



Environmental Factor Guideline

Air Quality

The objective of the factor *Air Quality* is:

To maintain air quality and minimise emissions so that environmental values are protected.

Purpose

The purpose of this guideline is to communicate how the factor *Air Quality* is considered by the Environmental Protection Authority (EPA) in the environmental impact assessment (EIA) process.

Specifically, the guideline:

- describes the factor *Air Quality* and explains the associated objective
- describes EIA considerations for this factor
- discusses the environmental values of good air quality, and their significance
- describes issues commonly encountered by the EPA during EIA of this factor
- identifies activities that can impact on air quality
- provides a summary of the type of information that may be required by the EPA to undertake EIA related to this factor.

What is air quality?

For the purposes of EIA, the EPA defines the factor *Air Quality* as:

The chemical, physical, biological and aesthetic characteristics of air.

'Air' refers to all the air above the ground up to and including the stratosphere.

The environmental objective for the factor *Air Quality*

The EPA's environmental objective for the factor *Air Quality* is: "To maintain air quality and minimise emissions so that environmental values are protected".

The objective recognises the fundamental link between air quality and the environmental values supported by good air quality. It also recognises the principle of waste minimisation as set out in the *Environmental Protection Act 1986*.

In the context of this factor and objective, the EPA's primary focus is maintaining air quality and minimising emissions for human health and amenity.

Considerations for environmental impact assessment

Considerations for EIA for the factor *Air Quality* include, but are not necessarily limited to:

- application of the mitigation hierarchy to avoid and minimise emissions, where possible
- characterisation of potentially harmful emissions and the pathways by which they may be released to air
- whether numerical modelling and other analyses to predict potential impacts has been undertaken using recognised standards with accepted inputs and assumptions
- whether existing background air quality, including natural variations, has been established through monitoring and accepted proxy data
- whether analysis of potential health and amenity impacts has been undertaken using recognised criteria and standards, where relevant, informed by Australian and international standards
- the application of technology appropriate to the potential environmental impacts and risks
- the significance of the likely change to air quality as well as the environmental values affected by those changes, in the context of existing and predicted cumulative impacts
- whether proposed mitigation is technically and practically feasible
- whether siting of the proposal's main emission sources takes into consideration current and future sensitive land uses.

Environmental values of air quality and their significance

'Environmental values' is defined under the *Environmental Protection Act 1986* as a beneficial use, or an ecosystem health condition. The ecosystem health values related to air quality as applied in EIA are human health and amenity.

From time to time, poor air quality can also impact other environmental factors. For example, dust may smother flora and vegetation. In these circumstances, EIA of the potential impacts will be undertaken against the relevant environmental factor, in this example the environmental factor *Flora and Vegetation*.

Issues

The following issues are matters that are commonly encountered by the EPA due to the nature of proposals that are referred to it. Background on these issues is provided here to help proponents and the community engage with EIA. This issues section will be updated from time to time to reflect new issues as they arise in referrals and EIA.

Reasonable and practicable measures to minimise harmful emissions to air

Consistent with the principle of waste minimisation as set out in section 4A of the *Environmental Protection Act 1986*, the EPA encourages the application of all reasonable and practicable measures to minimise harmful emissions to air. This might include facility design, technology choice, operation and closure.

Reasonable and practicable measures include those measures which are reasonably practicable, having regard to, among other things, local conditions and circumstances (including costs) and the current state of technical knowledge.

Under some circumstances, the EPA may expect more stringent standards such as Maximum Extent Achievable, particularly where hazardous contaminants are involved. Maximum Extent Achievable requirements incorporate technology and environmental management procedures which are the most stringent measures available and achievable, at a scale relevant to the proposal, to control the level of risk imposed by the hazardous pollutants being considered. Hazardous contaminants include known or suspected carcinogens, mutagens, teratogens, highly toxic or highly persistent substances.

In undertaking EIA, the EPA will consider the choice of technology to ensure that it is capable of achieving appropriate emission standards and minimizing emissions commensurate with the risk to the environment.

Maintaining ambient air quality to protect human health

It is well recognised that air pollution can have an adverse effect on human health. Maintaining or improving ambient air quality is important for public health outcomes.

When undertaking EIA and making judgements about the acceptability of potential impacts to ambient air quality and, therefore, human health, the EPA's assessment will typically be informed by accepted air quality standards and criteria¹, which are based on epidemiological studies.

Where there is an absence of a recognised standard or criteria to determine likely risk to human health, there may be the need to develop standards based on the available information and knowledge and, where appropriate, consultation with technical experts. This will depend on the circumstances and identified sensitive receptors.

Particulates

In recent years, there has been scientific evidence that small particulates have the potential to impact human health irrespective of their chemical composition.

Emission of fine particulates is associated with vehicle emissions and any activities which generate dust, and is particularly relevant when located in close proximity to residential and other sensitive land uses.

It is likely that EIA will increasingly consider particle size and occurrence, as well as chemical composition.

Air sheds and cumulative impacts

An air shed is a geographical area within which air is frequently confined or channelled. All parts of the air shed are, therefore, subject to similar conditions of air pollution.

This becomes particularly important when there are cumulative impacts from multiple emitters within an air shed. There will be a point at which combined emissions mean that the air shed no longer meets established standards or human health is affected.

When undertaking EIA, existing or future cumulative impacts to an air shed will be an important consideration.

Greenhouse Gas Emissions

Emissions of greenhouse gases contribute to the changing climate. The effects of the changing climate are predicted to be significant in Western Australia, with a drying climate in the south-west, more frequent and severe storms in the north-west, and a rising sea level along our entire coastline.

The EPA encourages proposal design, technology and operation that ensure emissions are minimised. Periodic review and adoption of advances in technology and process management can also reduce emission intensity over the life of a proposal.

The EPA may decide to assess greenhouse gas emissions within the EIA process if a proposal's expected total greenhouse gas emissions are deemed to be significant. The EPA defines this as proposals that have the potential to significantly increase the State's greenhouse gas emissions, which totalled 83.4 Mt of CO₂-e in 2013-14.

¹ The Ambient Air National Environment Protection Measure (NEPM) provides a common national goal to best protect human health and wellbeing from the adverse impacts of air pollution.

Impacts

Development activities that have the potential to impact air quality include, but are not necessarily limited to:

- waste to energy plants where the emissions from the combustion of waste is discharged to the air
- the capture, processing and refining of oil and gas
- the burning of fossil fuels for the production of energy
- heavy industries that emit atmospheric waste such as metal smelting and refineries
- bulk handling and transport (both road and rail) of materials, including the loading and unloading of bulk materials
- port operations that include the transport, loading, unloading and storage of bulk materials
- stockpiling of bulk material
- the crushing and screening of materials
- incineration of wastes, for example medical waste
- mining, handling, processing and transfer of metallic and non-metallic minerals that include activities causing dust
- chemical manufacturing and processing.

Information required for EIA

Where *Air Quality* has been identified as an environmental factor, the EPA may require the proponent to provide information or studies within the following broad topics:

For air emissions that may affect human health or amenity:

- characterisation of the feedstock and the pollutants and contaminants that are likely to be emitted
- characterisation of and proximity to sensitive receptors
- background ambient air modelling and the impact of emissions on sensitive receptors, including likely impacts during, worst, best and most likely case scenarios
- assessment against published standards and criteria
- identification of emission reduction equipment and proposed technologies and, where relevant, demonstration of the use of proven technologies
- description of proposed management and monitoring arrangements.

For greenhouse gas emissions:

- characterisation of greenhouse gas emission sources from the proposal and estimation of expected Scope 1 (direct) and Scope 2 (energy indirect) greenhouse gas emissions in accordance with the *National Greenhouse and Energy Reporting Act 2007* (NGER Act)²
- analysis of greenhouse gas intensity (i.e. quantity of CO₂-e generated per tonne of product produced) and comparison with published benchmarked practice for equivalent plant, equipment and operations.

² For details of the national greenhouse gas reporting requirements, including a description of the different types of greenhouse gas emissions, please refer to <http://www.cleanenergyregulator.gov.au/NGER>

Environmental Protection Authority 2016, *Environmental Factor Guideline: Air Quality*, EPA, Western Australia.

This document is available in alternative formats upon request.

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