

Technical Memorandum

27 April 2022

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From	Tom Young	Ref. No.	12559567
Subject	EES referral for the Geelong Hydrogen Hub – Greenhouse gas assessment		

1. Introduction

GHD Pty Ltd (GHD) is engaged by GeelongPort Pty Ltd (GeelongPort) to support the preparation of environmental referral documents in relation to the proposed development of the Geelong Hydrogen Hub at the Port of Geelong. GeelongPort is seeking to undertake the following referrals to the relevant agencies:

- Environmental Effects Statement (EES) referral to the Victorian Minister for Planning and the Department of Environment, Land, Water and Planning (DELWP) under the *Environment Effects Act 1978*
- *Environment Biodiversity and Conservation Act 1999* (EPBC) self-assessment, and potentially a referral under the same Act to the Commonwealth Department of Agriculture Water and Environment (DAWE)

1.1 Purpose of this memo

This memorandum has been prepared to support and inform the environmental referral documents through an initial assessment of the potential direct greenhouse gas emissions (i.e. Scope 1 from the combustion of fuels etc).

This technical memorandum presents the findings from the following activities:

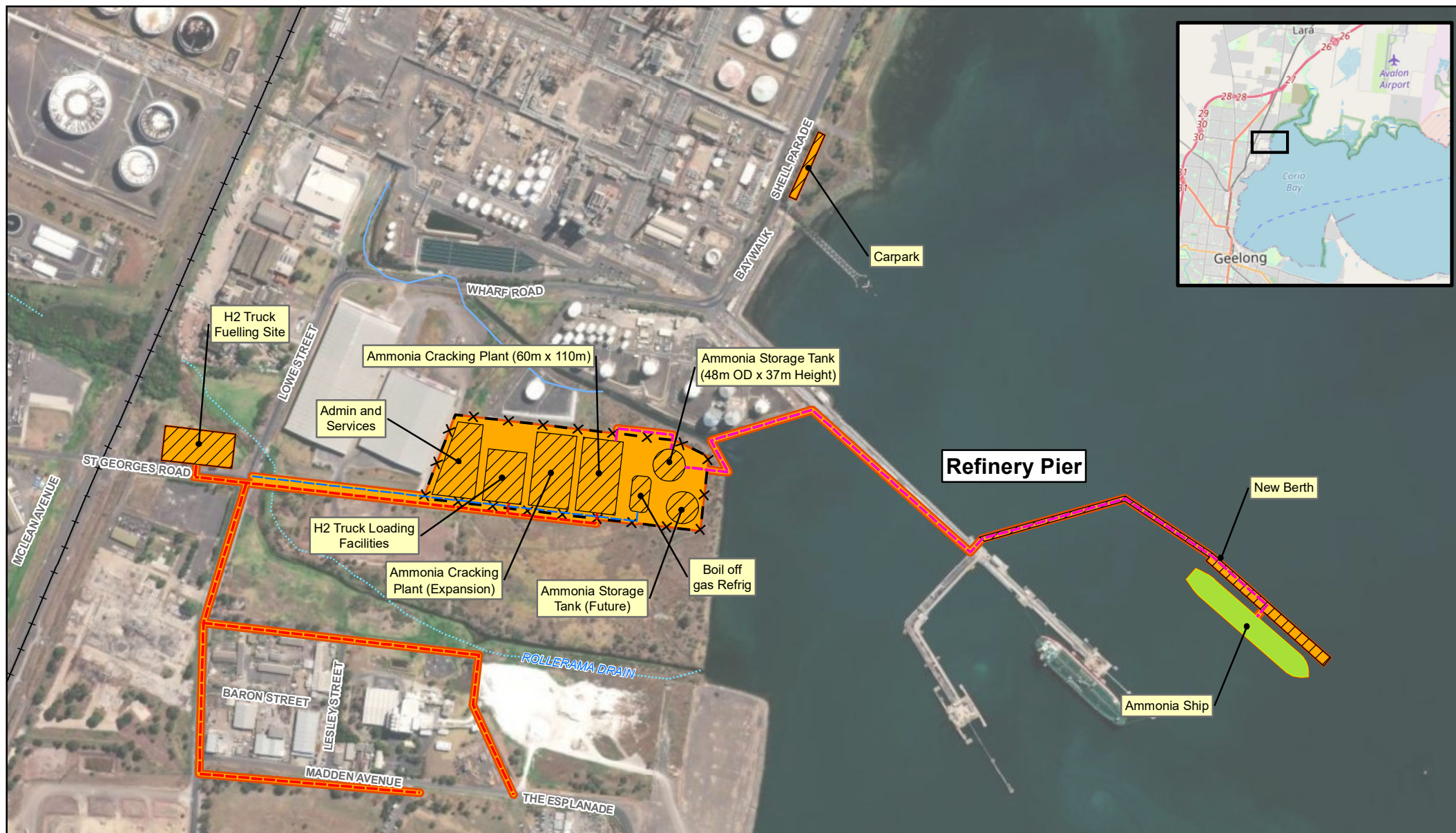
- High level summary of relevant legislation
- High level qualitative assessment of construction emissions
- High level qualitative assessment of operational emissions
- Recommendations for further investigations

2. Project overview

GeelongPort propose to develop a facility at Port of Geelong to import liquid ammonia, produce hydrogen and nitrogen by ammonia decomposition (or cracking over a catalyst), and distribute hydrogen to potential offtake users within the Port of Geelong as well as in wider Victoria. Use of hydrogen for these industrial processes will present a strong offset for gas production and consumption needs. The site layout highlights the key process buildings, pipeline routes and structures, and allows for future expansion or alternative applications for the ammonia/hydrogen (Figure 1). The proposed site for the facility comprises approximately 7.5 hectares of land that is wholly owned by GeelongPort. The key project components comprise:

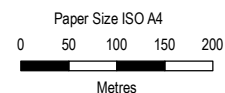
- New ammonia import berth as an extension of Refinery Pier in Corio Bay
- Transfer pipeline to an onshore storage facility
- Onshore storage facility for liquid ammonia (60m diameter storage tank(s))
- Catalytic cracking plant(s) to decompose ammonia into hydrogen and nitrogen
- Onshore distribution pipelines to potential industrial users either within the Port of Geelong or in adjacent industrial zones
- Vehicle refuelling facility (hydrogen)
- Carpark

An options assessment was undertaken for alternative berth layouts to accommodate future imports of ammonia. The preferred berth layout is located within the existing dredge pocket and therefore no capital dredging is required.

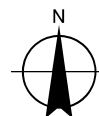


LEGEND

- Hydrogen Off Take Route Options
- Ammonia Import Pipeline
- Road and Power Utilities
- Building/area
- Ammonia Ship
- Fence
- Concept layout footprint



Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55



GeelongPort
GeelongPort Hydrogen Facility EES Referral

Conceptual site layout

Project No. 31-12559567
Revision No. 0
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FIGURE 2

3. Relevant legislation, policy and guidelines

Table 1 presents an overview of the key legislation and policy that forms the regulatory framework for greenhouse gas emissions in Victoria and Australia.

Table 1 Relevant transport legislation and strategies

Legislation and strategies	Brief description
Commonwealth	
<i>National Greenhouse and Energy Reporting (NGER) Act 2007</i>	The NGER Act establishes the legislative framework for the NGER Scheme which is a national framework for reporting greenhouse gas emissions, greenhouse gas projects and energy consumption and production by corporations in Australia.
NGER Regulations 2008	The NGER Regulations 2008 sets out the details that establish compliance rules and procedures for administering the NGER Act. For example, the NGER Regulations specify the information that must be provided in reports under the NGER Act and the way in which the NGER Act must be applied
NGER Measurement Determination 2008	The NGER Measurement Determination describes the methods, standards and criteria to be applied when estimating greenhouse gas emissions, energy production and energy consumption
NGER (Safeguard Mechanism) Rule 2015	The NGER (Safeguard Mechanism) Rule sets out the details that establish compliance rules and procedures for administering the safeguard mechanism. The safeguard mechanism provides a framework for Australia's largest emitters to measure, report and manage their emissions. It does this by encouraging large facilities, whose net emissions exceed the safeguard threshold, to keep their emissions at or below emissions baselines set by the Clean Energy Regulator.
State legislation, policies, and guidelines	
<i>Climate Change Act 2017</i>	<p>The <i>Climate Change Act 2017</i> provides Victoria with the legislative foundation to manage climate change risks, maximise the opportunities that arise from decisive action, and drive our transition to a climate-resilient community and economy with net-zero emissions by 2050. The Act:</p> <ul style="list-style-type: none"> – Establishes a long-term emissions reduction target of net-zero by 2050 – Requires 5 yearly interim targets, to keep Victoria on track to meet this long-term target – Introduces a new set of policy objectives and an updated set of guiding principles to embed climate change in government decision making – Requires the government to develop a Climate Change Strategy every 5 years, which will set out how Victoria will meet its targets and adapt to the impacts of climate change (from 2020) – Requires Adaptation Action Plans for key systems that are either vulnerable to the impacts of climate change or essential to ensure Victoria is prepared (from 2021) – Establishes a pledging model to reduce emissions from government's own operations and from across the economy (from 2020) – Establishes a system of periodic reporting to provide transparency, accountability and ensure the community remains informed – Sits alongside other key Victorian Government energy and climate change initiatives including Victoria's Climate Change Framework, Victoria's Climate Change Adaptation Plan 2017-2020 and Victoria's Renewable Energy Action Plan
Protocol for Environmental Management: Greenhouse gas emissions and energy efficiency in industry	This Protocol for Environmental Management is an incorporated document of the State environment protection policy (Air Quality Management) (SEPP (AQM)). Whilst SEPP(AQM) has been repealed with the amendment to the Environment Protection Act, the Protocol for Environmental Management currently remains EPA Victoria's guidance document for businesses on requirements for the management of greenhouse gas emissions and energy consumption.

4. Potential greenhouse impacts

4.1 During construction

The most significant greenhouse gas emissions that are likely to occur during construction will be those associated with the embodied energy of the materials used (for instance concrete and steel). These are referred to as Scope 3 emissions which are indirect emissions which occur away from the project's boundaries. Scope 3 emissions are not counted towards the relevant EES trigger threshold of '200,000 tonnes of carbon dioxide equivalent per annum, directly attributable to the operation of the facility' as set out on page 7 of the 'Ministerial guidelines for assessment of environmental effects under the Environment Effects Act 1978'.

Whilst there will be some direct greenhouse gas emissions from sources such as fuel consumption of construction equipment (Scope 1 emissions) it is considered improbable that they would reach the trigger threshold and in any case do not meet the second part of the trigger as they are not 'directly attributable to the **operation** of the facility'.

4.2 During operations

The greatest potential source of emissions during the operation of the facility will be from the energy used to 'crack' the ammonia to hydrogen and nitrogen. The technology used to crack ammonia would be a closed loop system to preserve the integrity of the green hydrogen, and the plant would operate using ammonia or hydrogen as its energy source. Consumption of green ammonia or hydrogen does not represent direct greenhouse gas emissions.

There are a number of other potential significant indirect (Scope 2 and 3) greenhouse gas emission sources such as emissions generated during the production of ammonia (unless certified green ammonia is produced) and emissions associated with the transport of green ammonia.

None of the above identified emission sources meet the EES trigger requirement as they are not 'directly attributable to the operation of the facility'. It is considered that any onsite direct emissions, such as compressors or vehicles, are unlikely to meet the '200,000 tonnes of carbon dioxide equivalent per annum' trigger threshold.

5. Conclusions

5.1 Summary of findings

It is considered unlikely that the project will meet the '200,000 tonnes of carbon dioxide equivalent per annum, directly attributable to the operation of the facility' as set out on page 7 of the 'Ministerial guidelines for assessment of environmental effects under the Environment Effects Act 1978'.

5.2 Recommendations

The following items are recommended before proceeding with the construction and development of the new facility:

- The above assessment represents a high level qualitative assessment based on a general understanding of the project at the early project definition stage. A more comprehensive impact assessment of construction and operations greenhouse gas emissions considering Scope 1, 2 and 3 emissions should be carried out once the project is further defined and an ammonia cracking technology is selected. Opportunities to reduce emissions should be considered in the assessment.

Regards

Tom Young

Technical Director – Greenhouse Gas Impact Assessment