

# **ANNEXURE 5**

**Air Quality Assessment**

**prepared by GHD Pty Ltd**

**Lot 1 DP 838753 (No. 160), Lot 241 DP 1130535 (No. 171)  
and Lot 143 DP 1069758 (220), Bolong Road, Bomaderry**



12 December 2017

Anthony Gstalter  
Supagas Pty Ltd  
23 Commercial Drive  
Dandenong VIC 3175

Our ref: 2127004-29941  
Your ref:

Dear Anthony,

## **Shoalhaven Starches Mod 13 Air Quality Assessment Review of Air Quality**

### **1 Introduction**

Shoalhaven Starches Pty Ltd have been approached by Supagas to construct a Carbon Dioxide (CO<sub>2</sub>) plant adjacent to the former Dairy Farmers factory site that now belongs to the Manildra Group of Companies and which Shoalhaven Starches forms a part of. The site is located at 220 Bolong Road, Bomaderry (Lot 143 DP 1069758).

The proposed CO<sub>2</sub> plant has the potential to influence the local air quality. An air quality assessment has been undertaken to provide supporting information for the Project Approval.

### **2 Review of proposal and potential emissions**

#### **2.1 Site location and sensitive receptors**

The proposed CO<sub>2</sub> plant location is identified in Figure 2-1. The proposed CO<sub>2</sub> plant is located to the northeast of Shoalhaven Starches manufacturing facility.

The site is proximate to a number of sensitive receptors. The township of Bomaderry lies to the northwest of the existing Shoalhaven Starches factory and west of the packing plant and proposed CO<sub>2</sub> plant. Nowra is situated south of the proposed CO<sub>2</sub> plant.

The nearest receptors to the existing factory, packing plant and environmental farm, and the proposed CO<sub>2</sub> plant are identified Table 1. The proposed CO<sub>2</sub> plant is located further from the identified receptors than any existing site sources of odour or pollutants onsite.

**Table 1      Summary of nearby sensitive receptors**

Receptor	Range, m	To nearest odour source	Direction
R1	150	Packing Plant	W
R2	1300	Factory	SW
R3	700	Factory	S
R4	1300	Factory	SE



Figure 2-1 Site location and sensitive receivers



## 2.2 Overview of proposal

Supagas seeks to establish a plant on the subject land to take CO<sub>2</sub> from the Shoalhaven Starches operations and process this gas to food grade for the food and beverage market.

Supagas will take CO<sub>2</sub> with a purity of approximately 92% from the Shoalhaven Starches operations and process this gas into food grade CO<sub>2</sub> (>99.99% purity) suitable for food and hospitality markets around Australia.

The flue gas will be taken directly from the Shoalhaven Starches CO<sub>2</sub> flue therefore reducing CO<sub>2</sub> emissions by up to 50 tonnes per day during the initial stage of the proposal and up to 100 tonnes per day when fully operational.

Supagas propose installing the following equipment at the site to enable this to be undertaken:

- **Cold water scrubber.** This dehumidifies the warm, moist CO<sub>2</sub> existing the raw gas feed and will primarily remove water and alcohol from the feed stream.
- **CO<sub>2</sub> compressor.** The CO<sub>2</sub> compressor takes the dry CO<sub>2</sub> from the cold water scrubber and raises the CO<sub>2</sub> pressure to 1950 kPa.
- **Sulphide removal beds.** CO<sub>2</sub> is fed into the columns that contain an active ingredient and removes any organic sulphides. This active ingredient is removed when spent and sent for disposal at an authorised facility.
- **Cat Ox System.** CO<sub>2</sub> is fed through a CATOX (similar to a car exhaust) and all traces of Hydrocarbons are burnt into moisture and CO<sub>2</sub>. This system runs at 330 degrees.
- **CO<sub>2</sub> driers.** The CO<sub>2</sub> is further dried to a point where its moisture content is reduced to less than 20 parts per million.
- **CO<sub>2</sub> liquifier.** The gaseous CO<sub>2</sub> at approximately 1900 kPa is liquefied.
- **CO<sub>2</sub> NO<sub>x</sub> removal vessel.** Liquid CO<sub>2</sub> is run over a bed of molecular sieve. This absorbs any NO<sub>x</sub>. This is changed every 9 months or so and disposed of in accordance with statutory requirements.
- **CO<sub>2</sub> tanks.** The CO<sub>2</sub> is then stored in one 100 tonne and one 200 tonne tanks (providing total storage of 300 tonnes) awaiting despatch.
- **Distribution.** The CO<sub>2</sub> is then distributed. It is anticipated that there will be 2 types of transport combinations. A B-Double capable of carrying a 30 tonne payload and a single tanker that has a capacity of 20 tonnes. Stage 1 will involve a maximum of 2 truck movements per day and stage 2 will involve a maximum of 5 truck movements per day. Supagas anticipate all movements occurring during daylight hours.

An indicative site layout is provided in Figure 2-2.

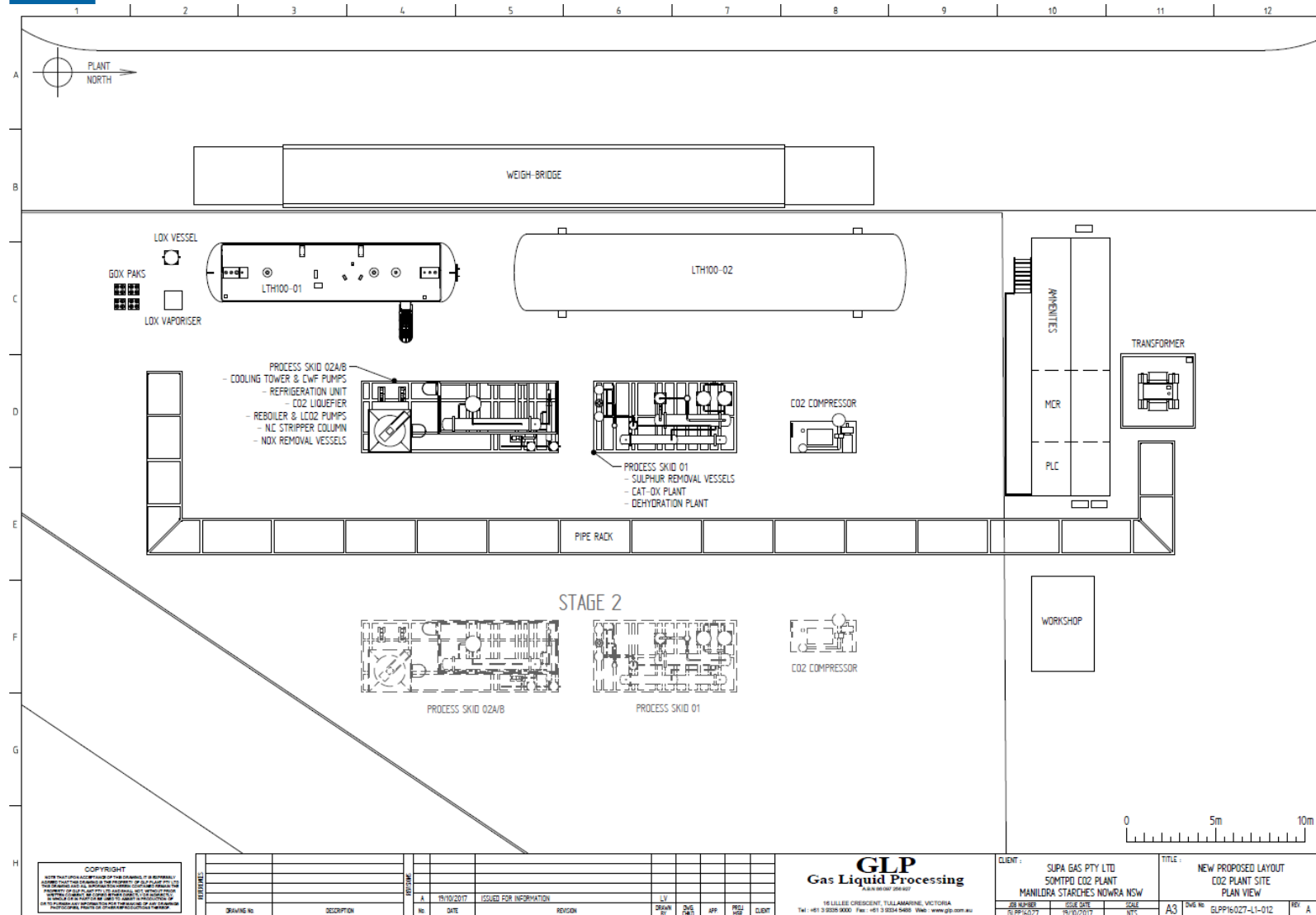


Figure 2-2 Indicative site layout



## 2.3 Emissions

Supagas have supplied a summary of potential emissions from the various process streams. As the system is primarily enclosed, only minor quantities of emissions are anticipated. The concentrations of various emissions is presented in Table 2 below.

Streams 1, 2,3 and 6 are liquid and are composed primarily of H<sub>2</sub>O.

Stream 1 (cold scrubber drain) is estimated to have vapour comprising of a number of potentially odorous oxygenated chemical compounds including Ethanol, Acetaldehyde and Ethyl Acetate. Supagas have advised that vapour exiting the cold scrubber is sent down the pipeline to the CO<sub>2</sub> plant on the Meats Works Site for further treatment. Therefore this stream will not be a source of odorous or toxic emissions.

Stream 2 (CO<sub>2</sub> compressor after-cooler condensate drain) may contain trace levels of oxygenated chemical compounds, however this stream of up to 1.8 litres per hour (99.7% H<sub>2</sub>O and 0.3% CO<sub>2</sub>) is not a significant quantity to be a source of odorous emissions.

Stream 3 (dehydration unit cooler condensate drain) and Stream 4 (Drier regeneration gas vent) contain no odorous or toxic air pollutants.

The two sources of gaseous emissions are Stream 4 (Drier regeneration gas vent) and Stream 5 (CO<sub>2</sub> liquefier gas vent) and contain no odorous or toxic air pollutants.



**Table 2 Summary of plant emissions**

*Stream	Description	Flowrate	Temperature °C	Concentration (Mole %)						
				CO <sub>2</sub>	O <sub>2</sub>	N <sub>2</sub>	H <sub>2</sub> O	**Oxygenates	pH (Typ)	Odour
1	Cold scrubber drain	1,028 LPH	17.7	0.1	0	0	99.57	0.33	6.2	Probable
2	CO <sub>2</sub> compressor after-cooler condensate drain	1.8 LPH	35	0.3	Trace	Trace	99.7	Trace	3.0	Nil
3	Dehydration unit cooler condensate drain	10.2 LPH	9.5	0.3	Trace	Trace	99.7	Nil	3.0	Nil
4	Drier regeneration gas vent	60 sm <sup>3</sup> /hr	0 - 240	65.2	5.52	29.28	Nil	Nil	NA	Nil
5	CO <sub>2</sub> liquefier gas vent	128 sm <sup>3</sup> /hr	-28.7	65.2	5.52	29.28	Nil	Nil	NA	Nil
6	Cooling tower blow-down	LPH	90	Trace	Trace	Trace	100	Nil	6.8	Nil

\*Stream numbers may be found on Proposed Block Flow Diagram Document Number P16027\_BFD 01\_R5 (shown on Page 2-2)

\*\*Oxygenates comprises mixture of compounds given below in varying proportions with the predominate species being ethanol:





### 3 Legislation and criteria

The *Protection of the Environment Operations Act 1997* (POEO Act 1997) establishes, amongst other things, the procedures for issuing licences for environmental protection in relation to aspects such as waste, air, water and noise pollution control. The owner or occupier of premises engaged in scheduled activities is required to hold an EPL and comply with the conditions of that licence.

The POEO Act 1997 requires that no occupier of any premises causes air pollution (including odour) through a failure to maintain or operate equipment or deal with materials in a proper and efficient manner. The operator must also take all practicable means to minimise and prevent air pollution (sections 124, 125, 126 and 128 of the POEO Act 1997).

The POEO Act 1997 includes the concept of 'offensive odour' (section 129) and states it is an offence for scheduled activities to emit 'offensive odour'.

Shoalhaven Starches operate as per Environmental Protection Licence Number 883 that states they must not cause or permit the emission of offensive odour beyond the boundary of the premises. Previous odour assessments undertaken for Shoalhaven Starches (Mod13 Air Quality Assessment, GHD 2017) show that the site is currently predicted to comply with the odour criterion at the four assessed nearby receptors.

### 4 Potential Impacts

GHD has reviewed the project information and potential emissions associated with the project. Small quantities of potentially odorous emissions are generated from Stream 1 however any of this vapour will be discharged into the pipeline to the CO<sub>2</sub> plant. Stream 2 may have trace levels of oxygenated chemical compounds however this would be less than 1.8 millilitres (less than 0.1% of 1.8 L) per hour. No significant or assessable odour or other toxic emissions are anticipated and based on the information provided there will be no impacts on any nearby sensitive receptors.

### 5 Conclusion

GHD has undertaken a review of the proposed CO<sub>2</sub> plant including a summary of emissions for the key process streams. The proposal is primarily enclosed with only minor emissions to air. Air quality impacts (odour and other pollutants) are not anticipated and there is no expected increase to the cumulative levels in the local area.

Sincerely  
GHD Pty Ltd



**Evan Smith**

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