Great Southern Waste Technologies waste to energy works approval decision

EPA VICTORIA | Environment Protection Authority Victoria

Publication 1900 August 2020 **Summary report**

Introduction

Great Southern Waste Technologies Pty Ltd (GSWT) has proposed construction of a modular gasification waste to energy facility at 70 Ordish Road, Dandenong South VIC 3175 in Melbourne's south eastern suburbs. The facility will process residual municipal solid waste, and commercial and industrial waste.

The proposed facility requires a works approval from the Environment Protection Authority Victoria (EPA) under - the *Environment Protection Act 1970* (the Act). A works approval is required for industrial and waste management activities that have the potential for significant environmental impact. The approval permits the construction of a plant, the installation of equipment or the modification of processes.

This document summarises the key aspects of EPA's assessment and decision-making process for the works approval application. It also provides a response to each of the recommendations of the s20B conference Chair in its report to EPA. The full works approval application assessment report is available via EPA's website.

EPA decision on the works approval application

On 23 October 2019, EPA received an application for works approval from GSWT. On the statutory decision due date of 20 July 2020, EPA approved the proposed works, subject to conditions.

What was proposed in the works approval application?

GSWT proposed building and operating a waste to energy facility in Dandenong South. The proposed facility will thermally treat approximately 100,000 tonnes (+/- 10%) per year of residual municipal solid waste and industrial and commercial waste. Through this process the facility will be capable of recovering the energy content of the waste to produce electricity for export to the local grid.

Activities to follow a works approval

Activities that GSWT will need to undertake following works approval include:

- obtaining other permits (for example, a planning permit)
- complete final detailed designs
- securing waste contracts consistent with the works approval conditions
- a construction phase
- a commissioning phase
- obtaining an EPA operating licence.

The facility has an expected operational lifetime of 25-years.

Works approval application process

Table 1 below shows some of the key steps in the works approval application and assessment process.

Table 1: key steps in the works approval assessment process

23 October 2019	EPA receives the works approval application
27 November 2019 to 8 January 2020	Advertisement and public submission period
11 February 2020	S22 Notice (1) request for additional information issued
3 March 2020	S20B community conference was held
14 May 2020	S22 Notice (1) response accepted
21 May 2020 to 4 June 2020	Supplementary public submission period
18 June 2020	S22 Notice (2) request for additional information issued
10 July 2020	S22 Notice (2) response accepted
20 July 2020	EPA issues works approval subject to conditions

Background: waste to energy

There are over 1,600 operational waste to energy facilities globally. Modern, well-run facilities are commonly found throughout countries of Europe (Sweden, France, United Kingdom) and East Asia (Japan, South Korea).

The technology generates energy as heat from the combustion or gasification of waste materials that would otherwise go to landfill. Heat is converted to steam, which can be used to generate electricity and/or in operational processes.

Victoria has a number of EPA-approved and licensed waste to energy facilities. Recently, EPA has approved

several large-scale waste to energy facilities that will use a waste feedstock similar to GSWT.

Works approval application details

GSWT has conducted an international search of available waste to energy technologies and has established an exclusive licence and engineering agreement with Energos – AS (Norway) for the design and supply of its technology for Dandenong South.

The proposed design of the facility is based on operating facilities in Norway.

The facility will have a capacity to treat a total annual residual waste volume of approximately 100,000 tonnes (+/- 10%), coming from Greater Dandenong and metropolitan Melbourne. The facility will not treat waste that is prescribed industrial waste, hazardous waste, or pre-sorted recycling waste.

Proposed key design controls

The proposed key design controls include:

- continuous emission monitoring of pollutants
- continuous monitoring of crucial operating parameters (for example temperature, pollutants in flue gas) to enable optimisation of plant operation (for example waste gasification, energy generation and flue gas treatment efficiency)
- flue gas treatment system optimised to remove acidic gases, heavy metals, and complex halogenated compounds (e.g. dioxins and furans)
- hazardous waste and waste that does not comply with waste acceptance criteria to be segregated and rejected
- pre-treatment of incoming waste to recover ferrous and non-ferrous metals for recycling
- two stage gasification process with sufficient temperature and residence time and turbulence to destroy harmful pollutants
- waste receival hall and waste and fuel bunkers operated under negative atmospheric pressure to capture and prevent escape of odorous gases from waste
- all plant equipment, waste, and chemicals storage and handling in areas containing walls and impervious floors to reduce potential for chemicals or contaminants to escape into soil, groundwater and surface waters.

EPA assessment process

Relevant legislation and policies

A works approval application is required to comply with the Act and subordinate legislation. Other legislation also needs to be considered, such as the *Climate Change Act 2017*.

The Act, regulations, and state environment protection policies (SEPPs) establish a framework to ensure that waste treatment infrastructure is appropriately located, designed, constructed, operated, and managed to minimise risks to the environment and public health.

EPA considers that the following SEPPs and protocols for environmental management are particularly relevant for this proposal:

- SEPP (Waters)
- SEPP (Prevention and Management of Contamination of Land)
- SEPP (Air Quality Management)
- SEPP (Control of Noise from Commerce, Industry and Trade)
- The Protocol for Environmental Management: Greenhouse Gas Emissions and Energy Efficiency in Industry (publication 824).

Departmental and agency consultation

In assessing the application, EPA consulted with several other departments and agencies including:

- City of Greater Dandenong
- Sustainability Victoria
- Metropolitan Waste and Resource Recovery Group
- Country Fire Authority.

Determination of best practice

Integrated within the SEPPs is the requirement to meet best practice. The proposed waste to energy (WtE) facility must meet international best practice standards. This includes ‘the best combination of eco-efficient techniques, methods, processes or technology used in an industry sector or activity that demonstrably minimizes the environmental impact of a generator of emissions in that industry sector or activity’. In determining best practice, EPA has considered the application against the following international standards for WtE facilities:

- European Union – Industrial Emissions Directive
- Best available techniques reference document – incineration
- Best available techniques conclusions.

In addition, EPA staff have previously inspected operational waste to energy facilities in the United Kingdom, France, and across Scandinavia and met with environmental regulators of these facilities and organisations associated with thermal treatment of municipal solid waste. The staff reviewed European directives and member state legislation that govern the approval and oversight of waste to energy facilities.

Community engagement

As required by the Act, the works approval application was advertised in newspapers, and communicated on a dedicated Engage Victoria website.

There was an extended period of public comment, from 27 November 2019 to 8 January 2020, with a dedicated public information session held on 11 December 2019. A supplementary public comment period was held between 21 May 2020 to 4 June 2020.

EPA received 79 submissions during the public comment period including a petition with 1454 objection signatures, and a petition with 280 local resident objection signatures. EPA received an additional 36 submissions during the supplementary public comment period.

Following review of these responses, EPA organised a community conference, held on 3 March 2020 in Dandenong. The conference, hosted by an independent chair, provided an additional opportunity for the community to raise concerns and, where possible, attempt to reach a just resolution of them, consistent with section 20B of the Act.

The chair subsequently published recommendations, which have been considered as part of EPA's determination. EPA's response to each of the recommendations is summarised in Appendix A below.

EPA assessment

What did EPA assess?

This section summarises the findings relating to the most important issues as part of EPA's assessment and those raised during the community conference. For more information on how EPA assessed all the key issues of concern, see the full assessment report.

Regulatory compliance

EPA has determined that the proposal:

- is protective of human health and the environment
- is compliant with the SEPPs
- meets the Environment Protection Principles of the Act
- is consistent with the Statewide Waste and Resource Recovery Infrastructure Plan, Metropolitan Implementation Plan, and the Recycling Victoria policy
- will contribute to meeting waste disposal needs for Victoria and does not undermine recycling
- has considered potential climate change impacts in accordance with EPA's obligations
- GSWT meets the 'fit and proper person' requirement of the Act.

Key issues

Best practice

Why is it a concern?

Best practice is a requirement of the SEPPs. New sources of emissions must apply best practice to manage those emissions. EPA considers best practice one of the most important requirements of the policy as changes over time will place stricter controls and requirements on new sources of emissions.

Conclusions of the assessment

WtE is an established disposal method that is used globally, with international best practice standards available and used in this assessment. Accordingly, the potential environmental risks and impacts are well known, with evolving improvements in containment, control, and monitoring technologies. The European Union's Industrial Emissions Directive (IED 2010/75/EU) and the Best Available Techniques reference document and conclusions, are key compliance policy documents that the facility will need to meet.

These directives and polices are regularly updated to reflect international best practice environmental standards. During the assessment period of GSWT's application the directives and reference documents were updated. The updates introduced more stringent air and water emission standards – see table 2. The facility will need to comply with all relevant updated environmental standards.

Table 2: previous and updated best practice air emissions

Emission limit for continuous monitoring		
Pollutant	**EU 2010/75/EU**	**BAT Conclusions 2019**
Total dust	10 (mg/Nm^3) daily average	< 2-5 (mg/Nm^3) daily average
Total organic carbon	10 (mg/Nm^3) daily average	< 3-10 (mg/Nm^3) daily average
Hydrogen chloride	10 (mg/Nm^3) daily average	< 2-6 (mg/Nm^3) daily average
Hydrogen fluoride	1 (mg/Nm^3) daily average	< 1 1 (mg/Nm^3) daily average
Sulphur dioxide	50 (mg/Nm^3) daily average	5-30 (mg/Nm^3) daily average
Nitrogen dioxide	400 (mg/Nm^3) daily average	50 – 120 (mg/Nm^3) daily average
Mercury	N/A	< 5-20 (µg/Nm3) daily average
Emission limits for non-continuous monitoring		
Pollutant	**EU 2010/75/EU**	**BAT Conclusions 2019**
Dioxins/furans	0.1 (ng/Nm^3) average over the sampling period	< 0.01-0.04 (ng/Nm^3) average over the sampling period
Metals	0.05 (mg/Nm^3) average over the sampling period	0.005-0.02 (mg/Nm^3) average over the sampling period

How will it be managed?

The requirements of EPA approval and licence conditions will ensure the operation of the plant is managed in accordance with best practice.

Air emissions

Why is it a concern?

Combustion or gasification of waste generates emissions of a range of air pollutants. EPA received a number of submissions raising concerns specifically about the potential environmental and health impacts of emissions from the facility. Air quality modelling was performed according to the requirements of the SEPP.

Conclusion of the assessment

The application complied with the requirement to achieve best practice and continuous improvement for all relevant indicators and reductions to the 'maximum extent achievable' for the most hazardous air pollutants.

How will it be managed?

There will be a flue gas treatment system and best practice controls will achieve compliance with the SEPP.

There will be continuous monitoring of air pollutants, with the results governing treatment of the flue gas to achieve best practice emission control.

Air emissions – separation distances

EPA has also assessed the suitability of the separation distances from the facility to nearest residences, community centres, and schools. EPA has considered the air, amenity, and human health assessments detailed in the application and has determined that the proposed separation distances are adequate for the facility. EPA also notes the site is:

- within an area identified as the state-significant Southern Industrial Precinct under Plan Melbourne 2017-2050
- within an area identified as the Ordish Road Precinct Hub of State Importance under the Statewide Waste and Resource Recovery Infrastructure Plan
- within an area subject to the Ordish Road Precinct Waste and Resource Recovery Hub Plan.

Examples of the separation distances at Energos reference facilities is provided in figures 1 and 2 below.

Air emissions – public reporting of emission monitoring

The works approval includes conditions requiring the public reporting of monitoring results on an accessible website. This includes:

- reporting of continuous emission monitoring results
- reporting of residual ash waste monitoring results
- reporting of daily compliance status of air emissions against licence limits
- GSWT will also need to prepare a community engagement and complaints response plan.

Health impacts

Why is it a concern?

Protecting human health is integral to the intent of the Act, subordinate legislation and policies. EPA's assessment process specifically considers the potential impacts to human health and how these impacts are controlled.

To supplement its application GSWT submitted a human health risk assessment.

In additional to an assessment of the works approval application, EPA has previously commissioned an independent literature review of publicly available research on human health impacts from air emissions from modern waste to energy facilities. The objective

was to determine the possible impacts on the health of residents living close to the waste to energy facilities.

Conclusion of the assessment

EPA's review of literature concluded that there was little potential for health impacts or risk from exposure to emissions from modern waste to energy facilities, noting the few studies available.

The contribution of emissions from the proposed activity were found to be very low and the technology of the facility design combined with conditions of operation, capable of ensuring protection of human health.

How will it be managed?

Management will largely be though the implementation of key design controls and operation of the facility to meet international best practice. Conditions of EPA approvals will require routine review of the operations and emissions to ensure the necessary protections of health.

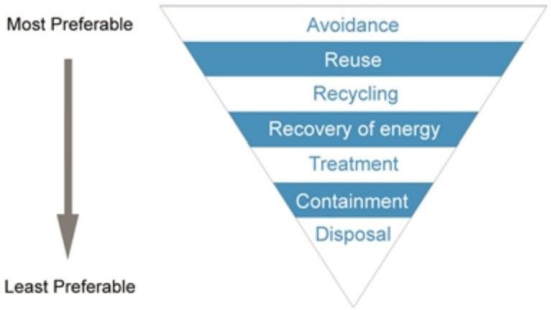
Waste hierarchy

Why is it a concern?

The waste hierarchy is one of the eleven principles of the Act. EPA needs to give consideration of how an application and a decision aligns with these principles.

Conclusions of the assessment

The waste hierarchy preferences recovery of energy from waste after recycling as a method for managing waste over sending the waste to landfill. Landfilling is currently the dominant option available in Victoria for residual waste. This proposal targets only residual wastes and so does not undermine recycling options.



How will it be managed?

EPA has required the facility maintains capacity to install a system capable of higher waste recovery and an investigation reviewing the feasibility of building such a pre-sort facility every 5 years.

Precautionary principle

Why is it a concern?

The precautionary principle is one of the eleven principles of the Act. EPA needs to give consideration of how an application and a decision aligns with these principles.

Conclusions of the assessment

The precautionary principle requires the consideration of the risk-weighted consequences, rather than a total avoidance of all risks. This requires a reasonable balance between the risks and costs associated with various environment protection measures and the benefits to be derived from them.

The potential environmental risks and impacts from waste to energy facilities are well known, with evolving improvements in emission containment, control, and monitoring technologies. The EU's directives and reference documents are also the key compliance policy documents that the proposal will need to meet. These are regularly updated to reflect international best practice.

How will it be managed?

EPA requires appropriate controls on incoming waste feedstock, on site waste storage, outgoing residual waste, air emission pollution controls, and monitoring programmes.

Other issues assessed

Waste generated by the facility

Incineration or gasification of waste creates three types of ash: bottom ash, boiler ash, and air pollution control residue (also known as fly ash). Bottom ash will be stored onsite pending reuse or disposal. Boiler and fly ash will be stored separately onsite pending offsite treatment and disposal. Any waste generated by the facility will need to be disposed of in accordance with the framework of the Act, including the *Environment Protection (Industrial Waste Resource) Regulations 2009*. Any reuse will require EPA approval.

Energy use and greenhouse gas emissions

EPA has determined that the proposal includes best practice energy efficiency standards for waste to energy facilities and will use best practice management of greenhouse gas emissions.

Noise

Operational noise will meet the noise levels set in SEPP at all times. Measurements will be taken during the operation of the facility to confirm that the actual noise of operations reflects the application predictions.

Odour

Controls will be sufficient to reduce the risk of odour beyond the site boundary. The waste and fuel bunkers will be constantly under negative pressure, with air injected into the gasification process which destroys odorous gases.

Conditions of approval

The works approval is subject to conditions. Some conditions must be met prior to commencement of construction, other relate to commissioning of the facility. In addition, operation of the facility will be regulated through an EPA-issued licence. The works approval conditions include:

- The final detailed design must be verified by an EPA-appointed industrial facilities auditor (or alternative expert approved by EPA).
- The construction of the facility must be verified by an EPA-appointed industrial facilities auditor (or alternative expert approved by EPA).
- The commissioning of the facility will be verified under EPA-issued commissioning approval.
- Verification that the facility can treat the waste in a safe manner.
- GSWT must clearly describe the waste streams that will be accepted at the premises, including waste categories, volume, and sources.
- GSWT must make monitoring data publicly available at daily, monthly, and quarterly intervals.
- Provision for future incorporation of options to improve material recovery from the waste feedstock prior to gasification, if this becomes viable.

More information

Read EPA's full assessment report on Engage Victoria.

Please contact EPA on 1300 372 842 (1300 EPA VIC) or via email on contact@epa.vic.gov.au

Examples of reference facility separation distances

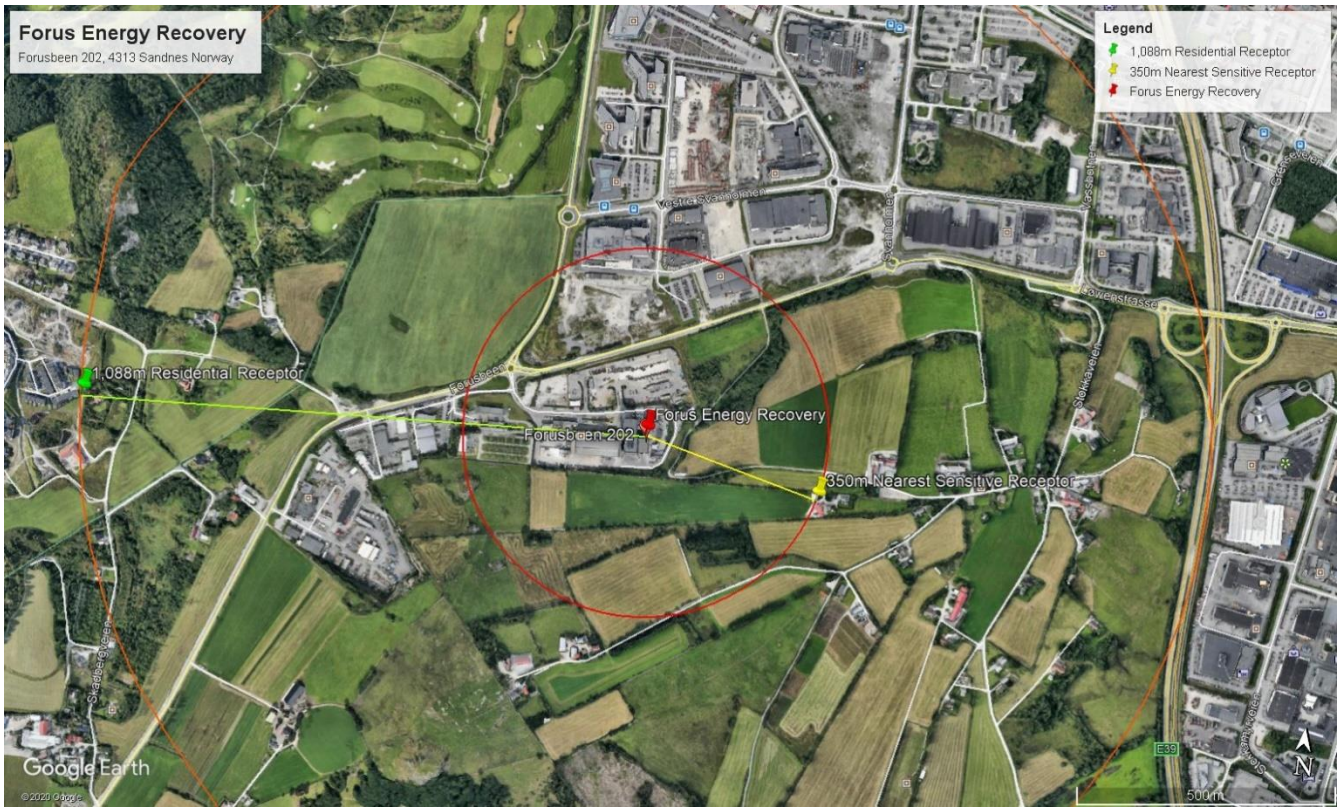


Figure 1 example of Energos reference facility separation distance Forus, Norway

Figure 2 example of Energos reference facility separation distance Sarpsborg, Norway

Appendix A: EPA's response to the Recommendations of S20B Conference Chair Report

RECOMMENDATIONS OF THE CHAIR OF THE COMMUNITY CONFERENCE
Before the determination of the works approval application, it is further recommended that the following actions be undertaken by EPA Victoria. It is also recommended that a response to each of the actions is included in EPA's works approval assessment report, with a summary that is written in plain English and (if appropriate) translated in line with the requirements of CALD community members:
1.1. Verify, through expert assessment, the nature and extent of potential odour and other air emission risks and the likely ability of GSWT to keep these within regulated limits, including during abnormal conditions (e.g. plant breakdown, blackouts, fire, extreme winds etc.). Include relevant information from similar technology in operation overseas, and its potential application in this location.
EPA has verified, through expert assessment, the nature and extent of potential odour and other air emission risk and the likely ability of the applicant to keep within these regulated limits. See section 6.3, 6.4, 6.5 and 6.12 of the full works approval application assessment report (WAAAR).
1.2. Verify, through expert assessment, the nature and extent of risk associated with storage, treatment, and disposal of process by-products and the likely ability of GSWT to keep these within regulated limits, including during abnormal conditions (e.g. plant breakdown, blackouts, fire, extreme winds etc.). Include relevant information from similar technology in operation overseas, and its potential application in this location.
EPA has verified, through expert assessment, the nature and extent of risk associated with storage, treatment, and disposal or process by-products and the likely ability of the applicant to keep within these regulated limits. See section 6.7, 6.8, 6.9, 6.10, 6.11 and 6.12 of the full WAAAR.
1.3. Further to Recommendations 1.1 and 1.2, consider the use of the Precautionary Principle where verifiable data regarding potential health and environmental impacts do not exist.
EPA has considered the Precautionary Principle. See section 5.2.1 of the full WAAAR.
1.4. Require the development of an Air Quality Management and Monitoring Plan including regular publication of data in a form that is easily understood and accessible by the layperson. The Plan should include the actions that Great Southern Waste Technologies will take if emissions exceed threshold limits.
See condition WA_W1(8) requiring an emissions monitoring and assessment plan. See condition WA_W1(13) requiring public reporting of monitoring results.
1.5. Investigate, through EPA's Environmental Public Health Unit, baseline health data and the potential health implications of the Application, particularly the potential cumulative impacts given the existing local industry.
The WAA included a Human Health Risk Assessment (**HHRA**). EPA has assessed the HHRA and considered the potential health implications of the proposal. See section 6.4 of the full WAAAR.

1.6. Clarify, publicise and explain the rationale for the acceptable 'separation distance' for a facility of this nature in relation to residential areas and schools, with reference to relevant planning policy.

The WAA included an air quality impact assessment, odour impact assessment, and HHRA. EPA has assessed these in relation to the adequacy of the separation distances.

See section 6.3, 6.4, 6.5, and 6.6 of the full WAAAR.

1.7. Require the Applicant to clarify how this proposal is consistent with state government's Circular Economy Policy and the 2017 Climate Change Act and that it represents the best available technology.

EPA has assessed the application against the Victorian Waste and Resource Recovery Infrastructure Planning Framework and *Climate Change Act 2017*.

See section 1.7.4, 5.4, and 6.1 of the full WAAAR.

1.8. Require the Applicant to develop succinct, plain English fact sheets and translate in line with local CALD community requirements. These should describe the proposal, including answering outstanding questions as detailed in this report. Efforts should be made to ensure that the documents are not written from a public relations perspective or in complex scientific language, but are developed with the sole purpose of building community understanding. In particular, the following should be explained:

1.8.1. The rationale for proposing the development at this location given the concerns that community members have expressed,

1.8.2. An evidence-based explanation of potential air emission and noise impacts and planned management strategies,

1.8.3. A detailed explanation as the how feedstock will be correctly sorted and the strategies employed to ensure that subsequent emissions are within EPA limits,

1.8.4. Strategies to ensure that local waterways, neighbouring properties and groundwater are not adversely impacted due to drainage or leaching and

1.8.5. Emergency response strategies in the case of abnormal conditions.

EPA required the applicant to provide a response to issues raised through two submission periods. The applicant's responses are available on the dedicate Engage Victoria webpage.

1.9. Consider a further information session or question and answer process after the Requests for Information have been received from the Application and accepted by EPA. These sessions should include language translation where necessary and appropriate technical experts to answer community questions clearly and succinctly.

EPA provided an additional public comment period to allow community members to make submissions on the additional information received. During this period, EPA received 36 submissions. The applicant provided a response to these submissions which is available on the dedicate Engage Victoria webpage.

Should the works approval application be approved, it is further recommended that the following actions be undertaken by EPA Victoria:

3.1 Require the development and ongoing implementation of a Community Engagement and Complaints Response Plan as a condition in the works approval and/or licence.

See condition WA_W1(14) requiring a report detailing a community engagement and complaints response plan.

3.2 Ensure that the Air Quality Management and Monitoring Plan (as detailed in Recommendation 1.4) is implemented in accordance with any EPA licence that is issued.
Licence condition will require ongoing emission monitoring in accordance with plans approved by EPA. The company will be required to publish emission monitoring results on a publicly accessible website.
3.3 Following the issue of any EPA licence to operate, ensure that any breaches of air emissions or noise conditions are enforced.
EPA has considered licensing of the proposed facility. Severe penalties apply for contravention of the *Environment Protection Act 1970.* See section 7 of the full WAAAR.
3.4 Actively promote the EPA's role in managing compliance to local residents, including detail on how to register a complaint in the event of noncompliance.
See condition WA_W1(13) requiring a plan providing public reporting of monitoring results. See condition WA_W1(14) requiring a report detailing a community engagement and complaints response plan. Information on how to report pollution can be found on EPA's website: https://www.epa.vic.gov.au/report-pollution
3.5 Provide information to the community about the requirements post-closure of the Applicant to ensure that the site is remediated.
See condition WA_W1(14) requiring a decommissioning plan that identifies risks of contamination including potential remediation actions.
Regardless of whether the works approval application is approved or rejected, it is further recommended that the following actions be undertaken by EPA Victoria:
5.1. Make this report publicly available.
The full WAAAR is available on the dedicated Engage Victoria webpage for this WAA. This document presents a plain English summary of the WAAAR.