceedances). The measurement of the 1-hour averaging period is calculated on the clock hour average of measurements. The measurement of the 4-hour and 8-hour averaging periods is calculated on the rolling 4-hour or 8-hour average based on 1-hour averages. For 24-hour and 1-year averaging periods, this is calculated on the calendar day and calendar year average of all measurements. In order to assess objectives, sufficient monitoring needs to be undertaken to assess an objective with respect to each specified averaging period. (Note: The EPA undertake continuous monitoring consistent with gathering data for averaging periods for all indicators for which averaging periods are specified, except for lead.[[35]](#footnote-36) This is described in Chapter 5).

**Maximum exceedances**: The maximum exceedances are the maximum number of periods of the specified time period that the objective may be exceeded over an averaging period, for the objective to be achieved or maintained. An exceedance occurs once the concentration reported at instrument precision exceeds the objective.

### Methods used to prepare the standards for air

#### Environmental values

The proposed ERS adopts all the environmental values in SEPP (AAQ). These were adopted when SEPP (AAQ) was introduced in 1999, and were initially introduced in an earlier Victorian policy, known as SEPP (The Air Environment) 1981.

The environmental values introduced in SEPP (The Air Environment) set out the critical uses of the environment that were to be protected through the policy, and which provided the basis for establishing the air quality objectives of the policy. They were developed through a policy development process undertaken during 1978-79, which included the release of a draft policy and a public consultation period during mid-1979.[[36]](#footnote-37) The environmental values were re-examined but retained following a public review of SEPP (The Air Environment) in 1988. They were also retained when SEPP (The Air Environment) was split into two new policies - SEPP (AAQ) and SEPP (AQM) - in 1999[[37]](#footnote-38), and again when these policies were varied in 2001, and in all subsequent variations.

The proposed ERS also adopts the additional environmental value for climate systems from SEPP (AQM). The climate systems environmental value was added to SEPP (AQM) when it was varied in 2001, following a thorough review of the policy that began in June 1999. The review process included a detailed internal review of the policy and development of a preliminary draft policy, which was released for public comment. Based on submissions received on the preliminary draft a formal draft policy was released, along with a Policy Impact Assessment (PIA).[[38]](#footnote-39) The PIA recommended inclusion of the climate systems environmental value “to reflect the principles of eco-efficiency and ecologically sustainable development and the management of global issues in the SEPP (AQM)”.[[39]](#footnote-40) The inclusion of the climate systems environmental value provided the policy foundation for the introduction of measures in SEPP (AQM) for the management of greenhouse gas emissions. Its inclusion in the proposed ERS reflects the continued critical importance of this value to the community.

#### Methods used to prepare indicators and objectives

##### Standards adopted from SEPP (AAQ)

The proposed ERS adopts all the indicators and objectives in SEPP (AAQ). Most SEPP (AAQ) standards were initially developed through NEPM (AAQ) processes - either the original 1998 NEPM (AAQ) or the 2015 variation to NEPM (AAQ) for particulate matter. Development of NEPMs, and their variation, must follow the process described in the Commonwealth *National Environment Protection Council Act 1994*. Table 9 presents a timeline of the development of the NEPM (AAQ) and SEPP (AAQ).

Table 9 - Changes to NEPM (AAQ) and SEPP (AAQ)

|  |  |  |
| --- | --- | --- |
| **Year** | **NEPM (AAQ)** | **SEPP (AAQ)** |
| 1998 | NEPM (AAQ) introduced 26 June 1998 and commenced 8 July 1998.  NEPM (AAQ) introduced a nationally consistent framework for monitoring and reporting on six common ambient air pollutants. These were carbon monoxide, lead, nitrogen dioxide, photochemical oxidants (ozone), sulfur dioxide and particulate matter (PM10). | SEPP (AAQ) gazetted 9 February 1999.  SEPP (AAQ) adopts the requirements of the NEPM (AAQ). |
| 2001 |  | SEPP (AAQ) Variation gazetted 21 December 2001.  Variation to make the air quality objectives in the SEPP fully consistent with the NEPM (AAQ) standards for photochemical oxidants. |
| 2003 | NEPM (AAQ) Variation 2 June 2003.  Variation to include smaller PM2.5 particles (less than 2.5 micrometres - 2.5 µm). |  |
| 2015 to 2016 | NEPM (AAQ) Variation 15 December 2015.  Variation to the AAQ NEPM standards for particles to adopt reporting standards for annual average and 24-hour PM2.5 particle levels of 8 µg/m3 and 25 µg/m3, respectively.  Annual average standard for PM10 particles of 25 µg/m3 established. | SEPP (AAQ) Variation gazetted 28 July 2016.  Variation incorporates the changes to the particle standards made to the NEPM.  Victoria adopted a more stringent annual average PM10 standard of 20 µg/m3 in order to pursue continuous improvement in air quality in line with community and local government expectations. The new standard was consistent with the World Health Organization guidelines. (This is described below) |
| 2015 to present | NEPM (AAQ) Review  A review of the NEPM (AAQ) is currently underway with a view to strengthen the standards for sulfur dioxide, nitrogen dioxide, and ozone. Victoria is leading the review of these standards to incorporate new evidence on the health effects of these pollutants.  An impact statement and proposed variation have been published on the NEPC website. Following a public consultation period, the proposed standards are likely to be presented to the NEPC for consideration at the end of 2019.  Upon finalising the variation, Victoria will consider adopting the strengthened standards in the ERS. |  |

There are two indicators and objectives in SEPP (AAQ) that do not reflect current NEPM (AAQ) standards:

* SEPP (AAQ) sets the 1-year averaging period objective for PM10 at 20 μg/m3, which is a more stringent standard than the 25 μg/m3 objective in NEPM (AAQ). 20 μg/m3 is the WHO annual standard[[40]](#footnote-41) for PM10 and at the time of the NEPM (AAQ) review Victoria advocated for that standard to be adopted. Although it was not adopted in the NEPM (AAQ), Victoria chose to adopt this standard within Victoria through SEPP (AAQ) in 2016 after the national review was completed. There is no established threshold for particulate matter below which health effects are not observed, and Victoria chose to adopt the stronger standard in order to pursue continual improvement in air quality and to meet community and local government expectations. Meeting the standard would achieve a higher level of protection from chronic health effects, in particular, respiratory conditions.
* SEPP (AAQ) has an indicator for visibility and an associated objective of 20 km minimum visual distance. The NEPM (AAQ) does not have an indicator for visibility, as it is not health-related – visibility is an aesthetic indicator. Inclusion of a visibility indicator and objective is consistent with the inclusion of an environmental value for local amenity and aesthetic enjoyment. It is included in SEPP (AAQ) because visibility is one of the primary means by which the community judges air quality, and because the impact on visibility-reducing particles on the amenity of the public is the subject of complaints received by the EPA. Victorian data for visibility has been collected since 1979 so it provides a valuable way of assessing air quality over time.

Victoria is currently leading a national review of the NEPM (AAQ) standards for sulfur dioxide, nitrogen dioxide and ozone with a view to update the standards to reflect contemporary scientific evidence for these pollutants. The review is being undertaken in accordance with a *Methodology for setting air quality standards in Australia*, which was adopted by the NEPC in 2011.[[41]](#footnote-42) NEPC have published a notice of intention to vary NEPM (AAQ). It is anticipated that NEPM (AAQ) will be updated in 2020.

##### Proposed objective for odour

The proposed ERS also adopts a qualitative objective for odour. The objective has been newly developed for the proposed ERS. Neither SEPP (AAQ) nor SEPP (AQM) include ambient air quality objectives for odour, although SEPP (AQM) does contain an odour point source design criterion. Odour is proposed for inclusion as it allows the ERS to present a fuller description of the characteristics of the ambient air environment that are considered to achieve or maintain the environmental values.

Table 10 shows in which instrument each of the proposed ERS indicators and objectives were first introduced.

Table 10 - Origins of current SEPP (AAQ) air quality standards

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Indicator** | **Objective** | **Averaging period** | **Max. exceedances** | **First introduced** |
| Carbon monoxide (max. concentration) | 9.0 ppm[[42]](#footnote-43) | 8 hours | 1 day a year | NEPM (AAQ) 1998 |
| Nitrogen dioxide (max. concentration)1 | 0.12 ppm | 1 hour | 1 day a year | NEPM (AAQ) 1998 |
| 0.03 ppm | 1 year | None | NEPM (AAQ) 1998 |
| Photochemical oxidants (as ozone) (max. concentration)1 | 0.10 ppm | 1 hour | 1 day a year | NEPM (AAQ) 1998 |
| 0.08 ppm | 4 hours | 1 day a year | NEPM (AAQ) 1998 |
| Sulphur dioxide (max. concentration)1 | 0.20 ppm | 1 hour | 1 day a year | NEPM (AAQ) 1998 |
| 0.08 ppm | 1 day | 1 day a year | NEPM (AAQ) 1998 |
| 0.02 ppm | 1 year | None | NEPM (AAQ) 1998 |
| Lead (max. concentration) | 0.50 µg/m3 | 1 year | None | NEPM (AAQ) 1998 |
| Particulate matter as PM10 (max. concentration) | 50 µg/m3 | 1 day | None | NEPM (AAQ) Variation 2015 |
| 20 µg/m3 | 1 year | None | SEPP (AAQ) Variation 2016 |
| Particulate matter as PM2.5 (max. concentration) | 25 µg/m3 | 1 day | None | NEPM (AAQ) Variation 2015 |
| 8 µg/m3 | 1 year | None | NEPM (AAQ) Variation 2015 |
| Visibility-reducing particles | 20 km | 1 hour | 3 days a year | SEPP (AAQ) 1999 |
| Qualitative | N/A | An air environment that is free from offensive odours from commercial, industrial, trade and domestic activities | N/A | Newly-proposed |

1 – Note: the standards for nitrogen dioxide, sulfur dioxide and ozone are the subject of a current review process

#### Future changes to ERS standards

The Victorian government will consider further changes to the ERS, including whether it should incorporate any changes made to NEPM (AAQ), in 2020.

### Findings and recommendations of the Chief Environmental Scientist

#### Findings

The CES makes a number of observations and findings in relation to the proposed ERS standards for air.

**NEPM (AAQ) standards**: The CES observes that the ERS standards that have their origins in the NEPM (AAQ) have been subject to comprehensive review and consultation.

**The PM10 annual standard**: The CES supports the adoption in the proposed ERS of the WHO and SEPP (AAQ) PM10 annual standard of 20 µg/m³, instead of the NEPM (AAQ) standard of 25 µg/m³. The CES observes that the SEPP (AAQ) standards was adopted in Victoria “to meet community and local government expectations and to aim for continual improvement in air quality management. Meeting the international guideline provides for a higher level of protection from the chronic effects of air pollution. At this time there is no established threshold for particulate matter below which health effects are not observed, hence there is a need to continually work towards reducing PM emissions and exposure.”

**Visibility objective**: The CES observes that the proposed ERS/SEPP (AAQ) objective for visibility was established for aesthetic purposes and not for health protection, although visibility is strongly influenced by particle concentration. The CES observes that although its basis is necessarily subjective, the impact of visibility reducing particles on people’s amenity is the subject of complaints received by EPA, and visibility is the primary means by which the community judges whether air quality is good. As such, this objective is still considered to be appropriate and relevant to air quality in Victoria. However, as the visibility objective has not been reviewed since the mid-1990s it should be reviewed as a priority.

**Odour objective**: The CES observes that odour is the most frequent source of pollution reports to EPA. The CES notes that no objective exists for odour and that further work will be required to define an objective(s).

**Air Toxics standards**: the CES notes that the NEPM (Air Toxics)[[43]](#footnote-44) sets reporting standards for air toxics, however Victoria has not consistently monitored air toxics and hence does not have sufficient information to inform whether measurable air toxics are at or below levels of concern. The CES observes that additional work is required to establish air toxics concentrations and to determine whether these should be included in an ERS.

**SEPP (AQM)**: The CES also discusses SEPP (AQM), which with exception of the climate systems environmental value has not been included in the proposed ERS, as the standards need review. Of the Intervention Levels (IL) and design criteria in SEPP (AQM), the CES observes:

* ***Intervention Levels*** – IL are numerical value(s) for indicators which if exceeded may trigger development of a neighbourhood environment improvement plan (“NEIP”). IL were set at 20% higher than ambient air quality standards and are not considered to be ‘acceptable’ levels but as levels that, if exceeded, would trigger action to improve local air quality. The derivation of the IL at 20% higher than the ambient air quality standards is unclear and has limited basis in science
* ***Design Criteria*** – In SEPP (The Air Environment) 1981 design criteria were used for assessment of new or expanded sources of emissions to the environment. Design criteria are intended only for use in modelling the dispersion of emission from specific sources and should not be used separately from the modelling process, with its inbuilt limitations, assumptions and safety factors

#### Recommendations

In accordance with the observations and findings, the CES makes the following specific recommendations for air quality with regard to a program of work to support future review of the standards:[[44]](#footnote-45)

* ***Recommendation 2*** – An odour indicator and objective are recommended to be developed and included in the ERS.
* ***Recommendation 3***. Guidance is developed on design ground level concentrations for air pollutants for predictive modelling and assessment activities.
* ***Recommendation 4***. Review the need for indicators and objectives to be developed for ‘climate systems’.
* ***Recommendation 5*** – A review is undertaken to establish whether ambient air toxic values, indicators and objectives can be set based on the current NEPM reporting criteria. Victoria has not consistently monitored air toxics and hence does not have a sufficient amount of information to inform whether measurable air toxics are at or below levels of concern.
* ***Recommendation 6*** - Current standards for ozone, nitrogen dioxide and sulphur dioxide are being reviewed and that the numeric values agreed to via the NEPM process are automatically adopted in the ERS.

## ERS standards for land

### Overview of ERS standards for land

The proposed ERS standards for land are based on the environmental values, land use categories, indicators and objectives contained within the SEPP (Prevention and Management of Contamination of Land) - SEPP (PMCL).[[45]](#footnote-46) The ERS standards do not include other aspects of SEPP (PMCL), such as the attainment programs and related activities, as these are outside the scope of an ERS. Attainment programs are planned to be addressed in organisational and science strategies and programs. The management of contamination of land under the EP Act will be through the General Environmental Duty, the Duty to Manage, the Duty to Notify Contaminated Land and supporting guidance.

The standards in SEPP (PMCL) are related to, and refer to, the standards of the NEPM Assessment of Site Contamination - NEPM (ASC)[[46]](#footnote-47) - or to standards derived using the methodologies it prescribes. It also refers to standards in the *Food Standards Australia New Zealand, Food Standards Code* (Food Standards Code).[[47]](#footnote-48) Some standards are described qualitatively as the application of the standards for the land environment may depend on site-specific or subjective characteristics or uses, for example aesthetic considerations.

#### Environmental values

The ERS has five environmental values that apply to Victoria’s land environment. The environmental values and a description are presented in Table 11.

Table 11 - Environmental values of the land environment

|  |  |
| --- | --- |
| Environmental value | Description of environmental value |
| Maintenance of natural ecosystems, modified ecosystems and highly modified systems | 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, due to introduced contaminants. |
| Aesthetics | Aesthetic issues do not adversely impact the use of land. Aesthetics 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. |

#### Land use categories

The environmental values are applied to areas of Victoria using a set of land use categories called segments. These are:

1. *Parks and Reserves* includes national parks, state parks, state forest, nature conservation reserves and wildlife reserves;
2. *Agricultural* includes rural areas involved in agricultural or horticultural practices;
3. *Sensitive use* includes land used for residential use, a child care centre, pre-school, or primary school. A sensitive use may occur in an area of high density (where development makes maximum use of available land space and there is minimal access to soil) or in other lower density areas (where there is generally substantial access to soil);
4. *Recreation / Open space* includes general open space and public recreation areas;
5. *Commercial* includes land used for commercial and business activities, that is not within the *Industrial* category described in f);
6. *Industrial* includes land used for utilities and industrial activities.

Land use categories are consistent with and complement land uses defined in the Victoria Planning Provisions. The environmental values that apply to each land use category are presented in Table 12.

Table 12 - Application of land use categories (land) to environmental values

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | Parks & reserves | Agricultural | Sensitive use | | Recreation / Open space | Commercial | Industrial |
| High density | Other (lower density) |
| Maintenance of ecosystems | Natural ecosystems |  |  |  |  |  |  |  |
| Modified ecosystems |  |  |  |  |  |  |  |
| Highly modified ecosystems |  |  |  |  |  |  |  |
| Human health | |  |  |  |  |  |  |  |
| Buildings & structures | |  |  |  |  |  |  |  |
| Aesthetics | |  |  |  |  |  |  |  |
| Production of food flora and fibre | |  |  |  |  |  |  |  |

#### Indicators and objectives

Given the breadth of potential indicators for land, and the potential need to consider site-specific characteristics, the proposed ERS mostly describes how indicators and objectives may be determined, rather than specifying a defined set of indicators and objectives. Many indicators and objectives refer to relevant parts of the NEPM (ASC). The proposed ERS incorporates these parts of the NEPM (ASC), so that the ERS indicators and objectives to update automatically as the NEPM (ASC) is updated from time to time.

Indicators and objectives for land are shown in Table 13 and are further described in the section below.

Table 13 - Indicators and objectives for land environment

|  |  |  |
| --- | --- | --- |
| Environmental value | Indicators | Objectives |
| Maintenance of ecosystems | Inorganic and organic contaminants listed 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) for each indicator, 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 listed 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) for each indicator, unless—  (a) there is no such investigation or screening level; or  (b) due to site specific characteristics the more appropriate objective is:   * + - 1. (i) the level derived using the risk assessment methodology described in the NEPM(ASC); or       2. 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 & 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 and flora and fibre | Inorganic and organic contaminants listed 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. |

### Methods used to prepare the standards for land

#### Environmental values

The environmental values in the proposed ERS are adopted from SEPP (PMCL), which has included these environmental values since it was introduced in 2002.

Draft environmental values for SEPP (PMCL) were presented to the public in an Issues Paper[[48]](#footnote-49) in 1997 and were revised following public feedback. The revised environmental values were included in the consultation draft SEPP (PMCL) and draft Policy Impact Assessment[[49]](#footnote-50), released in 1998 for a further public consultation period. These environmental values were adopted with only slight change[[50]](#footnote-51) in the final policy. The environmental values were retained without change when the policy was varied in 2013.

#### Methods used to prepare indicators and objectives

The ERS indicators and objectives are also based on those in SEPP (PMCL). The wording of the indicators in the ERS has been updated from SEPP (PMCL) to aid clarity, but it does not change their meaning. Minor changes have also been made to objectives – mainly to aid clarity and to align the objectives as presented in the ERS with the provisions of the EP Act.

As noted, the indicators and objectives relate to, and refer to, aspects of the NEPM (ASC) and the Food Standards Code, along with some qualitative descriptions. NEPM (ASC) was first introduced in 1999 and updated in 2013. Aspects of the Food Standards Code are updated from time to time.

##### Indicators

For the environmental values of maintenance of ecosystems, human health and production of food and fibre, the indicators are described as inorganic and organic contaminants listed 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). Appendix A of Schedule B2, which was updated in 2013, contains an indicative list of possible analytes for soil contamination.[[51]](#footnote-52) Around 200 contaminants are listed. Given that any other contaminants present at the site may also be an indicator, the potential list of indicator contaminants is unlimited.

For the buildings and structures environmental value the indicators are described as pH, sulfate, redox potential[[52]](#footnote-53), salinity or any chemical substance or waste that may have a detrimental impact on the structural integrity of buildings or other structures; and for the aesthetics environmental value, the indicator is any chemical substance or waste that may be offensive to the senses. This corresponds to the descriptions of indicators for these environmental values in SEPP (PMCL), and again does not limit the range of potential indicator contaminants.

##### Objectives

###### *Objectives for the environmental values of maintenance of ecosystems, and human health*

For the environmental values of maintenance of ecosystems, and human health, the objective for each indicator is:

the [relevant ecological or health] investigation or screening level in the NEPM (ASC) for each indicator, unless—

(a) there is no such investigation or screening level; or

(b) due to site specific characteristics the more appropriate objective is:

* + - 1. (i) the level derived using the risk assessment methodology described in the NEPM (ASC); or
      2. (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.

This means that an appropriate objective can be either applied, determined or established for any potential contaminant, as described below.

Investigation levels and screening levels in the NEPM ASC)

In the NEPM (ASC), investigation levels and screening levels – such as Ecological Investigation Levels (EILs), Health Investigation Levels (HILs), and Health Screening Levels (HSLs) - define concentrations (levels) of substances above which further appropriate investigation and evaluation will be required to assess risks. They are concerned with different substances: investigation levels relate to and have been developed for a broad range of metals and organic substances; screening levels have been developed for selected petroleum compounds and fractions and are applicable to assessing human health risk via the inhalation and direct contact pathways.

Levels derived using a risk assessment methodology described in the NEPM (ASC)

Levels derived using a risk assessment methodology described in the NEPM (ASC) relate to any levels that may be derived in accordance with a methodology such as:

* the methodology for deriving EILs in NEPM (ASC) Schedule B5b, which is based on *the Australian Methodology to Derive Ecological Investigation Levels in Contaminated Soils*, which was developed by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and published in 2009;[[53]](#footnote-54) and
* the site-specific health risk assessment methodology in NEPM (ASC) Schedule B4. This is based on the enHealth guideline *Environmental Health Risk Assessment: Guidelines for assessing human health risks from environmental hazards,*[[54]](#footnote-55) published in 2012, which sets out a national approach to environmental health risk assessment.

Background levels determined in accordance with section 36 of the EP Act

Background levels determined in accordance with section 36 of the EP Act are levels that are either determined by the EPA - the proposed EP Regulations section 8 gives the EPA the power to make such a determination - or are levels that are naturally occurring in a location. This provision allows for the ERS to recognise regions of Victoria where background or naturally-occurring levels of a substance may be higher than levels that may be derived for that substance using either an investigation level or screening level, or a risk assessment methodology. Background levels can be determined for specific indicators, at specific locations or regions and are based on current knowledge. Their application will also depend on these circumstances and they are not likely to be applicable to all of Victoria. Where the EPA determines background levels, it will also specify the circumstances under which they apply.  It is anticipated that the initial introduction of background levels will occur incrementally and over time after the commencement of the new environment protection framework.

The inclusion of background levels as objectives in the ERS corresponds to and replaces the inclusion of “levels approved by the Authority” as objectives in SEPP (PMCL).

###### *Objectives for the environmental values of buildings and structures, and aesthetics*

The objectives for the environmental values of buildings and structures, and aesthetics, are qualitative statements, respectively that: “land is not corrosive to or otherwise adversely affecting the integrity of structures or building materials”; and “land that is not offensive to the senses of human beings.” These are the same as the objectives for these environmental values in SEPP (PMCL).

###### *Objectives for the environmental value of production of food and flora and fibre*

There are two objectives for the environmental value of production of food and flora and fibre, which correspond to a similar objective under SEPP (PMCL).

The first objective is the levels specified in the Food Standards Code detected in any food, flora or fibre produced at the site. Any levels specified in the Food Standards Code may be applied. Relevant levels in the Code include:

* prescribed maximum levels (MLs) of contaminants and natural toxicants in food, contained in Schedule 19, which was last updated in 2017. MLs are developed in accordance with the criteria established in the international *General Standard for Contaminants and Toxins in Food and Feed,*[[55]](#footnote-56) which was last revised in 2015; and
* levels for substances for which a ML is not listed but have been derived through an assessment using available oral toxicity data and assessment of exposure pathways.

The second objective is a qualitative statement that “levels that do not adversely affect produce quality or yield.” This statement is included as an indicator contaminant may adversely affect produce quality or yield at different concentrations, depending on the crop or plant that is being considered. Further guidance is provided in the Food Standards Code.

### Findings and recommendations of the Chief Environmental Scientist

#### Findings

The CES makes a number of observations and findings in relation to the proposed ERS standards for land.

**Difficulty of deriving objectives for land**: The CES observes that deriving measurable objectives that pose a risk to the environment and human health are difficult for land as there are so many factors contributing to the risk, for example land use, activity, specific contaminant, depth to contamination, soil quality, type, chemical binding, depth to groundwater, soil vapour transport etc, hence the approach to derive investigation levels which can be variable at a site level.

**Development of new objectives to cover legacy and emerging contaminants**: the CES observes that investigation levels in NEPM (ASC) that are proposed to be used as objectives for the maintenance of ecosystems and human health environmental values do not cover all contaminants or exposure scenarios - hence the need to derive levels through risk assessment methodologies specified in the NEPM (ASC), where necessary or appropriate. The CES observes that these risk assessment methodologies are dependent on numerous supporting guideline documents, such as toxicity assessment, exposure assessment, and fate and transport modelling. The CES finds that EPA will need to assess other guidance or state of knowledge for those contaminants with no derived values and the relevant risk assessment approaches to development of criteria and that objectives for these contaminants will need to be prioritised for development.

**Guidance for using and interpreting the ERS**: The CES observes that the ERS standards are subject to interpretation and finds that the appropriate use of the standards will need to be explicitly stated, with guidance recommended to support the ERS, including:

* The manner in which the ERS can or should not be used;
* The application of HILs, EILs and HSLs; and
* Clarification on approaches to the risk assessment methodologies set out in the NEPM (ASC).

**EILs and the methodology for derivation of EILs**: The CES observes that EILs have only been derived for a limited number of contaminants for Australian conditions. The CES also observes that currently the review of criteria is undertaken on a site by site basis using a range of different guidance and technical papers or expertise with varying levels of suitability. The CES finds that this is a limitation that needs to be addressed - that the current established EILs and the methodology for deriving EILs will need to be reviewed for their applicability, given the passage of time and the context in Victoria.

The CES notes that as part of this review process EIL values will also need to be established for agricultural land segments. The CES notes this will likely be a significant area of work as agricultural soils will need evaluation in relation to crop toxicity, plant contaminant uptake and detailed consideration of soil type.

**Background levels**: The CES notes the provision in the ERS for background levels to be determined in accordance with the EP Act. The CES finds that the process to derive background levels will need to be developed.

**Guidance for consideration of standards for Aesthetics, and Buildings and structures**: The CES finds that guidelines will be necessary for the consideration of aesthetics and what chemical or waste may be considered offensive to human senses, and for consideration of those conditions that would be considered corrosive to buildings and structures.

**Food, flora and fibre objectives**: The CES observes that consideration of impacts to food flora and fibre, both from a food safety and from a quality and yield perspective, is complex. The CES notes that the proposed ERS/SEPP (PMCL) objectives have not been reviewed for some time and finds that this should be undertaken to identify more appropriate objectives based on best practice and established science.

#### Recommendations

In accordance with the observations and findings, the CES makes the following specific recommendations for land with regard to a program of work to support future review of the standards for land:[[56]](#footnote-57)

***Recommendation 9*** – Guidance developed on risk assessment methodologies and subsequent derivation (selection of TRVs[[57]](#footnote-58)) of land criteria protective of environmental values and surface water and groundwater specifically.

***Recommendation 10*** – That EPA prioritises contaminants for inclusion in the ERS and undertake review and development.

***Recommendation 11*** - The methodology and current established standards for EILs will need to be reviewed for their applicability given the passage of time and in the context of Victoria.

***Recommendation 12*** - An EIL value will need to be established for the protection of agricultural land segments.

***Recommendation 13*** – Review of objectives set out for the environmental value Food, Flora and Fibre.

## ERS standards for noise

### Overview of ERS standards for noise

The proposed ERS adopts the three environmental values contained within the SEPP (Control of Noise from Industry, Commerce and Trade - SEPP (N-1)[[58]](#footnote-59) and SEPP (Control of Music Noise from Public Premises (N-2)),[[59]](#footnote-60) plus two additional environmental values that were identified through a review of these SEPPs. The proposed ERS also includes new indicators and objectives, which in contrast to the noise SEPPs, provide a means of characterising the environmental values with respect to the *ambient* acoustic environment. The proposed ERS objectives are not regulatory noise limits – they are simply a description of the acoustic conditions that are consistent with achieving or maintaining the environmental values in a location. The proposed ERS relates the indicators and objectives to areas of Victoria through the use of different categories of land use settings as well as the natural environment. This reflects the difference between urban settings where some sound may be considered as unwanted noise, while natural settings may include noise that is considered to be an integral part of the wanted soundscape. The land use categories are also newly-developed for the proposed ERS.

While the proposed ERS adopts all the environmental values from the noise SEPPs, it is essentially a new reference tool that characterises valued aspects of the ambient acoustic environment and clarifies the noise levels above which there is an increased risk of impact to human health. The regulatory aspects of the noise SEPPs do not form part of the proposed ERS, nor do the proposed ERS noise standards perform any direct regulatory function.

In the new environment protection framework, noise regulation, which has been informed by the SEPPs review – and other processes, such as the review and remaking of the of the Residential Noise Regulations[[60]](#footnote-61) - is achieved through the proposed EP Regulations and the accompanying *Noise Limit and Assessment Protocol for the control of noise from commercial, industrial and trade premises and entertainment venues*. (the Noise Protocol).[[61]](#footnote-62) The EP Regulations set regulatory obligations for duty holders (including the use of the Noise Protocol for the prediction, measurement, assessment and analysis of noise emissions) to ensure compliance with relevant noise limits and operating times. The noise limits are the maximum effective noise levels allowed in relation to a range of defined noise sensitive areas. The EP Regulations also prescribe the circumstances when noise emissions will be found to be unreasonable or aggravated. The Noise Protocol is an incorporated document to the EP Regulations and sets out the methodologies used to calculate specific noise limits that represent compliance obligations for the control of noise for premises within defined noise sensitive areas.

#### Environmental values

The ERS contains five environmental values for noise, which apply to Victoria’s acoustic environment, [[62]](#footnote-63) as presented in Table 14.

Table 14 - Environmental values of the acoustic environment

|  |  |
| --- | --- |
| Environmental value | Description of environmental value |
| Sleep during the night | An acoustic environment that supports minimal sleep disruption at night |
| Domestic or recreational activities | An acoustic environment that supports recreational and domestic activities in a residential setting |
| Normal conversation | An acoustic environment that allows for a normal conversation indoors without the need to raise voices |
| Child learning and development | An acoustic environment that supports cognitive development and learning in children |
| Human tranquillity and enjoyment outdoors in natural areas | An outdoor acoustic 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 |

#### Land use categories

To apply the proposed ERS standards for noise to areas of Victoria, a set of five land use categories are proposed (Categories I, II, III, IV and V). A similar approach is used in other jurisdictions (New South Wales and South Australia)[[63]](#footnote-64) to characterise the different urban form or land use settings that are typically associated with urban, regional, rural and natural areas. The five categories proposed, provides an appropriate range of descriptors that can represent the ambient acoustic objectives across the state. This approach is different to the noise SEPPs and the proposed EP Regulations and Noise Protocol, which are concerned with regulating noise between a source (for example, an industrial premises), and a sensitive receptor (for example, a residential dwelling), in the context of other sources of noise. The noise limit methodology of the SEPPs, and the proposed Noise Protocol, provide a means for determining noise limits, and these factor in land use planning zones and urban and rural settings.

The proposed land use categories identify typical land use settings ranging from highly urbanised areas (Category I) to relatively natural areas (Category V). The categories are defined by reference to the planning zones they comprise, with planning zones with similar characteristics grouped together in each category. The categories are consistent with the differences in intensity or scale of development of the built environment within urban, regional and rural areas. They are based on ambient noise levels that are likely to be found in each respective category. For example, Category I typically contains an urban form with distinctive features or characteristics of taller buildings, high commercial and residential intensity and high site coverage. The Central Business District of Melbourne is an example. Category II typically contains medium rise building form with a strong urban or commercial character with mixed land uses including activity centres and larger consolidated sites, and an active public realm. The major activity centres around metropolitan Melbourne are examples.

The land use category approach is intended to provide a suitable level of granularity and simplicity, while also ensuring a necessary balance between existing and likely activity associated with future development.

The five proposed land use categories are described, and planning zones identified, in Table 15.

Table 15 – Proposed land use categories for noise

|  |  |  |
| --- | --- | --- |
| **Land Use Category** | **General description** | **Planning Zones** |
| 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 are frequently called the ‘country’ because they enable people to see and interact with native vegetation and wildlife. |  |
| 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.

#### Indicators and objectives

The proposed ERS adopts as an indicator the LAeq metric, which provides a representation of the ambient quality of the acoustic environment over the defined period of time – environmental noise varies over time and the LAeq metric represents this by converting the environmental noise over the defined period into an equivalent continuous sound pressure level. The LAeq metric is the single number indicator for measuring ambient or environmental noise that is most widely used internationally and in other jurisdictions in Australia. The LAeq metric is described in more detail in the next section.

The indicators are expressed for day and night periods as follows:

* night time indicator as outdoor LAeq,8h, from 10p.m. to 6 a.m. (that is, the equivalent continuous sound pressure level for the eight-hour period from 10p.m. to 6 a.m.)
* day/evening indicator as LAeq,16h, from 6 a.m. to 10 p.m. (that is, the equivalent continuous sound pressure level for the sixteen-hour period from 6 a.m. to 10p.m.)

The objectives (with the exception of Category V) are measured in decibels (dB). The objectives vary according to land use category to ensure that the variation in noise levels that would normally be associated with different land use settings is captured by the ERS. Night time objectives for Category I through IV reduce from 55 dB (for Category I) to 35 dB (for Category IV). Similarly, the day-evening objectives reduce from 60 dB (for Category I) to 40 dB (for Category IV). These objectives are not regulatory noise limits. Rather, they define the equivalent continuous sound pressure noise level over the defined time period that is consistent with supporting the environmental values.

A qualitative indicator is used for Category V (natural areas) as what is heard in the context of this land use category is a better indicator of tranquility and human enjoyment than a broad dB level. For example, while natural sounds associated with the area, such as noise from the ocean or from wildlife, may result in relatively high values of LAeq, they form part of the valued acoustic environment.

Indicators and objectives are presented in Table 16.

Table 16 - Noise standards - indicators and objectives for the acoustic environment

|  |  |  |
| --- | --- | --- |
| Land Use Category | Indicator | Objective |
| Category I | Outdoor LAeq,8h from 10 p.m. to 6 a.m.​  Outdoor LAeq,16h from 6 a.m. to 10 p.m. | 55 dB​ (A)  60 dB​ (A) |
| Category II | Outdoor LAeq,8h from 10 p.m. to 6 a.m.​  Outdoor LAeq,16h from 6 a.m. to 10 p.m. | 50 dB​ (A)  55 dB​ (A) |
| Category III | Outdoor LAeq,8h from 10 p.m. to 6 a.m.​  Outdoor LAeq,16h from 6 a.m. to 10 p.m. | 40 dB​ (A)  50 dB​ (A) |
| Category IV | Outdoor LAeq,8h from 10 p.m. to 6 a.m.​  Outdoor LAeq,16h from 6 a.m. to 10 p.m. | 35 dB​ (A)  40 dB​ (A) |
| Category V | Qualitative | An acoustic quality that is conducive to human tranquillity and enjoyment having regard to the ambient natural soundscape. |

### Methods used to prepare the standards for noise

This section describes the methods undertaken to identify environmental values, to define proposed land use categories, and to derive new indicators and objectives for noise.

#### Review of Noise SEPPs and legislative reform

From 2014-2018 the EPA and DELWP undertook a review of regulation of noise in the two noise SEPPs. In line with environment protection legislative reform, the SEPPs review process evolved into the development of the provisions that are proposed for inclusion in the future noise framework, in particular the regulatory measures in the proposed EP Regulations and the Noise Protocol.

The review process began with the release of a discussion paper[[64]](#footnote-65) in August 2014, which identified potential areas for review. Comments on the discussion paper were received through written submissions and through targeted stakeholder consultation with industry, regulatory bodies, and community stakeholders. Results from the review process were collated in the publication of a consultation paper in 2015.[[65]](#footnote-66)

The Noise External Reference Group (NERG) was created in 2015 to support engagement on the review and examine all emerging issues raised through the consultation period. The group consisted of community groups, government and sector representatives (including eight local councils and the MAV), and acoustic consultants with specific expertise in noise measurement and management. Five workshops were held with the NERG during November and December 2015. Local government was represented at all five workshops. The NERG met periodically to provide feedback on technical and policy alternatives throughout the duration of the review process.

The EPA also undertook extensive internal review activities to inform the development of regulatory options, including a socio-acoustic survey and noise mapping and an analysis of noise impacts and regulation on business and the community. The EPA also considered comprehensive reports on environmental noise by enHealth[[66]](#footnote-67) and the World Health Organisation (WHO).[[67]](#footnote-68)

The SEPP review confirmed the validity of the three existing environmental values in the noise SEPPs, and also identified a scientific rationale for the inclusion of new environmental values (within a SEPP-based regulatory approach). Although the proposed EP Regulations and Noise Protocol do not refer to environmental values, the substance of these values is reflected in the proposed EP Regulations through the regulation of noise limits with respect to defined noise-sensitive areas.

With the EP Act making provision for the introduction of an ERS, it was recognised that the environmental values identified through the SEPPs review would also be appropriate standards for inclusion in an ERS, if it was determined that standards for the ambient acoustic environment should be included.

The EPA and DELWP have assessed that the inclusion of noise standards in an ERS is appropriate. Inclusion of noise standards in an ERS sends a signal as to the significance of the ambient acoustic environment for human health. By defining objectives, linked to land use categories, the noise standards provide a basis for monitoring, assessment and reporting on the ambient acoustic environment, if such broad scale environmental assessment were to be undertaken. They would also provide objectives that represent appropriate outcomes that could be referred to, with respect to activities that fall outside the scope of environment protection noise regulation, such as roads and railways.

#### Methods used for reviewing environmental values

The proposed ERS contains five environmental values for noise – the environmental values in the ERS include those within SEPP (N-1) and SEPP (N-2), and two newly identified values.

The environmental values previously defined under the SEPP noise framework, which was introduced in 1989, explicitly identified ‘sleep in the night period’ and ‘normal domestic and recreational activities,’ from SEPP (N-1); and ‘normal conversation’ as an environmental value in relation to noise from outdoor values, from SEPP (N-2). The SEPP review process confirmed the need to reflect the three existing environmental values from the noise SEPPs in the development of the ERS.

##### Additional environmental values

Internal review undertaken during the SEPP review process supported the inclusion of two additional environmental values:

1. the environmental value of *child learning and development* refers to children learning to read and comprehend written texts, being able to hear and understand teaching instruction and communicate in learning environments, concentrating and maintaining focus on tasks that require attention. These aspects of child learning and development can be impaired in a noisy environment; and
2. the environmental value of *human tranquility and enjoyment, outdoors in natural areas* refers to the quality of calm or enjoying the environment for its natural condition. Human sounds (noise) intruding into natural areas can detract from the tranquility and pleasantness of the environment. “The benefits of quiet or tranquil places are not usually considered in terms of health but rather in ideas of amenity, attractiveness, pleasantness, calmness, restfulness and restoration.”[[68]](#footnote-69)

There is a clear relationship, supported by scientific literature, of the impact of noise on learning and child development, and the high value that the community places on public open space for sporting activities, active recreation, restoration and rest.

The WHO identified cognitive impairment as a critical health outcome that can “affect vulnerable individuals (children) and have a significant impact later in life”.[[69]](#footnote-70) Strong evidence was also available for the inclusion of tranquillity and human enjoyment as a further environmental value in high amenity natural areas such as national and state parks. The inclusion of tranquillity as an environmental value supports consideration of conservation and recreational values in high amenity natural areas, such as national parks and state parks. This provides a way to characterise impacts that are outside of parks (such as nearby industrial activities) on enjoyment within the area.

#### Methods used to prepare land use categories

As described in the previous section, the proposed land use categories have been developed as a practical means of applying the proposed ERS ambient objectives to the whole state. The intensity of land use development across the state varies considerably from: (1) highly developed urban areas (common in capital and regional cities); (2) industrial and commercial land uses that can be located in a variety of geographic locations; (3) suburban development (common across metropolitan Melbourne and regional towns); (4) smaller townships that are sparsely developed (such as that found in rural Victoria); and (5) undeveloped or natural areas (including, for example, state parks and other environmentally significant areas).

Consistent with this variety of development intensity, a set of five categories has been proposed that ensures both the coverage of all the typical land use settings that occurs across the state, as well as the necessary level of granularity that enables useful and relevant monitoring of the ambient acoustic environment in a variety of settings. The selection of a smaller number of categories would mean the ERS would not be designed to provide the requisite granularity that ensures the intended purpose of the ERS for noise monitoring can be achieved, and that noise monitoring data would not be relevant to the reality of different land use intensities that exist across Victoria. Similarly, a larger number of categories would make the ERS design overly complex and be more difficult to interpret. This would reduce the ability of the ERS to meet its intended function.

The ERS category descriptions were developed based on similar descriptions used in the Victorian planning system and are generic characterisations that reflect typical urban form outcomes within each of the categories. As such, the descriptions are not intended to be comprehensive, rather, they capture the major differences in urban form that will be relevant in the context of ambient noise monitoring across Victoria.

##### Assignment of land use zones to categories

The foundation of the Planning System in Victoria includes the Victoria Planning Provisions (VPPs) that include, among other things, land use zones (and associated schedules to the zones, and overlays). The VPPs and the land use zones are used by planning authorities and responsible authorities (such as local councils) to make decisions on approvals for different development proposals. Essentially, the zones provide the planning ‘rules’ for what development types are allowed, allowed with specific permit conditions, or restricted in particular locations.

The method used to align the planning land use zones with the ERS categories involved a desk-top assessment of the purpose of each land use zone that is defined within the VPPs and matching those development types to the typical development types that would be found within each ERS Category. For example, ERS land use Category I includes urban form characterised by taller buildings, high commercial and residential intensity and high site coverage. The planning land use zones where this form of development can be found include the capital city zone (labelled as CCZ in the VPPs), Docklands zone (labelled as DZ in the VPPs), road zone (RDZ1), port zone (PZ), and industrial zones (IN1Z, INZ2). A similar match of the other land use zones within the planning system was undertaken to assign them to the other ERS categories.

It is important to note that some land use zones within the planning system include schedules to the zones that further identify specific types of developments. This is the reason why some zones (Comprehensive Development Zone, Priority Development Zone, Special Use Zone, and Public Use Zone) must be assessed on a case by case basis as their specific assignment to an ERS category will depend 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.

#### Methods used to prepare indicators and objectives

The indicators and objectives proposed for inclusion in the ERS have been developed by the EPA to in accordance with current scientific knowledge of the noise levels that characterise the maintenance of the environmental values, and above which there is an increased risk of impact to human health. The indicators and objectives of the ERS are consistent with the scientific basis that underpins the SEPPs and the proposed EP Regulations.

##### Methods used in selecting indicators

Several metrics (or indicators) can be used to assess noise. Measures of environmental noise “consider the frequency content of the sounds, the overall sound pressure levels and the variation of these levels with time.”[[70]](#footnote-71) In most cases, the sounds and noises we hear are not steady. For noise that increases or decreases in level over time, methods of obtaining a single number to represent the noise level over the whole time period are used. Two commonly used “descriptors” of noise are: the per cent exceeded level (Ln) e.g. L10, and the equivalent continuous sound pressure level (Leq).

Leq is the noise level that is equal to the same amount of energy over a given time period as if the time-varying sound was constant in level. When the Leq is written as LAeq the “A” refers to the frequency weighting which accounts for the sensitivity of human hearing at different frequencies of sound.

The per cent exceeded level, “Ln”, is the sound pressure level which a given percent of the levels are greater than over the time period. The commonly used values of “n” for the percent exceeded level, Ln are 10 and 90. L10 is the level exceeded for 10 per cent of the time. It represents the highest 10 per cent of the sound pressure levels (it is sometimes referred to as the average maximum level). L90 is the level exceeded 90 per cent of the time. The L90 level is generally considered to represent the background level of sounds. A-weighted 90 per cent exceeded level is written as LA90.

The WHO recommends using LAeq to evaluate more-or-less continuous environmental noise.[[71]](#footnote-72) All other Australian states and territories, except Western Australia and the Australian Capital Territory, use LAeq as the primary indicator of environmental noise. The NSW *Noise Policy for Industry* (2017)[[72]](#footnote-73) uses this approach, noting the LAeq descriptor is used for amenity noise levels and is most widely correlated with the subjective effect of noise. LA10, T is used in WA and ACT.

The European Union *Environmental Noise Directive (2002)*[[73]](#footnote-74) adopts the similar Leq based descriptors Lden and Lnight, where Lden is the LAeq over the whole day with penalties for evening and night time noise and Lnight is the long-term average LAeq over an 8-hour night period.

In Victoria, LAeq is used in the noise SEPPs and the *Passenger Rail Infrastructure Noise Policy (2013)*[[74]](#footnote-75). While currently the VicRoads *Traffic Noise Reduction Policy (2005)*[[75]](#footnote-76) uses LA10,18h, a change in descriptor to LAeq metrics has been explored by VicRoads.[[76]](#footnote-77) An equivalence between LA10,18h and LAeq,16h or LAeq,8h can be established using conversion factors based on measurement campaign.[[77]](#footnote-78)

The LAeq is the most appropriate indicator that is consistent with the function of the ERS and provides a representation of the ambient quality of the acoustic environment over time.

In summary, the LAeq,8h and LAeq,16h [[78]](#footnote-79) indicators are measures of sound level in dBs that indicate an equivalent continuous sound level or a time-average sound level, that is adjusted to reflect the response of the human ear that is less sensitive to low and high frequencies.

Consequently, the LAeq indicator provides the functionality required by the ERS to describe the external, ambient noise environment. In addition, the selection of this indicator is consistent with most community noise measurements and will, therefore, assist in understanding and comparison. In summary, this is the most appropriate indicator of ambient acoustic environments and the most appropriate indicator to adopt within the ERS.

##### Methods used in selecting objectives

Objectives are set for each indicator to ensure certainty, consistency and transparency in assessing the condition of the acoustic environment.

For the purposes of the acoustic environment, objective means the typical ambient noise level for the night period and the day/evening period. These numerical objectives apply in areas where there is already a certain level of human-made noise. Based on scientific evidence, the objective values have been grouped into 5 dB increments. This provides an adequate level of granularity for the spatial distribution of ambient noise levels and the typical land use categories.

Note, however, the objective levels have no function in determining regulatory noise limits. Rather, they reflect the fact that more developed areas are usually subject to higher ambient noise levels.

WHO guidelines from 1999[[79]](#footnote-80) and 2018[[80]](#footnote-81) include recommended maximum environmental noise levels for specific environments and time periods, and also document the relevant critical health effects. The WHO 1999 guideline provided guideline values for community noise in specific environments, for example, an outdoor living area guideline value of 55 dB(A) during the day and evening to protect against serious annoyance. The WHO 2018 guideline provided recommended maximum noise levels associated with adverse health effects for different noise sources.

In considering the dB level at which noise affects sleep, the WHO 2009 guideline outlined that for night time noise levels up to 30 dB “no substantial biological effects are observed.”[[81]](#footnote-82) This is referred to as the no-observed-effect level (NOEL) and is measured as Lnight, outside. Lnight, outside is the long-term annual A-weighted average sound level for each 8-hour night period.

At levels greater than 30 dBA at night the effects of noise increase, however up to 40 dB the effects are modest. Based on an assessment of international research evidence, the WHO further identifies a night time lowest-observed-adverse-effect level (LOAEL) of 40 dB (as Lnight, outside).[[82]](#footnote-83)

The WHO 2009 recommendations for health protection acknowledged that achieving the LOAEL may be difficult and recommended an Interim Target of 55 dB Lnight, stating “[a]bove 55 dB the cardiovascular effects become the major public health concern, which are likely to be less dependent on the nature of the noise.”[[83]](#footnote-84) Furthermore, WHO added that above 55 dB “[t]he situation is considered increasingly dangerous for public health. Adverse effects occur frequently, a sizeable proportion of the population is highly annoyed and sleep-disturbed. There is evidence that the risk of cardio-vascular disease increases.”[[84]](#footnote-85)

These WHO guideline values have also been applied in jurisdictions in Australia. In Tasmania the *Environment Protection Policy (Noise) 2009[[85]](#footnote-86)* adopts acoustic environment objectives consistent with the WHO *Guidelines for Community Noise*.[[86]](#footnote-87) For example, the policy for ‘outdoor living area’ notes serious annoyance may occur during the daytime and evening periods when noise levels exceed 55 dB(16h), and moderate annoyance when levels exceed evening 50 dB(16h).

Other jurisdictions have developed policies with noise levels varying with land use settings. This is based on the concept of increasing ambient noise levels with human activity and urbanization. For example, the NSW *Noise Protection Policy for Industry* (2017)[[87]](#footnote-88) contains recommended amenity noise levels for different land use settings. The ‘Residential Suburban’ category, for example, has recommended levels of 55 dB (day), 45 dB (evening) and 40 dB (night). These are similar to ERS Category III ERS objectives (day-evening 50 dB, night 40 dB).

The South Australian *Environment Protection (Noise) Policy 2007*[[88]](#footnote-89) contains recommended levels for different land use categories including ‘Rural Living’ (47 dB day, 40 dB night), ‘Residential’ (52 dB day, 45 dB night), ‘Rural Industry’ (57 dB day, 50 dB night), ‘Light Industry’ (57 dB day, 50 dB night) ‘Commercial’ (62 dB day, 55 dB night), ‘General Industry’ (65 dB day, 55 dB night), and ‘Special Industry’ (70 dB day, 60 dB night).

The increased risk from higher ambient noise levels can be managed by reducing exposure through several measures including building design and site orientation[[89]](#footnote-90) and by closing windows to reduce the intrusion of external noise indoors. This exposure reduction approach is consistent with WHO recommendations to reduce noise exposure in the population exposed to levels above the guideline values.[[90]](#footnote-91)

The objective noise levels in the ERS broadly align with the Australian Standards for recommended design sound levels and reverberation times for building interiors[[91]](#footnote-92) with consideration for achieving these levels based on whether the windows are open or closed. It is important to note that operable windows are also very important for other amenity outcomes including natural ventilation, and the proposed objectives factor in consideration that people do not keep windows closed at all times.

The development of objectives is consistent with and largely reflects comparable aspects of the existing regulatory (SEPP N-1) framework for noise. Table 17 provides a visual comparison of the proposed ERS objectives for Category I, II, III and IV with the zoning levels (dBA) and the base noise limits contained within SEPP N-1 and the Noise in Regional Victoria (NIRV) guidelines.[[92]](#footnote-93) The objectives for each land use setting correspond with different ‘Influence Factors’[[93]](#footnote-94) (as defined in SEPP (N-1)) that are associated with different land uses. The table shows that proposed ERS objectives are similar to zoning levels that are applicable to land use settings that are representative of comparable Influence Factors, and consistent with the comparable mix of land use zoning types. The proposed objectives are therefore consistent with the noise compliance levels used currently with respect to noise from commerce, industry and trade.

For example, the dark red highlighted cells indicate that the ERS Category I day-evening objective (60dBA) is similar to the evening Zoning level (61 dB) that is applicable to a land use setting that is representative of an Influence Factor of 1 and consistent with a land use mix containing all Type 3 uses (such as industry and major roads).

Similarly, the light red cells illustrate the similarity of the ERS Category II objective value for the day-evening period (55dBA) with a range of day or evening Zoning levels applicable to comparable land use settings. A similar logic applies to the other colour-coding in the table, for both ERS day/evening and night objectives. As the table illustrates that, from a scientific perspective, the ERS objectives are consistent with typical ambient noise levels that would be found in the different land uses of the environment.

Table 17 - Comparison of SEPP (N-1)/NIRV zoning levels and base noise limits with ERS objectives

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Land use zoning types | Influencing factor | ERS category day/evening | Zoning level (dBA) | | | ERS category night |
| Day | Evening | Night |
| All type 3 – industry and major roads - road category 1 | 1 | Category I = 60 dBA | 68 | 61 | 56 | Category I = 55 dBA |
| Type 2 & 3 – equal portions | 0.75 |  | 64 | 57 | 52 |  |
| All type 2 – commercial and road category 2 | 0.5 | Category II = 55 dBA | 59 | 53 | 48 | Category II = 50 dBA |
| Type 1 & 2 – equal portions | 0.25 |  | 55 | 48 | 43 |  |
| All type 1 – residential/parkland | 0 | Category III = 50 dBA | 50 | 44 | 39 | Category III = 40 dBA |
| Base noise limit SEPP (N-1) | NA | Category IV = 40 dBA | 45 | 40 | 35 | Category IV = 35 dBA |
| Base noise limit NIRV | NA |  | 45 | 37 | 32 |  |

###### Natural Areas

ERS Category V addresses natural areas for human enjoyment and tranquility. People visit natural areas to appreciate landscapes, enjoy scenery, for tranquility and for a nature experience.

Human-made noise can affect visitors to natural areas by changing their experience and reducing the benefits that come from visiting these areas. Benefits of visiting natural areas include stress reduction, natural quiet, scenic appreciation and solitude,[[94]](#footnote-95) which is broadly equivalent to ‘tranquility and human enjoyment’ as used in the ERS.

Studies of outdoor “recreationists” visiting natural areas have shown that noise can interfere with an appreciation or enjoyment of a natural area. The level of interference, or unacceptability of the human-made noise, is related to the context in which the noise is heard - whether the sounds are appropriate in the particular setting – rather than the loudness or quietness of the sound.[[95]](#footnote-96) For example, mechanical sounds are more detracting in vegetated areas compared to built landscapes, urban parks and residential areas.[[96]](#footnote-97) Natural areas that have the sounds of nature without intrusion of human sounds are more enjoyable and appreciated.

Human-made noise, or non-natural sounds, in natural areas can affect wildlife by masking (or interfering with) the acoustic signals used by wildlife for communication, navigation, mating, nurturing, detection of predators and foraging.[[97]](#footnote-98)

Like in humans, “noise is a stressor for wildlife, particularly where they cannot escape the noise when bound to a location through their breeding, feeding or nurturing activities, or where a whole of habitat range may be affected. Such stress contributes, along with other stressors they experience, to impact on the viability of wildlife populations.”[[98]](#footnote-99) This stress is referred to as the fight or flight response and can result in physiological changes to metabolism, heart rate, respiration rate and blood flow to organs. It can increase the susceptibility to infection and parasites and alter growth.[[99]](#footnote-100) Studies of the impacts of noise are specific to individual species and settings, and species show differences in their adaption and habituation to noise.

Other Australian states such as NSW and SA use criteria based on a noise level measured as LAeq (in dBA) and adjusted for frequency and temporal variation. While this approach aims to protect amenity, it is not suitable for protecting other environmental and recreational values where the audibility and noticeability of the noise can substantially detract from the visitor experience and the absence of intruding human-made noise in the soundscape is fundamental to the area’s value.

Qualitative objectives are applied in Tasmania and Queensland to protect tranquility and biodiversity of ecosystems. Tasmania adopts the WHO (1999) recommendation that “existing quiet outdoor areas should be preserved and the ratio of intruding noise to natural background sound should be kept low” to protect areas from disruption of tranquility.

Queensland’s *Environmental Protection (Noise) Policy (2008)* protects “the qualities of the acoustic environment that are conducive to protecting the health and biodiversity of ecosystems.”[[100]](#footnote-101) The standard is the level of noise that preserves the amenity of the existing area or place (or marine park) to protect the health and biodiversity of ecosystems. The noise level to achieve this standard would be location specific and species specific, however it could be used as a proxy for minimal or no noise.

Given the discussion above, the ERS adopts a qualitative objective for Category V. In practice, the inclusion of this objective draws attention to the importance of considering the soundscape, rather than consideration of a specific decibel level, when seeking to assess the potential impacts of activities in these areas.

### Findings and recommendations of the Chief Environmental Scientist

#### Findings

The CES makes a single finding when discussing the proposed ERS standards for noise:

**Standards for biodiversity protection**: The CES notes that the noise environmental values do not address biodiversity protection and observes that this is due to the absence of good science to reflect impacts on the wide range of noise settings and impacts on biodiversity. The CES observes that the environmental value of protection of natural areas will to some extent address the potential for biodiversity impacts as it talks about the quality of tranquillity, however it would be appropriate for the ERS to have an environmental value that does not yet have corresponding objectives. It is recommended an environmental value on biodiversity be developed.

#### Recommendations

The CES makes two specific recommendations for noise with regard to a program of work to support future review of the standards for noise:[[101]](#footnote-102)

***Recommendation 7*** – That a review be undertaken as to whether an environmental value for biodiversity protection can be defined and whether qualitative or quantitative indicators and objectives can be developed for inclusion in the ERS.

***Recommendation 8*** – That the objective for human tranquillity and enjoyment outdoors in natural areas is an acoustic quality that will need to be determined for each location as required.

## ERS standards for water

### Overview of the ERS standards for water

The proposed ERS derives the environmental values, segments, indicators and objectives from SEPP (Waters), which includes standards for both surface waters and groundwater, with only minor changes, as described below. The proposed ERS follows the SEPP (Waters) standards closely, as the SEPP (Waters) standards were themselves introduced very recently, in October 2018. The ERS does not include other aspects of SEPP (Waters), such as rules and obligations, and measures for the management of risks, as these are outside the scope of an ERS. Where applicable, these obligations are addressed through the General Environmental Duty (supplemented with guidelines), with higher order risks (for example, waste discharge from vessels, clean-up of non-aqueous phase liquid, waste discharge to aquifer, etc), addressed through provisions of the proposed EP Regulations.

#### Environmental values

The proposed ERS adopts 13 of the 14 environmental values for water from SEPP (Waters) – the proposed ERS does not include the environmental value for cultural and spiritual values, as is described below. Some environmental values are applicable to all waters, while others have application to groundwater or surface waters only. Environmental values for water are presented in Table 18

Table 18 - Environmental values of waters

|  |  |
| --- | --- |
| Environmental value | Description of environmental value |
| 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—   * the integrity of riparian vegetation as it contributes to the health of water dependent ecosystems and bank stability; * groundwater quality that does not adversely affect surface water ecosystems; * 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;[[102]](#footnote-103) * maintenance of fish passage. |
| 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. |
| 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, due to introduced contaminants. |
| Geothermal properties | Groundwater quality that will not affect the natural thermal capacity (including temperature) of the groundwater. |

##### Proposed removal of cultural and spiritual values environmental value

SEPP (Waters) included an environmental value for cultural and spiritual values, which was included to recognise that the broader community had cultural, spiritual or ceremonial practices that relied on suitable water quality. Specific indicators and objectives were never developed for this environmental value and may be very difficult to develop. This environmental value has not been included in the proposed ERS, as it is considered that in achieving or maintaining the objectives for other environmental values (for example water dependent ecosystems and species, water-based recreation, and traditional owner cultural values) would also be maintained.

#### Water segments

Following SEPP (Waters), the proposed ERS applies environmental values to areas of Victoria by dividing water regions into geographic areas called segments, with environmental values matched to these segments. For surface waters, segments have common features, including water quality under unimpacted conditions, physical system characteristics, climatic variability and ecosystem character. Groundwater segments are based on a salinity gradient.

##### Surface water segments

Figure 4 shows segments for surface waters.

Figure 3 - Surface water segments (rivers, streams and marine)

##### 

##### Groundwater segments

Groundwater environments are divided into seven segments, which are defined by the background level[[103]](#footnote-104) of total dissolved solids (TDS)[[104]](#footnote-105) in the groundwater. Groundwater segments are presented in Table 19.

Table 19 - 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 |

##### Application of environmental values to segments

The proposed ERS applies environmental values to segments consistent with SEPP (Waters). This presented in the proposed ERS in a set of tables (for groundwater, inland water, and marine and estuarine water segments). The tables are not reproduced here.

###### Exclusions

The proposed ERS does not include from SEPP (Waters) the set of exclusions from the application of environmental values to surface waters in certain locations. The exclusions are not adopted because these relate, in SEPP (Waters), to a framework of obligations for managing surface waters, including placing restrictions on some activities, which is not the intended purpose of an ERS. Notably, some exclusions point to risks that are being managed via an existing licence and/or other legislation – these controls will transition into regulatory aspects of the new framework.

However, the proposed ERS maintains the SEPP (Waters) position that environmental values do not apply to surface waters in artificial assets, which are defined as including any of the following:

1. constructed—
2. stormwater drains;
3. agricultural drains;
4. irrigation channels and drains;
5. wetlands;
6. waste and wastewater treatment systems;
7. reticulated water supply distribution systems;
8. off-stream private dams;
9. water tanks;

SEPP (Waters) includes separate provision for the management of artificial assets, including provision for the protection of water quality in these assets and connected receiving environments, where relevant. These provisions are proposed to be saved via transitional regulations for a period of up to two years to allow for future arrangement to be determined. Assets must still be designed and managed to minimise risks of harm, for the purposes of meeting the General Environmental Duty.

The proposed ERS also does not apply environmental values to particular surface water or groundwater where 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.

#### Indicators and objectives

The ERS includes a set of indicators and objectives that are defined for the particular environmental values that apply in each surface water and groundwater segment. The ERS uses several types of indicator, as described in Table 20.

Table 20 - Types of indicators (water)

|  |  |
| --- | --- |
| Types of Indicator | Description and examples |
| Physical and chemical parameters | Typically, the ‘default indicators’ for monitoring and evaluating the ecological health of water environments include, among others, nutrients, turbidity, salinity, dissolved oxygen and toxicants. Objectives for physical and chemical parameters specify an upper or lower limit for a given indicator. Limits are typically set based on an upper percentile of values observed from long-term data in a healthy or reference water body where environmental values are known to be supported. For toxicants, the upper limits are based on concentrations that are known to be harmful to aquatic organisms based on experimental studies. |
| Biological indicators | Provide integrative measures that respond to the effects of multiple physical and chemical stressors acting together and provide measures of longer-term impacts and responses of environmental condition. Objectives specify a condition or state that, when not met, indicates environmental values are potentially at risk. Include freshwater macroinvertebrates, chlorophyll-a, algal abundance and seagrasses. |
| Microbial indicators | Include *E. coli* and *enterococci* in freshwater systems and *enterococci* only in estuarine and marine systems that indicate the presence of faecal contamination and risk to human health. |
| Weight of evidence indicators | Indicators use multiple lines of evidence from physical, chemical and biological indicators as well as the results of toxicity testing. This includes the use of new sediment ecotoxicity objectives for identifying risk due to sediment contamination. |

The proposed ERS identifies an extensive set of indicators and objectives for water environments. Except as outlined in the next section, the indicators and objectives are adopted from SEPP (Waters) without substantial change.

The proposed ERS specifies indicators and objectives either directly in an ERS table or refers to indicators and objectives in other reference documents, such as the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*[[105]](#footnote-106) (ANZG Guidelines), the *Australian Drinking Water Guidelines* (ADWG),[[106]](#footnote-107) the *Guidelines for Managing Risks in Recreational Water*,[[107]](#footnote-108) and the *Food Standards Code*.[[108]](#footnote-109)

Table 21 presents the proposed ERS table of indicators and objectives for surface waters, and Table 22 presents the ERS table of indicators and objectives for groundwater. The numerous tables presenting specific indicators and objectives are not reproduced here – they can be viewed in the proposed ERS.[[109]](#footnote-110)

Table 21 - proposed ERS indicators and objectives for surface waters[[110]](#footnote-111)

|  |  |  |
| --- | --- | --- |
| **Environmental value** | **Indicators** | **Objectives** |
| Water dependent ecosystems and species | For the relevant segment, the indicators are specified in the following Tables—   * Rivers and streams (six segments) in Tables 8 and 9 * Lakes in Tables 10 and 11 * Estuaries in Table 12 * Port Phillip Bay in Table 13 * Western Port Bay in Table 14 * Corner Inlet in Table 15 * Gippsland Lakes in Table 16 * Open Coasts in Table 17 | For the relevant segment, the level of indicators specified in the following Tables—   * Rivers and streams (six segments) in Tables 8 and 9 * Lakes in Tables 10 and 11 * Estuaries in Table 12 * Port Phillip Bay in Table 13 * Western Port Bay in Table 14 * Corner Inlet in Table 15 * Gippsland Lakes in Table 16 * Open Coasts in Table 17 |
| 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 18 | The level that achieves a low risk score as set out in the last column (Ranking 1 – low risk) of Table 18. Objectives are determined using the weight of evidencetoxicant risk scoring system in Table 18. |
| Human consumption after appropriate treatment | Indicators specified in the Australian Drinking Water Guidelines | Health-related guideline value for each indicator specified in the Australian Drinking Water Guidelines |
| Agriculture and irrigation (irrigation) | Indicators specified for irrigation and water for general on-farm use in the ANZG Guidelines | Level of the indicators specified in the ANZG Guidelines |
| Agriculture and irrigation (stock watering) | Indicators specified for livestock drinking water quality in the ANZG Guidelines | Level of the indicators specified in the ANZG Guidelines |
| Human consumption of aquatic foods | For the relevant segment, the indicators are specified in the following Tables—   * Rivers and streams (six segments) in Tables 8 and 9 * Lakes in Tables 10 and 11 * Estuaries in Table 12 * Port Phillip Bay in Table 13 * Western Port Bay in Table 14 * Corner Inlet in Table 15 * Gippsland Lakes in Table 16 * Open Coasts in Table 17 | For the relevant segment, the level of indicators specified in the following Tables—   * Rivers and streams (six segments) in Tables 8 and 9 * Lakes in Tables 10 and 11 * Estuaries in Table 12 * Port Phillip Bay in Table 13 * Western Port Bay in Table 14 * Corner Inlet in Table 15 * Gippsland Lakes in Table 16 * Open Coasts in Table 17 |
| 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 | Guideline values specified for physical and chemical stressors for aquaculture in the ANZG Guidelines.  If an objective is not specified in the ANZG Guidelines 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. |
| Toxicants | Guidelines values specified for toxicants for aquaculture in the ANZG Guidelines.  If an objective is not specified in the ANZG Guidelines for a toxicant for aquaculture, the objective for that indicator is the toxicant objective specified for the environmental value of water dependent ecosystems. |
| Off-flavour compounds | Guideline values specified for off-flavour compounds in water found to cause tainting of the flesh of fish and other aquatic organisms in the ANZG Guidelines |
| 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. |
| Water-based recreation | *E.coli¸* enterococci  Note: for freshwater either *E. coli* or enterococci can be used, but for marine and estuarine water only enterococci can be used. | 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 the Authority.  If there are no such site specific microbial water quality objectives:  - the microbial water quality objectives for long term assessment are specified in Table 19. 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  19; and  - the microbial water quality objectives for short term assessment are specified in Table 20. |
| Cyanobacteria/algae, chemical hazards, aesthetic effects | Health-related and aesthetic guideline value for each indicator specified in the National Health and Medical Research Council Guidelines for Managing Risks to Recreational Water. |
| Traditional Owner cultural values | Indicators must be developed in consultation with Traditional Owners and may be informed by the process identified in the ANZG Guidelines 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 Guidelines 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 22 - proposed ERS indicators and objectives for groundwater

|  |  |  |
| --- | --- | --- |
| **Environmental value** | **Indicators** | **Objectives** |
| Water dependent ecosystems and species (subterranean) | Indicators that are relevant to the subterranean species of troglofauna and stygofauna, which may include total suspended solids, salinity, toxicants in water, toxicants in sediment and dissolved oxygen. | The level that ensures the groundwater quality does not adversely affect the subterranean species of troglofauna and stygofauna that depend on the groundwater. |
| 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:   1. exceeds the level of that indicator (if specified as an upper limit); or 2. 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. |
| Potable water supply | Indicators specified in the Australian Drinking Water Guidelines | Health-related guideline value for each indicator specified in the Australian Drinking Water Guidelines.  Aesthetic guideline value for each indicator specified in the Australian Drinking Water Guidelines. |
| Potable mineral water supply | Indicators specified in the Australian Drinking Water Guidelines | Health guideline values for each indicator specified in the Australian Drinking Water Guidelines.  Aesthetic guideline values for each indicator set out in the Australian Drinking Water Guidelines. |
| Agriculture and irrigation (irrigation) | Indicators specified for irrigation and water for general on-farm use in the ANZG Guidelines | Level of that indicator specified in the ANZG Guidelines |
| Agriculture and irrigation (stock watering) | Indicators specified for livestock drinking water quality in the ANZG Guidelines | Level of that indicator specified in the ANZG Guidelines. |
| 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 | *E. coli* | 10 *E. coli*/100mL (if no human faecal contamination sources identified)  0 *E. coli/*100mL (if human faecal contamination sources identified) |
| Chemical hazards, aesthetic effects | Health-related and aesthetic guideline value for each indicator specified in the National Health and Medical Research Council Guidelines for Managing Risks to Recreational Water. |
| 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. |

##### Proposed changes to water indicators and objectives

The proposed ERS includes the following variations in indicators and objectives compared to the standards in SEPP (Waters):

**Pollutant Load targets/objectives**

Pollutant load targets from SEPP (Waters) are renamed marine pollutant load objectives and are retained in the proposed ERS. However, commitments in SEPP (Waters) to achieve pollutant load targets/objectives by a specified year are not included in the proposed ERS as an ERS is not intended to create specific obligations with respect to targets.

**Potable Mineral Water Supply indicators and objectives**

SEPP (Waters) specified that, for the purposes of potable mineral water supply, groundwater should not be affected to the extent that the level for any indicator exceeds the level specified in the Food Standards Code (Standard 2.6.2 – Non-alcoholic beverages and brewed soft drinks); and the constituents of groundwater should not be affected so as to exceed an aesthetic guideline value in the Australian Drinking Water Guidelines. In the proposed ERS, all the indicators and objectives for potable mineral water supply refer to the guideline values in the Australian Drinking Water Guidelines – the Food Standards Code is no longer referenced.

This variation from SEPP (Waters) is proposed to make the proposed ERS indicators and objectives for potable mineral water supply consistent with the indicators and objectives for other environmental values relating to water supply and consumption – “human consumption after appropriate treatment” (surface waters) and “potable water supply” (groundwater). The proposed change reflects the assessment that, for the purposes of the ERS, the objectives that support environmental values for water supply and consumption should be consistently and equitably applied, regardless of the source.

### Methods used to prepare the standards for water

The environmental values, indicators and objectives in the proposed ERS are adopted from SEPP (Waters), with some modifications, as just described.

SEPP (Waters) was gazetted in October 2018. It replaced two previous SEPPs - SEPP (Waters of Victoria) 2003, and its schedules, and SEPP (Groundwaters of Victoria), 2002. SEPP (Waters) combines the statutory policies for surface water and groundwater environments in a single instrument.

The introduction of SEPP (Waters) followed a review process undertaken from 2014-18. The review process involved extensive consultation and engagement with stakeholders, and a detailed review of environmental values, segments, indicators and objectives, which was overseen by an independent expert Science Advisory Panel (SAP).

SEPP (Waters) was developed to be consistent with, and operate within, the broader National Water Quality Management Strategy[[111]](#footnote-112) and the ANZG Guidelines. The ANZG Guidelines were developed to provide a national, strategic direction for the management of Australia’s surface, groundwater and coastal waters, while allowing for local conditions in particular catchment areas. SEPP (Waters) applies the risk-based approach of the ANZG Guidelines, drawing on long-term Victorian monitoring data, where available, to develop standards that are relevant and applicable to Victoria’s water environments.

#### Methods used to prepare environmental values and segments

The environmental values defined in previous water SEPPs were reviewed in the development of SEPP (Waters) to ensure they continued to reflect community values for water and whether the segments to which they applied were still appropriate. This was informed by submissions to the SEPP (Waters) Discussion Paper released in 2015[[112]](#footnote-113), and input from stakeholders involved throughout the review.

More information about how environmental values were developed is presented in the EPA publication *State Environment Protection Policy (Waters) Review: Part 1 Beneficial Uses – Proposed Changes, April 2017*.[[113]](#footnote-114)

Under the direction of the SAP, segments for all waters were reviewed and revised, and a process undertaken to match environmental values to segments. More information on these processes is presented in the EPA publication *State Environment Protection Policy (Waters) Review: Part 2 Matching Beneficial Uses to Segments, July 2017.*[[114]](#footnote-115)

#### Methods used to prepare indicators and objectives

Overseen by the SAP, indicators and objectives were reviewed and revised to reflect:

* new scientific knowledge;
* improved understanding of environmental conditions that support different environmental values;
* improved long-term water quality monitoring data;
* changes to national and international guidelines; and
* changes to environmental values and segments.

The indicators and objectives were developed in line with, and to complement, the approach outlined in the ANZG Guidelines. A range of methods were used to develop objectives. For surface waters these were mostly locally-derived, to better represent Victorian conditions. Most of the derived objectives are designed to protect the environmental value of water-dependent ecosystems and species, as it is assumed that if this environmental value is protected, then the other environmental values are also protected. Specific objectives were also developed for aquaculture and water-based recreation.

It was not possible to develop locally-derived objectives for groundwater due to the limited availability of groundwater datasets in Victoria. Instead, the indicators and objectives for groundwater were based on standards contained in the Australian Drinking Water Guidelines, the Food Standards Code, and the ANZG Guidelines.

Some environmental values are not linked to quantified objectives and have been described qualitatively.

More information about how SEPP (Waters) indicators and objectives were developed is presented in EPA Publication 1733 – *Development of environmental quality indicators and objectives for SEPP (Waters)*.[[115]](#footnote-116)

### Findings and recommendations of the Chief Environmental Scientist

#### Findings

The CES makes the following observations and findings in relation to the proposed ERS standards for water:

**Review of indicators and objectives to address knowledge gaps:** The CES notes that some proposed ERS/SEPP (Waters) environmental values for water do not have indicators and objectives due to the science not being sufficiently developed or the appropriateness of objectives for some water bodies being not well understood.

**Development of site-specific water quality objectives for microbial contamination**: The CES observes that the proposed ERS/SEPP (Waters) short-term and long-term microbial objectives for the environmental value of water-based recreation were derived from the *Guidelines for Managing Risks in Recreational Water*,[[116]](#footnote-117) which were based on an epidemiological study with a particular mix of faecal contamination sources. The CES notes that differences between the mix of faecal contamination in this study and those recorded in studies conducted in Port Philip Bay suggest that the derived objectives may be conservative for protecting human health, particularly where the type of waterbody and faecal sources are different. To address this, the CES finds that site-specific objectives that better characterise the risk at particular locations should be developed for inclusion in the ERS, supported by default objectives where site-specific objectives have not been developed. The CES notes that a framework is being developed by EPA to ensure that a robust, consistent approach to developing site-specific objectives is applied.

#### Recommendations

Corresponding to the findings, the CES makes the two recommendations for water with regard to a program of work to support future review of the standards:[[117]](#footnote-118)

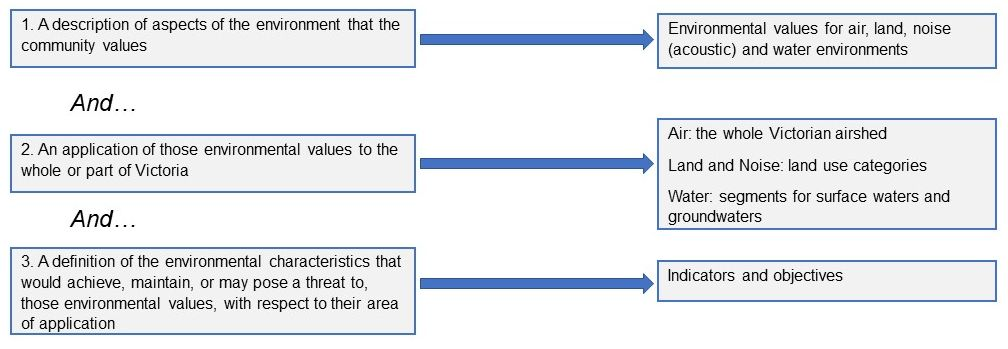
***Recommendation 14*** - Review the establishment of short and long term site specific water quality objectives for microbial contamination.

***Recommendation 15*** - Review and develop indicators and objectives to address the knowledge gaps described in Appendix E of the SEPP (Waters) MER frameworks[[118]](#footnote-119) and priority emerging contaminants in water.

# Chapter 5 – Intended operation and impact

This chapter describes the ways in which the ERS is intended to operate or be used. It also describes the expected impacts of the ERS, compared to the base case.

## Introduction

It is useful by way of introduction to re-summarise the basic components of the ERS. It consists of:

In simple terms, these components collectively identify, and provide a means to evaluate, certain aspects of the environment that the Victorian community value. The ERS therefore provides a means for understanding the environment, for assessing and reporting on environment conditions, and for informing decisions about activities that may have an impact on the environment.

### Intended operation

In bringing together environmental values, defined by location, with indicators and objectives, the ERS allows for valued environmental characteristics of any given location to be clearly described. This provides a means for comparing the environmental conditions that support (or pose a potential threat to) an environmental value in a location to the actual state of the environment. It provides a reference point for determining whether the environmental conditions that support an environmental value have been achieved or are being maintained, or may be threatened, or not currently being met. It also provides a reference point when having regard to an activity that may have impacts on the environment, whether positive or negative. The ERS enables potential threats to environmental values from an activity to be understood and given proper consideration.

In short, the ERS is rightly named a reference standard. It is a benchmark.

As the ERS is a legislative instrument of the EP Act, its environmental values, indicators and objectives have legal authority. Their incorporation in the ERS declares the standards to be an authoritative benchmark. Indeed, it confirms that the standards are to be considered the primary benchmark to be referenced in situations where reference to environmental values is relevant. As will be described in this chapter, this is significant because it provides clarity and transparency regarding the standards that *should* be referenced in such situations.

As a benchmark, the value of the ERS comes from its utility as a tool to support other activities, actions and decisions. It has no direct, independent operation – it does not impose a direct compliance obligation on any duty holder under the EP Act, and does not by itself prescribe, proscribe or delimit any action or activity. Rather, the ERS operates indirectly. Its intended operation is to provide standards that must or may be referred, for the range of situations where reference to such standards will make a necessary or useful contribution.

Corresponding to the objectives of the ERS identified in Chapter 3, this chapter describes the intended operation and impact of the ERS in three interrelated categories:

1. To communicate effectively about environmental issues;
2. To assess and report on environmental conditions; and
3. To inform the provision of environment protection advice and decision-making.

### Assessing impact

The impact of the ERS must be understood in terms of the effects of its use on other actions, activities and decisions. Assessing these impacts requires analysis of the effects of the ERS across the range of its use, compared with what would be expected to occur in the absence of the ERS.

As noted in Chapter 2, for this impact assessment, the ERS will be assessed in comparison to a base case consisting of a counterfactual scenario where, on 1 July 2020 the EP Act and proposed EP Regulations take effect, but the ERS is not introduced. Impacts will be described in terms of the incremental effects on circumstances or outcomes that are likely to occur as a consequence of the ERS as it is variously used, compared with the base case.

In this base case world, the activities that an ERS supports would still occur, but a range of alternative standards would need to be referred to instead of an ERS. This will entail less consistency and potentially higher costs, as described in this chapter.

## To communicate effectively about environmental issues

The most general way in which the ERS can be used are to promote a shared understanding between government, community and other stakeholders about what is valued in the environment. This shared understanding provides a foundation for effective communication about important environmental issues by, and between, different stakeholders.

By describing the environment in terms of environmental values, the ERS provides a frame of reference that can assist Victorians to identify and describe with greater clarity what they personally consider to be important about the environment. The ERS provides a coherent vocabulary for discussing the environment that can be broadly supported by the community, even where individuals or groups might question particular environmental values. It has the potential to facilitate recognition and agreement about shared values and to promote a shared understanding of the environment, which are essential precursors for individuals and communities to agree on, and work together to achieve, common environmental goals. Used effectively, the ERS can be a powerful tool to drive these outcomes.

As a legislative instrument of the EP Act, the ERS represents a public declaration about the desired state of the environment, which can be harnessed by the EPA and other government organisations in their engagement with individuals, communities, business and industry, regulators and other parts of government. The simple, compelling logic of the ERS – that objective(s) ‘x’ are characteristic of conditions that either support, or may pose a threat to, environmental value ‘y’ – is mutually intelligible for stakeholders from different industries. This provides a basis for mutually-comprehensible discussion of general environmental issues or about the government’s proposed approach to a particular issue of local or regional concern. For example, the EPA or a Catchment Management Authority (CMA) can refer to the ERS to show how changes in total phosphorus or nitrogen loads may affect the environmental values of an estuary. Planning authorities may use the ERS to initiate a dialogue with their communities about their vision for the environment in their region.

A more broadly-accepted understanding of valued aspects of the environment may enable stakeholders to better understand and utilise information generated by assessment and reporting activities that reference the ERS – which are described in the next section. This may increase the reach and effectiveness of those activities.

The ERS provides a source of information that may assist communities to engage more meaningfully in environmental debates, which is an important principle of environmental justice. Similarly, it may assist communities in their efforts to draw attention to particular issues of environmental and public health concern. Because the ERS is a transparent statement about the desired state of the environment, it provides clarity about whether an environmental value is regarded as applying to a particular location, and how to determine whether it is being achieved, maintained or threatened. By reference to the ERS, communities can demonstrate where an environmental value may be threatened. This can help the community to raise awareness about the issue, to facilitate public debate, and to advocate for change.

For business and industry, the ERS provides a broad means of demonstrating – to the community and consumers – that the organisation understands environmental value and undertakes good practice environmental management.

### Impact of ERS on effective communication about environmental issues

The impact of the ERS as a means of promoting a shared understanding of, and of communicating about environmental issues depends on the extent to which it comes to be utilised for these purposes. It will certainly be used as a tool by the EPA to communicate with communities and government, including other regulators. To this extent it will provide a benefit to the EPA. Without the ERS, the environment protection framework will not have an extant set of Victorian Government-endorsed standards that can be employed for this function. And while there are many sources of environmental information available, there are no other readily-available and consolidated standards that could perform the same function to the same extent.

The ERS may provide a moderate benefit to communities, local government and other government entities wishing to draw attention to an environmental issue, again to the extent that it is utilised for this purpose. Without the ERS, communities and others would need to invest time and effort to locate and refer to other studies, reports, and sources of information to provide a referential basis for awareness-raising efforts. And while some sources may be scientifically robust, others may be unreliable, biased, or not suitable to be applied in the local area. No alternative environmental reference would have the authority that is possessed by the ERS due to its status as a legislative instrument. Use of the ERS enables stakeholders to focus more energy on the issue of concern, and avoids search costs associated with debating and defining the characteristics of particular environmental issues.

The ERS may provide a moderate marketing benefit to business and industry where it is able to use the ERS to better demonstrate its environmental credentials to environmentally-focussed consumers.

## To assess and report on environmental conditions

Section 93(1) of the EP Act states that an ERS is “to be used to assess and report on environmental conditions in the whole or any part of Victoria.” In other words, the ERS performs the function of a benchmark against which environmental conditions can be compared, in order to evaluate the presence or absence of, or threats to, environmental values. The introduction of an ERS makes it the authoritative benchmark to be used with respect to the elements and aspects of the environment, and parts of Victoria, to which it applies.

The ERS is intended to be a benchmark that can be used to produce information about whether valued aspects of air, land, acoustic and water environments are being achieved or maintained, or may be threatened. It is intended that this information, assessed and reported at appropriate time-scales, will support high quality policy advice and well-informed environmental management activities. It is also intended that this information will be made accessible to the public, and communicated clearly, through digital media and other sources, so that the public can make well-informed decisions about their use and enjoyment of the environment.

Regular assessment and reporting of environmental conditions against ERS standards will increase their visibility to the public, which will contribute to the standards becoming broadly recognised and accepted by stakeholders. This is likely to move stakeholders towards a greater degree of agreement about what is valued in the environment, which facilitates more effective communication about environmental issues – the function of the ERS described in the previous section.

The ERS does not specify that it must be used for any particular assessment and reporting function. However, it is anticipated that the ERS will underpin a range of environmental condition assessment and reporting activities undertaken by the EPA, DELWP, partner government agencies, and other entities such as the Commissioner for Environmental Sustainability - relevant examples are described over the next several pages. Foremost among these are activities that refer to SEPPs standards currently. The ERS meets a community expectation that these functions are informed by clear, reliable, relevant scientific benchmarks.

Not all of the government’s environmental assessment activities and reporting functions will utilise the ERS. In many cases, environmental assessments and reports may include a more extensive range of indicators or metrics, which may give a fuller picture of the complex factors that interact to affect the health of different ecosystems or locations. Or they may be focussed on the conditions necessary to obtain specific or local outcomes, for example, breeding by a target species of bird. The ERS is not intended to replace all objectives and targets in existing environmental assessment and reporting mechanisms with a single, uniform set of indicators and objectives. The ERS’ role is to provide an efficient, robust yet accessible means of comparison, against which environmental values – widely-held and desired attributes or functions of the environment – may be evaluated. It will be adopted in those assessment and reporting measures that are intended to assess and communicate with respect to such values.

### EPA’s monitoring, assessment and reporting

In 2016 the EPA Inquiry recommended that “the EPA assess the adequacy of its air and water monitoring networks, particularly in relation to air quality, and consider options to improve data sharing and accessibility, and community communications” (recommendation 6.3).

Reflecting this recommendation, the EP Act gives the EPA a clear mandate and responsibility to assess and report on the environment. The EPA’s legislated functions from commencement include:

* to monitor and assess environmental quality;
* to identify, assess and monitor risks of harm to human health and the environment; and
* to provide information and education to the Victorian community in relation to:
  + environmental quality; and
  + risks of harm to human health and the environment.[[119]](#footnote-120)

EPA’s current and future monitoring and assessment activities can be broadly categorised into three types – the monitoring and assessment of trends, interventions, and events. Currently, the assessment of environmental conditions by comparison to SEPP standards plays a significant role in these types of assessments. The ERS is intended to continue to play a similarly significant role in the future.

**Trends monitoring and assessment** is undertaken to monitor ambient environmental conditions and is undertaken routinely over a defined spatial area and timeframe. It supports an understanding of the baseline environmental state and the identification of changes and trends over time, including changes due to pollution and waste, and from climate change. The ERS will play a central role as a benchmark against which environmental conditions, trends and threats can be identified, assessed and reported. In turn, trends monitoring, and assessment provides a core information base to inform future reviews of ERS standards.

**Intervention monitoring and assessment** is undertaken to assess the effectiveness of a specific, targeted action or intervention in the environment to reduce or prevent harm, or to answer a specific knowledge gap. The ERS could be used to determine whether an intervention has been successful, for example, whether an environmental value has been attained or restored. Intervention assessment may also inform future ERS standards by improving scientific knowledge in relation to standards with particular knowledge gaps.

**Event monitoring and assessment** is undertaken to inform the response to pollution and waste events, including emergencies. It enables the provision of relevant and timely information and advice to the community, partners and emergency services. This includes the issue of EPA alerts or warnings to the public. The ERS will be used in conjunction with other tools for some events assessment and reporting, for example as a benchmark for communicating to the public when an environmental value is threatened by the event or has been resolved.

To underpin delivery of its future monitoring, assessment and reporting functions, the EPA has developed an overarching Environmental Monitoring and Assessment Framework. This provides a coherent architecture, and set out the objectives, principles and priorities for its monitoring and assessment program. The framework will support detailed monitoring and assessment plans, which will set out methodologies to be used to assess and report on different aspects of Victoria’s environment. The EPA plan to make a version of the framework available to the public later in 2019.

The EPA will provide further information about proposed future programs to monitor and assess the environment, and ways for communicating about the environment, when they are further developed.

#### Air quality monitoring, assessment and reporting

The EPA is responsible for the monitoring, assessment and reporting of Victoria’s air pollution.

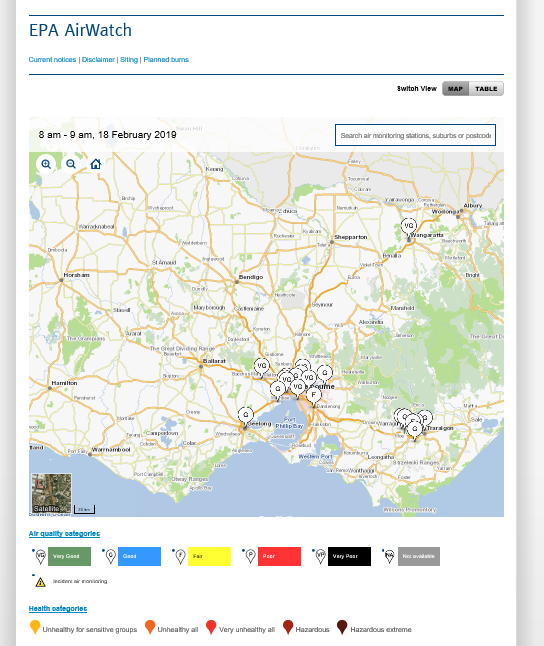
The EPA currently measures ambient air quality for common, widespread air pollutants – carbon monoxide, nitrogen dioxide, photochemical oxidants (as ozone), sulfur dioxide, particulate matter (PM10 and PM2.5) and visibility[[120]](#footnote-121) - at 19 monitoring stations across Victoria. Due to the higher population density, most ambient air quality monitoring occurs in the Port Phillip Region, with 12 sites in Melbourne, five sites in the LaTrobe Valley and one each in Geelong and Wangaratta. Pollutant concentrations measured at these stations are compared to and reported against the SEPP (AAQ) standards. These are updated online on an hourly basis on the EPA’s AirWatch website - see Figure 5 - and provide the information base for annual Air Monitoring Reports, undertaken in compliance with the NEPM (AAQ).[[121]](#footnote-122) Hourly reporting would in future be benchmarked against ERS standards.

Figure 4 - EPA AirWatch

The EPA provides hourly data updates on ambient air quality for each monitoring station on its AirWatch website - <https://www.epa.vic.gov.au/our-work/monitoring-the-environment/epa-airwatch>

Air quality at each site is shown on AirWatch as falling into one of five colour-coded categories, ranging from ‘Very Good’ to ‘Very Poor’. The categories are aligned with the SEPP (AAQ) standards - pollutants listed as ‘Poor’ or ‘Very poor’ are in exceedance of the corresponding objective for that indicator.

EPA is developing a new, upgraded AirWatch program, which is expected to be announced later in 2019.

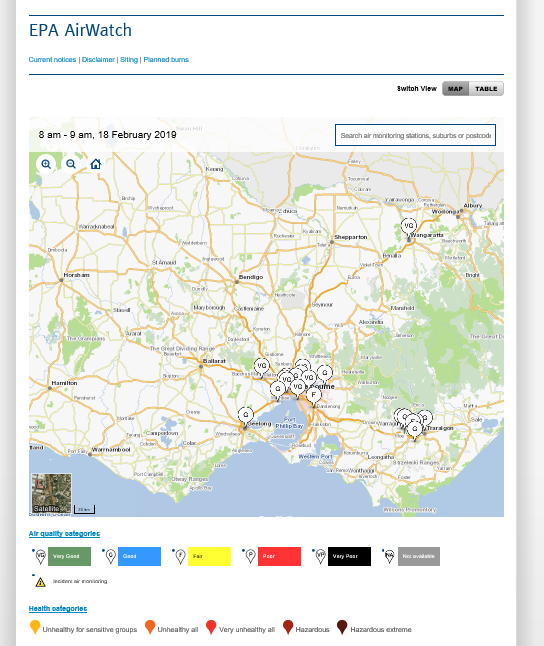


**Example - EPA AirWatch**

The EPA provides hourly data updates on ambient air quality for each monitoring station on its AirWatch website - <https://www.epa.vic.gov.au/our-work/monitoring-the-environment/epa-airwatch>

Air quality at each site is compared to the reference standard and is shown on AirWatch as falling into one of five colour-coded categories, ranging from ‘Very Good’ to ‘Very Poor’. The categories are aligned with the reference standards - pollutants listed as ‘Poor’ or ‘Very poor’ are in exceedance of the corresponding objective for that indicator.

EPA is developing a new, upgraded AirWatch program, which is expected to be announced later this year. What can we say here?



The EPA also monitors air quality at locations with localised pollution issues, and during air pollution incidents and emergencies, providing reports and issuing health alerts as needed.

As mentioned above, the EPA Inquiry recommended that EPA assess the adequacy of its air quality monitoring network, and consider options to improve data sharing and accessibility, and community communications. In 2018 the Victorian Auditor-General’s Office (VAGO) report *Improving Victoria’s Air Quality*[[122]](#footnote-123) also recommended that the EPA expand its air monitoring network and improve its reporting on air quality.[[123]](#footnote-124) EPA accepted VAGO’s recommendations and is considering how best to develop and implement its future air quality monitoring, assessment and reporting program.

#### Land monitoring, assessment and reporting

There is currently no overarching program of land monitoring in place in Victoria.

Assessment of land condition at specific sites is generally undertaken through investigations required by EPA notices, environmental site assessments, or the environmental audit process. Investigations are used to identify and assess potential risks to human health and the environment posed by land contamination, and environmental audits are often required by planning authorities and EPA to be undertaken as part of land remediation or when developing or redeveloping a site. These activities produce information that can be used to develop a broader picture of the condition of the land environment.

Section 40 of the EP Act creates a duty for a person in management or control of land to notify the EPA if land has been contaminated. While the purpose of this duty is to ensure the EPA is informed of higher-risk contamination to support its compliance and enforcement programs, it is also anticipated to strengthen the data on contaminated land available to the EPA.

The EPA will seek to improve systems for the collection and collation of data on contaminated land and the land environment, and to make the data that the EPA publishes more accessible and comprehensible to the public over time. One recent initiative to improve the public’s access to information about possible land contamination is the *Victoria Unearthed* online tool – see Figure 6. The ERS standards for land provide a benchmark that can be used to identify land that has the potential to be contaminated, and where further assessment is required to determine if there is a risk to human health or the environment. The ERS may be utilised to assess and report on this information in *Victoria Unearthed*, and in other land assessment and reporting activities, in the future.

In March 2019 DELWP, in collaboration with EPA, launched *Victoria Unearthed* - <https://www.environment.vic.gov.au/sustainability/victoria-unearthed>.

*Victoria Unearthed* is an online tool and database, including a searchable map. The first release of the tool brings together information about historical business listings, potential land and groundwater contamination and EPA environmental audits – noting that it is not a source of all information about current contamination.

The current version of *Victoria Unearthed* may provide information that is indirectly related to the ERS, in that the ERS may inform assessments made by environmental auditors that are uploaded to the tool. *Victoria Unearthed* also provides a platform that has the potential to be expanded in the future, for example through the addition of new data layers, that could be used to provide assessment and reporting to the public on land contamination, or the condition of the land environment, by comparison to ERS standards.

Figure 5 - Victoria Unearthed

#### Noise monitoring, assessment and reporting

There is currently no program of general ambient noise monitoring in place in Victoria.

From time to time the EPA has conducted studies to better understand the extent of noise within the environment, and its significance and effects. EPA undertook noise surveys in 2006-07,[[124]](#footnote-125) which included a social survey of Victorian residents and a measurement survey, which took noise levels at 50 sites in the inner, middle, and outer suburbs of Melbourne. The results of the noise measurement survey were compared to the WHO *Guidelines for Community Noise*[[125]](#footnote-126) to provide a general assessment of the potential impacts of noise on Melbourne’s residents in relation to critical health effects such as serious annoyance during the daytime and evening, and sleep disturbance during the night time. The EPA has also conducted an investigation into population exposure to noise from road, rail and industrial zones.[[126]](#footnote-127) The investigation compared exposure data, from 2011, to the WHO *Night Noise Guidelines for Europe[[127]](#footnote-128)* and the *European Union Environmental Noise Directive[[128]](#footnote-129)* to estimate the proportion of people exposed to excessive night-time noise.

The ERS standards for noise present, for the first time, a set of environmental values, indicators and objectives that are aligned, through use of land use categories, to Victorian conditions. These provide the basis for strategic assessment and reporting on Victoria’s ambient acoustic environment.

The EPA is considering how the ERS will be utilised to support acoustic assessment and reporting activities in the future. This will be considered as part of future reviews.

#### Water quality monitoring, assessment and reporting

Monitoring and assessment of Victoria’s water environments, particularly surface waters, has been undertaken for many decades. Under Victoria’s Regional Water Quality Monitoring Partnerships program, which is coordinated by DELWP, surface water data is collected from around 780 monitoring sites around the state.[[129]](#footnote-130) Currently there are 41 organisations within the partnership program, including water corporations, CMAs and local governments. Groundwater data is collected primarily through the State Observation Bore Network which is generally focused on groundwater elevation levels and includes minimal groundwater quality sampling. Water quality data for both surface water and groundwater is made available on DELWP’s Water Quality Information System database.[[130]](#footnote-131)

This systematic water quality surveillance monitoring allows the general condition and trends in the quality of water environments to be assessed. CMAs and water corporations compare water quality data with SEPP (Waters) objectives to identify threats to environmental values and prioritise interventions. Where the assessment of these threats triggers a management intervention by an organisation with management responsibility for a waterway, the SEPP (Waters) objectives may be used to assess the effectiveness of the intervention. These activities in the future would be undertaken with reference to ERS objectives.

The current SEPP (Waters) monitoring, evaluation and reporting (MER) framework[[131]](#footnote-132) notes that effective reporting should include communication about areas where environmental conditions support or pose a threat to environmental values and should communicate trends in those conditions. Again, the proposed ERS would provide the reference for equivalent reporting and communication activities in the future.

The ERS standards are also anticipated to be adopted by, or used to inform, future versions of a wide range of strategies, management plans, programs and reports that use SEPP (Waters) standards currently. Some major examples include:

* **Regional waterway strategies** developed and implemented by CMAs, and approved by the Minister for Water, in accordance with section 190 of the *Water Act 1989*. Regional waterway strategies identify high-value waterways and priority management activities within CMA water management districts over an eight-year planning period. SEPP objectives are incorporated in the assessment and decision-making framework for these strategies – refer to the case study in Figure 6.
* **Environmental management plans** thatincorporate SEPP (Waters) pollution load targets, such as the Lake Wellington Land and Water Plan, Corner Inlet Water Quality Improvement Plan, a management plan for Western Port, and the Port Phillip Bay Environmental Management Plan.[[132]](#footnote-133) These plans are required under SEPP (Waters) in order to manage pollutant loads to protect the environmental values of each water body. The ERS contains equivalent pollution load objectives which are likely to be adopted in future management plans.
* **Water resource plans** for northern Victorian catchments within the Murray-Darling Basin. In accordance with the Murray-Darling Basin Plan (Basin Plan), Victoria must prepare and implement water resource plans to show how the requirements of the Basin Plan will be met. Victoria has prepared water resource plans for five water resource plan areas – three for surface water and two for groundwater.[[133]](#footnote-134) Among the requirements of water resource plans is to provide a water quality management plan, which includes water quality target values that are to be considered in the development of measures for each water resource plan area. The Basin Plan proposes a set of default water quality target values for fresh water-dependent ecosystems, irrigation water and recreational water. Instead of adopting these, Victoria has decided to use SEPP (Waters) objectives as target values for fresh water-dependent ecosystems and recreational water, as these are based on long-term Victorian monitoring data and more accurately reflect the particular environmental characteristics of Victorian catchments.
* **Environmental reports**, such as the *State of the Bays* report by the Commissioner for Environmental Sustainability. *State of the Bays* 2016[[134]](#footnote-135) provided a baseline study of the health of Port Phillip Bay and Westernport Bay. For many water quality indicators, the report used SEPP (Waters of Victoria) objectives as the basis for assessing the status and trends in environmental condition. Another example is the annual Port Phillip Bay, Western Port and Gippsland Lakes Reports Cards,[[135]](#footnote-136) which have used water quality indicators to report on the health these water bodies, and their associated catchments, since 2012-2013.
* **Beach Report and Yarra Watch**, which during summer months provides public forecasts for water quality at 36 beaches around Port Phillip Bay and four sites along the Yarra River, that assist swimmers to decide whether or not to swim that day. The forecasts are benchmarked against SEPP objectives for water-based recreation (primary contact) – see Figure 8.

Figure 6 - Regional Waterway Strategies

Each of Victoria’s Catchment Management Authorities (CMAs) is required under the *Water Act 1989* to produce a regional waterway strategy. Strategies currently in effect cover an eight-year planning period from 2014-2022. The development of these strategies was underpinned by regional priority-setting processes, which were partly-informed by SEPP objectives. To undertake the process, CMAs:

* developed high level regional goals for waterway management (for example, to maintain or improve water quality in high priority water supply catchments);
* identified high value waterways;
* filtered and selected those high value waterways that aligned with regional goals;
* identified threats and levels of risk to those waterways;
* used the threats and levels of risk to determine priority waterways for the strategy period;
* identified high level management activities and assessed their feasibility and cost effectiveness; and
* selected priority management activities for the priority waterways to form a regional work program for the strategy period.

SEPP (Waters of Victoria) objectives were integrated into this decision-making framework, by providing a benchmark for the identification and assessment of water quality-related threats and levels of risk to high value waterways. Where poor water quality was identified as a potential threat, the applicable SEPP objectives for water quality, and the SEPP biological objectives for rivers and streams (SIGNAL indicators), were two of the data sources used to verify that a threat existed, and to inform assessment of threat severity. In this way, SEPP objectives inform the selection of management activities implemented through the strategies.

Regional waterway strategies guide the development by CMAs of environmental water management plans and seasonal watering proposals to the Victorian Environmental Water Holder (VEWH). In this way, SEPP objectives may also indirectly influence the seasonal watering plans and watering actions undertaken by the VEWH.

In future, the ERS is intended to provide an equivalent benchmark for water quality objectives. It is likely to be used in a similar way to inform the development of the next round of regional waterway strategies from 2022 onwards.

#### Commissioner for Environmental Sustainability

The Victorian Commissioner for Environmental Sustainability (the Commissioner) has statutory objectives that include to report on matters relating to the condition of the natural environment in Victoria, to encourage decision-making that facilitates ecologically sustainable development, to enhance knowledge and understanding of issues relating to ecologically sustainable development and the environment.

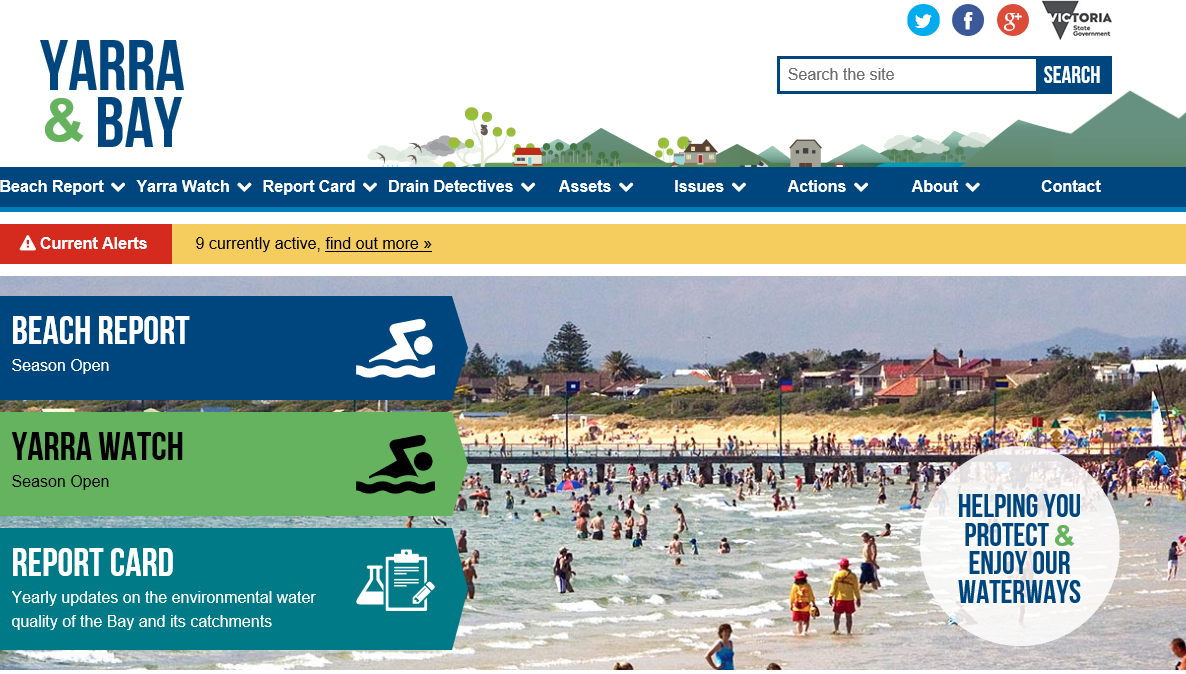
One of the Commissioner’s statutory functions is to prepare a report on the state of the environment of Victoria, at least every five years. The Commissioner’s *2018 State of the Environment Report*,[[136]](#footnote-137) released in March 2019, makes extensive use of SEPP standards to assess and report on the state of the environment, particularly in relation to air and water quality standards. The *2018 State of the Environment Report* also makes several recommendations that the government expand its monitoring and reporting of aspects of the environmental sustainability, including air, land, noise and water environments. As noted previously, the Commissioner’s *State of the Bays 2016* report also relied heavily on assessment of environmental conditions against SEPP (Waters of Victoria) standards.

The ERS would provide a valuable repository of standards for the Commissioner to adopt and use when undertaking future assessment and reports.

Between December and March, the EPA, in partnership with DELWP and Melbourne Water, issue twice-daily forecasts of water quality for 36 beaches in Port Phillip Bay and four sites along the Yarra River. The forecasts are based on a combination of weekly sampling of microbial water quality and use of a forecasting matrix and regional or site-specific modelling.

By comparison to SEPP objectives for water-based recreation (primary contact), water quality is forecast to be either ‘good’ (suitable for swimming), ‘fair’ (may not be suitable for swimming) or ‘poor’ (not suitable for swimming) – forecast water quality of ‘good’ and ‘fair’ meets the SEPP objectives. The forecast is published on the Victorian Government’s Yarra and Bay website - <https://yarraandbay.vic.gov.au/> – on Twitter, through SMS notifications (to SMS subscribers for bay beaches where water quality is forecast as poor), and on forecast signs at lifesaving club beaches (on weekends and public holidays). An alert is issued on the website and Twitter when water quality is ‘Unacceptable’ for swimming.

This information enables the beachgoing public to be well-informed and to make their own decisions about whether to go to the beach or go swimming, and which beach to visit. The SEPP objective provides a transparent benchmark for categorising water quality conditions. It provides assurance and gives the public confidence that they can rely on the information provided. The ERS objectives will be used in the same way as the SEPP objectives are used.



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Figure 7 - Beach Report and Yarra Watch

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### Impact of ERS on assessment and reporting of environmental conditions

The ERS provides a clear, authoritative and accessible benchmark against which environmental conditions may be assessed and reported. The key benefits of an ERS for assessment and reporting are:

**Efficiency** – The ERS are a robust set of ready-made standards that can be adopted, and quickly and easily applied, for assessment and reporting function where comparison of environmental conditions to environmental values is relevant. This avoids the need for new standards to be developed, or alternative standards to be located, for each new, relevant activity. Without an ERS, considerable time and resources may be required to develop or decide on alternative standards.

**Consistency** - The ERS standards will continue to apply (until they are updated), and for as long as the ERS is in effect. For assessment and reporting functions that utilise the ERS, the standards provide a constant reference for reporting over time. Without an ERS to provide an authoritative, stable reference, such consistency is less likely to be achieved.

**Transparency** – The ERS is a reference that is available to all Victorians. It makes clear the environmental conditions that are considered to achieve, maintain, or pose a potential threat to, environmental values. This allows everyone to be informed of the standards against which relevant assessment and reporting activities will be based. Without an ERS, the basis for assessment and reporting is likely to be more difficult for Victorians to ascertain.

In the absence of the ERS, assessment and reporting of air, land, acoustic and water environments will still take place, but these will need to find alternative bases for comparison, which may be less appropriate or fit for purpose. For example, the EPA would still undertake AirWatch, Beach Report and Yarra Watch. As the regulator, the EPA has the expertise to identify and use appropriate alternative standards. In practice, without an ERS, these activities would most likely continue to be reported by comparison to the former SEPP (AAQ) and relevant SEPP (Waters) standards, even though these instruments would no longer hold formal legal status. However, over time the SEPP standards will become increasingly out-of-date, and the EPA would be expected to choose or to develop new standards to support these activities. So, in the absence of an ERS, the EPA ultimately would need to adopt something that effectively performs the same function as an ERS to continue to perform its assessment and reporting activities effectively.

Similarly, the Commissioner for Environmental Sustainability would still undertake reporting in the absence of an ERS, but the lack of any recognised successor standards to the SEPPs standards may affect the authority and comprehensiveness of those reports and may impair the Commissioner’s related functions. Without relevant, current benchmarks, government and agency management plans and strategies that are currently informed by SEPP standards would still occur, but these would need to adopt other standards from a range of other extant sources. This would reduce the overall coherence of Victoria’s assessment and reporting approach and may pose a reputational risk to government.

There are no additional assessment and reporting costs attributable to the ERS - the ERS itself does not introduce any new assessment and reporting activities, nor will its introduction necessarily result in new activities being undertaken. There could be resourcing costs for government if it chose to undertake new reporting dedicated to communicating the state of the environment in relation to ERS standards, if this reporting was additional to all existing reporting activities. However, this should not be attributed to the ERS, as such a decision is not a direct consequence of its introduction.

Due to the efficiency with which the ERS may be adopted, described above, there may be a reduced overall cost to assessment and reporting activities.

No other cost has been identified.

## To inform the provision of environment protection advice and decision-making

A third key function of the ERS is to provide a reference that can be used to inform the provision of advice and support decision-making regarding activities that may have an impact on human health and the environment.

The ERS provides information about the environmental conditions needed to support an environmental value, and the conditions where an environmental value may be threatened. Through reference to the ERS, the potential effects of an activity on environmental values are brought in to focus, which allows them to be more carefully considered in providing environment protection advice or recommendations, and in making decisions. Use of the ERS in this way supports clear, transparent and consistent advisory and decision-making functions, which benefits everyone – the regulator, the regulated, and the wider community.

The ERS is intended to operate as the primary reference to be used in situations where information about the environmental values and conditions that are sought to be achieved or maintained is a relevant consideration. By defining these conditions in a legislative instrument, their authority is enhanced.

The EP Act positions the ERS as the pre-eminent environmental reference by making it a requirement that it be considered when making certain decisions under the EP Act and other acts. The proposed EP Act Regulations also require that an ERS must be considered in certain decisions. These are summarised in Figure 8.

The ERS is not a compliance standard. There is no direct requirement for a duty holder to protect, uphold, meet or achieve the standards it describes. It simply provides an authoritative, scientifically-informed benchmark that may be factored into decisions where consideration of such a benchmark may be important, relevant or helpful. While ERS-informed decisions may impart an obligation on a duty holder, this is a function of the decision-making situation rather than the ERS, and the ERS is typically one of many factors to be considered. Without access to an ERS, the need for environmental reference information to inform such decisions would need to be searched for and met from other sources.

The ERS is not relevant to every environmental decision. In many circumstances, rules or regulations specify standards that must be applied, or environmental conditions that must be met, for example, regulations prescribing noise limits that apply to noise-sensitive areas. In these cases, the requirements are clearly set and there is no need to consider other environmental benchmarks. But for the many decision-making situations that are not the subject of prescriptive regulation, and where the subject matter is addressed in by the ERS, is the presumed default reference. In such situations, where the EP Act does not specify reference to the ERS, its presumptive status is a function of its authority as a legislative instrument.

#### The ERS and the General Environmental Duty (GED)

The cornerstone of the EP Act is the GED, which requires that “a person who is engaging in an activity that may give rise to risks of harm to human health or the environment from pollution or waste must minimise those risks, so far as reasonably practicable.”[[137]](#footnote-138) Through the GED, the EP Act creates a positive obligation for duty holders to minimise risks. The EP Act states that to minimise risks a person must eliminate risks where reasonably practicable, and to reduce risks so far as reasonably practicable if it is not reasonably practicable for them to be eliminated.[[138]](#footnote-139) The baseline requirement for a person to discharge their duty under the GED is to ensure all reasonably practicable risk identification, assessment and control measures are implemented, through appropriate practices, systems and processes. This requirement applies at all times, no matter what the environmental context of the activity.

As discharging one’s duty under the GED involves minimising risks rather than protecting prescribed environmental standards, the GED does not depend on an ERS to function - the ERS does not play a central role in meeting duty requirements. However, one way that the ERS could support the GED is in the characterisation of potential harms.

Harm is defined in the EP Act[[139]](#footnote-140) as an adverse effect on human health or the environment (of whatever degree and duration). The EP Act notes that harm may arise as a result of the cumulative effect of harm arising from an activity combined with harm arising from other activities or factors. While harm is not defined as the actual or potential loss of an environmental value, such a loss would meet the definition of harm, whether it occurs through single or cumulative activities or factors.

The EP Act extends the ordinary meaning of “reasonably practicable”[[140]](#footnote-141) in relation to the minimisation of risks of harm. To determine the level of response required to discharge the GED, regard must be had to the following matters:

1. the likelihood of those risks eventuating;
2. the degree of harm that would result if those risks eventuated;
3. what the person concerned knows, or ought reasonably to know, about the harm or risks of harm and any ways of eliminating or reducing those risks;
4. the availability and suitability of ways eliminate or reduce those risks; and
5. the cost of eliminating or reducing those risks.

The ERS identifies the environmental values that apply to a place and the conditions that have been characterised as supporting those values or posing a potential threat to those values. It therefore provides a reference that can help identify some of the potential harms that may occur if risks eventuated. It also constitutes part of what a duty holder knows or ought reasonably to know about potential harms (what is known as the ‘state of knowledge’). By clarifying some of the potential consequences if environmental risks were realised, the ERS provides information that can contribute to the calculation of what risk minimisation measures may be considered reasonably practicable to minimise the risk of harm for an activity in a particular location. In practical terms this means that the determination of the risk measures considered to be reasonably practicable may be of a higher order for activities that occur in places with significant or particularly sensitive environmental values. To discharge the duty in this context may require measures that go beyond the baseline requirements that would be expected for a similar activity in a different location.

The EP Act specifies circumstances where an ERS must be considered. It also makes consequential amendments to other Victorian legislation that specifies further circumstances where an ERS either must or may be considered. The proposed EP Regulations also specify circumstances where the ERS must be considered.

*Note: This box describes all circumstances where current legislation or the proposed EP Regulations prescribe that an ERS must or may be considered. It does not identify circumstances where an ERS could be considered but is not prescribed.*

**Ministerial decisions**

The Minister must take into account an ERS when making a decision relating to:

* Whether to recommend the making of regulations under the EP Act;
* Whether to recommend the making of a compliance code; or
* Whether to declare an issue to be an issue of environmental concern (EP Act section 99).

**Development licences, operating licences, and pilot project licences**

When determining whether or not to issue a development licence (EP Act section 69), an operating licence (section 74), or a pilot project licence (section 78), the Authority (the EPA) must take into account several matters (such as measures undertaken to comply with the general environmental duty, and best available techniques and technologies). The EPA must also take into account the impact of the activity on human health and the environment, including the impact on any environmental values identified in any ERS, taking into account any other activities being or proposed to be engaged in by the applicant or any other person. The EPA must also refuse to issue the development licence, operating licence, or pilot project licence if it considers that the activity poses an unacceptable risk of harm to human health and the environment.

The EPA must also, among several considerations, consider the impact of the operating licence activity on human health and the environment, including the impact on any ERS, when considering whether or not to vary the conditions of a licence or revoke a licence (EP Act section 76).

A person may apply for an exemption from the requirement for a development or operating licence (EP Act section 80). The proposed EP Regulations specify that the EPA, in considering the application, must consider whether granting an exemption will adversely impact human health or the environment, the interests of any person other than the applicant, or any environmental values identified in any relevant ERS (EP Regulations section 25).

**Permit applications and exemptions under the proposed EP Regulations**

When determining whether to issue a permit (EP Act section 81) for the prescribed permit activity of discharge of waste to aquifer, the proposed EP Regulations require that the EPA must take into account, among other matters, whether granting a permit may adversely impact any environmental values identified in any relevant ERS (EP Regulations section 29(e)). When council is determining whether to issue a permit exemption (EP Act section 83) for the prescribed permit activity of onsite wastewater management systems, the proposed EP Regulations require that council must, among other matters, take into account whether granting the exemption may adversely impact any environmental values identified in any relevant ERS (EP Regulations section 33).

**Planning permit applications**

The EP Act makes a consequential amendment to the *Planning and Environment Act 1987*, to specify that a Responsible Authority considering an application for a planning permit under that act may consider several matters including, if the circumstances appear to so require, any relevant ERS.

**Functions of an environmental auditor**

When carrying out the functions of an environmental auditor under the EP Act or any other act, an environmental auditor must have regard to any relevant ERS, along with any guidelines issued by the EPA, any relevant compliance code, and any prescribed matter (EP Act section 190).

**Matters VCAT must take into account**

In determining an application for review for a reviewable decision specified in Chapter 14 Division 2 of the EP Act, VCAT must take into account …(c) any relevant ERS or order under section 156(1) [Note: section 156(1) relates to a new instrument of the EP Act called Obligations of Managers of Land or Infrastructure (OMLI)].

Consequential amendments require that VCAT must also consider an ERS when reviewing certain decisions in relation to other acts. VCAT must take into account any relevant ERS, and, except in relation to applications in relation to the *Planning and Environment Act 1987*, give effect to any relevant ERS:

* In determining an application for review under the *Planning and Environment Act 1987*.
* In determining an application for review of the decision to serve, or the specified provisions of, a land use condition or land management notice under the *Catchment and Land Protection Act 1994*, or an application for a declaration concerning the validity of such as a decision;
* In determining an application for review of a requirement or prohibition placed on a person by a confirmed interim conservation order under the *Flora and Fauna Guarantee Act 1988*, or a decision or a licence suspension in relation to that order, or in making a declaration concerning those matters;
* In determining an application for review of a decision under the *Water Act 1989* (other than an application for review under section 266(6) of that act); and
* In determining an application under the *Subdivision Act 1988* (other than an application under section 39 of that act).

**Impact plans and statements under the *Major Transport Projects Facilitation Act 2009***

Project proponents preparing an impact management plan (section 27) or a comprehensive impact statement (section 39) for a declared project under the *Major Transport Projects Facilitation Act 2009* must set out, in the plan or statement, how any relevant ERS will be taken into account.

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**Note**: On 13 June 2019 the Environment Protection Amendment Bill 2019 was introduced into the Victorian Parliament. At the time of writing the Bill includes a proposed amendment to the provision for consideration of an ERS by VCAT under the *Catchment and Land Protection Act* 1994, *Flora and Fauna Guarantee Act 1988*, *Water Act 1989*, and *Subdivision Act 1988*. The proposed amendment will clarify that when reviewing relevant decisions under these acts VCAT must “take into account” any relevant ERS, rather than “take into account and give effect to” any relevant ERS. The proposed amendment would make the requirement for VCAT under these acts consistent with the requirement for relevant decisions under the EP Act and the *Planning and Environment Act 1987*. The proposed amendment is consistent with intended operation of the ERS as a benchmark, rather than a compliance standard containing rules and obligations.

The Bill also proposes an amendment to the *Water Act 1989*, which would introduce a requirement for the Minister to consider any ERS when issuing certain water shares or making certain determinations in respect of a water share under that act.

The Environment Protection Amendment Bill 2019 can be accessed from: <https://www.parliament.vic.gov.au/legislation>.

Figure 8 - Statutory and regulatory requirements to consider an ERS in decision-making

#### Operation of the ERS in licence decisions

As noted in Figure 8, the EPA must take into account the impact of an activity on human health and the environment, including the impact on any environmental values identified in any ERS, when determining whether to issue a development licence, operating licence or pilot project licence, and when determining whether or not to vary the conditions or revoke an operating licence. The proposed EP Regulations[[141]](#footnote-142) also require the environmental values in an ERS to be considered when determining whether to grant an exemption from the requirement for a development or operating licence.

It is worth presenting the full set of requirements that the EPA must take into account when determining whether to issue one of these licences. The EPA must consider:

1. any measures the applicant has taken or proposes to take in order to comply with the General Environmental Duty when engaging in the activity that is the subject of the application;
2. the impact of the activity on human health and the environment, including the impact on any environmental values identified in any relevant ERS, taking into account any other activities being or proposed to be engaged in by the applicant or any other person;
3. the principles of environment protection;
4. the best available techniques or technologies;
5. whether the activity is otherwise consistent with this Act and the Regulations;
6. [*for development licences only*]: if the Regulations require the Authority to refer the application to a prescribed agency, any comments or submissions received from that agency;
7. [*for development licences only*]: any comments and submissions received -
8. in response to the notice of the application published under section 52
9. within the time specified in that notice; and
10. any prescribed matter.

As the cornerstone of EP Act, it is the GED that is intended to underpin the EPA’s determination of licence decisions. The EPA’s first consideration is whether the application demonstrates that all reasonably practicable measures are taken to minimise risks of harm. As noted in the previous section, the ERS may inform the determination of what is reasonably practicable through consideration of the environmental context of the proposed activity, with the EPA determining that a higher than baseline standard may be applied in areas with critical or sensitive environmental values. Consideration of the best available techniques or technologies will also contribute to the assessment of what is reasonably practicable.

The ERS provides a reference that can be considered as part of taking into account the impact of the activity on human health and the environment. So, once an applicant’s proposed measures to comply with the GED have been considered, the ERS may be used to identify some of the potential harms posed by any residual impacts on the environment. Where these impacts constitute a threat to an environmental value – as a direct result of the proposed activity, or through the cumulative effects of the activity with other activities and factors – this may be the basis for requiring additional controls to be placed on the activity through licence conditions. A scenario of the use of an ERS to inform licence conditions is presented in Figure 9.

The EP Act requires that the EPA must refuse to issue a licence if it considers that the activity poses an unacceptable risk of harm to human health or the environment. By clarifying potential harms, the ERS may also inform the assessment of whether a residual risk is unacceptable.

In the future environment protection framework, permitted activities in the licensing tier will be required to meet conditions set out in an operating licence. Conditions in an operating licence must not contradict the GED and must consider the ERS, along with other regulations and guidance, when specifying what duty holders must do to meet their obligations.

Scenario:

A large-scale brick production factory undergoes a development licence permissioning process. Due to the use of large kilns to fire and set the bricks, there are large volumes of PM2.5, SO­2 and CO that would be emitted from the premises. The proponent has provided modelling data showing the air emissions from the stacks and for the ground level concentrations from several scenarios. They include maximum and average daily throughput rate.

The modelling results are assessed against both the ERS standards for air and against guidance and regulations relating to air emission design standards. Modelling shows that even at the maximum daily throughput the design criteria set out in guidelines would be met. However, there are several large emitters of SO2 in the area and a residential zone approximately 500 m away from the boundary of the premises, and there are no levels of SO2 at which some level of health impact is not observed.

Given there is an environmental value of *Life, health and well-being of humans* for Victoria’s air environment, EPA works with the proponent to ensure the application demonstrates how the proponent intended to minimise the air emissions to what is reasonably practicable. The proponent investigates a more effective wet scrubber system to further minimise some of their emissions and the modelling indicates a further reduction in emissions.

A development licence is issued to the proponent requiring stack testing during commissioning to verify the air emissions. A review of the test data supports EPA to decide on an appropriate emission limit from the premises within the operating licence.

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**Scenario – ERS informing licence conditions**

[Case study in development]

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Figure 9 - Scenario - ERS informing licence decisions

The requirement for the EPA to consider an ERS is not expected to introduce an additional cost burden, compared to the base case. Without an ERS, the EPA would still be required to consider the impact of an activity on human health and the environment. As regulator, the EPA has the expertise to assess impact, and would be expected to do so by reference to benchmarks that are substantially the same as those proposed for inclusion in the ERS, resulting in similar controls being placed on the activity. The ERS may entail reduced costs for regulator and proponent, given the increased certainty and transparency they provide.

#### Consideration of an ERS by the Minister

Section 99 of the EP Act requires the Minister to take into account an ERS when making a decision relating to:

* whether to recommend the making of Regulations under the Act;
* whether to recommend the making of a compliance code; or
* whether to declare an issue to be an issue of environmental concern.

The intention of this requirement is to ensure that desired environmental outcomes - and where applicable, comparison of desired outcomes to current environmental conditions - are explicitly considered as part of the Minister’s consideration of these decisions. It not a statutory requirement for the Minister to ensure that a regulation or compliance code must be designed to achieve or maintain ERS standards, although the Minister may require that it should. The Minister’s consideration of an ERS may look at the consistency between the proposed instrument and the ERS. Where there appears to be inconsistency, this may be a prompt for the Minister to seek further advice, including policy analysis or policy development, or for the Minister to require modification of the proposed regulatory instrument.

In practice, the requirement establishes an expectation that departments and agencies providing advice to the Minister on a proposed regulation or compliance code will undertake appropriate policy analysis and other assessments of the potential impacts of, and consistency between, the proposed instrument and the ERS. It will result in greater clarity and transparency on these issues in any advice or recommendations provided to the Minister or to government, which supports well-informed decision-making.

Section 160 of the EP Act allows the Governor in Council to declare an issue to be an issue of environmental concern. The declaration must describe the nature and scope of the issue, describe the operation and impacts of the declaration - including but not limited to the person or class of persons required to address the issue and the actions they may take – invite the submission of a better environment plan to address the issue, and set out actions that may be taken if the issue is not addressed.[[142]](#footnote-143) The ERS will provide a useful benchmark for the Minister when considering whether to make a declaration. It is not the intention that the Minister would necessarily make such a declaration where an environmental value is not being achieved or maintained. However, where comparison of environmental conditions to the ERS shows that a trend in environmental condition is placing an environmental value under increasing threat, or is continuing to deteriorate, this knowledge may assist the Minister in making the decision.

Beyond the requirements of the EP Act sections 99 and 160, the Minister may of course use the ERS as a reference to inform consideration of any issue. The ERS may be used by the Minister to help clarify whether environmental policy or regulatory change may be required.

#### The ERS and EPA’s advisory and decision functions

In addition to the statutory requirement for EPA to consider the ERS in licensing decisions, the ERS is intended to be used routinely to support the EPA’s advisory and decision-making functions. In particular:

* **Advice to the Minister** – the EPA may proactively communicate or provide advice to the Minister and other authorities based on environmental trends observed in relation to the ERS.
* **Strategic planning advice** – the ERS will be an important reference for the EPA when providing advice to planning authorities on major projects, such as major roads, mines, airports; or plans, such as precinct plans.
* **Referrals** – the ERS is intended to be used extensively by the EPA in the provision of referral advice and recommendations. The ERS will underpin the provision of consistent, transparent advice.
* **Sanctioning** – breach of the GED is the central offence of the EP Act. It is not necessary for environmental harm to occur for the GED to be breached - only for a duty holder to fail to take all reasonably practicable measures to minimise risks. However, assessing occurrence of harm and its intensity will still play a role in EPA’s sanctioning activities. In some situations, the ERS may provide evidentiary support to the EPA in demonstrating that a harm or potential harm to an environmental value has or may have occurred. More generally, in court proceedings, the ERS will be used by the EPA to demonstrate the environmental values and the conditions used to assess those values, that are said to be applicable to a location. EPA experts giving expert evidence in court can refer to the ERS to provide independent, objective support in relation to their evidence.
* **Guidance** – the ERS may be used to characterise environmental harms, with guidance used to articulate the means for eliminating or controlling risks to those harms for specific activities, for example, mixing zones for wastewater discharge.
* **Monitoring and assessment** – trends observed in relation to the ERS will inform the EPA’s prioritisation of its program activities, including prioritisation of monitoring and assessment activities, and interventions.

The ERS will be incorporated into internal EPA assessment and decision processes to ensure they provide effective support for these and other uses.

#### The ERS and decision making on noise

As described in Chapter 4, the proposed ERS includes five environmental values for the acoustic environment, two of which - “child development and learning” and “human tranquillity and enjoyment outdoors in natural areas” - are new. It also proposes to introduce indicators and objectives for defined land use categories.

The ERS standards for noise provide an informative reference that clarifies the noise levels above which there is an increased risk of impact to human health. They are not intended to have direct regulatory force. Instead, environmental regulation of the noise environment is set out in some detail in the proposed EP Regulations and the accompanying Noise Protocol, which is an accompanying incorporated document.[[143]](#footnote-144) These specify regulations in relation to noise from residential premises, from commercial, industrial or trade premises, and noise from entertainment venues.

The proposed EP Regulations also set out noise limits, which are the maximum effective noise levels allowed in relation to a range of noise-sensitive areas[[144]](#footnote-145). Noise sensitive areas are areas defined in relation to: dwellings and residential buildings; a range of other buildings, such as hospitals, hotels and retirement villages; rooms in which learning occurs, including childcare centres, kindergartens, primary and secondary schools; and areas in relation to a noise sensitive residential use.[[145]](#footnote-146) Noise limits for noise-sensitive areas provide the basis for regulatory decision making, and correspond directly in their subject matter with all environmental values except “human tranquillity and enjoyment outdoors in natural areas.” The ERS will have no decision-making role where noise limits are set.

The ERS standards for noise do not override local planning policy. However, in places where the local planning policy is silent, the ERS may provide a resource that can be used to inform the planning process. The ERS has a role in the land use planning system, which is described in the next section.

The role of ERS standards for noise are to encourage consideration of what constitutes best practice in noise management, and to provide a reference that helps authorities when considering the potential harms associated with noise-generating activities that don’t have specific environment protection regulation, such as noise from road, rail, major infrastructure construction and aviation. The ERS does not impose compliance standards, or any new obligations, for these activities - it simply provides an authoritative reference on the potential impacts of noise on human health and wellbeing. This is intended to lead to better-informed consideration of measures that may be appropriate for strategies and activities for noise management and mitigation – strategies and activities that would occur in any case. The ERS provides a repository of standards that could be considered for inclusion, where relevant, in Environment Effects Statements and other environmental assessments. The inclusion of indicators and objectives in the ERS would mean that such standards would not need to be sought from alternative sources, for example other jurisdictions, which may not be appropriate to Victorian contexts.

#### The ERS and the land use planning system

Victoria’s planning system is established by the *Planning and Environment Act 1987* (P&E Act)[[146]](#footnote-147). The P&E Act provides for the preparation and approval of standard planning provisions known as the Victoria Planning Provisions. Planning schemes are also developed in accordance with planning policies and strategies. They contain planning policies, zones, overlays and other provisions that affect how land can be used and developed. The P&E Act sets out requirements for amending planning schemes and for obtaining permits for the use or development of land within the planning scheme.

The ERS expresses the high-level environmental outcomes that are sought to be achieved or maintained, so forms part of the state of knowledge that may be considered within the planning system. It is intended that the ERS will interact, formally and informally, with various stages of the land use planning process, including initial proposal development, assessment, decision-making and review.

For proponents considering whether to make a development proposal, the ERS provides a high-level frame and environmental context through which the early development of a proposal may be considered. This may inform the proponent’s initial contextual analysis for a proposal, and their design response. The ERS may provide one point of reference that can help proponents to characterise existing urban form, and to align the proposal to the existing context. At this early stage of development, prior to the development of a detailed design, ERS objectives may provide a useful guide to assist proponents to identify and apply design principles that are consistent with the character of a place.

The ERS may inform the assessment of proposals. For planning permit applications or permit amendment applications, where a planning scheme specifies that the EPA is a referral authority, the EPA may use the ERS to characterise desired environmental outcomes, and as a means for providing consistent, high-level advice to the Responsible Authority (RA). Where relevant, the EPA make recommendations or propose permit conditions that are consistent with the maintenance of environmental values.

For major projects where the proposed development may result in significant impacts on the environment and require a planning scheme amendment to proceed, Ministerial Direction No.19 requires that the planning authority seek the views of the EPA on the proposed amendment. The planning authority must include in its explanatory report for the proposed planning scheme amendment a statement of how the proposed amendment addresses the views expressed by the EPA – refer to Figure 11. The ERS will be utilised by the EPA as a means to characterise aspects of the desired environmental state.

Projects that could potentially have significant environmental effects are also referred to the Minister for Planning for determination of whether an Environment Effects Statement (EES) under the *Environment Effects Act 1978[[147]](#footnote-148)* is required. An EES considers the environmental effects of a proposal and provides decision makers with information that supports decision making about whether a project with potentially significant environmental effects should proceed. The ERS provides an appropriate benchmark for assessing and describing certain environmental impacts and relevant standards are likely to be drawn on in the development of the EES.

**Early EPA engagement in planning scheme amendments or reviews – Ministerial Direction No. 19**

In October 2018 the Victorian Minister for Planning issued Ministerial Direction No.19. The Ministerial Direction requires a planning authority to seek the views of the EPA in the preparation of planning scheme reviews and amendments that could result in use or development of land that may result in significant impacts on the environment, amenity and human health due to pollution and waste.

The Ministerial Direction applies to the review of planning schemes, preparation of planning scheme amendments and any strategies, policies, plans or reviews forming the strategic basis for a review or amendment, including precinct structure plans. It specifically applies to such proposed amendments that may “allow the use or development of land that could result in water, noise, air or land pollution impacts on the environment, amenity or human health, including as defined by SEPPs.”

It requires that a planning authority must:

* seek the written views of the EPA about the potential impacts of the review, amendment etc on the environment, amenity and human health
* for a planning scheme amendment, include in the explanatory report a statement of how the proposed amendment addresses the views of the EPA.

Ministerial Direction No.19 is intended to provide a trigger that ensures the EPA is consulted early, so that potential adverse environmental impacts from land use planning decisions can be properly addressed.

The ERS would underpin the views expressed by the EPA on potential environmental impacts and will guide its provision of strategic advice on how these can be addressed.

Figure 10 - Ministerial Direction No. 19

The *Major Transport Projects Facilitation Act 2009* (MTPF Act)[[148]](#footnote-149) provides for integrated planning and environmental assessment and approvals process for major transport projects. The MTPF Act allows the Premier to assess the economic, social and environmental significance of a project and declare it to be a declared project, subject to the MTPF Act’s assessment and approval pathway. The assessment of declared projects requires that the project proponent must prepare either an Impact Management Plan (IMP), or a Comprehensive Impact Statement (CIS), as directed by the Minister for Planning. The MTPF Act requires that a project proponent preparing either an IMP or CIS must set out in the relevant plan how any relevant ERS will be taken into account. Where a CIS is required the proponent must release the statement for public comment and public submissions are made to an assessment committee. The assessment committee makes recommendations to the Minister for Planning, and arranges for the EPA assessment, where a development licence is required. The requirement for both an IMP or CIS to set out how any relevant ERS will be taken into account helps to make sure the standards provide a visible, explicit context for the development of these projects. It is not necessarily intended that the ERS specifies minimum compliance standards for such projects. But by clarifying environmental values and potential threats, the ERS provides a clearer reference to guide the development of appropriate strategies to minimise potential impacts.

The ERS may be considered in land use planning decision-making. The ERS would underpin EPA’s advice in relation to planning scheme amendments that may have significant environmental impacts. And for decisions on planning permit applications where EPA is a referral authority, the P&E Act requires that any objection or permit condition recommended by the EPA must be considered by the RA in making its decision. The P&E Act also states that in making its decision the RA may also directly consider any relevant ERS “if the circumstances appear to so require.” This ensures that the ERS can be utilised by a RA to provide an extra level of contextual input to assist decisions on permit applications, especially in cases where the EPA has not made its own submission.

Permit decisions are subject to review by the Victorian Civil and Administrative Tribunal (VCAT), which may affirm or set aside the decision of the RA, and may decide to grant, change the conditions of, or refuse to grant a permit. In determining an application for review of a permit decision, VCAT must consider any relevant ERS. The intended operation of this requirement is once again to ensure that the appropriate benchmark for the desired environmental state is referenced, and is given proper consideration, in relation to the permit decision process. The ERS helps to inform VCAT when making deliberations on matters about which it may not necessarily have the expertise. It does not mean that VCAT’s decision should depend on whether a permit will protect ERS standards. The inclusion of a requirement for VCAT to consider the ERS is likely to encourage more extensive and transparent use of the ERS in EPA’s referral advice and in the deliberations and decisions of the RA.

#### Consideration of an ERS by VCAT

In addition to the possible consideration of an ERS when reviewing permit decisions under the P&E Act, VCAT must consider an ERS when reviewing a range of other decisions. Many decisions under the EP Act are reviewable by VCAT, in accordance with the requirements of Division 2 of Chapter 14.[[149]](#footnote-150) VCAT must consider any relevant ERS, along with other considerations, in determining an application for review for all of these decisions. VCAT must also consider an ERS when reviewing certain decisions under the *Catchment and Land Protection Act 1994*,*[[150]](#footnote-151)* the *Flora and Fauna Guarantee Act 1988*,*[[151]](#footnote-152)* the *Subdivision Act 1988*,*[[152]](#footnote-153)* and the Water *Act 1989*.[[153]](#footnote-154)

The intention of these requirements is to ensure that VCAT has ready access to relatively easy-to-understand reference information about the desired state of the environment to inform and guide its review of decisions. The range of situations where an ERS must be considered establishes the ERS as the authoritative benchmark, to which VCAT should consistently refer when reviewing decisions where it may be relevant.

As a legislative instrument, the ERS has a privileged status, which makes the ERS standards matters that are largely beyond legal debate. Consequently, VCAT may be inclined not to question the appropriateness of the standards, or to allow the substance of the standards, or their application, to be contested by the parties to a dispute. The ERS provides a benchmark through which VCAT may consider other sources of environmental information that parties to a dispute may seek to cite.

#### The ERS and the functions of an environmental auditor

Part 8.3 of the EP Act establishes the environmental audit system, which is overseen by the EPA. It provides for the appointment of environmental auditors, whose core functions are to conduct preliminary risk screen assessments and environmental audits, and to prepare statements and reports on these assessments and audits. In carrying out their functions an environmental auditor must have regard to any relevant ERS, along with any guidelines issued by the EPA, any relevant compliance code, or any prescribed matter.[[154]](#footnote-155)

Preliminary risk screen assessments are used to assess the likelihood of the presence of contaminated land, to determine if an environmental audit is required, and to recommend a scope for the audit.[[155]](#footnote-156) Environmental audits are undertaken to assess the nature and extent of the risk of harm to human health or the environment from contaminated land, waste, pollution or any activity, and to recommend measures either to manage the risk of harm or to manage the contaminated land, waste, pollution or activity.[[156]](#footnote-157) Environmental audits are generally undertaken to assess and address risk before a potentially contaminated site is redeveloped, as required by the EPA, or in relation to proposed new industrial facilities.

The ERS is intended to be used by environmental auditors as a benchmark that provides a source that informs knowledge about the potential nature and extent of harms to human health and the environment, against which contaminated land, waste, pollution or an activity may be assessed.

### Impact of ERS on provision of advice and decision-making

The ERS does not impose any additional direct regulatory requirement on a decision. In each case where the ERS may be used to inform the provision of advice or support a decision-making function, the circumstance in which the advice is provided, or the decision made, would occur anyway, regardless of the availability or otherwise of an ERS. Moreover, in these situations, there is generally a requirement to consider the environment, environmental impacts, and the desired environmental state, that is established independently of consideration of an ERS and would be met regardless of the availability of an ERS. For example:

* the GED is general, applies to all duty holders, and does not require the ERS to operate. The assessment of reasonably practicable risk minimisation measures under the GED is not necessarily related to the attainment of particular environmental outcomes, nor does it depend on the environmental context of the activity, but may draw on the ERS to identify and characterise potential harms. Without an ERS, any need to characterise potential harms would rely on other environmental reference information;
* the EP Act establishes the EPA as the deciding authority for the issue or amendment of development, operating and pilot project licences. The EP Act requires that the EPA must consider the impact of the activity on human health and the environment, irrespective of whether an ERS is available to inform the assessment of impact;
* similarly, the proposed Regulations require impacts on human health and the environment to be considered independently of any ERS;
* without recourse to an ERS, the EPA would still deliver its referral function and utilise its expertise to provide high-quality advice;
* the land use planning system would continue to operate as before. While proponents preparing an IMP or a CIS under the MTPF Act are required set out how any ERS will be considered, if no ERS was available the proponent would be expected to use another means of demonstrating that environmental considerations have been appropriately considered;
* VCAT would continue to consider and make determinations on applications for review. VCAT may seek other sources of environmental reference information to help it adjudicate on the arguments and evidence presented by the parties to a dispute; and
* environmental auditors conducting assessments or environmental audits would continue using NEPM (ASC) and other tools to identify and assess potential harms to human health and the environment.

In summary, there is no direct cost resulting from the existence or use of the ERS compared to the base case. The differences in indirect regulatory burden of decisions that have been informed by consideration of the ERS, compared to the base case, will depend on the alternative scientific reference information that might be employed. This will vary depending on the context of the decision-making situation and the aspect of the environment that is being considered, and it may result in either an increased or reduced indirect burden, compared to the base case.

In the absence of the ERS, the standards used in SEPPs are likely to be referenced, as they form part of the state of knowledge and would represent the best available scientifically-derived reference standards, even though they will no longer be part of a statutory rule. Over time, confidence in the currency of SEPPs standards will gradually recede and their relevance may degrade. For consideration of air quality and land environments, another source of reference information is the standards in the relevant NEPM, which may be updated from time to time. For water standards, the national guideline values of the ANZG could be used, even though these values have not been derived for, and for some standards they are considered inappropriate for, Victorian water environments. The Australian Drinking Water Guidelines would also provide values for some water objectives. For noise standards, it is anticipated that reference would be made to standards used in other Australian or international jurisdictions, or to WHO guideline values, although these may not be appropriate standards for the local context. It is also likely that greater reference would be made by some stakeholders to surveys or to local or regional scientific studies that might suggest environmental values or conditions that could be applied to particular regions.

The scientific reference information used in the absence of an ERS may in fact be the same or similar to the ERS standards, especially where the ERS standards are simply derived from or incorporate those standards. In some cases, the alternative reference information may suggest that there are more environmental values associated with a place, and in other cases may suggest that there are fewer, or different, environmental values. Equally, in some case they may suggest that a higher quality of environmental condition is necessary for an environmental value to be achieved or maintained, and in other cases a lower or different quality. On average, across the range of regulatory decisions, the impact on a regulated party of decisions made with reference to the ERS, compared to decisions made under the base case would be roughly equivalent, with little net impact.

One of the key benefits of an ERS is its authority. The ERS is a legislative instrument, which elevates the status of the standards it contains. The ERS standards have enhanced authority because they are the benchmark that the government has declared to apply. They carry a legislative weight that cannot be easily ignored, discounted or undermined. In contrast, without an ERS there would be no endorsed benchmark. Whatever standards that may be used do not possess the authority of a legislative instrument, so may be more liable to have their status questioned in decision-making situations. This relative lack of authority increases the risk that a stakeholder may succeed in characterising the environment subjectively to meet the immediate needs of their particular situation.

The authority of the ERS supports several interrelated benefits:

**Clarity** – The introduction of an ERS provides certainty about the standards that will or should be referenced when seeking to understand the desired environmental state. The ERS sets out the standards transparently, which allows all stakeholders to know equally what the standards are, and to have confidence that they are the standards that will be used to inform relevant advice and decisions. Without an ERS, the standards that might be referenced to characterise the desired state of the environment are less certain.

**Consistency** – The ERS provides a stable set of benchmarks that will be applied consistently over time. This improves the consistency of advice provided and is an input that supports more regular, predictable decision-making. Without an ERS, there may be greater variability in decision-making and less stability, which may reduce stakeholder confidence in the fairness and transparency of decision-making processes.

**Quality** – The ERS ensures that decisions are informed by an appropriate, scientifically-derived set of standards that are relevant to local conditions. Without an ERS, there can be less confidence that relevant standards will always be considered. In fact, it is likely that some parties to a dispute may seek to propose inappropriate benchmarks.

**Efficiency** – Reference to the ERS is quick and simple. In general, it requires relatively little commitment in terms of time, labour, research and analysis, or expense. Without an ERS there may be costs involved with determining the standards that should be referenced for each new situation.

**Confidence** – The legislative status of the ERS, and the methods used to develop the ERS standards, tends to promote public confidence in the instrument. In turn, this instils confidence that decisions informed by the ERS have been informed by reference to appropriate standards. This makes a modest yet important contribution to the public’s overall confidence in the appropriateness and effectiveness of the environment protection framework. Public confidence is an intangible asset. Greater confidence and trust in decision-making processes may contribute to an increase in overall public behaviour that is consistent with, and willingness of the public generally to act in ways that are consistent with, the purposes and objectives of the framework. Without an ERS, no other alternative standards are likely to instil comparable confidence, which may contribute to comparatively fewer actions that are consistent with the framework.

In summary, the authority of the ERS clears the ground to ensure that relevant decisions have access to and are informed by an appropriate environmental benchmark. This benefit may also be described as the avoidance of the disbenefits that may occur in the absence of an ERS or an alternative instrument with comparable authority.

# Chapter 6 – Monitoring, evaluation and reporting requirements

## Introduction

This chapter describes the monitoring, evaluation and reporting (MER) approach for the ERS. Consistent with the purpose of an evaluation strategy as described in the *Victorian Guide to Regulation* (VGR),[[157]](#footnote-158) the MER approach describes mechanisms that will allow government to explain how, and how well, the ERS has worked in practice, and to drive continuous improvement over time.

This chapter provides an outline of MER requirements for two interrelated areas of assessment:

* MER on the performance of the ERS in relation to its objectives. This relates to whether it is delivering the positive outcomes that it is intended to deliver, within the context of the broader outcomes of the environment protection framework; and
* MER that contributes to the ongoing improvement of the ERS standards. This relates to processes or programs that will advance the scientific knowledge underpinning the standards, and which may inform future changes to existing ERS standards and/or the introduction of new standards.

## MER to evaluate the performance of the ERS

A simple approach for assessing the performance of the ERS is proposed, proportionate to its intended operation as a scientific reference standard with no direct compliance role.

### What will be evaluated

MER will evaluate the performance of the ERS in relation to the ERS objectives:

1. To promote a shared understanding of environmental value;
2. To improve assessment and reporting on environmental conditions; and
3. To ensure that relevant environmental regulatory decisions are informed by appropriate, consistent scientific reference information.

MER will seek to evaluate both the contribution attributable to the ERS to meeting these objectives, and its effectiveness in achieving the objectives. MER will aim to evaluate each objective separately.

Where possible, MER will also seek to gather information about the utility of particular ERS standards – whether they provide support for and further the ERS objectives. This information will provide a stream of knowledge that will support future reviews of the ERS.

### How it will be done

The ERS objectives will be evaluated through the assessment of a set of key evaluation questions. Key evaluation questions are yet to be defined, but may include:

1. ***To promote a shared understanding of environmental value***

* Do stakeholders use the ERS to communicate about environmental issues?
* Is the ERS used by the EPA and other agencies with environmental functions to communicate about the environment?

1. ***To improve assessment and reporting on environmental conditions***

* Is the ERS being used as intended to underpin assessment and reporting of environmental conditions?
* Has use of the ERS improved the public’s knowledge about the environment?
* Do the public make decisions about their use and enjoyment of the environment based on information that is underpinned by ERS standards?

1. ***To ensure that relevant environmental regulatory decisions are informed by appropriate, consistent scientific reference information***

* Is the ERS used as intended in relevant environmental decision-making?
* Is the ERS well-integrated into relevant EPA internal processes?
* Is the ERS accessible and easy to reference in decision making?
* Does the ERS support more consistent, high quality decision making?

A set of quantitative and qualitative indicators will be developed to evaluate the finalised key evaluation questions. The indicators will be grounded in the EPA’s organisational performance management framework and data will be collected through performance information data sources connected to that framework.

Examples of categories of indicators that may be used include:

* Indicators of the frequency of online searches for the ERS (for example, through the EPA website), and extent of online mentions of the instrument;
* Indicators of the frequency of the community’s reference to, and online engagement with, assessment and reporting activities that refer to ERS standards (for example, Beach Report and Yarra Watch);
* Indicators of the extent, frequency or consistency with which the ERS is used to inform the EPA’s decision making;
* Indicators of stakeholder satisfaction with the use of the ERS in decision making; and
* Indicators of the frequency with which the ERS is reviewed and/or its standards revised, including reviews and updates to any ancillary guidance materials.

The proposed MER approach to evaluating the ERS is still under development. EPA intends to describe its proposed approach in more detail by publishing a MER plan in 2021.

### Who will do it

The EPA will be primarily responsible for MER of the ERS, including data collection and analysis. MER may involve analysis of media mentions, page views and downloads of relevant materials, and other online data analytics. MER may also involve engagement with stakeholders through qualitative surveys, in line with activities undertaken to evaluate the EPA’s overall organisational performance.

### When it will be done

Data will be collected on an ongoing basis as part of performance monitoring through the EPA’s organisational performance management framework.

MER will be undertaken in line with standardised reporting cycles, including through quarterly organisational reporting to the EPA Board, reported in the EPA’s Annual Reports. EPA will ensure that MER is also calibrated to provide performance information necessary to support continuous improvement of the ERS standards.

## MER for continuous improvement of the ERS standards

ERS indicators and objectives are based on the best available scientific understanding of the environmental conditions needed to achieve or maintain environmental values. In some cases, this understanding is highly developed, while for others there is a range of knowledge gaps about what indicators and objectives are appropriate to support these environmental values.

Monitoring and assessment programs are essential to advance scientific knowledge of the environment. This will enable ERS standards to be revised over time to reflect the best current scientific knowledge.

Monitoring and evaluation will be undertaken to understand the appropriateness of ERS standards and inform their continual improvement. The MER activities will be embedded into EPA’s overarching Environmental Monitoring and Assessment Framework. This integrated framework sets out the objectives, principles, priorities, governance and types of monitoring activities that will guide the EPA’s monitoring, evaluation and reporting activities.

### What will be evaluated

MER will address the following:

* assess and report on environmental conditions and whether the environmental values are being achieved or maintained, where data are available;
* determine whether the indicators and objectives set out in the ERS are appropriate measures of whether environmental values are being achieved or maintained;
* revise and refine the indicators, objectives and segments based on an improved understanding of the environmental conditions needed to achieve or maintain the environmental values giving regards to the state of knowledge, and in particular trends, emerging issues or technologies; and
* develop (or inform the setting of) new indicators and objectives for environmental conditions, in the whole or a part of Victoria.

### How it will be done

The EPA’s Monitoring and Environmental Assessment Framework establishes a framework for developing specific Monitoring and Assessment Plans for each major element of the environment (including air, land, noise and water). These plans provide a greater degree of technical detail for each of the EPA’s monitoring and assessment programs and is intended to provide transparency, guidance and keep track of monitoring and assessment activities. It is a working document for internal EPA staff, and its partners involved in the design, implementation and use of monitoring and assessment information.

As described in Chapter 4, the EPA already undertakes a range of existing monitoring and assessment activities that will with the implementation of these plans, and which will support the continuous improvement of the ERS.

### Who will do it

The EPA will lead science activities, in partnership with other agencies, to support the continuous improvement and revision of the ERS standards.

### When it will be done

MER will be conducted on an ongoing basis.

## Recommendations of the Chief Environmental Scientist about a future program of work to review the standards

The CES identifies some limitations with the proposed ERS standards and areas where the science is less certain. The majority of these the CES considers to be low risk and can be addressed through the development of guidance, and in the longer-term, in future iterations of the ERS.

The CES makes 15 recommendations about a program of work to support future review of the ERS standards – one general recommendation concerning general guidance on the application and interpretation of the ERS, and 14 recommendations that relate specifically to standards for the air, land, noise or water environments. The recommendations are reproduced in Figure 11 below.

EPA support these recommendations in principle, subject to further assessment and prioritisation.

The CES also proposes that, to support implementation of the recommendations, a process is established to facilitate further processes for the review of ERS standards and development of supporting guidance. This process would also facilitate efficient update of the ERS when new or revised standards have been developed through national or state processes. The CES outlines such a process and a suggested governance model (see Appendix E Attachment 1). This proposes that an ERS Steering Committee be formed, that will establish an initial list of priority guidance and ERS standards to be reviewed and/or developed.

EPA also support this approach, in principle.

## Future review of the ERS standards

The EPA will provide a plan for future review of the ERS standards, as part of the MER Plan identified in this chapter, to be published in 2021. The plan will reflect consideration of the recommendations and proposed approach suggested by the CES, and these will be incorporated into the plan as appropriate, consistent with EPA’s assessment of priorities in 2021.

The plan will include an indicative timeline for future review of priority ERS standards and supporting guidance.

***Recommendation 1*** – General Guidance be developed on the application of environmental reference standards including applicable measurement methods. ERS values are subject to interpretation and will need to be stated explicitly to inform their appropriate use and guidance is recommended to support the ERS.

***Air quality***

***Recommendation 2*** – An odour indicator and objective are recommended to be developed and included in the ERS.

***Recommendation 3*** - Guidance is developed on design ground level concentrations for air pollutants for predictive modelling and assessment activities.

***Recommendation 4*** - Review the need for indicators and objectives to be developed for ‘climate systems’.

***Recommendation 5*** – A review is undertaken to establish whether ambient air toxic values, indicators and objectives can be set based on the current NEPM reporting criteria. Victoria has not consistently monitored air toxics and hence does not have a sufficient amount of information to inform whether measurable air toxics are at or below levels of concern.

***Recommendation 6*** - Current standards for ozone, nitrogen dioxide and sulphur dioxide are being reviewed and that the numeric values agreed to via the NEPM process are automatically adopted in the ERS.

***Noise***

***Recommendation 7*** – That a review be undertaken as to whether an environmental value for biodiversity protection can be defined and whether qualitative or quantitative indicators and objectives can be developed for inclusion in the ERS.

***Recommendation 8*** – That the objective for human tranquillity and enjoyment outdoors in natural areas is an acoustic quality that will need to be determined for each location as required.

***Land***

***Recommendation 9*** – Guidance developed on risk assessment methodologies and subsequent derivation (selection of TRVs) of land criteria protective of environmental values and surface water and groundwater specifically.

***Recommendation 10*** – That EPA prioritises contaminants for inclusion in the ERS and undertake review and development.

***Recommendation 11*** - The methodology and current established standards for EILs will need to be reviewed for their applicability given the passage of time and in the context of Victoria.

***Recommendation 12*** - An EIL value will need to be established for the protection of agricultural land segments.

***Recommendation 13*** – Review of objectives set out for the environmental value Food, Flora and Fibre.

***Water***

***Recommendation 14*** - Review the establishment of short and long term site specific water quality objectives for microbial contamination.

***Recommendation 15*** - Review and develop indicators and objectives to address the knowledge gaps described in Appendix E of the SEPP (Waters) MER frameworks and priority emerging contaminants in water.

Figure 11 - CES recommendations for a program of work to support future review of the ERS standards

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# Appendices

## Appendix A: Advice from the Commissioner for Better Regulation on the adequacy of impact assessment



23 August 2019

Dr Cathy Wilkinson

Chief Executive Officer

Environment Protection Authority

200 Victoria Street

CARLTON VIC 3053

Dear Dr Wilkinson

IMPACT ASSESSMENT for the PROPOSED ENVIRONMENT REFERENCE STANDARD

I would like to thank your staff at the Environment Protection Authority (EPA) for working with my team and with the Department of Environment, Land, Water and Planning (DELWP) on the preparation of the Impact Assessment (IA) for the proposed Environment Reference Standard (ERS).

As you know, under the *Environment Protection Act 2017 (as amended by the Environment Protection (Amendment) Act 2018)*, the *Subordinate Legislation Act 1994* (SLA) applies to a proposed Environment Reference Standard in a different way to other legislative instruments prepared in Victoria. In place of the Regulatory Impact Statement (RIS) that would normally be prepared, an IA is prepared for a proposed ERS. IAs are slightly different in scope.

Given that section 12H(3) of the SLA continues to apply to a proposed ERS, the Commissioner for Better Regulation is required to provide independent advice on the adequacy of the analysis provided in its IA.

As for a RIS, an IA will be deemed to be adequate when it contains analysis that is logical, draws on relevant evidence, is transparent about any assumptions made, and is proportionate to the proposal’s expected effects. The IA also needs to be clearly written so that it can be a suitable basis for public consultation.

These are the first ERS and IA to be prepared. EPA worked closely with the staff of my office to agree on an appropriate approach.

I am pleased to advise that the final version of the IA received by us on 22 August 2019 meets the adequacy requirements of the SLA.

**Background**

In 2015, the Victorian Government conducted an independent inquiry into the Environment Protection Authority (EPA), which recommended fundamental changes to modernise Victoria’s environment protection legislative framework and to enable the EPA to address current and future environmental challenges. In response, the *Environment Protection Act 1970* was completely overhauled and rewritten in two tranches:

* The *Environment Protection Act 2017*, which modernises EPA’s corporate governance, strengthens its status as a science-based regulator, and gives it a clear objective to protect human health and the environment by reducing the harmful effects of pollution and waste.
* The *Environment Protection Amendment Act 2018, which* amends the *Environment Protection Act 2017* and repeals the *Environment Protection Act 1970*, introducing a new legislative framework to support this objective, focused on preventing waste and pollution impacts, rather than managing the impacts after they have occurred.

This new approach incorporates a general environmental duty for action-takers to take reasonably practicable steps to eliminate or otherwise reduce risks of harm to human health and the environment from pollution and waste.

The framework is supported by establishing tiered permissioning systems, modernising EPA’s compliance and enforcement powers, updating offences and penalties, and making more environmental information available to the public. Where necessary, the proposed Environment Protection Regulations give additional prescription or detail to support the new environment protection laws’ effective implementation.

In particular, the new legislative framework includes provision for a new stand-alone subordinate instrument called an Environment Reference Standard (ERS). An ERS supports the protection of the environment from pollution and waste by providing a benchmark to assess and report on environmental conditions.

The proposed ERS largely reflects existing standards set out in State Environment Protection Policies (SEPPs), which will cease to operate as legislative instruments when the new Act comes into force (the regulatory elements of SEPPs are replaced by provisions in the proposed Regulations, along with the general environmental duty, other duties and guidance). The SEPPs and their standards have already been subject to various Policy Impact Assessments and reviews.

The IA describes the proposed ERS, how it was prepared, how it will be monitored and evaluated, and its intended operation and impacts.

**Purpose and objectives**

Individuals, organisations and regulators all make decisions informed by or that have an impact on the environment. The IA explains how the proposed ERS aims to provide a clear and transparent benchmark for these decisions. The purpose of the proposed ERS is:

*“…to support the protection of human health and the environment from pollution and waste by providing a benchmark to assess and report on environmental conditions in the whole or any part of Victoria.”*

To support this, the objectives of the proposed ERS are:

* to promote a shared understanding of environmental value;
* to improve assessment and reporting on environmental conditions; and
* to ensure that relevant environmental regulatory decisions are informed by appropriate, consistent scientific reference information.

The ERS therefore addresses the key problem relating to information about the state of the environment: that a lack of clear and authoritative scientific standards for reporting and decision-making increases the level of uncertainty and inconsistency, while decreasing transparency, effective communication and coordination.

**The proposed standards and how they were prepared**

The proposed standards have four key elements:

* *Environmental values* – describe uses, attributes or functions of the environment which are valued qualities that the Victorian community wants to achieve or maintain.
* *Indicators* – the qualities or substances that have been selected as a metric to assess an environmental value.
* *Objectives* – the character, level, concentration or amount of an indicator that is used to assess an environmental value in an area. Objectives describe the conditions that achieve or maintain an environmental value, where a value may be threatened, or where further assessment may be required.
* *Areas* – the area(s) of Victoria to which an environmental value relates, whether the whole or part of the state.

Standards are proposed across four elements of the environment: air, land, noise and water.

*Air*

The proposed environmental values for air are:

* Life, health and well-being of humans;
* Life, health and well-being of other forms of life, including the protection of ecosystems and biodiversity;
* Local amenity and aesthetic enjoyment;
* Visibility;
* The useful life and aesthetic appearance of buildings, structures, property and materials; and
* Climate systems that are consistent with human development, the life, health and well-being of humans and the protection of ecosystems and biodiversity.

The proposed values, indicators and objectives are adopted, with minor changes to wording, from the current SEPP (Ambient Air Quality), and SEPP (Air Quality Management). The proposed ERS also includes a new qualitative objective for odour.

*Land*

The proposed environmental values for land are:

* Maintenance of natural ecosystems, modified ecosystems and highly modified systems;
* Human health;
* Building and structures;
* Aesthetics; and
* Production of food, flora and fibre.

The proposed values, indicators and objectives are adopted, with minor changes to wording, from the current SEPP (Prevention and Management of Contaminated Land) (SEPP (PMCL)).

As with the SEPP (PMCL), the ERS objectives are related to, and refer to, the standards of the NEPM Assessment of Site Contamination or to standards derived using the methodologies it prescribes as well as the Food Standards Australia New Zealand, Food Standards Code (the Food Standards Code).

*Noise*

The proposed environmental values for noise are:

* Sleep during the night;
* Domestic or recreational activities;
* Normal conversation;
* Child learning and development; and
* Human tranquillity and enjoyment outdoors in natural areas.

The proposed ERS adopts the three environmental values contained within the SEPP (Control of Noise from Industry, Commerce and Trade - SEPP (N-1) and SEPP (Control of Music Noise from Public Premises (N-2)), plus two additional environmental values that were identified through a review of these SEPPs.

The proposed new indicators and objectives provide a means of characterising the environmental values with respect to the ambient acoustic environment and clarify the noise levels above which there is an increased risk of impact to human health.

To apply the proposed standards, a set of five land use categories are proposed which reflect different urban form or land use settings ranging from highly urbanised to relatively natural areas.

*Water*

The proposed environmental values for water are:

* Water dependent ecosystems and species;
* Human consumption after appropriate treatment;
* Potable water supply;
* Potable mineral water supply;
* Agriculture and irrigation;
* Human consumption of aquatic foods;
* Aquaculture;
* Industrial and commercial use;
* Water-based recreation;
* Traditional Owner cultural values;
* Navigation and shipping;
* Buildings and structures; and
* Geothermal properties.

The proposed values, segments, indicators and objectives are adopted, with minor changes to wording, from the current SEPP (Waters), with the exception of cultural and spiritual values, as it is expected these are adequately captured by the other values.

Some of the proposed indicators and objectives are specified directly in the ERS table, while others are made by reference to other standards, such as the Australian and New Zealand Guidelines for Fresh and Marine Water Quality, the Australian Drinking Water Guidelines, the Guidelines for Managing Risks in Recreational Water, and the Food Standards Code.

**Intended operation and impact**

The proposed ERS’ operation and impacts are mostly indirect, operating through other individuals’ or regulators’ decisions. The IA uses largely qualitative discussions to explain these impacts as playing an important role in supporting the objectives described above:

* *To promote a shared understanding of environmental value:* by providing a consistent and authoritative frame or “vocabulary”, the ERS is expected to support individuals, businesses and government to communicate more easily about environmental matters.
* *To improve assessment and reporting on environmental conditions:* the standards in the proposed ERS are expected to assist the EPA and other government agencies in reporting more efficiently, consistently and transparently about the health of the environment.
* *To ensure that relevant environmental regulatory decisions are informed by appropriate, consistent scientific reference information:* the *Environment Protection Act 2017* (as amended) and proposed *Environment Protection Regulations* specify a range of circumstances where the ERS must or may be considered as part of making a regulatory decision. The standards may be useful to a range of decisions where environmental matters should be taken into account, and will support those with clear and authoritative information or measurement approaches.

The IA describes these expected impacts compared to a hypothetical “base case” where the ERS is not made. In that situation, environmental issues would still matter to individuals and regulators and so the same considerations would still need to be made. Without an authoritative and consolidated set of standards, this would happen with greater costs incurred to identify and apply the appropriate standards, and with less consistency in the standards applied.

Compared to that situation, EPA expects the proposed ERS will make communication, assessment and reporting on environmental conditions more transparent, consistent and less costly.

**Independent review by the Chief Environmental Scientist**

To provide a further scientific assessment of the standards included in the proposed ERS, the Chief Environmental Scientist (CES) provided an independent assessment of the proposed ERS. The CES considered that most of the proposed standards are underpinned by scientific evidence that confirms that they are objective, peer-reviewed and based on national and international best practice.

The CES made fifteen recommendations for future reviews of the ERS standards and supporting guidance. EPA supports these recommendations in principle, subject to further assessment and prioritisation. The CES also suggested a process and governance arrangements for implementing her recommendations, which the EPA also supports in principle.

**Monitoring, evaluation and reporting**

The IA describes two types of monitoring, evaluation and reporting that EPA will apply to the proposed ERS.

To understand the performance of the ERS in achieving its objectives, a set of key evaluation questions and indicators will be developed and incorporated into EPA’s regular reporting processes through its organisational performance management framework.

To ensure the ERS standards are based on the best-available scientific information and supporting the environmental values, EPA will monitor environmental conditions and the evolving scientific knowledge that might inform new (or amendments to existing) standards, through their existing Monitoring and Environmental Assessment Framework.

The IA commits EPA to providing further detail on the questions and indicators noted above, and setting out an indicative timeline for future reviews of the ERS standards and guidance material in 2021. That timeline will reflect EPA’s consideration of the CES’ recommendations and proposed approach, noted above.

Should you wish to discuss any issues raised in this letter, please do not hesitate to contact my office on (03) 9092 5800.

Yours sincerely



Anna Cronin

Commissioner for Better Regulation

## Appendix B: Draft Human Rights Certificate

**Subordinate Legislation Act 1994**

**Draft Human Rights Certificate**

(Section 12D)

**Environment Reference Standard**

I, Lily D'Ambrosio, Minister for Energy, Environment and Climate Change, and Minister responsible for administering the **Environment Protection Act 2017** certify under section 12D(2) of the **Subordinate Legislation Act 1994** that, in my opinion, the proposed Environment Reference Standard does not limit any human right set out in the **Charter of Human Rights and Responsibilities Act 2006**.

## Appendix C: The principles of environment protection and the ERS

Section 95(2) of the EP Act requires that when determining whether to recommend whether an ERS should be made, the Minister must take the principles of environment protection contained in Part 2.3 of the EP Act into account.

This appendix outlines how the principles of environment protection relate to the ERS. The explanatory descriptions of the principles are presented are as they are described in the Environment Protection Amendment Bill 2018 Explanatory Memorandum.

***Principle of integration of environmental, social, and economic considerations***

The principle means that environmental, social and economic considerations should be effectively integrated, or brought together, in decision making.

* While the ERS is an environmental reference instrument, it enables environmental considerations to be equally considered along with social and economic considerations in decision making.

***Principle of proportionality***

The principle means that any decision, action or thing directed towards minimising harm or a risk of harm to human health or the environment should be proportionate to the harm or risk of harm that is being addressed.

* The ERS helps to identify potential risks of harm to human health and the environment, enabling them to be properly considered in decision making. The ERS does not prescribe any specific decision, action or thing, but provides a reference that may help to guide the proportionality of a response.

***Principle of primacy of prevention***

The principle means prevention of harm to human health and the environment is preferred to remedial or mitigation measures.

* The ERS identifies valued aspects of the environment, and thereby provides clarity that assists policy makers, industry and the community to work towards preventing harm.

***Principle of shared responsibility***

The principle reflects that all levels of Government, industry, business, communities, and the people of Victoria, have a shared responsibility for the protection of human health and the environment.

* The ERS transparently describes the environment in terms of environment values held in common by all Victorians. Although the ERS is not a compliance instrument, it expresses and reflects that Victorians have a shared responsibility towards the protection of human health and the environment.

***Principle of polluter pays***

The principle means that persons who generate pollution and waste should bear the cost of containment, avoidance and abatement. The principle reflects that polluters should take responsibility for the external costs arising from their pollution, including cleaning up the pollution.

* The ERS is not directly related to this principle. The ERS relates indirectly in that it provides a benchmark that may help to clarify potential harms to the environment, which may provide a context for any containment, avoidance and abatement measures for which the polluter is required to bear the cost.

***Principle of waste management hierarchy***

The principle means that wastes should be managed in the following order of preference, so far as reasonably practicable: avoidance; reuse; recycling; recovery of energy; containment; disposal. The principle reflects that persons who are managing waste should consider whether avoidance of the production of the waste is reasonably practicable, and if not, whether reuse of the waste is reasonably practicable, and if not, whether recycling the waste is reasonably practicable, and so on.

* The ERS is not directly related to this principle. Waste should be managed in accordance with the waste management hierarchy, and persons who are managing waste should consider reasonably practicable measures in accordance with the waste management hierarchy, irrespective of the ERS or of any environmental values, indicators and objectives contained in the ERS.

***Principle of evidence-based decision-making***

The principle means actions or decision made under the EP Act should be based on the best available evidence in the circumstances that is relevant and reliable.

* The ERS contains relevant scientifically-derived standards that provide the best available reference when considering an action or decision with regard to the desired state of the environment.

***Precautionary principle***

The principle means that, if there exist threats of serious or irreversible harm to human health or the environment, lack of full scientific certainty should not be used as a reason for postponing measures to prevent or minimise those threats.

* The ERS is consistent with the precautionary principle. The ERS is a scientifically-derived reference that may be used to identify actual or emerging threats. On matters where there is less scientific certainty and/or matters that are not addressed in the ERS, this does not provide any basis for postponing measures to prevent or minimise those threats.

***Principle of equity***

The principle comprises both intra-generational equity and inter-generational equity. Intra-generational equity means that all persons, irrespective of their personal attributes or location, are entitled to live in a safe and healthy environment and should not disproportionately bear the costs or impacts of environmental harm. Inter-generational equity means that the present generation should ensure that the state of the environment is maintained or enhanced for the benefit of future generations.

* The broad-scale application of environmental values throughout Victoria affirms and demonstrates that all persons, irrespective of their personal attributes or location are entitled to live in a safe and healthy environment. Environmental values are applied to areas of Victoria based on environmental and land use considerations, rather than the personal characteristics, and so is consistent with the principle of intra-generational equity. There is some risk that considerations of the environment and land use could introduce a bias in favour of persons who live in, and who can afford to live in locations where higher environmental outcomes could be achieved or maintained. To address this potential risk, processes for the development and review of ERS standards should be inclusive, transparent and fair. The potential risk of ERS standards reflecting intra-generational inequities will be actively considered.

By describing the desired state of the environment to be achieved or maintained (including for future generations), the ERS provides a reference that enables well-informed decisions on actions that maintain or enhance the state of the environment for future generations. As such, it is consistent with the principle of inter-generational equity.

***Principle of accountability***

The principle means that members of the public should—

* have access to reliable and relevant information in appropriate forms to facilitate a good understanding of issues of harm or risk of harm to human health or the environment and of how decisions are made under this Act; and
* be engaged and given opportunities to participate in decisions made under this Act, where appropriate to do so; and
* have their interests taken into account in decisions made under this Act.

The principle emphasises the importance of procedural fairness, transparency and access to information.

* The ERS is a clear, reliable reference that enables the public to understand issues of harm or risk of harm. Reporting of environmental information against the ERS allows the public to understand actual or potential risks and make well-informed decisions about their use or enjoyment of the environment. The ERS also provides standards and a vocabulary for the public to engage with decision making under the EP Act, and to communicate and advocate for environmental outcomes.

***Principle of conservation***

The principle means that biological diversity and ecological integrity should be protected for purposes that include the protection of human health.

* The ERS includes objectives that characterise the environmental conditions that support, or may pose a threat to, human health and well-being. This provides a reference that assists decision making regarding the protection of biological diversity and ecological integrity to be well-informed.

## Appendix D: Climate change and the decision to recommend making an ERS

The *Climate Change Act* 2017 requires that the Minister must have regard to climate change in making the decision to recommend that an ERS be made, amended, or revoked. The Minister must have regard to both the potential impacts of climate change relevant to the decision, and the potential contribution to the state's greenhouse gas emissions of the decision.

### Impacts of climate change

Climate change will alter global and local climates. For Victoria, climate change means a warmer and drier future, with increasing likelihood of more extreme events such as heatwaves, bushfires and storms.[[158]](#footnote-159) The EPA Publication *Protecting our Future Environment in a Changing Climate* (EPA Publication 1293)[[159]](#footnote-160) outlines some ways in which climate change will impact on Victoria’s air and water environments. It notes that some impacts of a changing climate include:

*Air — Summer smog, smoke from bushfires and prescribed burning, and windblown dust are likely to increase.*

*Freshwater — Declining water quantity and quality and the loss of some aquatic systems is leading to a decline and the potential loss of aquatic species.*

*Groundwater — The impacts are hard to identify because of the long lag times between changes on the surface and impacts on groundwater quality. The most significant impacts are likely to be from increased extraction of groundwater and use of aquifers for water storage.*

*Marine — Warming oceans, increasing acidity and changing ocean currents and wind patterns off Victoria’s coast could lead to changed distribution patterns and decline and loss of some marine species.*

### Potential impacts of climate change relevant to the decision to make an ERS

The proposed ERS recognizes the significance of climate change to the community. This is expressed in the proposed ERS standards for the air environment, which include an environmental value for climate systems:

*“Climate systems that are consistent with human development, the life, health and well-being of humans, and the protection of ecosystems and biodiversity.”*

The proposed ERS further clarifies this environmental value to mean:

*“Air quality that is not undermined, or at risk, by a warming and drying climate together with increasing population and economic growth.”*

The potential impacts of climate change were considered in the development of other proposed ERS standards in that they were considered, where relevant, in the development of the SEPPs and NEPMs from which proposed ERS standards were adopted. The Policy Impact Assessment for SEPP (Waters),[[160]](#footnote-161) notes that the development of SEPP (Waters) considered climate change through accounting for the full suite of impacts (economic, environmental, health and social), both direct and indirect, in comparing policy options. The SEPP (Waters) Policy Impact Assessment gives an example:

*“…hydrodynamic modelling was undertaken to predict the future changes to catchment flows and the hydrodynamics of the major embayments. This has been undertaken to assist in the identification of actions to be taken to mitigate the risks to water environments. Distinct modelling scenarios, all of which included climate scenarios, were selected for each region reflecting differences in their key pressures, threats and processes.”[[161]](#footnote-162)*

The effects of climate change and air quality are considered by the NEPC in the development of proposed variations to the standards in NEPM (AAQ). For example, the impact statement for the review of NEPM (AAQ) standards for particulate matter notes that while it is difficult to predict the effects of climate change on regional air quality, hot summers are likely to become more typical in the future, leading to a higher frequency of summer pollution episodes. At higher temperatures, emissions of volatile organic compounds – which are implicated in secondary particulate matter formation – are also likely to increase.[[162]](#footnote-163) The impact statement for the current review of NEPM (AAQ) standards for sulfur dioxide, nitrogen dioxide and ozone observes that climate variability and higher temperatures are likely to increase the potential for ozone formation, which is likely to exacerbate the incidence and severity of photochemical smog events in Australian cities.[[163]](#footnote-164)

The main consideration of climate change in the development of SEPPs and NEPMs relates to the impacts of a changing climate on the ability to meet the standards, and the policy measures or management actions that may be necessary, to be informed about, mitigate, or adapt to, climate change-induced pressures.

In contrast to SEPPs and NEPMs, an ERS does not contain measures or actions that are intended to deliver policy outcomes. It is concerned only with setting appropriate standards, that is:

* **Environmental values**, that describe aspects of the environment that the Victorian community values, applied to areas of Victoria; and
* **Indicators and objectives**, that are a scientific characterization of the conditions that are considered to achieve or maintain, or may pose a threat to, the environmental values.

Consideration of climate change impacts for the proposed ERS is therefore more narrowly-focused on potential impacts that are relevant to setting the standards.

Environmental values describe valued uses, attributes or functions of the environment that are held by the Victorian community. The meanings expressed in particular environmental values are relatively constant expressions of value that would not necessarily require adjustment in response to the impacts of climate change – the Victorian community would, for example, value a land environment that supports human health, or water quality that is suitable for human consumption (after appropriate treatment), regardless of climate.

Climate change does however have the potential to impact in the future on the areas of Victoria to which an environmental value may be applied. For example, a warming, drying climate may lead to declines in water quantity and quality in a location, which may make it impossible to achieve or maintain certain environmental values ascribed to the location. The change may be so significant that the ongoing application of those environmental values to that location is no longer justified.

Similarly, climate change may potentially impact on objectives. While objectives aim towards a scientifically-objective means or characterizing or assessing an environmental value, the derivation and setting of objectives often necessarily involves consideration of factors such as environmental background conditions, or the current modified condition of the environment. Setting of objectives may also consider the risk profile associated with a particular aspect of the environment or location. As climate change impacts on these factors, changes may be required in the future to the objectives that are applied to certain locations, and some objectives may need to be re-derived.

The EP Act requires that an ERS must be reviewed within a 10-year review period, and there is scope for all or part of the standards to be updated as required. This allows for the ERS standards to be periodically assessed with respect to the observed, predicted or potential impacts of climate change, and to be recalibrated as necessary.

### Potential contribution to the state’s greenhouse gas emissions of the decision to make an ERS

The environment protection framework - whose purpose is to protect human health and the environment from pollution and waste – may deliver an overall reduction in Victoria’s greenhouse gas emissions. The ERS, as a constituent part of this framework, may contribute in a very broad sense to such an outcome.

As a stand-alone reference or benchmark that does not create obligations or impose a compliance requirement on a duty holder, the ERS does not directly require actions or induce behaviours that would either increase or decrease the state’s greenhouse gas emissions.

The indirect impacts of the ERS on greenhouse gas emissions are likely to be small. The use of the ERS to communicate more effectively about the environment may contribute to the Victorian community having a greater shared understanding of the environment and encourage more collaboration to achieve common environmental goals. Resulting actions may reduce greenhouse gas emissions. Likewise, the use of the ERS to assess and report on environmental conditions may result in a better, more accessible information, which may be harnessed to inform actions that are, on balance, more likely to reduce emissions. However, it is unrealistic to seek to apportion or quantify any potential emissions reduction to the ERS.

The use of the ERS as a reference to inform various advisory and decision-making situations may result in decisions that reduce emissions. However, the ERS is not intended to create more stringent standards than would otherwise be referenced, or to impose additional burdens. Rather, the main intentions of the ERS are to provide robust scientific reference standards and, by introducing the standards, to provide clarity as to the standards that should be referenced. In the absence of an ERS, a range of other sources of scientific information would be employed to inform these decisions, which may differ from ERS standards, one way or another, but overall would be expected to deliver comparable decisions, but with greater search costs. Therefore, the difference in consequential greenhouse gas emissions due to decisions made under the two scenarios is likely to be small.

## Appendix E: Assessment of ERS standards by Victoria’s Chief Environmental Scientist

Victoria’s Chief Environmental Scientist, Dr. Andrea Hinwood, has undertaken an assessment of the underpinnings of the standards included in the proposed ERS (based on drafts of the proposed ERS, and the Impact Assessment, as provided to the Chief Environmental Scientist up until 28 May 2019). The Chief Environmental Scientist assessed the standards to:

1. Endorse the process undertaken to select standards;
2. Provide general endorsement of the scientific content;
3. Identify and make recommendations concerning standards where the science may be less certain or less current; and,
4. Make recommendations about a future program for ERS

The Chief Environmental Scientist’s assessment, presented in the four sections just listed, and two supporting attachments, is reproduced below.

**ASSESSMENT**

* Overall, my assessment found the processes to select environmental values, indicators and objectives appropriate and the processes to develop indicators and objectives, comprehensive.

1. **Endorse the process undertaken to select standards**

* I consider the processes used to set the environmental values and objectives for the current draft ERS comprehensive. The standards selected have been through a rigorous process to derive and agree on environmental values, indicators and objectives, their numeric value and application. The selection of standards takes account of national and international best practice and aligns with processes applied by similar environmental regulators. The ERS standards adopted via State and National processes have been established via technical/scientific working groups in the context of legislative, social, environmental and economic factors relevant to Victoria. The final standard chosen strikes the best balance between health/ecological protection, social and economic costs, regional differences and achievability.
* ERS are proposed for four environmental segments of air, noise, land and waters for selected pollutants. The purpose of the ERS reflects the varying approaches to managing pollution and waste in the four segments and hence the differences in and the application of the numeric value of objectives for each environmental segment. For example, the standards for ambient air pollutants have been developed on the basis of health impacts on populations and apply to air sheds. They are based on desirable concentrations of pollutants in air that are needed to be maintained to protect environmental public health. In contrast, indicators and objectives set for land, selected noise and water ERS are reflective of pollutant levels that have been set for assessment and investigation purposes. For selected ERS, concentrations and levels have been established that include some level of pollution or impact to environmental values. Some also take account of existing environmental levels and regional differences.
* The standards were selected for their applicability against the stated purpose and their rigour and currency in development and implementation. Standards which are no longer based on best-practice scientific evidence have been generally been excluded from the ERS. There are several standards however, that have qualitative statements to signal intent and others included that are limited in their scientific basis but are required for implementation of new regulations. Existing standards outlined in SEPPs that have not been put forward for inclusion in the ERS are those where the evidence base is not clear or no longer appropriate. The process and methods of selection are outlined in the ERS impact statement.
* The drafting team selected standards for inclusion by reviewing state, national and international criteria such as the State Environment Protection Policies (SEPP) (draft and existing) and National Environmental Protection Measures (NEPM). The basis of criteria established by organisations engaged in standard setting were also examined including Food Standards Australia and New Zealand (FASANZ), the National Health and Medical Research Council (NHMRC), World Health Organisation (WHO), Australian and New Zealand Conservation Council (ANZCC), Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) and National Environment Protection Council (NEPC) were reviewed. These organisations have used rigorous processes to both develop and consult on the standards taking into account legal, social, economic and environmental, health and technical considerations.

1. **Provide general endorsement of the scientific content the draft ERS**

* I consider most ERS standards to be underpinned by scientific evidence that is objective, peer-reviewed and based on national and international best practice.
* For pragmatism and the need to have a benchmark for regulations, some ERS have been included despite not being reviewed for over 15 years.
* A significant portion of the draft ERS standards are adopted based on existing standards, as presented in Table 1 of **Attachment 1**. Areas of less scientific research and/or certainty have been outlined in section C and recommendations on review in Section D.
* Establishing standards or guidelines for pollutants requires an understanding of the source(s) of pollution, its character, magnitude, distribution and impact. In some cases, a lack of scientific information means the impact of pollutants can be hard to establish. Instead, risk assessment processes are commonly used to aid the development of standards, or, present a science-based methodology to assess risks.

***Air quality environmental values, objectives and indicators***

*Air quality values*

* The environmental values for air have been adopted from the SEPP AAQ beneficial uses (2001) and include the human health values in the Ambient air quality NEPM (2015). These have been subject to comprehensive review and consultation. The environmental values include odour as a qualitative statement only.
* A value *for ‘Climate systems that are consistent with human development, the life, health and wellbeing of humans and the protection of ecosystems and biodiversity* ‘ has been included but there are no indicators or objectives nor any description in the impact statement and hence no comment is made on this here.

*Air quality indicators and objectives*

* Ambient air quality objectives for the criteria pollutants except for visibility have been prepared using the process set out Table 1 and the methods are outlined in the Impact Assessment.
* The WHO PM10 annual standard of 20 µg/m³ (Air quality guidelines - global update 2005) was adopted in Victoria rather than the 25 µg/m³ AAQ NEPM standard in 2016 to meet community and local government expectations and to aim for continual improvement in air quality management. Meeting the international guideline provides for a higher level of protection from the chronic effects of air pollution. At this time there is no established threshold for particulate matter below which health effects are not observed, hence there is a need to continually work towards reducing PM emissions and exposure.
* The objective for visibility was established for aesthetic purposes (that is, to protect the visual appearance of the atmosphere), and not for health protection, though it is strongly influenced by particle concentration. Although its basis is necessarily subjective, the impact of visibility reducing particles on people’s amenity is the subject of complaints received by EPA. Visibility is the primary means by which the community judges whether air quality is good. As such, this objective is still considered to be appropriate and relevant to air quality in Victoria. The 20km objective was developed as a Melbourne specific standard. It was set on the ability to see the Dandenong’s from Camberwell. This was determined to be the centre of urban Melbourne based on the spatial distribution of suburban population growth in the east and south east Melbourne when the objective was determined in the mid-1990s.
* Visibility is discussed further in Section C as the objective requires review.
* Lead was a NEPM criteria air pollutant but is not proposed for inclusion as it is no longer monitored due to substantial decreases in concentrations well below established criteria.

***Noise values, indicators and objectives and indicators***

*Noise environmental values*

* The existing beneficial uses from the current Noise SEPPs for normal domestic and recreational activities, conversation and sleep at night have been retained in the ERS as environmental values.
* Two new values have been added:
* *child learning and development -* refers to aspects of child learning and development that can be impaired in a noisy environment such as reading
* *human tranquillity and enjoyment, outdoors in natural areas* - refers to the quality of calm or enjoying the environment for its natural condition.

*Noise indicators and objectives*

* The noise indicators and objectives are ambient environmental quality pollutant measures (refer Act s93(4)(a)) that are used to measure whether environmental values are being achieved or maintained in accordance with the *Environment Protection Amendment Act 2018* (s93(3)(e)). The objectives are numerical noise levels in A-weighted decibels (dB(A)) measured as LAeq except for human tranquillity and enjoyment, in natural areas. The objectives vary based on the land use category and range from 40 to 60 dB(A) during the day and evening, and 35 to 55 dB(A) at night taking into account all sources that contribute to the ambient noise. The time periods used for the ERS are 16 hours (6am to 10pm) for day/evening and 8 hours at night (10pm to 6am).
* The objectives were developed based on the Australian standards AS/NZS 2107:2016 (Acoustics – Recommended design sound levels and reverberation times for building interiors). These levels were adjusted for outdoor locations based on the typical sound attenuation of the buildings in the relevant land use setting and the anticipated adjustments that people make to their living arrangements in different settings.
* The objective for human tranquillity and enjoyment outdoors, in natural areas, is “an acoustic quality that is conducive to human tranquillity and enjoyment having regard to the ambient natural soundscape”. This is deliberately not a noise level expressed in decibel because the level of interference in natural areas is related the context in which the noise is heard. Rather than the magnitude (loudness or quietness) of the sounds, the acoustic indicator and objective must reflect whether the sounds are appropriate in the settings considered. Even low-level non-natural sounds can be heard in natural settings if the noise signal does not coincide with the timing of the sounds of nature, or the frequency of the sound. The achievement of the qualitative objective is site specific and is based on whether the noise is compatible or disturbing in the setting.

***Land values, indicators and objectives***

*Land values*

* The land segment ERS refers to the following environmental values and have been based on the SEPP and NEPM (ASC):
* Maintenance of ecosystems
* Human health
* Buildings and Structures,
* Aesthetics
* Food, flora and fibre

*Land indicators and objectives*

* Deriving measurable objectives that pose a risk to the environment and human health are difficult for land as there are so many factors contributing to the risk e.g. land use, activity, specific contaminant, depth to contamination, soil quality, type, chemical binding, depth to groundwater, soil vapour transport etc, hence the approach to derive investigation levels which can be variable at a site level.
* The methods used to derive environmental and health investigation levels which have been adopted in the ERS have been based on established risk processes.
* Land values for maintenance of ecosystems and human health identify indicators and objectives was established by the National Environment Protection (Assessment of Site Contamination) Measure 1999 as amended in 2013. The NEPM (ASC) was set up to achieve a national consistent approach to the assessment of site contamination; it was not intended to specify indicators and objectives that pose an actual risk to the environment and to human health. The objectives are conservatively set for this reason. The NEPM (ASC) values do not articulate the state of the environment, nor include every contaminant that poses a risk to the environment. These investigation levels are intended for use in specific settings, cognisant of their application intention as set out in the NEP(ASC)M.
* Derivation of NEP(ASC)M HILS/HSLs is based on a risk assessment methodology in NEP (ASC)M Schedule B4.
* EILs have been derived using the Species Sensitivity Distribution (SSD) approach. This statistical approach used cumulative toxicity values for multiple species to produce probability curves. Numbers can then be extrapolated to specify values of protection for a specified percentile of the distribution (e.g. 80% protection of species). These values need review and are outlined in Section C.
* Where there is no investigation level set out in the NEP(ASC)M for a contaminant or where the existing investigation level is not applicable to a specific land use or activity, the ERS sets out that criteria may be established using risk assessment methodologies set out in NEP(ASC)M Schedule B4.
* Indicators and objectives for aesthetics are based on qualitative judgement as to chemicals or waste in land that may be considered offensive to human senses.
* The indicators and objectives for buildings and structures set out that land should not be corrosive or otherwise adversely affect integrity of structures or building materials.
* The objectives for food flora and fibre include:
* The levels specified in the Food Standards Code detected in any food, flora or fibre produced at the site.
* Contaminants must not adversely affect produce quality or yield
* The Food Standards Code articulates that contamination should be as low as reasonably achievable (ALARA) with maximum levels allowable in food intended for human consumption set out in Schedule 19 for a small number of chemicals.
* The purpose of the objective for quality and yield is to protect produce from adverse effects associated with exposure to pollution and waste e.g. crop health, stock health, crop yields.

***Water quality values, indicators and objectives***

*Environmental values*

* The ERS for water quality are based on SEPP Waters and have been developed in line with, and to complement, the nationally agreed approach outlined in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG). The beneficial uses have been adopted in the ERS.
* SEPP (Waters) uses segments to define geographic areas that have broad difference in their natural characteristics, baseline water quality and beneficial uses to be protected. This approach has been continued and adopted in the ERS.

Surface water

SEPP (Waters of Victoria) classified 14 broad statewide segments. The regional schedules also contained additional local segments specific to their regions. In reviewing these surface water segments, EPA used a consistent approach based on criteria developed by technical experts. This approach was adopted to address the inconsistencies that resulted from the previous water SEPPs being developed at different times.

Groundwater

Options for groundwater were more limited, reflecting the ability of management to influence the system, the data available and the way groundwater is used. A literature review of legislative, regulatory and policy instruments, as well as guidance materials from Victoria, elsewhere in Australia and internationally, concluded that the existing approach to setting groundwater segments and the application of beneficial uses in SEPP (Groundwaters of Victoria) was appropriate.

*Water quality indicators and objectives*

* A range of methods have been adopted to set objectives, as outlined in Table 2 of **Attachment 1**. There are differences in methods reflecting the preferred approaches for measuring environmental values. The indicators and objectives reflect existing environments and reference environments.
* In the water division of the ERS, an objective is a numerical concentration limit, a biological state or condition, or a narrative statement that that supports and maintain a particular environmental value of water. Levels that are above some objectives may have a direct toxic effect on organisms (such as heavy metals), can adversely affect environmental values when levels are too high (e.g., due to effects of excessive nutrients), or too low (e.g., due to low oxygen) or may represent a state or condition that when not met indicates there are likely to be impacts from multiple pollutants. Exceedance of these objectives indicate a potential for an impact to occur, or that it has occurred. Hence the objectives are intended to be ‘triggers’ to identify potential impacts to environmental values prompt a management response, such as further investigation to identify the source of pollution or contamination and better understand and characterise the actual risk to environmental values.

1. **Identify and make recommendations concerning standards where the science may be less certain.**

* The science and policy reviews undertaken to inform the draft have inherently identified some limitations and cases where the science is less certain. The majority of these are considered low risk and can be addressed through the development of guidance, and in the longer-term, in future iterations of the ERS.
* Specific recommendations are outlined below along with a proposed prioritisation of ERS to be reviewed including a suggested program of work (Section D).

***Air Quality***

* The existing SEPP Air Quality Management (SEPP (AQM) (2001)), sets out the framework for managing air pollution in Victoria with a focus on the Port Phillip and Latrobe Valley Regions.
* Schedule B of the SEPP AQM includes Intervention Levels (IL), which are numerical value(s) for indicators which if exceeded may trigger development of a neighbourhood environment improvement plan (“NEIP”). IL were set at 20% higher than ambient air quality standards and are not considered to be ‘acceptable’ levels but as levels that, if exceeded, would trigger action to improve local air quality. The derivation of the IL at 20% higher than the ambient air quality standards is unclear and has limited basis in science.

* The SEPP AQM also sets design criteria (ground level concentrations) which are also not proposed to be adopted in the ERS. In the 1981 SEPP (The Air Environment), the design criteria were used for assessment of new or expanded sources of emissions to the environment and were derived by dividing the Occupational Health and Safety 8 hr Time Weighted Average (TWA) by a safety factor of 30. This procedure resulted in 3-min design criteria that was used with EPA’s regulatory dispersion model in the assessment of Works Approval and licence applications. Design criteria are intended only for use in modelling the dispersion of emission from specific sources and should not be used separately from the modelling process, with its inbuilt limitations, assumptions and safety factors.

Odour

* Odour is the most frequent source of pollution report to EPA. In 2017-18 EPA received 4466 odour reports, an increase of 28 per cent since 2016-17. The ERS currently contains no environmental value to capture the effects of odour. Further review will be required to define this objective.

*Visibility*

* The objective of visibility was established for aesthetic purposes. As noted above, visibility is the primary means by which the community judges whether air quality is good. As such, this objective is still considered to be appropriate and relevant to air quality in Victoria. The basis of the objective has not been reviewed since the mid-1990s and should be reviewed as a priority.

*Air toxics*

* NEMP (Air Toxics) sets reporting standards for selected air toxics**.** Victoria has not consistently monitored air toxics and hence does not have a sufficient amount of information to inform whether measurable air toxics are at or below levels of concern. Additional work is required to establish air toxics concentrations and whether ERS should be developed for these.

***Noise***

*Biodiversity*

* The noise environmental values do not address biodiversity protection. This is due to the absence of good science to reflect impacts on the wide range of noise settings and impacts on biodiversity. The environmental value of protection of natural areas will to some extent address the potential for biodiversity impacts as it talks about the quality of tranquillity, however it would be appropriate to have an environmental value that does not yet have corresponding objectives. It is recommended an environmental value on biodiversity be developed.

***Land***

*New Objectives to cover legacy and emerging contaminants*

* The ERS currently relies on the NEPM (ASC) to outline investigation levels as objectives for maintenance of ecosystems and human health. It is important to note this doesn’t cover all contaminants or exposure scenarios and the use of risk assessment methodologies as set out in NEP(ASC)M is provided for these scenarios. These methodologies are dependent on numerous supporting guideline documents e.g. toxicity assessment, exposure assessment, fate and transport modelling. EPA will need to assess other guidance or state of knowledge for those contaminants with no derived values and the relevant risk assessment approaches to development of criteria. Objectives will need to be prioritised for development.

*Guidance for using and interpreting ERS*

* Currently, the ERS values are subject to interpretation. They will need to be stated explicitly to inform their appropriate use and guidance is recommended to support the ERS. This includes:
* the manner ERS can/should not be used
* application of HILs/EILs and Health Screening Levels (HSLs)
* clarification on approaches to the risk assessment methodologies set out in the NEP(ASC)M when deriving investigation levels for chemicals or exposure pathways not covered in the current HIL/HSLs

*Maintenance of ecosystems*

* The methodology for the derivation of EILs uses cumulative toxicity values for multiple species to produce probability curves. Further, EILs have been derived for a limited number of contaminants for Australian conditions – Arsenic, Copper, Chromium III, DDT, Naphthalene, Nickel, Lead and Zinc. Currently, the review of criteria is undertaken on a site by site basis using a range of different guidance and technical papers/expertise with varying levels of suitability. This is a limitation that needs to be addressed. The methodology and current established standards will need to be reviewed for their applicability given the passage of time and in the context of Victoria.
* As part of this process, an EIL value will also need to be established for the protection of agricultural land segments. This will likely be a significant area of work as EILs are not applicable to agricultural soils which need evaluation in relation to crop toxicity, plant contaminant uptake and detailed consideration of soil type.

*Determining background levels*

* Other issues not picked up in current ERS include the determination of background levels which may provide a basis for attainment. This is due to the complexity of the soil and land environment.
* Section 36 of the Act allows for regulations to enable EPA to set ‘background levels’ (which are essentially ‘naturally occurring levels’) as an alternative for contaminated land. This provision allows for the ERS to recognise areas of Victoria where naturally occurring levels of a substance may be higher than levels that may be derived for that substance using either an investigation level/guideline value or a risk assessment methodology to derive indicators.
* Where EPA establishes an alternative background level value, the background level of the substance is the appropriate level for an ERS objective. The inclusion of background levels as objectives in the ERS corresponds to the inclusion of “levels approved by the authority” as objectives in SEPP (PMCL). The process to derive alternative background levels will need to be developed

*Aesthetics*

* Guidelines on consideration of aesthetics and what chemical or waste may be considered offensive to human senses will be necessary.

*Buildings and Structures*

* Guidelines on consideration of those conditions that would be considered corrosive to buildings and structures will be necessary.

*Food, flora and fibre*

* Consideration of impacts to food flora and fibre, both from a food safety and from a quality and yield perspective, is complex. The objectives set out in the ERS are based on the SEPP (PMCL) and have not been reviewed in some time. This should be undertaken in order to identify more appropriate objectives based on best practice and established science.

***Water***

*Setting and reviewing indicators and objectives*

* As alluded to in Section B, some environmental values for water do not have indicators and objectives as the science is not sufficiently developed or the appropriateness of some objectives for some water bodies is not well understood and it is recommended these be considered in a review of the Water ERS.
* The short-term and long-term microbial objectives for water-based recreation were derived from the National Health and Medical Research Council (NHMRC) Guidelines for Managing Risks in Recreational Water (2008). The NHRMC Guidelines were based on an epidemiological study where most of the faecal contamination was of human origin. Source tracking and Quantitative microbiological risk assessment (QMRA) studies conducted at three locations in Port Phillip Bay (Altona, Elwood and Frankston) over the 2018-19 summer indicated that human origin contributed an average of only 13% of the total faecal contamination at these locations and that there was a probability of less than 1% of gastro-intestinal illnesses expected at the three locations. In comparison, the SEPP objectives would have suggested that this probability would have been over 10%. Consequently, the SEPP/Environmental Reference Standards (ERS) objectives may be conservative for protecting human health, particularly where the type of waterbody and faecal sources are different. To address this an ERS for the development of site-specific objectives that better characterise the risk at particular locations based on sources of faecal contamination should be developed. If site specific objectives have not been developed for a waterbody, then the ERS provides default objectives that can be used in the interim. A framework is being developed by EPA to ensure that a robust, consistent approach is to be applied in developing site-specific objectives.

1. **To make recommendations about a future program for their review (such as prioritising and phasing standards for review including key considerations).**

* ERS are to be reviewed every 10 years. There is a need for a Program of work to support the review process, the inclusion of new or revised ERS and associated guidance. Recommendations for this program of work are outlined at **Attachment 2**.
* To support the implementation of the recommendations, it is proposed a process be established to facilitate the review processes and to efficiently update ERS when National and or State processes have been used to develop to define environmental values, indicators and objectives.
* To support the ERS, Guidance has also been recommended where interpretation of ERS will be required and for those indicators and objectives currently in SEPPs but not brought through in the ERS. The prioritisation of Guidance should also be considered in the review of ERS.
* A suggested governance model and process is outlined in Figure 1 of **Attachment 1**. It is proposed the ERS Steering Committee will establish the initial list of priority guidance and ERS to be reviewed and developed based on the impact assessment and this review.

### Appendix E - Attachment 1

**Table 1.** Existing standards adopted in the draft ERS

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Segment** | **Existing standard** | **Publication** | **Review** | **Other notes** |
| Air | * SEPP AAQ * NEPM (Ambient Air Quality (AAQ)) | 2001  2015 | * The SEPP AAQ is based on and adopts the NEPM when it is updated. It includes other parameters such as visibility * NEPM AAQ standards followed a comprehensive policy/scientific process required by the NEPC Act 1994 including and has been reviewed and updated in 2003 and 2015   + Exposure Assessment and Risk Characterisation to Inform Recommendations for Updating Ambient Air Quality Standards for Particles, Ozone, Nitrogen dioxide and Sulfur dioxide   + Economic Analysis to Inform the National Plan for Clean Air (Particles)   + Evaluating Options for an Exposure Reduction Framework in Australia   + Methodology for Valuing the Health Impacts of Changes in Particle Emissions)   + Analysis of historical and future ambient air quality (including air dispersion modelling where possible).   + Risk assessment: Hazard assessment, Hazard Identification, Identification of critical health outcomes, exposure (dose) response assessment, Exposure Assessment and Risk Characterisation.   + Cost-benefit analysis. | The draft ERS is also consistent with:   * WHO guideline values Health Risk Assessment – Preliminary Work to Identify Concentration-Response Functions for Selected Ambient Air Pollutants (2012) |
| Noise | * SEPP (Control of Noise from Commerce, Industry and Trade) “No N1” SEPP (Control of Music Noise from Public Premises) “No N2” including guidelines | 2001  1999 | * Review of noise SEPPs was undertaken by a Noise External Reference Group. * A Project Control Board worked on environmental values. All noise indicators and objectives have been specifically developed in the ERS to apply across a broad range of noise sources and were informed by a technical review of state, national and international literature. Review of noise SEPPs was undertaken by applied scientists and policy officers and included consultation of a Noise External Reference Group.”   *Note*: the release of the ERS will provide the first opportunity for broader stakeholder consultation on the values, indicators and objectives. | The draft ERS is also consistent with:   * WHO Guidelines for community noise (1999) * WHO Environmental noise guidelines for the European region (2018) * WHO Night noise guidelines for Europe (2009) Guidance from the Environmental Health Standing Committee (enHealth) 2018. |
| Land | * NEPM (Health Investigation Levels (HILs)) * SEPP (Prevention and Management of Contamination of Land) * NEPM (Ecological Investigation Levels (EILs)) | 2013  2013  2002 | * The SEPP (PMCL) is based on the National Environment Protection (Assessment of Site Contamination) Measure developed in 1999 and amended in 2013 (scientific review). Amended in 2013 but only to wording and references (no scientific review or changes) It also refers to standards in the Australia New Zealand Food Standards Code. The Health investigation levels were updated in 2013, A comprehensive update was not undertaken for EILs and these values need review. |  |
| Water | * SEPP (Waters) | 2018 | * SEPP (Waters) review involved:   + evaluating the intent, implementation and effectiveness of policy obligations;   + reviewing and revising environmental quality indicators and objectives to ensure that they reflect contemporary science; and   + developing approaches to drive the improvement of water quality across Victoria. * A Science Advisory Panel (SAP) and a separate Technical Review Group was established for the SEPP (Waters) Review. | Also developed in line with, and to complement, the nationally agreed approach outlined in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG). They are consistent with NHMRCs Guidelines for managing risks in recreational water and Australian Drinking Water Guidelines (ADWG) and the Food Standards Australia New Zealand (FSANZ) |

**Table 2** Methods used to derive indicators and objectives for water

|  |  |  |
| --- | --- | --- |
| Environmental value/indicator | Method of objective derivation | Comments on currency and suitability of indicators and objectives |
| Water dependent ecosystems and species | Physico chemical objectives have been derived from long term monitoring of reference condition sites where there are no known or significant contributors to water quality.  Toxicant objectives for rivers and streams, lakes, estuaries and marine waters adopt ANZG guidelines values for toxicants (ref). Water quality objectives are based on ecotoxicity testing using a species sensitivity distribution (SSD) of chronic toxicity data that will protect 90, 95 or 99% of species. Sediment quality values are based on effects-based (dose-response ecotoxicity) values from North America. | These parameters represent the condition of the environment without significant contributors and based on knowledge of parameters which could introduce stress into water ecosystems. |
| Human consumption after appropriate treatment,  Potable Water Supply, and Potable mineral water supply | NHMRC Australian Drinking Water Guidelines which are set as:   * the concentration or measure of a water quality characteristic that, based on present knowledge, does not result in any significant risk to the health of the consumer over a lifetime of consumption; * Ensure that water is aesthetically pleasing   For more information see (NHMRC, NRMMC (2011) Australian Drinking Water  Guidelines Paper 6 National Water Quality Management Strategy. National Health  and Medical Research Council, National Resource Management Ministerial Council,  Commonwealth of Australia, Canberra. | NHMRC is the peak body for protection for human health. Given the intention of the ADWG to consider chemicals over a lifetime exposure, these criteria were established to allow for low to moderate exceedances from time to time. They do not consider acute health effects.  Aesthetic considerations are based on value judgements and note that regionally appropriate objectives should be set by individual water authorities. |
| Agriculture and irrigation | Live-stock drinking water quality objectives adopt the ANZG guidelines are based on a range of evidence, including direct toxicity testing of animals, published literature on physiological tolerances and effects and are thresholds within which there should be minimal risk of adverse effects to animal health.  Irrigation water quality objectives are based on a range of evidence including published research and estimates of crop tolerances to contaminants (e.g., salinity) and levels of contaminants that indicate the presence of pollution (e.g., levels of faecal coliforms that indicate faecal contamination) |  |
| Home consumption of aquatic foods | Pollutants in tissues objectives are adopted from the Australian and New Zealand Food Standards and are based on maximum limits of contaminants and natural toxicants in tissues that are observed to have no effects on human health.  Pollutants in water for human consumption of aquatic foods are based on the water dependent ecosystem objectives described above. | Objectives for ecosystem protection in water have been used in the absence of relevant criteria for uptake into aquatic foods. These criteria have not been reviewed with respect to bioaccumulation. As such there is significant uncertainty as to whether these criteria are suitably protective. |
| Aquaculture | Pollutants in water for aquaculture species objectives are adopted from the ANZG guidelines and are based on ecotoxicity studies and well understood physiological limits of common aquaculture species, or, are based on the water dependent ecosystem objectives described above.  Pollutants in tissues objectives are adopted from the Australian and New Zealand Food Standards and are based on maximum limits of contaminants and natural toxicants in tissues that are observed to have no effects on human health. |  |
| Industrial and commercial use | Qualitative objectives without specific reference to a standard See Section C |  |
| Traditional Owner cultural values | Qualitative objectives without specific reference to a standard. See Section C |  |
| Cultural and spiritual values | Qualitative objectives without specific reference to a standard. See Section C |  |
| Navigation and shipping | Qualitative objectives without specific reference to a standard. See Section C |  |
| Buildings and structures | Qualitative objectives without specific reference to a standard |  |
| Geothermal properties | Qualitative objectives without specific reference to a standard |  |
| Water based recreation | Microbial levels are outlined in Guidelines for Managing Risks in Recreational Water (2008).  Other parameters objectives include:   * Cyanobacteria/algae which are based on concentrations with a low probability of adverse health effects from ingestion or skin contact, derived from peer reviewed international studies; * Chemical hazards which are intended to address potential for adverse health effects from short term ingestion or skin contact with known toxins. These are qualitative objectives without specific reference to a standard.   Aesthetic effects which are also based on qualitative objectives. For more information see (NHMRC (2018) Guidelines for managing risks In recreational water ref). | The microbial levels set are based on one study by (Kay et al 2004) where the origin of the faecal contamination was human. NHMRC specify that local criteria can be developed based on QRMA WHO (World Health Organization) (2003). Guidelines for Safe Recreational Water Environments. Volume 1. Coastal and Fresh Waters. WHO, Geneva.  The Recreational water guidelines set out in NHMRC are for chronic exposures and are not appropriate for use as short term objectives as per the ERS. Chronic objectives need to be included in the ERS.  Kay D, Bartram J, Prüss A, Ashbolt N, Dufour A, Wyer M, Fleisher J, Fewtrell L and Rogers A (2004). Derivation of numerical values for the World Health Organization guidelines for recreational waters. Water Research 38:1296–1304. |
| Load | Load based objectives have been developed from catchment to bay hydrological, hydrodynamic water quality models calibrated to long term water quality and physical monitoring data. Models were used simulate land use changes under different management scenarios to determine what were achievable reduction over 10 years that would improve water quality” |  |



**Figure 1** – Suggested governance model

### Appendix E – Attachment 2

**Recommendations**

* Recommendation 1 – General Guidance be developed on the application of environmental reference standards including applicable measurement methods. ERS values are subject to interpretation and will need to be stated explicitly to inform their appropriate use and guidance is recommended to support the ERS.

***Air quality***

* Recommendation 2 – An odour indicator and objective are recommended to be developed and included in the ERS.
* Recommendation 3. Guidance is developed on design ground level concentrations for air pollutants for predictive modelling and assessment activities.
* Recommendation 4. Review the need for indicators and objectives to be developed for ‘climate systems’.
* Recommendation 5 – A review is undertaken to establish whether ambient air toxic values, indicators and objectives can be set based on the current NEPM reporting criteria. Victoria has not consistently monitored air toxics and hence does not have a sufficient amount of information to inform whether measurable air toxics are at or below levels of concern.
* Recommendation 6 - Current standards for ozone, nitrogen dioxide and sulphur dioxide are being reviewed and that the numeric values agreed to via the NEPM process are automatically adopted in the ERS.

***Noise***

* Recommendation 7 – That a review be undertaken as to whether an environmental value for biodiversity protection can be defined and whether qualitative or quantitative indicators and objectives can be developed for inclusion in the ERS.
* Recommendation 8 – That the objective for human tranquillity and enjoyment outdoors in natural areas is an acoustic quality that will need to be determined for each location as required.

***Land***

* Recommendation 9 – Guidance developed on risk assessment methodologies and subsequent derivation (selection of TRVs) of land criteria protective of environmental values and surface water and groundwater specifically.
* Recommendation 10 – That EPA prioritises contaminants for inclusion in the ERS and undertake review and development.
* Recommendation 11. - The methodology and current established standards for EILs will need to be reviewed for their applicability given the passage of time and in the context of Victoria.
* Recommendation 12 - An EIL value will need to be established for the protection of agricultural land segments.
* Recommendation 13. – Review of objectives set out for the environmental value Food, Flora and Fibre.

***Water***

* Recommendation 14. Review the establishment of short and long term site specific water quality objectives for microbial contamination.
* Recommendation 15. Review and develop indicators and objectives to address the knowledge gaps described in Appendix E of the SEPP (Waters) MER frameworks and priority emerging contaminants in water.

1. On 13 June 2019 the Environment Protection Amendment Bill 2019 was introduced into the Victorian Parliament. The Bill includes proposed minor amendments to sections 93(2) and 93(3) of the EP Act 2018, which are intended to clarify the meaning of these sections. The Environment Protection Amendment Bill 2019 can be accessed from <https://www.parliament.vic.gov.au/legislation>.

   [↑](#footnote-ref-2)
2. Victorian Government, 2019. *Proposed Environment Reference Standard*. Available at: <https://engage.vic.gov.au/new-environmental-laws/subordinate-legislation>. [↑](#footnote-ref-3)
3. The terms of reference for the EPA Inquiry can be viewed at <http://epa-inquiry.vic.gov.au/terms-of-reference>. [↑](#footnote-ref-4)
4. Ministerial Advisory Committee, 2016. *Independent Inquiry into the Environment Protection Authority*. Available at: <http://epa-inquiry.vic.gov.au/epa-inquiry-report>. [↑](#footnote-ref-5)
5. Parliament of Victoria, 2017. *Environment Protection Act 2017*. Available from <http://www.legislation.vic.gov.au/>. [↑](#footnote-ref-6)
6. Parliament of Victoria, 2018. *Environment Protection Amendment Act 2018*. Available from <http://www.legislation.vic.gov.au/>. [↑](#footnote-ref-7)
7. WMP’s set out standards and objectives for waste management. They are outside the scope of the impact assessment. [↑](#footnote-ref-8)
8. Ministerial Advisory Committee, 2016, page 266. [↑](#footnote-ref-9)
9. EP Act section 93(1) and section 93(2). [↑](#footnote-ref-10)
10. On 13 June 2019 the Environment Protection Amendment Bill 2019 was introduced into the Victorian Parliament. The Bill includes proposed minor amendments to sections 93(2) and 93(3) of the EP Act 2018, which are intended to improve clarity. At the time of writing it is proposed that section 93(2) be amended so as to read “…an environment reference standard must identify environmental values to be achieved or maintained in the whole or any part of Victoria.” It is proposed that section 93(3) be amended so that paragraph 93(3)(e) is repealed and is replaced with a new section 93(4) stating “An environment reference standard may specify indicators and objectives to be used to measure whether an environmental value specified in the environment reference standard is being achieved or maintained.” The current section 93(4) would become section 93(5). This change is proposed to clarify that indicators and objectives are not required for an environment reference standard to be valid – that is, an environment reference standard may specify an environmental value without necessarily specifying indicators and objectives used to measure the environmental value. The Environment Protection Amendment Bill 2019 can be accessed from <https://www.parliament.vic.gov.au/legislation>. [↑](#footnote-ref-11)
11. EP Act definitions. [↑](#footnote-ref-12)
12. Parliament of Victoria, 2018a. *Environment Protection Amendment Bill 2018. Explanatory Memorandum*, p. 58. Available at: <http://classic.austlii.edu.au/au/legis/vic/bill_em/epab2018374/> [↑](#footnote-ref-13)
13. Parliament of Victoria, 1994. *Subordinate Legislation Act 1994*. Available from: <http://www.legislation.vic.gov.au/>. [↑](#footnote-ref-14)
14. Commissioner for Better Regulation, 2016. *Victorian Guide to Regulation*. Available from <http://www.betterregulation.vic.gov.au/Guidance-and-Resources>. [↑](#footnote-ref-15)
15. Parliament of Victoria, 2017a. *Climate Change Act 2017.* Available from: <http://www.legislation.vic.gov.au/>. [↑](#footnote-ref-16)
16. Victorian Government, 2019a. *Proposed Environment Protection Regulations*. Available from: <https://engage.vic.gov.au/new-environmental-laws/subordinate-legislation>. [↑](#footnote-ref-17)
17. Deloitte Access Economics, 2019. *Regulatory Impact Statement: Proposed Environment Protection Regulations*. Available from: <https://engage.vic.gov.au/new-environmental-laws/subordinate-legislation>. [↑](#footnote-ref-18)
18. Victorian Government, 2019. *Proposed Environment Reference Standard*. Available at: <https://engage.vic.gov.au/new-environmental-laws/subordinate-legislation>. [↑](#footnote-ref-19)
19. Victorian Government, 1999 (varied 2001 and 2016). *State Environment Protection Policy (Ambient Air Quality)*. Consolidated policy available from: <https://www.epa.vic.gov.au/about-us/legislation/air-legislation>. [↑](#footnote-ref-20)
20. Victorian Government, 2001. *State Environment Protection Policy (Air Quality Management)*. Victorian Government Gazette No. S 240, Friday 21 December 2001. Available from: <https://www.epa.vic.gov.au/about-us/legislation/air-legislation>. [↑](#footnote-ref-21)
21. Victorian Government, 2002 (varied 2013). *State Environment Protection Policy (Prevention and Management of Contamination of Land)*. Consolidated policy available at: <https://www.epa.vic.gov.au/about-us/legislation/land-and-groundwater-legislation>. [↑](#footnote-ref-22)
22. Victorian Government, 1989 (varied 1992 and 2001). *State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade) No. N-1*. Consolidated policy available at: <https://www.epa.vic.gov.au/about-us/legislation/noise-legislation#sepp_noise_commerce>. [↑](#footnote-ref-23)
23. Victorian Government, 1989 (varied 1999). *State Environment Protection Policy (Control of Music Noise from Public Premises) No. N-2*. Consolidated policy available at: <https://www.epa.vic.gov.au/about-us/legislation/noise-legislation#sepppublicpremises>. [↑](#footnote-ref-24)
24. Victorian Government, 2018. *State Environment Protection Policy (Waters)*. Available at: <https://www.epa.vic.gov.au/about-us/legislation/water-legislation/water-related-policies>. [↑](#footnote-ref-25)
25. The assessment was based on drafts of the proposed ERS, and the Impact Assessment, as provided up until 28 May 2019. [↑](#footnote-ref-26)
26. The proposed ERS slightly modifies the wording of some environmental values: “life, health and well-being of humans” is proposed instead of “human health and wellbeing”; “Life, health and well-being of other forms of life, including the protection of ecosystems and biodiversity” is proposed instead of “life, health and well-being of other forms of life including animals and vegetation”; and “local amenity and aesthetic enjoyment” is proposed instead of “aesthetic enjoyment and local amenity”. The meaning of the environmental values does not change.  [↑](#footnote-ref-27)
27. Victorian Government, 1999 (varied 2001 and 2016), *Op. cit.* [↑](#footnote-ref-28)
28. NEPC, 2015. *National Environment Protection (Ambient Air Quality) Measure.* Consolidated NEPM available at: <https://www.legislation.gov.au/Details/F2016C00215>. [↑](#footnote-ref-29)
29. These aspects of SEPP (AAQ) have been assessed to determine whether, and how, they should be addressed in the future environment protection framework. In general, these elements are anticipated to be addressed in Guidance. [↑](#footnote-ref-30)
30. Victorian Government, 2001, *Op. cit.* [↑](#footnote-ref-31)
31. Other aspects of SEPP (AQM) are anticipated to be addressed through regulations and guidance. [↑](#footnote-ref-32)
32. Ambient air environment refers to the external air environment and does not include indoor air. [↑](#footnote-ref-33)
33. Parts per million by volume. [↑](#footnote-ref-34)
34. Microgram per cubic metre referenced to a temperature of 0 degrees Celsius and an absolute pressure of 101.325 kilopascals. [↑](#footnote-ref-35)
35. Lead is no longer actively monitored as ambient lead levels have decreased very significantly since leaded petrol for cars was phased out in 2002. Ambient lead concentrations are not expected to approach or exceed objective levels in the foreseeable future. [↑](#footnote-ref-36)
36. The explanatory document released with the consultation draft for SEPP (The Air Environment) in 1979 notes that uses of the environment “such as supporting combustion, sustaining the flight of birds and aircraft, and propelling windmills and yachts, do not require special protection under the policy.” – EPA Victoria, 1979. *Draft State Environment Protection Policy for the Air Environment of Victoria and Explanatory Document*, June 1979. [↑](#footnote-ref-37)
37. SEPP (The Air Environment) was split into two policies in 1999 to align Victoria’s approach to air quality with the NEPM (AAQ), which was introduced in 1998. Victoria implemented elements of NEPM (AAQ) through SEPP (AAQ), while SEPP (AQM) addressed other aspects Victoria’s approach to air quality management. [↑](#footnote-ref-38)
38. EPA Victoria, 2000. *Protecting Victoria’s Air Environment: draft variation to State Environment Protection Policy (Air Quality Management) and State Environment Protection Policy (Ambient Air Quality) and Draft Policy Impact Assessment*. EPA Publication 728, December 2000. [↑](#footnote-ref-39)
39. Ibid. p49 [↑](#footnote-ref-40)
40. WHO, 2005. *Air Quality guidelines – global update 2005*. Available at: <https://www.who.int/airpollution/publications/aqg2005/en/>. [↑](#footnote-ref-41)
41. NEPC, 2011. *Methodology for setting air quality standards in Australia*. Available from: <http://www.nepc.gov.au/resource/methodology-setting-air-quality-standards-australia>. [↑](#footnote-ref-42)
42. parts per million by volume. [↑](#footnote-ref-43)
43. Refer to the NEPC website for further information on the NEPM (Air Toxics) - <http://www.nepc.gov.au/nepms/air-toxics>. [↑](#footnote-ref-44)
44. The full set of recommendations is included at Appendix E Attachment 2. [↑](#footnote-ref-45)
45. Victorian Government, 2002 (varied 2013), *Op. cit.* [↑](#footnote-ref-46)
46. NEPC, 1999 (varied 2013). *National Environment Protection (Assessment of Site Contamination) Measure.* Available at: <https://www.legislation.gov.au/Details/F2013C00288>. [↑](#footnote-ref-47)
47. Food Standards Australia and New Zealand, 2019. *Australia New Zealand* *Food Standards Code.* Available at:

    <http://www.foodstandards.gov.au/code/Pages/default.aspx>. [↑](#footnote-ref-48)
48. EPA Victoria, 1997. *Prevention and Management of Contamination of Land: Issues Paper*. EPA Publication 527, February 1997. [↑](#footnote-ref-49)
49. EPA Victoria, 1998. *Preventing and Managing Contaminated Land: Draft State Environment Protection Policy (Prevention and Management of Contamination of Land) and Draft Policy Impact Assessment*. EPA Publication 622, September 1998. [↑](#footnote-ref-50)
50. The environmental value for “production of food and flora” in the draft SEPP (PMCL) was revised to “production of food, flora and fibre” in the final policy. [↑](#footnote-ref-51)
51. NEPC, 1999 (varied 2013), *Op. cit.* Volume 3, p. 108-112. [↑](#footnote-ref-52)
52. Also known as oxidation / reduction potential – a measure of the tendency of a chemical substance to gain or lose electrons in reaction to an electrode and so become reduced, or oxidised, respectively. [↑](#footnote-ref-53)
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55. Food and Agriculture Organisation & World Health Organisation, 2015. *General Standard for Contaminants and Toxins in Food and Feed.* Available at:www.fao.org/input/download/standards/17/CXS\_193e\_2015.pdf. [↑](#footnote-ref-56)
56. The full set of recommendations is included at Appendix E Attachment 2. [↑](#footnote-ref-57)
57. Toxicity Reference Values [↑](#footnote-ref-58)
58. Victorian Government, 1989 (varied 1992 and 2001), *Op. cit.* [↑](#footnote-ref-59)
59. Victorian Government, 1989 (varied 1999), *Op. cit.* [↑](#footnote-ref-60)
60. Victorian Government, 2018a. *Environment Protection (Residential Noise) Regulations 2018*. Available from <https://www.epa.vic.gov.au/about-us/legislation/noise-legislation>. [↑](#footnote-ref-61)
61. Victorian Government, 2019. *Proposed Noise Limit and Assessment Protocol for the control of noise from commercial, industrial and trade premises and entertainment* venues. Available at: <https://engage.vic.gov.au/new-environmental-laws/subordinate-legislation>. [↑](#footnote-ref-62)
62. Acoustic environment refers to ambient (or external) sound levels that are experienced within a location. [↑](#footnote-ref-63)
63. For example, the NSW Noise Policy for Industry uses three residential categories (rural, suburban, urban), and categories for commercial premises, industrial premises and other special areas (such as schools, hospitals and national parks). The approach in South Australia uses more categories including general industry, special industry, rural living, residential, light industry and commercial. Queensland does not change the acoustic objective based on land use, and uses a single category for all dwellings, and a separate category for uses including schools, childcare and hospitals. [↑](#footnote-ref-64)
64. EPA Victoria, 2014. *Review of Victoria’s State Environment Protection Policies for Noise - Discussion Paper.* Publication No. 1570. Available at: <https://www.epa.vic.gov.au/~/media/Publications/1570.pdf>. [↑](#footnote-ref-65)
65. EPA Victoria, 2015. *Stakeholder responses to the review of Victoria’s State Environment Protection Policies (SEPP) for Noise - Report.* Publication 1593. Available at: <https://www.epa.vic.gov.au/~/media/Publications/1593.pdf>. [↑](#footnote-ref-66)
66. enHealth, 2004. *The health effects of environmental noise – other than hearing loss*. enHealth Council, Canberra. [↑](#footnote-ref-67)
67. WHO, 1999. *Guidelines for Community Noise*. Available at: <https://apps.who.int/iris/handle/10665/66217>; and WHO, 2009. *Night Noise Guidelines for Europe*. Copenhagen, Denmark. Available at: <http://www.euro.who.int/__data/assets/pdf_file/0017/43316/E92845.pdf>. [↑](#footnote-ref-68)
68. enHealth, 2018. *The health effects of environmental noise*. Available from: <https://www.health.gov.au/internet/main/publishing.nsf/Content/health-pubhlth-publicat-environ.htm>, page 5. [↑](#footnote-ref-69)
69. World Health Organisation (WHO), 2018. *Environmental Noise Guidelines for the European Region*.Available at: <http://www.euro.who.int/__data/assets/pdf_file/0008/383921/noise-guidelines-eng.pdf?ua=1>, page 19. [↑](#footnote-ref-70)
70. WHO, 1999. Op. cit., page vii. [↑](#footnote-ref-71)
71. Ibid. [↑](#footnote-ref-72)
72. Environment Protection Authority (NSW), 2017. *Noise Policy for Industry*, available at: <https://www.epa.nsw.gov.au/your-environment/noise/industrial-noise/noise-policy-for-industry-(2017)>. [↑](#footnote-ref-73)
73. European Union, 2002. *Directive 2002/49/EC relating to the assessment and management of environmental noise (the Environmental Noise Directive)*. Available at: <http://ec.europa.eu/environment/noise/directive_en.htm>. [↑](#footnote-ref-74)
74. Victorian Government, 2013. *Passenger Rail Infrastructure Noise Policy*. Available at <https://transport.vic.gov.au/about/planning/passenger-rail-infrastructure-noise-policy/>. [↑](#footnote-ref-75)
75. VicRoads, 2005. *Traffic Noise Reduction Policy 2005*. Available at: <https://www.vicroads.vic.gov.au/planning-and-projects/environment/noise>. [↑](#footnote-ref-76)
76. VicRoads, 2015. *Traffic Noise Reduction Policy Review, Discussion Paper*, August 2015. [↑](#footnote-ref-77)
77. Austroads, 2005. *Modelling, Measuring and Mitigating Road Traffic Noise*. Publication no. AP-R277-05, Available at: <https://austroads.com.au/publications/environment/ap-r277-05>; see also Buret, M. & McIntosh, J. 2016. “Measuring the environmental performance of Melbourne’s road network” in *Proceedings of* *Acoustics 2016*, Brisbane, 9-11 November 2016. <https://www.acoustics.asn.au/conference_proceedings/AASNZ2016/papers/p58.pdf>. [↑](#footnote-ref-78)
78. Both LAeq, 8h and LAeq,16h are examples of the of an LAeq,T indicator that is used as a single number to describe the noise exposure across a certain period (T). [↑](#footnote-ref-79)
79. WHO, 1999. Op. cit. [↑](#footnote-ref-80)
80. WHO, 2018. Op. cit. [↑](#footnote-ref-81)
81. WHO, 2009, Op. cit., page 108. [↑](#footnote-ref-82)
82. Ibid., page 109. [↑](#footnote-ref-83)
83. Ibid., page xvi [↑](#footnote-ref-84)
84. Ibid., page xvii. [↑](#footnote-ref-85)
85. Tasmanian Government, 2009. *Environment Protection Policy (Noise) 2009*, available at: <https://epa.tas.gov.au/policy/statutory-policies/state-policies-and-environment-protection-policies/environment-protection-policy-(noise)-2009>. [↑](#footnote-ref-86)
86. WHO, 1999, Op. cit. [↑](#footnote-ref-87)
87. Environment Protection Authority (NSW), 2017. Op. cit. [↑](#footnote-ref-88)
88. South Australian Government, 2007. *Environment Protection (Noise) Policy 2007*. Available from: [www.legislation.sa.gov.au](http://www.legislation.sa.gov.au). [↑](#footnote-ref-89)
89. Refer to DELWP, 2016. *Better Apartments Design Standards*. Available at: <https://www.planning.vic.gov.au/__data/assets/pdf_file/0024/9582/Better-Apartments-Design-Standards.pdf>. [↑](#footnote-ref-90)
90. WHO, 2018. Op. cit. [↑](#footnote-ref-91)
91. Standards Australia, 2016. *Acoustics – Recommended design sound levels and reverberation times for building interiors, AS/NZS 2017:2016*. Refer to [www.standards.org.au](http://www.standards.org.au). [↑](#footnote-ref-92)
92. EPA Victoria, 2011. *Noise from Industry in Regional Victoria*, EPA Publication 1411. Available at: <https://www.epa.vic.gov.au/our-work/publications/publication/2011/october/1411>. [↑](#footnote-ref-93)
93. The ‘Influence Factor’ is part of the noise limit setting methodology used in noise regulation that reflects the relative proportions of different types of land use zoning types within an area of interest where a noise sensitive receiver is located. The concept of influencing factor comes from SEPP (N-1). It is used to set noise limits when combined with the measured background noise level. The land use types used to calculate the influencing factor were originally in SEPP (N-1), and are currently in EPA Publication 316a. The method utilises three types (Type 1, Type 2, and Type 3) that are described within the Noise Protocol. Generally, residential, rural and open space is designated as Type 1, areas such as commercial, business and light industry as Type 2, and areas such as general industry and major roads as Type 3. As Table 17 indicates, where the area of interest contains land designated only as Type 3 (such as an entirely industrial zone), the Influence Factor will be one (1), the influencing factor is zero (0) when the relevant area contains only Type 1 (such as an area that is entirely residential and parkland). [↑](#footnote-ref-94)
94. New Zealand Department of Conservation, 2011. *The Impact of Noise of Recreationists and Wildlife in New Zealand’s Natural Areas*. Available at: <https://www.doc.govt.nz/documents/science-and-technical/sfc314entire.pdf>. [↑](#footnote-ref-95)
95. Brown, A.L., 2007. “Areas of High Acoustic Quality: Soundscape planning”.In B. Randall (ed.), *Fourteenth International Congress on Sound and Vibration (ICSV14).* Australian Acoustical Society, St Lucia, Queensland. Available at: <https://research-repository.griffith.edu.au/bitstream/handle/10072/19306/49885_1.pdf;sequence=1>. [↑](#footnote-ref-96)
96. New Zealand Department of Conservation, 2011. Op. cit. [↑](#footnote-ref-97)
97. Brown, A.L. 2007. Op. cit. [↑](#footnote-ref-98)
98. Ibid. page 3. [↑](#footnote-ref-99)
99. New Zealand Department of Conservation, 2011. Op. cit. [↑](#footnote-ref-100)
100. Queensland Government, 2008. *Environmental Protection (Noise) Policy 2008*. Available at: <https://www.legislation.qld.gov.au/view/html/inforce/current/sl-2008-0442>, page 4. [↑](#footnote-ref-101)
101. The full set of recommendations is included at Appendix E Attachment 2. [↑](#footnote-ref-102)
102. Stygofauna refer to animals found in groundwater. Troglofauna are terrestrial animals living in caves and other air-filled subterranean spaces. [↑](#footnote-ref-103)
103. The proposed ERS defines the background water quality level as the level or ranges 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. [↑](#footnote-ref-104)
104. TDS is a measure of salinity, measured by a method approved by EPA. [↑](#footnote-ref-105)
105. ANZG, 2018. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. Available at: <https://www.waterquality.gov.au/guidelines/anz-fresh-marine>. [↑](#footnote-ref-106)
106. National Health and Medical Research Council, 2011. *Australian Drinking Water Guidelines*. Available at: <https://www.nhmrc.gov.au/about-us/publications/australian-drinking-water-guidelines>. [↑](#footnote-ref-107)
107. National Health and Medical Research Council, 2008. *Guidelines for Managing Risks in Recreational Water*. Available at: <https://www.nhmrc.gov.au/about-us/publications/guidelines-managing-risks-recreational-water>. [↑](#footnote-ref-108)
108. Food Standards Australia and New Zealand, 2019. Op. cit. [↑](#footnote-ref-109)
109. Victorian Government, 2019a. *Proposed Environment Reference Standard*. Available from: <https://engage.vic.gov.au/new-environmental-laws/subordinate-legislation>. [↑](#footnote-ref-110)
110. References to “Tables” in this table are references to Tables in Part 5 of the proposed ERS. [↑](#footnote-ref-111)
111. Water Quality Australia, 2018. *National Water Quality Management Strategy*. Available at: <http://www.waterquality.gov.au/about>. [↑](#footnote-ref-112)
112. The 2015 SEPP (Waters) Discussion Paper is no longer available online. However, interested parties may obtain a copy from the EPA. [↑](#footnote-ref-113)
113. EPA Victoria, 2017. *State Environment Protection Policy (Waters). Review. Part 1: Beneficial Uses - Proposed Changes, April 2017.* Available at: <https://www.water.vic.gov.au/__data/assets/pdf_file/0029/77726/Part-1-SEPPWatersReview-BeneficialUsesPaper.pdf>. [↑](#footnote-ref-114)
114. EPA Victoria, 2017a. *State Environment Protection Policy (Waters). Review. Part 2: Matching Beneficial Uses to Segments - Proposed Changes, July 2017.* Available at: <https://www.water.vic.gov.au/__data/assets/pdf_file/0026/77822/Part-2-Matching-Beneficial-Uses-to-Segments.pdf>. [↑](#footnote-ref-115)
115. EPA Victoria, 2019. Publication 1733. *Development of Environmental Quality Indicators and Objectives for SEPP (Waters), May 2019*. Available at: <https://www.epa.vic.gov.au/~/media/Publications/1733.pdf>. [↑](#footnote-ref-116)
116. National Health and Medical Research Council, 2008. Op. cit. [↑](#footnote-ref-117)
117. The full set of recommendations is included at Appendix E Attachment 2. [↑](#footnote-ref-118)
118. DELWP and EPA Victoria, 2018. *State Environment Protection Policy (Waters): Monitoring, evaluation and reporting framework*. Available at: <https://www.water.vic.gov.au/waterways-and-catchments/rivers-estuaries-and-waterways/state-environment-protection-policy>. [↑](#footnote-ref-119)
119. Parliament of Victoria, 2018. Op. cit., section 358 “Functions of the Authority”. [↑](#footnote-ref-120)
120. Although the NEPM and SEPP (and the proposed ERS) have an indicator and objective for lead, it is no longer actively monitored. As noted in Chapter 4, this is because ambient lead levels have decreased very significantly since leaded petrol for cars was phased out in 2002. Ambient lead concentrations are not expected to approach or exceed objective levels in the foreseeable future. [↑](#footnote-ref-121)
121. EPA Victoria. 2019a ‘Air Monitoring Results Around Victoria’. <https://www.epa.vic.gov.au/our-work/monitoring-the-environment/monitoring-victorias-air/monitoring-results>. [↑](#footnote-ref-122)
122. Victorian Auditor-General’s Office, 2018. *Improving Victoria’s Air Quality, March 2018.* Available at: <https://www.audit.vic.gov.au/sites/default/files/2018-03/20180308-Improving-Air-Quality.pdf>. [↑](#footnote-ref-123)
123. Ibid. page 28. [↑](#footnote-ref-124)
124. EPA Victoria, 2007. *2007 Noise Surveys.* Available at: <https://www.epa.vic.gov.au/your-environment/noise/2007-noise-surveys>. [↑](#footnote-ref-125)
125. WHO, 1999. Op. cit. [↑](#footnote-ref-126)
126. Further information is available in: Commissioner for Environmental Sustainability Victoria, 2019. *Victorian State of the Environment 2018 Report: Scientific Assessments*, p103. Available at <https://www.ces.vic.gov.au/sites/default/files/SoE-2018-scientific-assessments.pdf>. [↑](#footnote-ref-127)
127. World Health Organization, 2009. Op. cit. [↑](#footnote-ref-128)
128. European Union, 2002. Op. cit. [↑](#footnote-ref-129)
129. DELWP, 2017.‘Surface Water Monitoring’. Available at: <https://www.water.vic.gov.au/water-reporting/surface-water-monitoring>. [↑](#footnote-ref-130)
130. DELWP, 2019. ‘Water Monitoring’. <http://data.water.vic.gov.au/static.htm?_ga=2.219412944.893318268.1551045648-641845240.1548126690>. [↑](#footnote-ref-131)
131. DELWP and EPA Victoria, 2018. Op. cit. [↑](#footnote-ref-132)
132. On 13 June 2019 the Environment Protection Amendment Bill 2019 was introduced into the Victorian Parliament. The Bill includes a proposed amendment to section 50b of the Victorian *Marine and Coastal Act 2018*. Section 49 of that act requires that the Minister must prepare and make available an environmental management plan on matters relating to and affecting Port Phillip Bay, and may prepare and make available an environmental management plan in respect of any other area of the marine environment. The proposed amendment would require that an environmental management plan must include a description of how the plan promotes the objectives of any environment reference standard applying to the area. The Environment Protection Amendment Bill 2019 can be accessed from <https://www.parliament.vic.gov.au/legislation>. [↑](#footnote-ref-133)
133. DELWP, 2019a. ‘Water Resource Plans’. Available at: <https://www.water.vic.gov.au/mdb/compliance/water-resource-plans>. [↑](#footnote-ref-134)
134. Commissioner for Environmental Sustainability Victoria, 2016. *State of the Bays Summary*. Available at: <https://www.ces.vic.gov.au/sites/default/files/reports/State%20of%20the%20Bays%202016Summaryreport_0.pdf>. [↑](#footnote-ref-135)
135. Victorian Government, 2019c. ‘Port Phillip Bay, Western Port and Gippsland Lakes Report Cards’. <https://yarraandbay.vic.gov.au/report-card>. [↑](#footnote-ref-136)
136. Commissioner for Environmental Sustainability Victoria, 2018. *State of the Environment Report.* Available at: <https://www.ces.vic.gov.au/reports/state-environment-2018>. [↑](#footnote-ref-137)
137. EP Act s25 - The General Environmental Duty. [↑](#footnote-ref-138)
138. EP Act s6(1) - The concept of minimising risks of harm to human health and the environment. [↑](#footnote-ref-139)
139. EP Act s4 - What is *harm?* [↑](#footnote-ref-140)
140. EP Act s6(2). [↑](#footnote-ref-141)
141. Proposed EP Regulations, section 25. [↑](#footnote-ref-142)
142. EP Act s160(2). [↑](#footnote-ref-143)
143. Victorian Government, 2019b. *Proposed Noise Limit and Assessment Protocol for the control of noise from commercial, industrial and trade premises and entertainment* venues. Available at: <https://engage.vic.gov.au/new-environmental-laws/subordinate-legislation>. [↑](#footnote-ref-144)
144. Noise-sensitive area is a defined term in the proposed EP Regulations. [↑](#footnote-ref-145)
145. Noise sensitive residential use is a defined term in the proposed EP Regulations and the Victoria Planning Provisions. [↑](#footnote-ref-146)
146. Parliament of Victoria, 1987. *Planning and Environment Act 1987*. Available from: <http://www.legislation.vic.gov.au/>. [↑](#footnote-ref-147)
147. Parliament of Victoria, 1978. *Environment Effects Act 1978*. Available from: <http://www.legislation.vic.gov.au/>. [↑](#footnote-ref-148)
148. Parliament of Victoria, 2009. *Major Transport Projects Facilitation Act*. Available from: <http://www.legislation.vic.gov.au/>. [↑](#footnote-ref-149)
149. Reviewable decisions are presented in a table included in EP Act s430(4). [↑](#footnote-ref-150)
150. Parliament of Victoria, 1994a. *Catchment and Land Protection Act 1994*. Available from: <http://www.legislation.vic.gov.au/>. [↑](#footnote-ref-151)
151. Parliament of Victoria, 1988. *Flora and Fauna Guarantee Act 1988*. Available from: <http://www.legislation.vic.gov.au/>. [↑](#footnote-ref-152)
152. Parliament of Victoria, 1988a. *Subdivision Act 1988*. Available from: <http://www.legislation.vic.gov.au/>. [↑](#footnote-ref-153)
153. Parliament of Victoria, 1989. *Water Act 1989*. Available from: <http://www.legislation.vic.gov.au/>. [↑](#footnote-ref-154)
154. EP Act s190(2). [↑](#footnote-ref-155)
155. EP Act s204. [↑](#footnote-ref-156)
156. EP Act s208(2). [↑](#footnote-ref-157)
157. Commissioner for Better Regulation, 2016, Op. cit. [↑](#footnote-ref-158)
158. EPA Victoria, 2018. ‘Climate Change’. <https://www.epa.vic.gov.au/your-environment/climate-change>. [↑](#footnote-ref-159)
159. EPA Victoria, 2009. *Protecting our future environment in a changing climate*. EPA Publication 1293. Available at: <https://www.epa.vic.gov.au/your-environment/climate-change>. [↑](#footnote-ref-160)
160. DELWP and EPA Victoria, 2017. *SEPP (Waters) Review: Policy Impact Assessment*. Available at: <https://engage.vic.gov.au/seppwaters>. [↑](#footnote-ref-161)
161. Ibid., page 18. [↑](#footnote-ref-162)
162. NEPC, 2014. *Draft variation to the National Environment Protection (Ambient Air Quality) Measure – Impact Statement*. Available at: <http://www.nepc.gov.au/nepms/ambient-air-quality/proposed-variation/consultation>, page 12. [↑](#footnote-ref-163)
163. NEPC, 2019. *Impact Statement – Draft variations to the National Environment Protection (Ambient Air Quality) Measures for O3, NO2 and SO2*. Available at: <http://www.nepc.gov.au/nepms/ambient-air-quality/proposed-variation/consultation-2019>, page 89. [↑](#footnote-ref-164)