

Air and greenhouse gas emissions



To help achieve our purpose: create a world without waste to preserve our planet, Sims Resource Renewal is aiming to build several resource renewal facilities globally by 2030. We are proposing the first resource renewal facility will be located at 1904 Hume Highway, Campbellfield, Victoria. The proposed facility will be our first step in eliminating approximately one million tonnes of waste to landfill. Our aim is to transform the waste material into useful products for society.

We will use plasma gasification to transform automotive shredder residue (ASR), left over once we have removed as much metal as possible as part of our metal recycling process, into a synthesis gas (syngas). The syngas is then further processed to produce products including hydrogen, carbon dioxide and a glass like vitrified product. Hydrogen and carbon dioxide will be captured and on-sold from day one.

Overview

The intent of the proposed facility is to maximise the production of hydrogen and the capture of carbon dioxide, while minimising emissions to the atmosphere. Hydrogen and carbon dioxide will be captured and on-sold as products from day one. Direct greenhouse gas (GHG) emissions from the facility will be reduced by recovering carbon for sale.

The proposed facility will generate emissions to air as a part of the day-to-day operation of the facility. The facility will use best available techniques and technologies to minimise emissions from the process and ancillary infrastructure.

The facility will be powered by a green electricity source.

Assessment

A specialist air quality assessment was undertaken, using computer modelling to assess the dispersion of air emissions from the proposed facility. The predicted levels of emissions were assessed against EPA Victoria's guidance, and included consideration of nearby sensitive receptors (the closest of which is a residential area 800m south of the site).

The assessment considered:

- Characteristics of the ASR.
- How the ASR is processed to create hydrogen.
- Ambient monitoring data from the nearest EPA Victoria station at Alphington.
- Emissions from nearby facilities that report to the Federal Government National Pollutant Inventory (NPI).
- Emissions from other EPA Victoria licenced facilities near the site.
- Air emissions sources from the proposed facility.
- Potential impacts on the air quality in the community surrounding the proposed facility.
- Potential impacts to Essendon Fields and Melbourne Airports.

GHG emissions will be considered in the context of energy consumption and non energy-related GHG emissions. GHG emissions reductions, relating to no longer needing to transport waste to landfill, have a positive benefit on overall emissions.

Further information on GHG emissions will be incorporated into the Development Licence and Planning Permit applications.



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Key findings

Preliminary findings from an air emissions assessment of the proposed facility has shown emissions will comply with relevant EPA guidance for air quality at sensitive receptors in the surrounding community (the closest of which is a residential area 800m south of the site).

The assessment has considered emissions from all types of operating conditions, including facility start-ups, normal “steady-state” operations and shutdowns. It is anticipated that there are two primary emission sources. They are the boiler, that operates continuously during standard operations, and the enclosed ground flare, that operates when the facility is turned on to relieve pressure as required.

Carbon dioxide and water will be the predominant products released to the atmosphere, with minor concentrations of oxides of nitrogen and carbon monoxide also released. There will be other emissions, however these will be minor.

The facility will be operational on a continuous basis and as such, we have presented the likely emissions for key compounds from the boiler stack during normal operation (Table 1). The results have been reported as a ground level concentration (GLC) and compared against the EPA Victoria guidelines. The GLC shown for each compound is the highest concentration reported in the surrounding area to the site. Contributions of criteria key pollutants from the proposed facility were modelled to be well below the existing concentrations anticipated in the background air quality.

It is anticipated that 85% of carbon from ASR will be captured through the process, with the remaining 15% lost through the various processes and subsequently emitted to the atmosphere as carbon dioxide. Sims Resource Renewal is investing in research and technology to further increase the amount of carbon captured to support its purpose of enabling a more circular operating model.

Table 1

Compound	EPA Victoria Guideline ($\mu\text{g}/\text{m}^3$)	Interval	Highest predicted GLC near proposed facility ($\mu\text{g}/\text{m}^3$)
Nitrogen dioxide	150	1 hour	53.2
	28	12 months	6.4
Carbon monoxide	10,306	8 hours	14.1
Sulfur dioxide	266	1 hour	0.010
	53	24 hour	0.008
Particulate matter (PM_{10})	50	24 hour	1.25
	25	12 months	0.19
Particulate matter ($\text{PM}_{2.5}$)	25	24 hours	1.25
	8	12 months	0.19
Polycyclic aromatic hydrocarbons (Benzo(a)Pyrene)	0.002	12 months	0.0000168
Dioxins	0.0000000037	12 months	0.0000000013
Lead	0.5	12 months	0.0000131

Next steps

The air quality study and further information on GHG emissions will be incorporated into the Development Licence application submitted to EPA Victoria, and Planning Permit application submitted to Hume City Council.

We will continue to work with EPA Victoria to demonstrate that our air treatment processes use best available techniques and technologies, prior to validating outcomes during commissioning testing. Validation is required by EPA Victoria prior to issuing of the final licence.