Modification Report

MODIFICATION APPLICATION No. 30 (Mod 30) (MADE PURSUANT TO SECTION 4.55(1A) OF THE ENVIRONMENTAL PLANNING & ASSESSMENT ACT

For

Supagas

Site address

220 Bolong Road Bomaderry (Lot 143 DP 1069758)

Date

27/03/2025

AllenPrice

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Table of Revisions

Initial	Rev	Date	Details
SR	0	27/03/2025	Client Review
SR	1	01/04/2025	Issued for Review by DPHI
SR	2	19 /06/2025	Issued for Review by DPHI
SR	3	27/06/2025	Issued for Approval

EXECUTIVE SUMMARY

Shoalhaven Starches is a member of the Manildra Group of companies. The Manildra Group is a wholly Australian owned business and the largest processor of wheat in Australia. It manufactures a wide range of wheat-based products for food and industrial markets both locally and internationally.

The Shoalhaven Starches factory located on Bolong Road, Bomaderry produces a range of products for the food, beverage, confectionary, paper and motor transport industries including starch, gluten, glucose and ethanol.

Project Approval MP06_0228 was granted by the Minister for Planning on the 28th January 2009 for the Shoalhaven Starches Expansion Project. This approval also encapsulated previous approvals for the site into one overall approval for the site (at that time).

The Shoalhaven Starches Expansion Project sought to increase ethanol production at the Bomaderry plant in a staged manner from 126 million litres per year to 300 million litres per year. To accomplish the increase in ethanol production, this project required a series of plant upgrades and increase in throughput of raw materials, principally flour and grain.

Following the Minister's determination Shoalhaven Starches have been implementing and commissioning works in accordance with this Project Approval.

On the 7 August 2018 the Independent Planning Commission granted a Modification Approval (Mod 15) to Project Approval MP-06_0228 enabling Supagas to construct a Carbon Dioxide (CO_2) Plant adjacent to the former Dairy Farmers factory site that now belongs to the Manildra Group of companies and which forms part of the Shoalhaven Starches operations. On the 16 October 2021 the Minister for Planning approved a further modification to the Mod 15 approval enabling the installation of additional CO_2 storage vessels and other plant and equipment (Mod 20).

The site is located at 220 Bolong Road Bomaderry (Lot 143 DP 1069758) ("the subject site").

Supagas have now established the CO_2 Plant on the subject land in accordance with Mods 15 and 20. This facility takes CO_2 from the Shoalhaven Starches operations and processes this gas to food grade quality for the food and beverage market. CO_2 taken directly from Shoalhaven Starches operations under these existing approvals reduce emissions from their operations at present by up to 90 tonnes per day (TPD) under these approvals.

The existing plant was approved in two stages, i.e. initially 50 TPD and then this was increased to the present day 90 TPD. Supagas propose to undertake alterations and additions to this existing carbon dioxide plant to process an additional 75 TPD of carbon dioxide bringing the total capacity of the plant at the site up to 165 TPD.

This Modification Report has been prepared to address the above Modification Proposal.

The Shoalhaven Starches Expansion Project was a 'transitional Part 3A Project" for the purposes of Schedule 6A of the Environmental Planning & Assessment Act. As of the 1st March 2018 the transitional arrangements for former Part 3A projects have been discontinued. The discontinuation of the transitional arrangements for Part 3A projects and concept plans means that modifications are assessed through the State Significant Development (SSD) pathway. As such this Modification Application is made pursuant to Section 4.55(1A) of the Environmental Planning & Assessment Act 1979.

This Modification Report is supported by the following expert consideration:

- A Preliminary Hazard Analysis prepared by Pinnacle Risk Management ("Pinnacle"). Pinnacle's assessment and demonstrates compliance with all relevant risk criteria.

  Pinnacle also identifies that societal risk, area cumulative risk, propagation risk, transport risk and environmental risk are also concluded to be acceptable. The

primary reasons for the low risk levels from the site according to Pinnacle, are the separation distances between the hazards to the nearest place of residence and that high levels of carbon dioxide are required to cause fatality.

As the proposed alterations and additions to the existing CO_2 plant involve plant and equipment that are very similar in design to the existing plant and that the proposed modifications have already been reviewed using the HAZOP technique then Pinnacles does not make any further recommendations in relation to this Modification Proposal.

- A Noise Impact Assessment (revised) prepared by GHD which concludes:

  A construction noise assessment was undertaken to determine potential for increased noise levels at sensitive receiver and the requirement for management and mitigation measures. Construction noise management levels were established using the background noise monitoring conducted. Construction noise impacts were modelled for four construction scenarios, with results indicating compliance with noise management levels for majority of construction activities. However, impact piling works may exceed management levels at one receiver (R6).

  The operation of the existing site and the proposed expansion were modelled and assessed against the operational noise limits applied in the environmental protection licence (EPL) and the project noise trigger levels (PNTLs). The results indicate compliance with the PNTLs at all sensitive receivers. At receiver R6 (39 Hanigans Ln, Bolong) the cumulative noise level is predicted to be 45 dBA during the worst 15-minute period during the day, with an existing noise level of 44 dBA, which is 5 dB above the existing EPL limit.

  To mitigate the exceedance at receiver R6, Supagas will implement mitigation measures to reduce noise from truck pressure releases as described in Section 6.2. After implementation of the mitigation measures, the predicted noise

level at receiver R6 (39 Hanigans Ln, Bolong) during the day is below the EPL noise limit.

No additional operational mitigation is required; however, monitoring should be undertaken at the completion of the project to confirm consistency with modelling assumptions made for this assessment.

The cumulative noise levels of the Supagas and Shoalhaven Starches sites are predicted to exceed the EPL limits. ***The contribution of the Supagas site is however considered negligible at most of the receivers due to the Shoalhaven Starches site contributing significantly****. This is consistent with the findings of the Shoalhaven Starches Noise PRP. A mitigation strategy has been developed within the Noise PRP to address these exceedances and the Noise PRP should be referred to for details on the mitigation measures to be implemented.*

- A Flood Assessment prepared by WMAwater. According to WMAwater as a result of the proposed works the maximum cumulative increases in flood level since 1990 will only experience a maximum increase of up to 0.1m.
    - 5% AEP – up to 0.1m,
    - 1% AEP – up to 0.2m,
    - PMF – up to 0.3m

    WMA Water identify that the maximum incremental increases in flood level since February 2025 are predominantly within land owned by Shoalhaven Starches.

    - 5% AEP – less than 0.01m,
    - 1% AEP – up to 0.1m,
    - PMF – up to 0.1m

    WMAwater indicates that there are no viable means of reducing the increase in peak flood levels resulting from these works. One of the most beneficial and practical means of reducing flood damages to existing buildings and risk to life is to improve the awareness and preparedness of the occupants

or employees. There are several ways of undertaking such a scheme and these are outlined by WMAwater and most require involvement by Council and / or the SES. Funding a scheme would assist in improving the community's flood awareness and consequently reducing flood damages for all floodplain occupiers.

- A traffic assessment prepared by Anton Reisch Consulting concludes:

Further to a detailed assessment of Modification, arc traffic + transport has determined that:

- *All access to the Facility will be provided via the existing intersection of Bolong Road & Gate 1; and via existing internal roads through the DF Site between Bolong Road and the Facility. The Bolong Road & Gate 1 intersection, and these internal roads, have all been designed to accommodate the movements of the largest trucks accessing the Facility (B-Doubles) and approved by Council and TfNSW.*
- *All roads providing access between the DF Site and sub-regional road network are approved by TfNSW and NHVR for use by the maximum sized trucks that will be generated by the Facility.*
- *The additional trip generation of the Facility further to the Modification is very minimal, and the total trip generation of the Site during a peak hour of 2 truck trips would be no different than the 2 truck trips per hour as approved under MOD 15. This level of trip generation would have no impact on the operation of the Bolong Road & Gate 1 intersections, nor on any roads or intersections in the local road network.*
- *On-site parking is provided within the Facility that meets peak staff and contractor demand.*
- *A CTMP has been prepared which indicates that the construction of the proposed new infrastructure can be undertaken safely and efficiently without impacting the local road network. The CTMP may be revised further to consideration of any future Conditions of Consent in a Modification approval.*

In summary, arc traffic + transport has determined that the Modification is entirely supportable further to access, traffic and parking considerations.

- A flora and fauna assessment carried out by Ecoplanning which concludes:

This Flora and Fauna Assessment has been prepared to consider the biodiversity values, including threatened fauna, flora, and ecological communities, which are present or that are considered likely to be present within the study area.

The FFA has assessed the potential impacts of the proposed construction of additional Carbon Dioxide processing facilities for Supagas, located on Lot 143 // DP 1069758, 220 Bolong Road, Bomaderry 2541. The removal of up to 0.12 ha of planted native vegetation is required as part of this proposal. Vegetation within the study area has been subject to considerable historical disturbance.

Planted native vegetation within the subject site was identified as having potential habitat for the GHFF, a threatened species under the BC Act and EPBC Act. A Test of Significance applied to this species according to both Commonwealth and State government criteria determined that the development would not result in a significant impact to the GHFF.

Potential indirect impacts associated with the proposal can be minimised and mitigated through measures recommended in Section 4.3 of this report. These measures include the preparation of a site-specific CEMP prior to construction taking place and the implementation of erosion and sediment control measures.

- An Integrated Water Cycle Management Strategy prepared by Allen Price which concludes that during operation the Modification Proposal is unlikely to generate stormwater pollutants within the site.

  Allen Price indicates that potential short term stormwater quality impacts arising from the construction works can be mitigated by the implementation of erosion and sediment control plan and staging earthworks.

  Allen Price consider the Modification Proposal is adequate from a stormwater management perspective.

- A Geotechnical, Contamination and Acid Sulphate Soils assessment prepared by GHD which concludes:

  <u>*Contamination*</u>

  Based in historical information and previous investigations, potential for contamination was identified by GHD in five Areas of Environmental Concern (AECs) potentially impacting soil, groundwater and / or surface water, which including:

- AEC 1: Fill of unknown quality and origin, notably three fill mounds (Fill Mounds 1 to 3), imported gravel used in hardstand areas, and fill at depth in the eastern portion of the site
- AEC 2: Storage and use of chemicals as part of the operation of the Stage 1 plant.
- AEC 3: Former rural land use, including potential historical use of pesticides and herbicides across the site during farming activities, possible storage/use of fuels/other chemicals.
- AEC 4: Electrical transformers located in the south and north-west of the site.
- AEC 5: Surrounding industrial activities including Manildra main plant (former Dairy Farmers milk processing operations) and the Stage 1 gas plant, both west of the site; and fabrication, welding and electrical workshops to the east.

The likelihood of contamination in Fill Mound 1 (AEC 1) was assessed by GHD as low to moderate as there has only been limited direct assessment of the fill material.

The likelihood of contamination to exist for remaining fill occurrences and other AECs was assessed by GHD as low or very low.

Based on the results of this PSI for contamination, GHD recommend that a Targeted Site Investigation (TSI) for AECs where the likelihood of contamination to exist is assessed as low to moderate (i.e. Fill Mound 1), to assess the suitability of the fill material for re-use on site, or pre-classify it for off-site re-use (e.g. under the Resource Recovery framework) or disposal if required.. AECs where the likelihood of contamination was assessed as very low can be managed at the time of construction should contamination be encountered.

GHD also recommend that:

- A Construction Environmental Management Plan (CEMP) be prepared to manage the potential contaminant exposure risks during construction activities, and manage potential unexpected finds (e.g. buried waste, demolition waste, ACM, etc.) that could be encountered. Therefore, the CEMP should also include an Unexpected Finds Protocol (UFP) and site-specific Work Health Safety and Environment (WHSE) plan, to inform site workers of potential contamination risks and appropriate personal protective equipment (PPE) required to work at the site.
- Assess waste classification of soils excavated as part of the development to allow off-site disposal of surplus materials to an appropriately licenced waste facility.
- For general contamination risk management, a contamination register should be prepared which clearly documents where contamination has been identified at the site or is likely to be encountered based on previous investigation results.

Acid Sulphate Soils (ASS)

GHD indicate that based on the results of previous investigations and limited information on subsurface conditions at the site, an Acid Sulphate Soil Management Plan (ASSMP) would not be required provided that less than 1,000 tonnes of material are disturbed and soils were of medium texture.

Riparian Stability

Based on the results of previous slope stability analysis that they have undertaken, GHD indicate that the location of the proposed gas storage vessels (i.e. 60 m to 65 m north of the riverbank) when supported on a piled footing system, would not contribute to instability of the riverbank or riparian corridor. GHD recommend that piles should be extended to a suitable bearing stratum below river bed level, i.e. either very stiff to hard clays or dense to very dense sandy soils, or to weathered rock. The pile design and founding depth of the piles will be subject to the findings of a geotechnical investigation.

- GHD were also engaged to undertake an air quality impact assessment in relation to this Modification Proposal. The air quality impact assessment undertaken by GHD concludes that air quality impacts during construction (dust) and operation (odour and other pollutants) are not anticipated and there is no expected increase to the cumulative levels in the local area.

The Modification Report concludes that the proposed modifications will have not have significant adverse environmental impacts and the development to which Project Approval MP06_0228 as modified by the Modification Application relates, will be substantially the same development as the development for which this consent was originally granted and before that consent as originally granted was modified.

1.0 INTRODUCTION

Project Approval MP06_0228 was granted by the Minister for Planning on the 28th January 2009 for the Shoalhaven Starches Expansion Project. This approval also encapsulated previous approvals for the site into one overall approval for the site (at that time).

The Shoalhaven Starches Expansion Project sought to increase ethanol production at the Bomaderry plant in a staged manner from 126 million litres per year to 300 million litres per year. To accomplish the increase in ethanol production, this project required a series of plant upgrades and increase in throughput of raw materials, principally flour and grain.

Following the Minister's determination, Shoalhaven Starches have been implementing and commissioning works in accordance with this approval.

On the 7 August 2018 the Independent Planning Commission granted a Modification Approval (Mod 15) to Project Approval MP-06_0228 enabling Supagas to construct a Carbon Dioxide (CO_2) Plant adjacent to the former Dairy Farmers factory site that now belongs to the Manildra Group of companies and which forms part of the Shoalhaven Starches operations. On the 16 October 2021 the Minister for Planning approved a further modification to the Mod 15 approval enabling the installation of additional CO_2 storage vessels and other plant and equipment (Mod 20).

The site is located at 220 Bolong Road Bomaderry (Lot 143 DP 1069758) ("the subject site").

Supagas have now established the CO_2 Plant on the subject land in accordance with Mods 15 and 20. This facility takes CO_2 from the Shoalhaven Starches operations and processes this gas to food grade quality for the food and beverage market. CO_2 taken directly from Shoalhaven Starches operations under these existing approvals reduce emissions from their operations at present by up to 90 tonnes per day (TPD) under these approvals.

The existing plant was approved in two stages, i.e. initially 50 TPD and then this was increased to the present day 90 TPD. Supagas propose to undertake alterations and additions to this existing carbon dioxide plant to process an additional 75 TPD of carbon dioxide bringing the total capacity of the plant at the site up to 165 TPD.

This Modification Report has been prepared to address the above Modification Proposal.

The Modification Application will not involve changes to the size, scale or intensity of the existing Shoalhaven Starches operations. The modification proposal will not result in any changes in the extent of impacts arising from the approved development.

The Modification Application is made pursuant to Section 4.55(1A) of the Environmental Planning & Assessment Act. This Modification Report has been prepared in support of the Modification Application.

The Modification Application is supported by plans prepared by Supagas.

This Modification Application is supported by the following expert assessments:

- A Preliminary Hazard Analysis prepared by Pinnacle Risk Management
- A Noise Impact Assessment by GHD Pty Ltd.
- A Flood Compliance Report prepared by WMAwater.
- A Traffic Impact Study prepared by Anton Reisch Consulting.
- A Flora and Fauna Assessment carried out by Ecoplanning Pty Ltd.
- An Integrated Water Cycle Management Strategy prepared by Allen Price.
- A Geotechnical, Contamination and Acid Sulphate Soils Assessment prepared by GHD.

It is considered that the components associated with this Modification Application will not have any significant adverse environmental impacts; and as a result of this Modification Application, the development to which Project Approval MP06_0228 as modified relates, will be substantially the same development as the

development for which this consent was originally granted and before that consent as originally granted was modified.

2.0 SITE CHARACTERISTICS AND SURROUNDING LAND USES

The works associated with this modification application are all located at 220 Bolong Road, Bomaderry (Lot 143 DP 1069758) on the former Dairy Farmers' factory site. This parcel of land comprises an area of 5.777 ha.

The subject site contains a factory complex previously occupied by the Dairy Farmers dairy factory. The subject site is now owned by the Manildra Group of Companies, which includes Shoalhaven Starches. The factory building has subsequently been used as a meat works by Argyle Meats, although this use has subsequently ceased operations.

The existing CO_2 Plant has been established in accordance with Mod 15 and subsequent Mod 20, adjacent to the former Dairy Farmers' factory on an area of land located between the eastern property boundary and the paved truck circulation area which adjoins the eastern side of the meat processing plant.

The subject site has access to Bolong Road. The existing access driveway for 220 Bolong Road, on which the CO_2 Plant will be located, comprises separate ingress and egress driveways with a central median. The driveway provides access to the factory site, and car park located to the front of the existing factory complex.

The western portion of 220 Bolong Road comprises a wastewater treatment plant associated with the former dairy factory consisting of treatment plant, storage dams and tanks. Further to the west of this site is the Shoalhaven Starches factory site.

The town of Bomaderry is located within 1 km to the west of the subject lots, and Nowra urban area is situated approximately 2 km to the south-west.

Figure 1 shows a site locality plan.

Located to the north of the 'subject site is the Shoalhaven Starches Environmental Farm.

To the east of the subject site is another industrial site, Boweld Constructions, a heavy engineering factory site. Further afield to the east is farm land and the former Paper Mill site (now also owned by the Manildra Group of Companies).

The Shoalhaven River is located to the south of the site across an existing private railway line.

Aerial photographs of the locality and the site, along with key components of the proposal are shown in **Figures 2 and 3**.

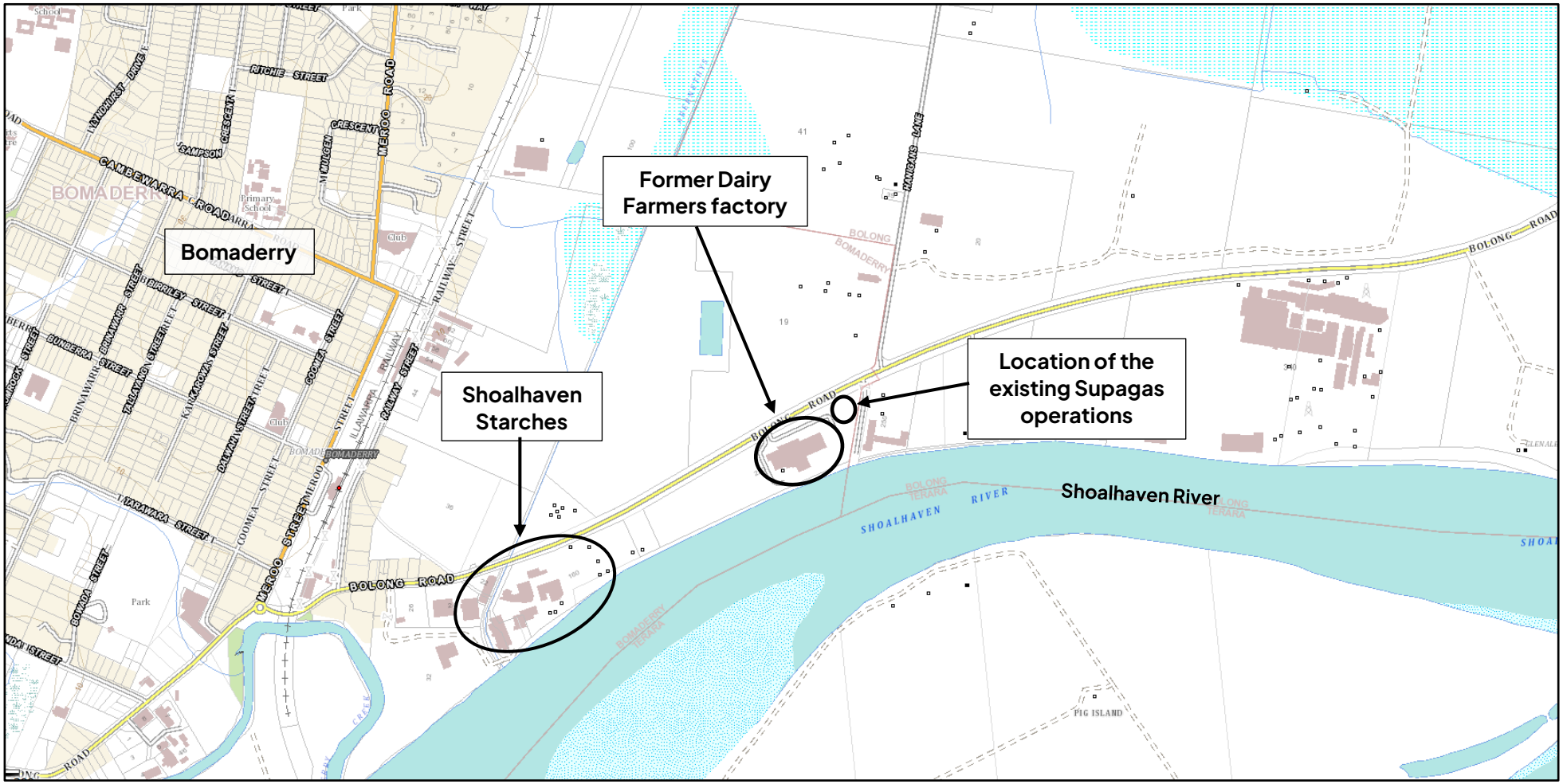

Figure 1: Site locality plan.

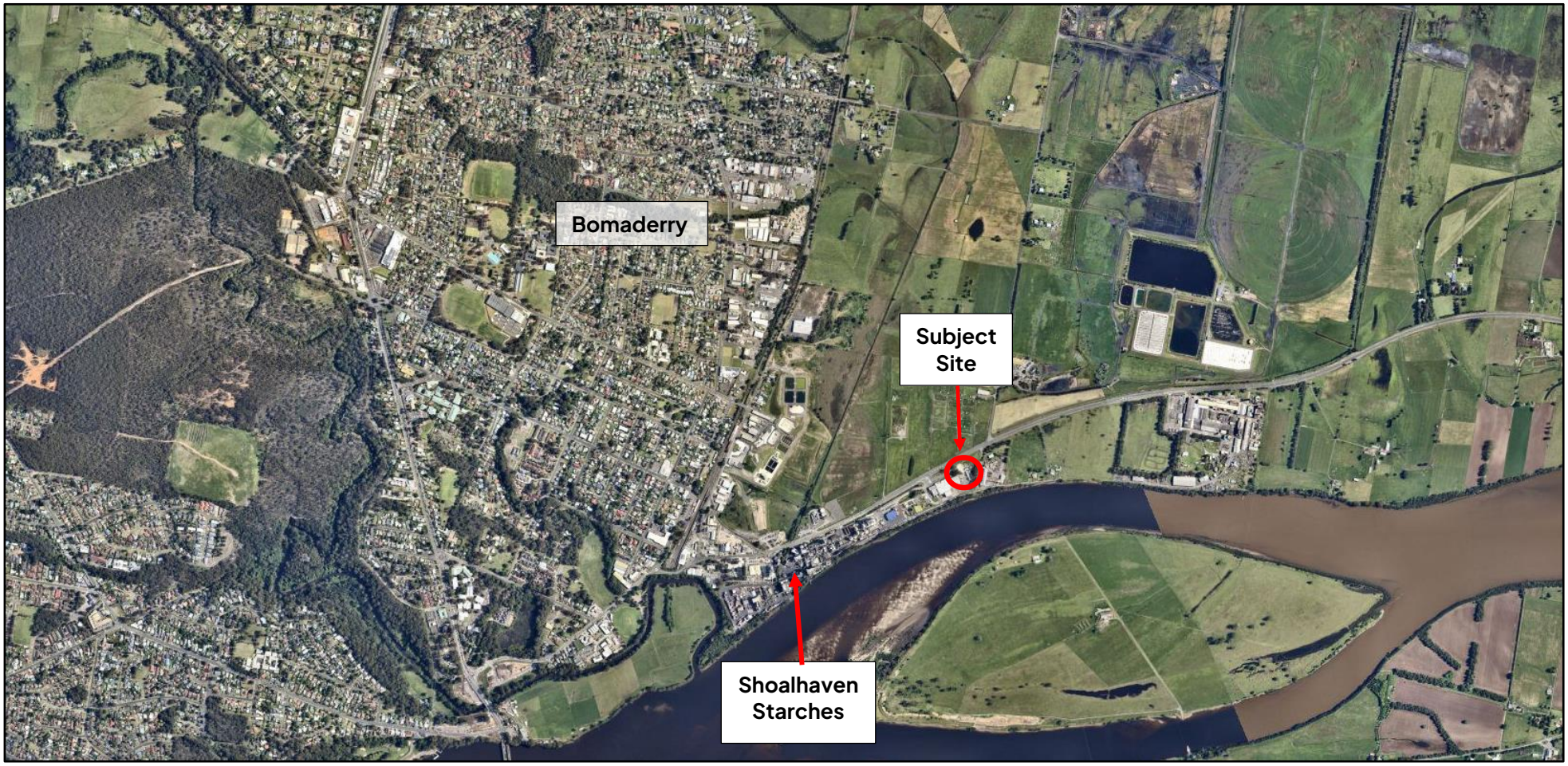

Figure 2: Aerial photograph of the locality.

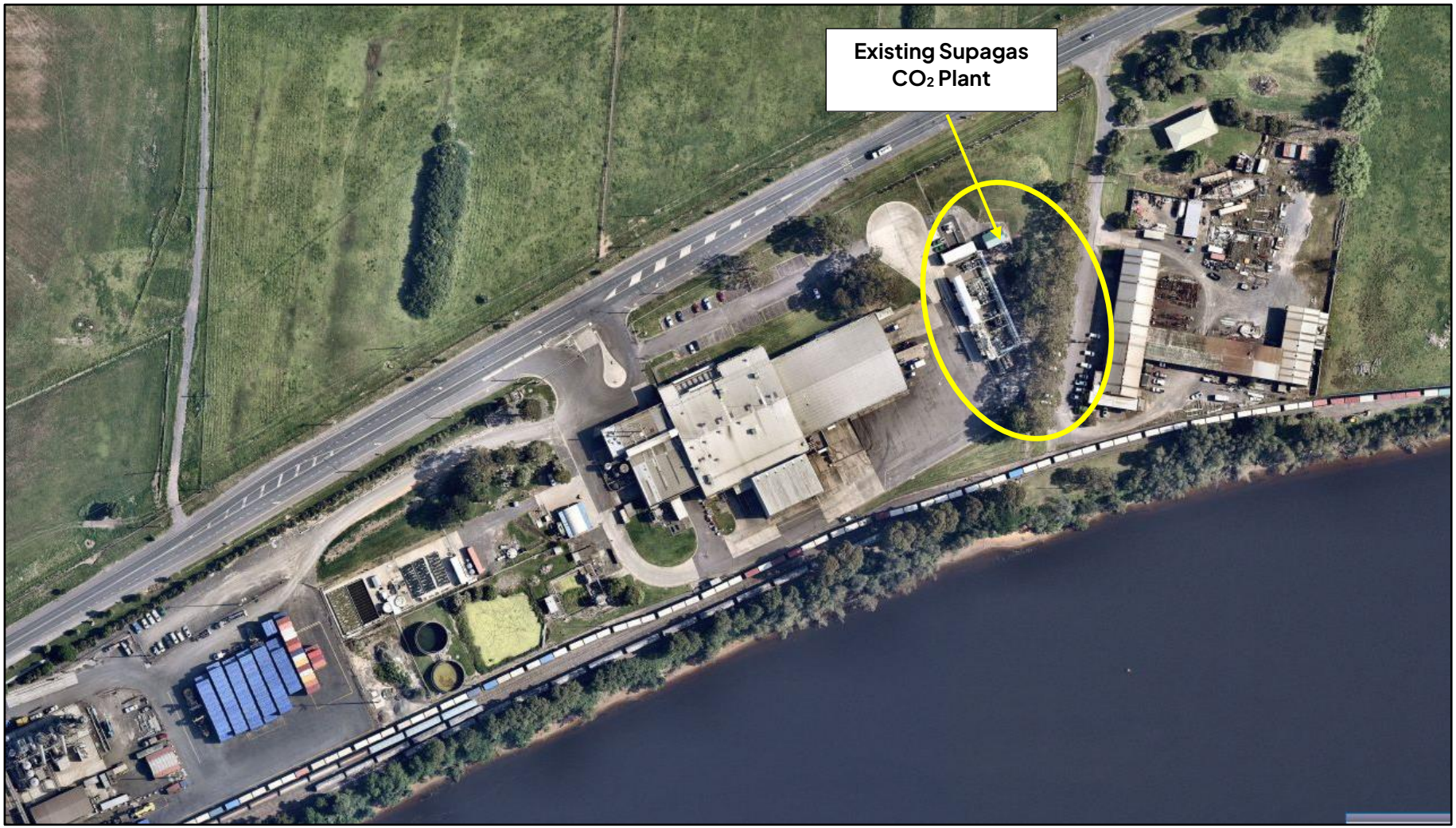

Figure 3: Aerial photograph of site.

3.0 BACKGROUND

3.1 Overall Production Processes – Shoalhaven Starches

The production process at the Shoalhaven Starches plant has developed over a number of years. Originally the plant was primarily concerned with the production of starch and gluten from flour. However, the Company has pursued a number of technological innovations particularly with respect to reducing the environmental impacts of the Company's operations. As a result, Shoalhaven Starches has been moving towards a "closed" system of production. Essentially this entails the efficient use of end products to ensure wastage is reduced to a minimum.

The first step in the production process is the delivery of flour and grain, by rail, from the Company's flour mills at Manildra, Gunnedah and Narrandera. The trainloads are brought into the plant via the switching yard at Bomaderry.

The Company received approval from the Minister for Planning for the erection of flour mills on site to enable the milling of part of the Company's flour requirements to be processed directly on the site. One flour mill has now been commissioned and the second flour mill is yet to be built. The remainder of the Company's flour requirements will continue to be sourced from the Company's off-site flour mills.

Flour is transferred via storage to the "wet end" of the plant where fresh water is added. The subsequent mixing and separation process produces starch and gluten.

The gluten is dried to enable it to be packaged and distributed as a high protein food additive for human consumption. This product is then taken from the site after packaging for both local and export markets. Starch is used for fermentation and distillation to produce ethanol.

The starch that is separated from the flour is either dried or remains in liquid form. The dried and liquid starch is sold to the paper and food industries. The starch is used for food, cardboard, paper and other industrial purposes. Liquid starch is used in the ethanol production process.

Starch is also used in the production of syrups on the site. The syrups plant products include glucose and brewer's syrup. These are used for foods, chocolates, confectionery, beer, soft drinks and fruit juice. The syrups plant products can also be used in the ethanol process.

The waste products from the starch, gluten and syrup production processes are combined to feed the fermentation and distillation stage of ethanol production. The outputs are fuel, industrial and beverage grade ethanol. Industrial grade ethanol is used in producing pharmaceuticals, printer's ink and methylated spirits.

Ethanol production results in some liquid and solid by-products, which are processed through the stillage recovery process plant (which was approved as part of PRP No. 7 in 2005). The solids in the stillage are recovered as DDGS (Dried Distillers Grains Syrup), dried and sold as a high protein cattle feed with the remaining water used for irrigation. The waste water resulting from the ethanol production is treated in the wastewater treatment plant and is re-used in the Starch Plant and the surplus is irrigated onto Shoalhaven Starches Environmental Farm to the north of Bolong Road. This farm land is used for fodder crops, pasture and cattle grazing.

CO_2 gas is emitted from the above process and expelled through a number of flue structures (stacks) within the Shoalhaven Starches factory. The existing Supagas CO_2 Plant captures and further processes these CO_2 gas emissions to food grade quality further reducing greenhouse gas emissions from the Shoalhaven Starches operations.

The CO_2 Plant takes CO_2 directly from the Shoalhaven Starches operations and processes this gas to food grade quality for the food and beverage market. By taking the CO_2 directly from the Shoalhaven Starches factory operations, CO_2 emissions under present operations are reduced by up to almost 50 tonnes per day and eventually up to 100 tonnes per day when fully operational in accordance with the Mod 15 approval.

3.2. THE SUPAGAS CO_2 PLANT OPERATIONS

On the 7th August 2018 the Independent Planning Commission granted a Modification Approval (Mod 15) to Project Approval MP-06_0228 to enable Supagas to construct a CO_2 Plant on the subject site. On the 16 October 2021 the Minister for Planning approved a further modification to the Mod 15 approval enabling the installation of additional CO_2 storage vessels and other plant and equipment (Mod 20).

The Supagas operation takes CO_2 from the Shoalhaven Starches operations and then processes this gas to food grade quality for the food and beverage market.

Supagas takes CO_2 with a purity of approximately 92% from the Shoalhaven Starches operations and processes this gas into food grade CO_2 (> 99.99% purity) suitable for food and hospitality markets around Australia.

The flue gas is taken directly from the Shoalhaven Starches CO_2 flue therefore reducing CO_2 emissions by up to 50 TPD during the initial stage of operations and up to 100 TPD when fully operational. At present the site operations process up to 90 TPD.

The current Supagas operations includes the following plant and equipment on the site:

- **Cold water scrubber:** This dehumidifies the warm, moist CO_2 exiting the raw gas feed and primarily removes water and alcohol from the feed stream.
- **CO_2 Compressor:** The CO_2 compressor takes the dry CO_2 from the cold-water scrubber and raises the CO_2 pressure to 1950 KPa.
- **Sulphide Removal Beds:** CO_2 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_2 is fed through a CATOX (similar to a car exhaust), and all traces of Hydrocarbons are burnt into moisture and CO_2.
- **CO_2 Driers:** The CO_2 is further dried to a point where its moisture content is reduced to less than 20 parts per million.

- **CO_2 Liquefier:** The gaseous CO_2 at approximately 1800 KPa is liquefied.
- **CO_2 NO_x removal vessel:** Liquid CO_2 is run over a bed of Molecular sieve. This absorbs any NO_x. This is changed out every 9 months or so and disposed of in accordance with statutory requirements.
- **CO_2 Tanks:** The CO_2 is then currently stored in four storage vessels ranging in volume form 100 Kl to 200 KL tanks (providing total storage capacity of 600 Kl) awaiting despatch.
- **Distribution:** The CO_2 is then distributed to customers. Distribution of processed product is undertaken either by 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.

The product is distributed to Supagas internal customers who then redistribute in the described format:

- Beenleigh, QLD - Dry ice, Gas bottles, Hospitality customers;
- Ingleburn, NSWFfigure - Dry ice, Gas bottles, Hospitality customers;
- Adelaide, SA - Dry ice, Gas bottles, Hospitality customers, Mini bulk CO_2 customers;
- Dandenong, VIC - Dry ice, Gas bottles, Hospitality customers, Mini bulk and Bulk CO_2 customers

Figure 4 is a Process Flow Diagram detailing the production process for the Supagas operation.

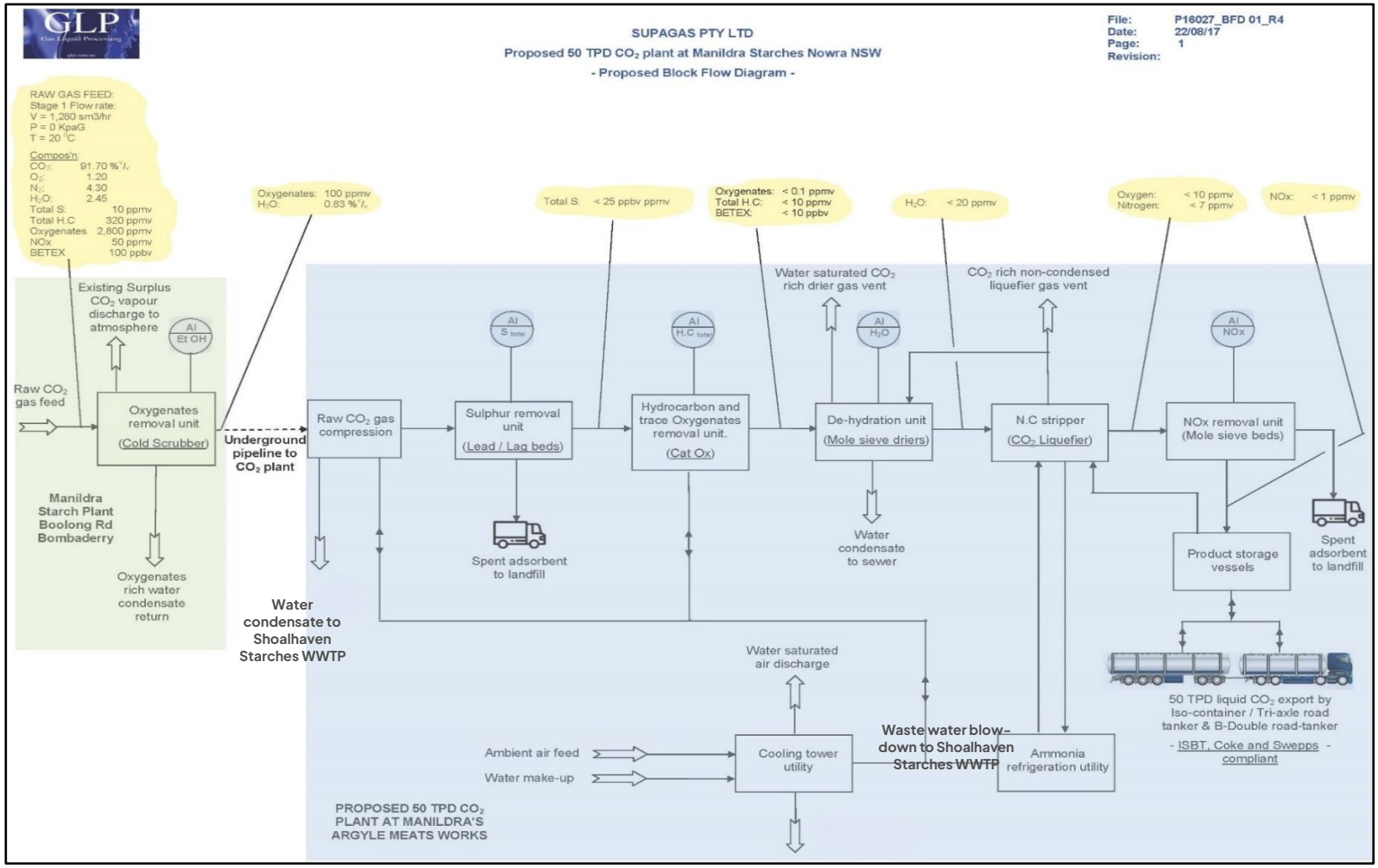

Figure 4: Process Flow Diagram – CO_2 Plant Facility.

3.3 RECENT DEVELOPMENT AND APPROVAL HISTORY

3.3.1 PROJECT APPROVAL MP 06_0228

On the 28th January 2009 the then Minister for Planning, issued Project Approval MP 06_0228 for the Shoalhaven Starches Expansion Project.

The primary objective of the Shoalhaven Starches Expansion Project was to increase the Company's ethanol production capacity to meet the expected increase in demand for ethanol primarily, arising from the then NSW Government's mandate to increase ethanol content by volume in petrol in NSW from 2% to 6% from October 2011, by upgrading the existing ethanol plant.

The approval, subject to certain conditions, enabled Shoalhaven Starches to increase ethanol production in a staged manner at its Bomaderry Plant from 126 million litres per year to 300 million litres per year.

To accomplish the increase in ethanol production, the Project Approval enabled Shoalhaven Starches to upgrade plant and increase throughput of raw materials, principally comprising flour and grain.

Following the Minister's determination Shoalhaven Starches have been implementing and commissioning works in accordance with this approval.

As outlined in previous modifications the expected increase in demand for ethanol to meet the demand arising from the NSW Government's mandate to increase the blending of ethanol in the total volume of petrol sold in NSW has however not occurred. This is due largely from a failure of the mandate to be imposed on petroleum suppliers. As a result, Shoalhaven Starches have been investigating alternative markets for products used in the manufacture of ethanol and Shoalhaven Starches now propose to undertake further modifications to the Shoalhaven Starches Expansion Project Approval (MP06_0228) as listed below. Cowman Stoddart Pty Ltd has prepared this Environmental Assessment on behalf of Shoalhaven Starches Pty Ltd for the following modifications.

Under Mod 16 Shoalhaven Starches obtained approval to utilise grain, that was approved to directly feed the fermentation process in the ethanol production process, to instead increase the amount of flour that was produced on site (with the installation of an additional Flour Mill) to in effect increase starch and gluten production.

In addition, under Mod 16 Shoalhaven Starches obtained approval for the construction of a new industrial building adjoining the recently constructed Starch Dryer No. 5 building to the west of Abernethy's Creek. This new industrial building will contain:

- The construction of a Specialty Product Building within which a range of modified gluten products for the food industry; and modified starches for both paper manufacturing as well as food production.
- The resultant increase in starch and gluten production would require the conversion of two existing Gluten Dryers (Nos. 1 and 2) into starch production. Mod 16 therefore included the construction of a new Gluten Dryer (D8), to replace the capacity lost by the conversion of Dryers Nos. 1 and 2 to starch.

The footprint of the GD8 building was subsequently increased under Mod 17. The increase in the footprint of the GD8 building under Mod 17 provided for the reorientation of the dryer to provide operational efficiencies and to enable the installation of a Wet End Processing Plant within the building.

3.3.2 APPROVAL HISTORY FOLLOWING MP 06_0228

DA 10/1843 – Upgrade Vehicle Entrance (Former Dairy Farmers Factory Site)

Project Approval MP 06_0228 required vehicle access points to the Bomaderry site to be upgraded to the satisfaction of Council and the RMS. The subsequent upgrading works included the construction of a concrete median along the centre of Bolong Road to the east of Abernethy's drain in such a manner that prevented vehicles travelling east along Bolong Road turning right into the central vehicle access point to the Shoalhaven Starches site and prevented

vehicles turning right out from this access point and travelling east along Bolong Road.

These works also prevented vehicles turning right out from the BOC Carbon Dioxide Plant located opposite the Shoalhaven Starches site. Shoalhaven Starches therefore sought approval from Shoalhaven City Council to upgrade the former Dairy Farmers site vehicular access and relocate the access to enable vehicles to enter Access Point 2 from the east. These works would also allow vehicles wishing to travel west from BOC Carbon Dioxide Plant to leave this site to first travel east; by allowing vehicles to travel to the former Dairy Farmers Factory Complex and using the upgraded access to turn around before travelling west along Bolong Road.

RA 11/1002 Interim Packing Plant

Following Project Approval MP 06_0228 Shoalhaven Starches also obtained a separate development approval to use an existing factory building located at 22 Bolong Road (Lot 21 DP 100265) as an Interim Packing Plant from Shoalhaven City Council (RA 11/1002 dated 26th October 2011). This Interim Packing Plant operates in conjunction with the Company's existing Packing Plant which is located within the existing factory site.

DA 11/1855 – Widening of Driveway

A further development application (DA 11/1855) was submitted to Shoalhaven City Council on the 4th August 2011 seeking approval to widen the driveways serving 22 Bolong Road Bomaderry (i.e. the site of the Interim Packing Plant) to accommodate semi-trailers. This development application was approved by Shoalhaven City Council on the 24th August 2011.

DA 13/1713 – Demolition of Dimethyl Ether Plant

On the 5th July 2013 Shoalhaven Starches submitted a development application to Shoalhaven City Council seeking the demolition of a Dimethyl Ether Plant on the site. This development application was approved by Shoalhaven City Council on the 15th July 2013.

DA 14/2161 – Additional Two (2) Grain Silos

On the 19th September 2014 Shoalhaven Starches submitted a development application to Shoalhaven City Council seeking development consent to erect two additional grain silos on the factory site within the vicinity of the existing Flour Mill, to provide security of raw material storage and supply when there are closures of the Illawarra rail line serving the Shoalhaven Starches site. Shoalhaven City Council approved this development application on the 27th April 2017.

DA 16/1827 – Demolition of Existing Air Compressor Shed

On the 7th July 2016 Shoalhaven Starches submitted a development application to Shoalhaven City Council seeking the demolition of an existing air compressor shed on the site. This development application was approved by Shoalhaven City Council on the 29th July 2016.

Other Approvals

There have been other approvals that have been issued by Shoalhaven City Council that are associated with the Shoalhaven Starches operations, but which do not directly relate to the operations of Shoalhaven Starches including:

- DA 11/1936 – Algae Demonstration Plant for evaluation of algae production and processing for alternative fuel and CO_2 sequestration. Proponent - Algae Tec Pty Ltd at 220 Bolong Road (former Dairy Farmers factory site).
- DA 14/1327 – Alterations to existing building (former Dairy Farmers Factory Building) and re-use as a meat processing plant. Proponent – Candal Investments Pty Ltd at 220 Bolong Road (former Dairy Farmers factory site).
- DA 15/1892 – Installation of Liquid Oxygen Vessel (6,000 L). Proponent – Argyle Prestige Meats Ltd at 220 Bolong Road (former Dairy Farmers factory site).

Modification Applications

Project Approval MP 06_0228 has also been the subject of the following modifications applications (**Table 1**).

Table 1

Summary of Recent Modification Applications

Modification	*Summary of Modifications*	*Approval Date*
Modification 1	• Removed the requirement for dried distillers' grain (DDG) pelletising plant from the list of mandatory odour controls. • Implement alternate odour controls including a new loading chute with dust extractor and extension of the load-out shed to fully enclose truck loading.	30/9/2011
Modification 2	• Install additional infrastructure to improve operational and energy efficiency, including two additional fermenter tanks, an evaporator, beer column, heat exchangers, substation and compressors.	14/9/2012
Modification 3	• Relocate approved 60 space staff car park to the former Dairy Farmers site and include the site in the project approval, following acquisition by the Applicant.	9/10/21012
Modification 4	• Relocate the approved DDG pelletising plant within the factory site, increases its footprint and approved height, from 21 m to 28 m.	24/3/2014
Modification 5	• Modify the design, footprint and odour controls on the DDG pelletising plant including a 49 m air discharge stack and eight storage silos.	Modification 5
Modification 6	• Demolish a disused industrial building "Moorehouse" purchased by the Applicant • Construct a temporary car park on the northern side of Bolong Road.	Modification 6
Modification 7	• Relocate the approved Starch Dryer No. 5 to the former "Moorehouse" site, increase the footprint and construct a substation, pipework and pipe gantry.	Modification 7
Modification 8	• Extend the existing flour mill to increase flour production from 265,000 to 400,000 tonnes per annum (tpa) and offset imports of flour to the factory from mills in western NSW.	Modification 8
Modification 9	• Increase the size of the approved packing plant to increase the type and volume of packaged dried products. • Construct a container storage and truck loading area with noise barriers. • Extend and duplicate the approved rail spur line.	Modification 9

	• Install product pipes under Bolong Road, a small bag packer at the DDG pellet plant and a new stormwater detention tank.	
Modification 10	• Construct a new flour mill B and increase flour production on site from 400,000 tpa to 842,400 tpa. Relocate storage silos and construct a mill feed structure.	Modification 10
Modification 11	• Reducing the number of approved DDGS Dryers from six to four. • A minor modification to the footprint of the four DDG dryers. • Relocation of the cooling towers in the DDG Plant. • A Mill Feed Silo and structure to feed DDG dryers. • Expanded use of the existing coal and woodchip storage area within the SS Environmental farm. • The addition of two biofilters to cope with the increased number of DDG Dryers. • A forklift maintenance building adjacent to the relocated DDG dryers, along with a container preparation area adjacent to the relocated DDG Dryers.	Modification 11
Modification 12	• Modifications to the existing Ethanol Distillery Plant to increase the proportion of 'beverage" grade ethanol that is able to be produced on the site. This modification will enable increased flexibility in terms of the range of types of ethanol produced at the site between fuel, industrial and beverage grade ethanol) to meet market demands; and modify the type and location of the Water Balance Recovery Evaporator that has been previously approved under Mod 2 adjacent to the Ethanol Plant.	Modification 12
Modification 13	• Modification of boilers 2 and 4, with the conversion of boiler 4 from gas fired to coal fired. Installation of an additional baghouse on boiler 6.	18/1/2018
Modification 14	Modifications to the former Australian Pulp & Paper Mills site, i.e. the site associated in part with this Modification Application. This Modification sought approval to use this site for: • The use of existing buildings on the site for the storage of finished products, as well as engineering plant. • The use of existing storage tanks for the storage of syrups. • The use of external areas on the site to lay down plant and materials that are to be used in the construction of approved plant on the Shoalhaven Starches factory site as well as temporary and overflow shipping container storage. • The use of existing administration buildings for office staff; and	27/4/2018

	• The use of existing workshops for maintenance purposes.	
Modification 15	Construction of the Supagas CO_2 plant at the former Dairy Farmers factory site.	7/8/2018
Modification 16	• Installation of a third flour mill C within the existing flour mill B building. • Undertaking modifications to flour mills A and B. • The construction of a new industrial building adjoining the Starch Dryer No. 5 building containing: – The new product dryer; – Plant and equipment associated with the processing of specialised speciality products. • Addition to Starch Dryer No. 5 building to house a baghouse for this dryer – Conversion of two existing gluten dryers (1 and 2) to starch dryers. – Additional sifter for the interim packing plant. – Construction of a coal-fired co-generation plant to the south of the existing boiler house complex. The co-generation plant will house a new boiler (no. 8). – Construction of lime silos: The lime injection system will consist of two storage silos and associated equipment for injecting powdered lime into each of the coal fired boilers. – Relocation of the existing boiler no. 7 to the northern side of the overall boiler house complex. – Construction of an indoor electrical substation on the northern side of Bolong Road. Construction of an additional rail intake pit for the unloading of rail wagons. – Extension of the existing electrical substation located within the main factory area. An additional coal fired co-generation plant was also approved under Mod 16. This coal fired co-generation plant was to be sited immediately to the south of the existing boiler house complex situated to the east of Abernethy's Creek. This coal fired co-generation plant would generate a total of 15 MW of power for the site. It is proposed that this coal fired co-generation plant will be in part replaced by the proposed gas fired co-generation plant as part of this Modification Application.	18/6/2019
Modification 17	• Relocation of Baghouse for Starch Dryer No. 5. • Installation of Service Lift adjacent to Starch Dryer No. 5. • Elevating Service Conduit extending from factory site on southern side of Bolong Road to approved packing plant on northern side of Bolong Road above ground. • Use of woodchips as fuel source in Boilers 2 and 4.	23/10/2020

	• Modification to condition 14J(e) – Amendment to design specification for silencers to exhaust fans for Flour Mill B. • The increase in the building footprint of Product Dryer Building (PDB). • The increase in the building footprint of the Specialty Products Building (SPB) which adjoins the PDB building. • The provision of additional bulk chemical storage to the south of the PDB and SPB buildings. • Demolition of part of the existing Maintenance Office and Stores to facilitate the extension of the PDB and SPB buildings to the west. • Repurposing the remaining part of the Maintenance building to provide staff amenities and Plant Operation Control Rooms. • To facilitate internal truck movements associated with the amendments to the SPB, existing car parking (48 spaces) currently located to the north and west of the Maintenance Building will be relocated to an existing approved car parking located on the north side of Bolong Road. • Extend the sifter room situated on top of the interim packing plant. • Install a Product Dryer (No. 9) within the footprint of the SPB as approved under Mod 16.	
Modification 18	• Relocation of Approved Gas Fired Boiler and other Associated Works to Facilitate Production of 'Hand Sanitiser' Alcohol in response to COVID 19 Crisis.	4/9/2020
Modification 19	• Expansion of the ethanol distillery plant including new distillery columns, three ethanol storage tanks and cooling towers to facilitate the production of 100 mega litres (ML) of beverage grade ethanol within the approved limits and additional site infrastructure.	8/320/21
Modification 20	• Alterations to Existing CO_2 Plant (Supagas)	26/10/2021
Modification 21	• Modification to Packing Plant including the reconfiguration of existing silo storage into 16 small storage silos, additional rail spur and associated train tunnel, and ancillary additions; installation of a raw wastewater tank; nitrogen generator and storage tanks; an Indirect Cooking Facility; and relocation of car parking.	16/05/2022
Modification 23	• Modification to construct and operate a 60 megawatt gas fired co-generation plant to replace two approved, but not constructed, co-generation plants.	28/04/2022
Modification 24	• Modification to the approved Gluten Dryer No. 8 (GD8) Building including the increase in building footprint, increase in building height, re-siting of the GD8 building and the relocation of site infrastructure to accommodate changes to the GD8 building.	16/02/2022
Modification 27	• Modification to approved RWW Buffer Tank	05/10/2022

Modification 28	• Temporary Emergency Grain Storage	20/06/2023
Modification 29	• Additional MVR evaporator and relocation of approved cooling towers; additional stillage evaporators and associated equipment; re-configuration of the approved biofilters; substations and switch room.	19/12/2024

4.0 CONSULTATION

Prior to the preparation of this Modification Report consultation has been undertaken with:

- Department of Planning, Housing & Infrastructure (DPHI);
- EPA;
- Shoalhaven City Council (SCC);

At the time of preparing this Modification Report a response has only been received from the DPHI. In an email dated 15 October 2024 DPHI state:

> *Although the Department has no concerns with the proposed modification application in isolation, the Department is concerned with introducing further noise sources to the site while there are existing noise exceedances.*
>
> *As per EPA's advice for MOD 29 (see attached), the Department considers it prudent to first identify and address existing noise exceedances through the noise Pollution Reduction Study negotiated with the EPA, before introducing additional noise sources to the site.*
>
> *Otherwise as per EPA's advice, any future modifications should be designed to achieve "better than the licenced noise limits".*
>
> *Nonetheless, I will progress the scoping task through the portal this afternoon.*

Comment

The Modification Report is supported by a Noise Impact Assessment prepared by GHD. Noise impacts issues are further addressed in Section 8.2 of this Modification Report.

Prior to submission of the final Modification Report to the Department, a draft Modification Report (with supporting assessments) was submitted to the Department for initial review. In an email dated 24 April 2025, the Department provided feedback in relation this draft Modification Report raising the following comments (with our responses included):

> Consultation

Details on the consultation undertaken with the EPA should be included.

Response

As outlined above, prior to preparing this Modification Report consultation was sought form the EPA in an email dated 11 November 2024. No response was received form the EDPA in relation to this email at the time of completion of the Modification report.

As will be discussed below, GHD have undertaken subsequent consultation with the EPA in relation to their noise assessment. This is discussed further in relation to this issue below.

Air Quality

The air quality section relies on a lack of complaints and a conclusion from the Mod 15 assessment to not require an AQIA. However, it is unclear how the modified proposal would still result in this. Additional information/justification should be included to demonstrate how/why the modified development will not result in further air quality impacts.

Response

GHD have been engaged to undertake an Air Quality Assessment in relation to this Modification Proposal. The findings of this Air Quality Assessment are detailed in Section 8.8 of this Modification Report. The Air Quality Assessment undertaken by GHD concludes that air quality impacts during construction (dust) and operation (odour and other pollutants) are not anticipated and there is no expected increase to the cumulative levels in the local area.

Noise

The noise assessment demonstrates the proposal cannot meet existing noise limits in the consent. It is also unclear if the cumulative noise assessment considered all noise on site, as this is what the limits relate to. It is unclear if the modification seeks to update the noise limits of the consent. Further work on noise needs to be undertaken and the EPA should be consulted prior to finalising the modification report. Further explanation on how the proposed works relates to the existing conditions of consent and the EPL should also be included in the modification report.

Following further consultation between GHD and the EPA the EPA provided the following further comments in relation to the noise assessment.

Given the early stage that this proposal is at in terms of the planning process (i.e. not yet lodged with NSW Planning), the EPA have only undertaken a high-level review of the draft noise impact assessment document and provides the comments below for consideration in any review and/or amendment of the NIA.

- *Following a brief review of the NIA, there does not appear to be any noise mitigation applied to the operation of the proposal to mitigate the existing and proposed noise levels.*

- *The Noise Policy for Industry clearly states that all feasible and reasonable mitigation should be applied. In addition, the Implementation and transitional arrangements for the Noise Policy for Industry (2017) state "Where an application is made to vary requirements using the new policy, the NSW Environment Protection Authority (EPA) will take into account existing commitments and requirements, and performance against those requirements, as evidence of the ability of the proponent/licensee to implement reasonable and feasible measures to mitigate noise." The proponent needs to demonstrate that all feasible and reasonable mitigation measures have been applied to achieve the* ***current noise limits*** *from the existing and proposed works.*

Response

GHD have revised their original Noise Impact Assessment to respond to the above issues raised by the EPA. With respect to the above issue raised by the EPA, the operation of the existing site and the proposed expansion were modelled and assessed by GHD against the operational noise limits applied in the environmental protection licence (EPL) and the project noise trigger levels (PNTLs). The results indicate compliance with the PNTLs at all sensitive receivers. At receiver R6 (39 Hanigans Ln, Bolong) the cumulative noise level is predicted to be 45 dBA during the worst 15-minute period during the day, with an existing noise level of 44 dBA, which is 5 dB above the existing EPL limit. To mitigate the exceedance at receiver R6, GHD recommend that Supagas implement mitigation measures to reduce noise from truck pressure releases. After implementation of the mitigation measures, GHD indicate that the predicted noise level at receiver R6 (39 Hanigans Ln, Bolong) during the day will be below the EPL noise limit.

In addition to the above, following a review of the draft Modification Report and Noise Impact Assessment, DPHI sought clarification as to whether the noise assessment had utilised the existing site wide noise model.

The *site wide noise model* is applicable to the *Shoalhaven Starches* site. The *Supagas* site is governed by its own EPL (License Number 21178) and which is separate to the Shoalhaven Starches License Number 883).

Furthermore, it is noted that during consultation with the EPA with respect to the preparation of this noise assessment, the EPA did not request that consideration be given to the site wide noise model for the Shoalhaven Starches site in connection with this proposal.

Notwithstanding this, the site-wide noise model developed as part of the Noise PRP for the Shoalhaven Starches site has been used as part of this noise assessment undertaken by GHD to predict cumulative noise levels with the Supagas site.

Hazards

There are inconsistencies in the hazard report with the modification application. The PHA refers to an increase of production of 72 tpd up from 50 tpd (totalling 122 tpd). However, the modification report proposed an increase to 170tpd up from 100tpd. This must be clarified and any assessment updated.

Response

The PHA prepared by Pinnacle Risk Management, and all other expert assessment reports in support of this Modification Report, have been revised to ensure consistency in terms of the proposed development associated with this Modification Proposal.

Stormwater

While it is noted the stormwater report recommended an OSD to mitigate SW quantity impacts, it is unclear if/where this is proposed.

Response

Drawing 131401-402 included within the original Integrated Water Cycle Management Strategy prepared by Allen Price in support of the Modification Report shows the location of the OSD.

Vegetation Removal

The modification sees some vegetation removal. The modification report should consider clause 30A(2)(c) of the Biodiversity Conservation (Savings and Transitional) Regulation 2017, relating to the need of a BDAR.

Response

The revised Modification Report is supported by a submission prepared by Ecoplanning responding to the provisions of clause 30A(2)(c) of the Biodiversity Conservation (Savings and Transitional) Regulation 2017, relating to the need of a BDAR. According to Ecoplanning, the findings of the Flora and Fauna Assessment (FFA) that they prepared and which supports the Modification Report, concludes that 0.12 ha of planted native vegetation will be removed and no significant impacts to any threatened species will occur. No additional impacts to biodiversity values have been identified in the FFA. Avoidance and mitigation measures have been included to ensure unforeseen impacts to biodiversity values are avoided. Ecoplanning therefore recommend that a BDAR is not required to support the Modification Application.

5.0 PROPOSED MODIFICATION TO PROJECT APPROVAL MP06_0228

Supagas wish to undertake further alterations and additions to their existing CO_2 plant, including:

Under the existing approvals for this project, it was envisaged that the site would process up to 50 TPD of CO_2 initially for Stage 1 increasing to 100 TPD at maximum processing capacity. To date Supagas's operations process up to 90 TPD at the site. **Figure 5** below details the site layout as envisaged under the original approvals for the site:

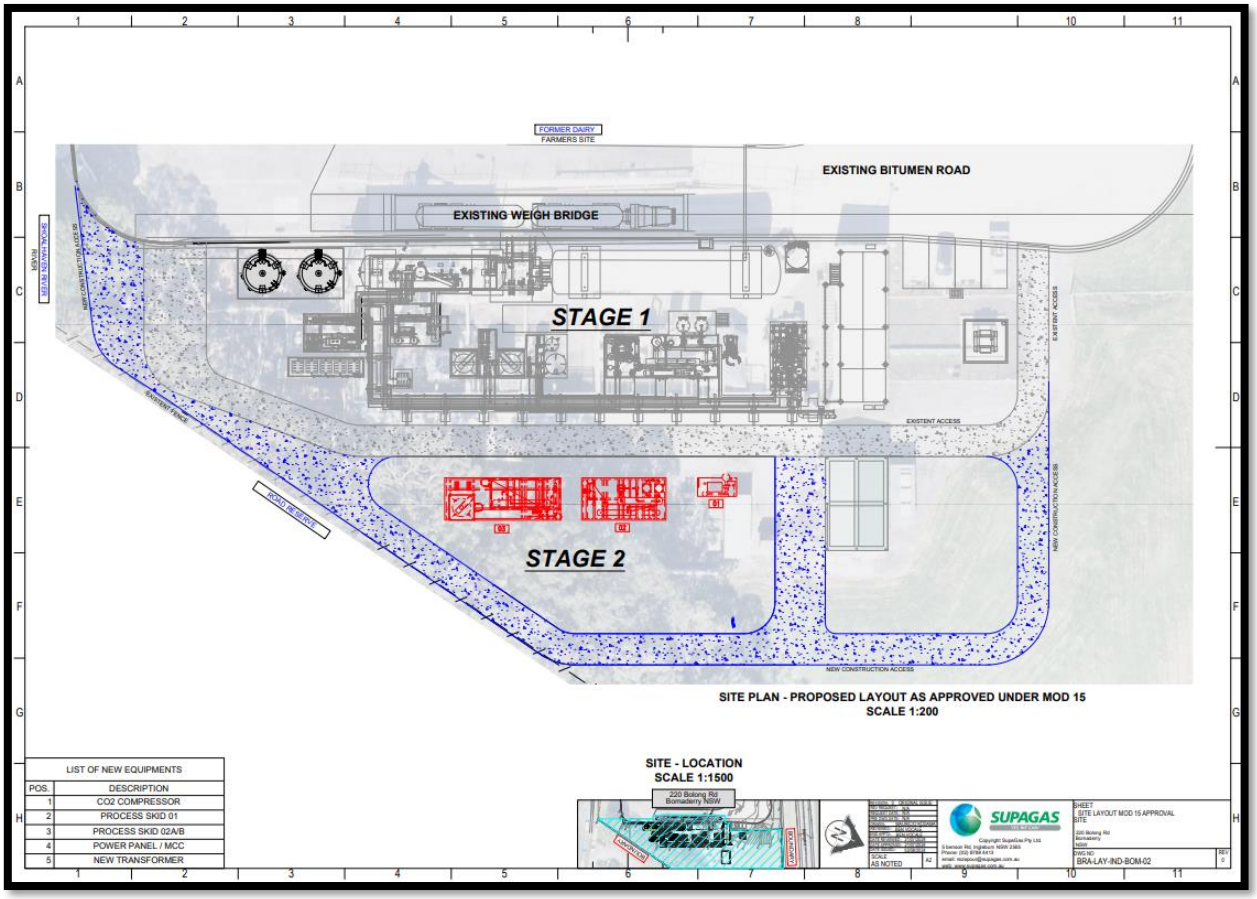

Figure 5: Existing Approved Layout

Supagas have now established the CO_2 Plant on the subject land in accordance with Mods 15 and 20. This facility takes CO_2 from the Shoalhaven Starches operations and processes this gas to food grade quality for the food and beverage market. CO_2 taken directly from Shoalhaven Starches operations under these

existing approvals reduce emissions from their operations at present by up to 90 tonnes per day (TPD) under these approvals.

Supagas propose to now undertake alterations and additions to this existing carbon dioxide plant to process an additional 75 TPD of carbon dioxide bringing the total capacity of the plant at the site up to 165 TPD.

With this in mind Supagas seek to modify their approval to reflect this refined footprint to accommodate this increase in processing capability. The alterations and additions are shown in **Figure 6** below and will include the following:

- Low Pressure / Ammonia Section
- CO_2 Compressor
- Guard Carbon Bed
- CATOX unit
- Dryer
- Refrigerant Compressor
- CO_2 Liquefaction
- Ammonia Receiver
- NOX Trap
- CO_2 Liquid pump
- Power panel / MCC
- KO Drum
- CO_2 Blower
- Transformer
- Cooling Towers
- Two (2) additional storage vessels each with a volume of 200 KL, height above ground level of at least 20 metres, diameter of 4.01 metres and a combined volume of 400 Kl

- CO_2 vaporisers – A C CO_2 vaporisers exchanges heat through a water-circulating and heating system that converts CO_2 liquid into gas.

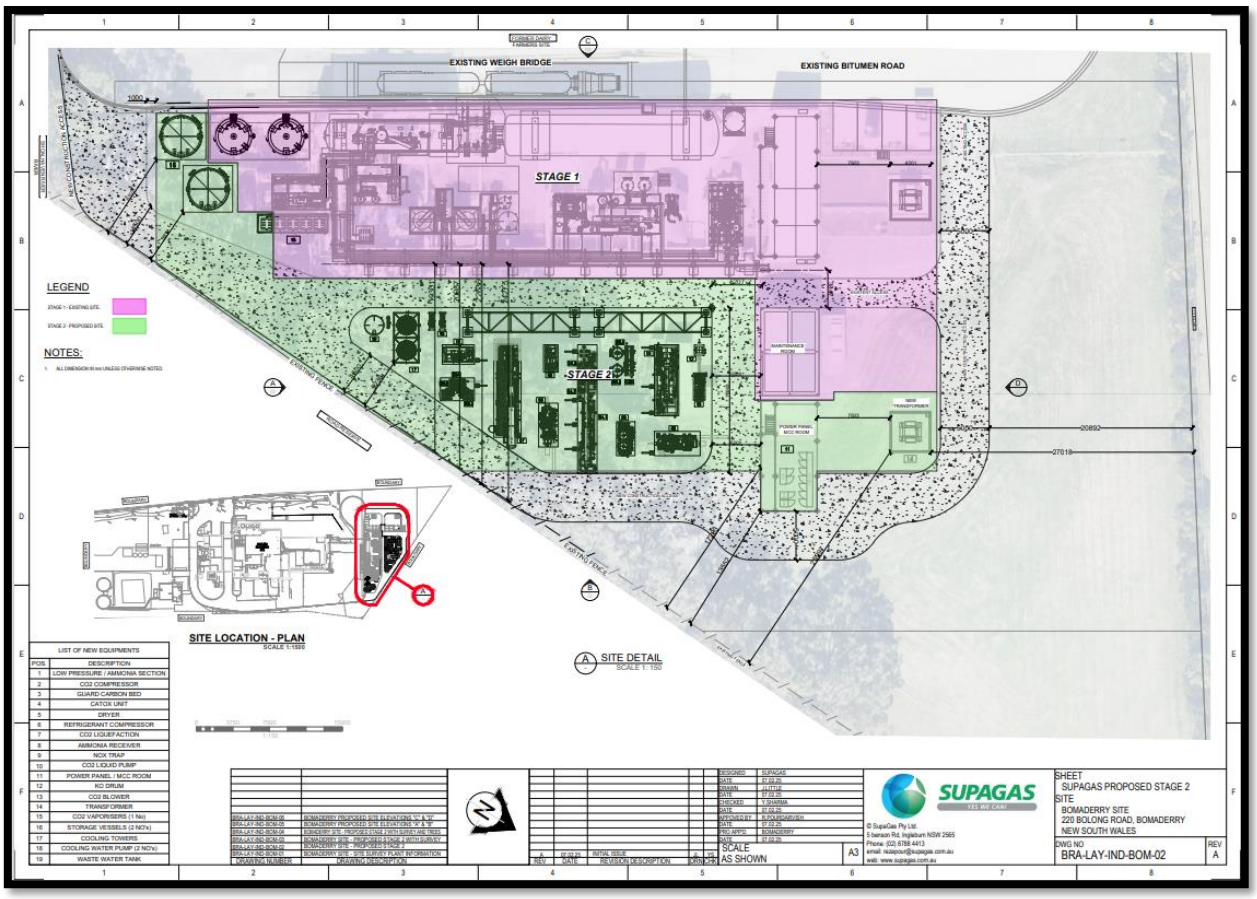

Figure 6: Proposed Modified CO_2 Plant Stage 2 Layout

The Modification Application is supported by plans prepared by Supagas.

6.0 SECTION 4.55(1A) OF THE EP&A ACT

This application is made pursuant to Section 4.55(1A) of the Environmental Planning & Assessment (EP&A) Act 1979.

Section 4.55(1A) of the EP&A Act reads:

> *4.55 Modification of consents—generally*
>
> *(1A)* ***Modifications involving minimal environmental impact*** *A consent authority may, on application being made by the applicant or any other person entitled to act on a consent granted by the consent authority and subject to and in accordance with the regulations, modify the consent if—*
>
> *(a) it is satisfied that the proposed modification is of minimal environmental impact, and*
>
> *(b) it is satisfied that the development to which the consent as modified relates is substantially the same development as the development for which the consent was originally granted and before that consent as originally granted was modified (if at all), and*
>
> *(c) it has notified the application in accordance with—*
>
> *(i) the regulations, if the regulations so require, or*
>
> *(ii) a development control plan, if the consent authority is a council that has made a development control plan that requires the notification or advertising of applications for modification of a development consent, and*
>
> *(d) it has considered any submissions made concerning the proposed modification within any period prescribed by the regulations or provided by the development control plan, as the case may be.*
>
> *Subsections (1), (2) and (5) do not apply to such a modification.*

Fundamentally, an application made pursuant to Section 4.55(1A) must demonstrate that the development to which the consent as modified relates will have minimal environmental impact; and is substantially the same development as the development for which consent was originally granted and before that consent as originally granted was modified.

Such an assessment would typically need to appreciate both the qualitative and quantitative aspects of the development being compared in its proper context as described by Bignold J at paragraphs 54 to 56 in *Moto Projects (No.2) Pty Ltd v North Sydney C [1999] NSWLEC 280 ("Mojo Projects")*. This judgment includes the following comments:

> 54. *The relevant satisfaction required by* ***s 96(2)(a)*** *to be found to exist in order that the modification power be available involves an ultimate finding of fact based upon the primary facts found. I must be satisfied that the modified development is substantially the same as the originally approved development.*
>
> 55. *The requisite factual finding obviously requires a comparison between the development, as currently approved, and the development as proposed to be modified. The result of the comparison must be a finding that the modified development is "essentially or materially" the same as the (currently) approved development.*
>
> 56. *The comparative task does not merely involve a comparison of the physical features or components of the development as currently approved and modified where that comparative exercise is undertaken in some type of sterile vacuum. Rather, the comparison involves an appreciation, qualitative, as well as quantitative, of the developments being compared in their proper contexts (including the circumstances in which the development consent was granted).*

Whilst the logic that underpins Moto Projects can be of assistance as a guide in most cases in determining whether a Modification Proposal can be considered "substantially the same"; a more recent case *Canterbury-Bankstown Council v Realize Architecture [2024] NSW LEC 31* ("Realize Architecture") provides further guidance that may also be instructive in this matter.

In this case both the initial appeal hearing before Espinos C and then following an appeal heard before Preston CJ Court approached its interpretation of the "substantially the same" test in the following ways:

- Comparing the ***quantitative differences*** between the proposed modified development against the original approved development

- Comparing the ***qualitative differences*** between the proposed modified development against the original approved development
- Comparing the ***critical elements*** of the proposed modified development against the original approved development
- Most importantly, by then ***balancing*** the evidence in respect of all of those factual comparisons before forming a subjective opinion as to whether the proposed modified development was 'substantially the same' as the original approved development

In doing so the Court supported the 'balanced' approach outlined in the final bullet point above, and having regard to 3 steps:

1. *Finding the primary facts: This first step involved identifying the ways in which the originally approved development is proposed to be modified. For example, height, bulk, scale, floor space, open space and land use.*
2. *Interpreting the law: This second step involved interpreting the words and phrases of the 'substantially the same' test in s.4.55 of the EPA Act as to their meaning. In this sense, there is long established case law with respect to the earlier statutory provisions and the current statutory provision, that suggest 'ways' in which the relevant comparison **might be** undertaken. The most commonly invoked ways have traditionally included:*
    - *As outlined in the Departments email, comparing the "**quantitative**" and "**qualitative**" differences between a proposed modified development against the original approved development. ('**Moto Projects**') at [56]*
    - *Comparing the "**material and essential features**" (Moto Projects at [55] and [58] and Arrage v Inner West Council [2019] NSWLEC 85 ('**Arrage**') at [26]) or "**critical elements**" (The Satellite Group (Ultimo) Pty Ltd v Sydney City Council [1998] NSWLEC 244 (unreported 2 October 1998) at [29]) of the proposed modified development against the original approved development*
    - *Comparing the "**consequences**, such as the **environmental impacts**" (Moto Projects at [62] and Arrage at [28]) of carrying out the proposed modified development against the original approved development*

    Importantly – although the above 'ways' will often be instructive and helpful to identify the differences between a proposed modification

application and the original development consent, they are not exhaustive, and they are certainly not mandatory. Chief Justice Preston in Realize Architecture expressly noted that s.4.55(2) of the EPA Act "does not refer to "critical elements" or even "elements", of the two developments" (at [38]) and that in relation to the task of identifying "the material and essential features of the originally approved and modified developments", in fact s4.55(2) "does not demand such an enquiry" (at [41] and [42]). This is because these traditional ways, even if helpful, do not displace the statutory test in s.4.55 of the EPA Act to consider whether the relevant developments are 'substantially the same' as one another, which does not demand that the comparison be undertaken in any particular way (Feldkirchen Pty Ltd v Development Implementation Pty Ltd [2022] NSWCA 227 at [112] and Arrage at [27] and [28]).

3. *Categorising the facts found: This third (and final) step involves determining whether the facts found (determined as part of the first step) fall within or without the words and phrases of the 'substantially the same' test in s.4.55 of the EPA Act (determined as part of the second step). Most critically, the Court described this final step at [30] as an "**evaluative one**" that "involves **assigning relative significance or weight** to the different facts and **a balancing of the facts**, as weighted. This categorisation **can be an instinctive synthesis** and not be articulated expressly" (our **emphasis**).*

   (Mills Oakley 2024)

The *Modifying an Approved Project* draft guidelines produced as part of the *Draft Environmental Impact Assessment Guidance Series* by the NSW Department of Planning and Environment in June 2017, also provides some guidance when assessing modifications of State Significant development:

> *For SSD, a proponent must demonstrate that the change, if carried out, would result in a development that would be substantially the same development as the original development. In order to draw this conclusion, a proponent must have regard to the following considerations, which have been established through decisions of the NSWLEC:*
>
> - *''Substantially'' means ''essentially or materially'' or ''having the same essence.''*
> - *A development can still be substantially the same even if the development as modified involves land that was not the subject of the original consent (provided that the consent authority is satisfied that the proposal is substantially the same).*

- *If the development as modified, involves an ''additional and distinct land use'', it is not substantially the same development.*
- *Notwithstanding the above, development as modified would not necessarily be substantially the same solely because it was for precisely the same use as that for which consent was originally granted.*
- *To determine whether something is ''substantially the same'' requires a comparative task between the whole development as originally approved and the development as proposed to be modified. In order for the proposal to be ''substantially the same'', the comparative task must:*
    - *result in a finding that the modified development is ''essentially or materially'' the same*
    - *appreciate the qualitative and quantitative differences in their proper context*
    - *in addition to the physical difference, consider the environmental impacts of proposed Modification Applications to approved developments.*

''Substantially'' means ''essentially or materially'' or ''having the same essence.''

Comments

It is considered the modification proposal is substantially the same as that approved and is development that could be considered "*materially the same as that previously approved*". Furthermore, it is considered that the modifications proposed are of the same '*essence'* as the approved development given that:

- The proposal maintains the current land use approved at the site and does not seek to alter the over-riding character of development.
- The proposed built form is substantially the same as that already approved, in that development is to consist of industrial buildings, plant and equipment located within the general confines of the overall approved Shoalhaven Starches Factory site.
- The proposed buildings maintain the same form as that approved with due consideration given in the Modification Application to relevant issues

pertaining to noise, flood and traffic impacts; and

- As demonstrated by this Modification Report, the Modification Proposal does not result in any additional significant environmental impacts.

> ***A development can still be substantially the same even if the development as modified involves land that was not the subject of the original consent (provided that the consent authority is satisfied that the proposal is substantially the same).***

Comment

The proposal does not involve land that was not the subject of the approval which was in place at the time that the Shoalhaven Starches Expansion Project site transitioned from the Transitional Part 3A provisions to being assessed as State Significant Development

> ***If the development as modified, involves an ''additional and distinct land use'', it is not substantially the same development.***

Comment

The proposal does not involve an *''additional and distinct land use'.* The proposed modification involves alterations and additions to any existing CO_2 Plant.

> ***Notwithstanding the above, development as modified would not necessarily be substantially the same solely because it was for precisely the same use as that for which consent was originally granted.***

Comment

The modification proposal does not seek to change the nature of the approved use of the site; it will remain as originally approved.

> ***To determine whether something is ''substantially the same'' requires a comparative task between the whole development as originally approved and the development as proposed to be modified. In order for the proposal to be ''substantially the same'', the comparative task must:***
>
> - ***result in a finding that the modified development is ''essentially or materially'' the same***
> - ***appreciate the qualitative and quantitative differences in their proper context***

- ***in addition to the physical difference, consider the environmental impacts of proposed Modification Applications to approved developments.***

Comment

Quantitatively, whilst the proposal will involve an increase in CO_2 processing capacity, the proposal does not represent any increases in overall production from the Shoalhaven Starches operations in the terms of processing of flour and starch / gluten or overall ethanol production. The proposal involves processing CO_2 that is already produced by the existing Shoalhaven Starches operations.

The qualitative elements of the proposal demonstrate that the environmental and amenity impacts of the modification proposal are limited and justifies this proposal being considered as a modification.

This proposal will not expand the overall footprint of the approved Shoalhaven Starches operations. The proposed modification is located within the site that have existing or approved development.

The proposed development will have a limited additional visual impact. The bulk, character and scale of the structures associated with this modification application will not be dissimilar to that of other industrial type development associated with the existing factory site. Furthermore, the proposed works will be sited within proximity of similar structures of a similar nature. The works will be sited in the midst of the existing factory complex and will be viewed within this context.

The proposed modification does not raise additional air quality or noise impacts over those already considered as part of the Project as approved.

The works associated with this modification application do not represent an additional and or distinct land use as all proposed modifications facilitate and improve the existing approved production processes.

Whilst the proposal will involve an increase in CO_2 processing, the amount of CO_2 that will be processed is already produced by the existing Shoalhaven Starches operations. The Modification Proposal will not however comprise any qualitative or

quantitative changes in overall production from the Shoalhaven Starches operations as approved under the Shoalhaven Starches Expansion Project Approval. The proposal essentially seeks to process CO_2 gas that would otherwise be vented to the atmosphere.

The modified proposal represents a scale of development that will be commensurate with the bulk, scale and character of the approved development.

It is our view that the proposed modification will have minimal environmental impacts, and the modified development is substantially the same as approved Project. As such the modification proposal is considered consistent with provisions of Section 4.55(1A) of the Act in this instance.

Given the above circumstances it is our view that the modification proposal; will have minimal environmental impact when compared to the original approved development; and the development as modified by this modification application will be substantially the same development as the development for which consent was originally granted having regard to both the qualitative and quantitative elements of that development.

7.0 SECTION 4.15(1)(A) – ENVIRONMENTAL PLANNING & ASSESSMENT ACT

In determining an application made pursuant to Section 4.55 of the EP&A Act the consent authority must take into consideration such of the matters referred to in Section 4.15(1) as are of relevance to the development the subject of the application.

7.1 ENVIRONMENTAL PLANNING INSTRUMENTS

7.1.1 STATE ENVIRONMENTAL PLANINNG POLICIES

Table 2 details State Environmental Planning Policies (SEPP) that apply to the land and whether they are applicable to the proposal.

Table 2
State Environmental Planning Policies that Apply to the Subject Site

State Environmental Planning Policy	***Applicable Yes/No***
State Environmental Planning Policy (Planning Systems) 2021	Yes (Proposal involves modification of SSD)
State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004	No
State Environmental Planning Policy (Exempt and Complying Development Codes) 2008	No
State Environmental Planning Policy (Biodiversity & Conservation) 2021	No
State Environmental Planning Policy (Housing) 2021	No
State Environmental Planning Policy (Transport & Infrastructure) 2021	Yes
State Environmental Planning Policy (Industry and Employment) 2021	No
State Environmental Planning Policy No 65-Design Quality of Residential Apartment Development	No
State Environmental Planning Policy (Primary Production) 2021	No
State Environmental Planning Policy (Precincts – Central River City) 2021	No
State Environmental Planning Policy (Precincts – Western Parklands City) 2021	No
State Environmental Planning Policy (Precincts – Eastern Harbour City) 2021	No
State Environmental Planning Policy (Precincts – Regional) 2021	No
State Environmental Planning Policy (Primary Production) 2021	No
State Environmental Planning Policy (Resilience & Hazards) 2021	Yes

SEPP – Transport & Infrastructure

Division 17 of this SEPP relates to Road and Traffic while Schedule 3 of the SEPP outlines traffic generating development which requires referral to Roads and Maritime Services (RMS). The proposal does not trigger the criteria in this Schedule that would warrant the development application being referred to the RMS, and therefore the provisions of this SEPP would not apply to this proposal.

Schedule 3 includes the following criteria that may have relevance to this proposal:

Development purpose	***Column 1:*** ***Size or capacity*** ***– site with access to any road***	***Column 2*** ***Size or capacity—site with access to classified road or to road that connects to classified road (if access within 90m of connection, measured along alignment of connecting road)***
Car parks	200 or more car parking spaces	50 or more car parking spaces
Industry	20,000m^2 in site area or (if the site area is less than the gross floor area) gross floor area	5000 m^2 in site area or (if the site area is less than the gross floor area) gross floor area
Any other purpose	200 or more motor vehicles per hour	50 or more motor vehicles per hour

The modification proposal does not specifically trigger the above criteria. Under these circumstances the RMS is not required to be notified of this proposal.

The Modification Proposal is supported by a traffic assessment prepared by ARC Consulting and traffic issues are further discussed in Section 8.5 of this report.

SEPP – Resilience & Hazards

Coastal Management

Part 2 of this SEPP deals with coastal management and stipulates Development Controls for Coastal Management Areas.

Division 1 outlines the controls to be applied to development in the Coastal Wetlands and Littoral Rainforests Area.

Coastal Wetlands and Littoral Rainforests Area

Mapping supporting the SEPP outlines the subject land is not mapped as containing coastal wetlands or littoral rainforest.

Coastal Environment Area

Division 3 of the SEPP stipulates the controls to be applied to development in the Coastal Environment Area.

The subject land is mapped under this SEPP Mapping as being located within the Coastal Environment Area as seen below in **Figure 7**.

Figure 7: Coastal Environment Area Map.

Clause 2.10 of the SEPP specifies matters that must be considered in determining development applications on land within the Coastal Environment Area. Clause 2.10 reads:

> *1) Development consent must not be granted to development on land that is within the coastal environment area unless the consent authority has considered whether the proposed development is likely to cause an adverse impact on the following:*
>
> *a) the integrity and resilience of the biophysical, hydrological (surface and groundwater) and ecological environment,*
>
> *b) coastal environmental values and natural coastal processes,*

c) *the water quality of the marine estate (within the meaning of the Marine Estate Management Act 2014), in particular, the cumulative impacts of the proposed development on any of the sensitive coastal lakes identified in Schedule 1,*

d) *marine vegetation, native vegetation and fauna and their habitats, undeveloped headlands and rock platforms,*

e) *existing public open space and safe access to and along the foreshore, beach, headland or rock platform for members of the public, including persons with a disability,*

f) *Aboriginal cultural heritage, practices and places,*

g) *the use of the surf zone.*

2) *Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that:*

a) *the development is designed, sited and will be managed to avoid an adverse impact referred to in subclause (1), or*

b) *if that impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise that impact, or*

c) *if that impact cannot be minimised—the development will be managed to mitigate that impact.*

Comment:

- The proposal is not near a headland or rock platform and as such does not impact on public access to these areas.
- The proposal will not adversely impact on the visual amenity and scenic qualities of the coast.
- The Modification Proposal is situated within an existing industrial site and is therefore unlikely to impact items of Aboriginal cultural heritage significance.
- The Modification Application is supported by a Flora and Fauna Assessment prepared by Ecoplanning. The proposal will not have any adverse impacts on marine or native vegetation and fauna or their habitats.
- The Modification Application is supported by an Integrated Water Cycle Management Study prepared by Allen Price which incorporates erosion and

sediment control measures to minimise impact on the water quality of the adjoining watercourses.

- The proposed development is not located within close proximity to the surf zone and will not impact on coastal environmental values or natural coastal processes.

Coastal Use Area

Division 4 of the SEPP specifies the controls to be applied to development in the Coastal Use Area. The subject land is also within the Coastal Use zone as seen below in **Figure 8**. As such the provisions which apply to this mapping are relevant to the proposed development.

Figure 8: NSW Coastal Management SEPP: Coastal Use Area Map.

Clause 2.11 of the SEPP specifies matters that must be considered in determining development applications on land within the Coastal Use Area. Clause 14 reads:

> *(1) Development consent must not be granted to development on land that is within the coastal use area unless the consent authority:*
>
> *(a) has considered whether the proposed development is likely to cause an adverse impact on the following:*

(i) *existing, safe access to and along the foreshore, beach, headland or rock platform for members of the public, including persons with a disability,*

(ii) *overshadowing, wind funneling and the loss of views from public places to foreshores,*

(iii) *the visual amenity and scenic qualities of the coast, including coastal headlands,*

(iv) *Aboriginal cultural heritage, practices and places,*

(v) *cultural and built environment heritage, and*

(b) *is satisfied that:*

(i) *the development is designed, sited and will be managed to avoid an adverse impact referred to in paragraph (a), or*

(ii) *if that impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise that impact, or*

(iii) *if that impact cannot be minimised—the development will be managed to mitigate that impact, and*

(c) *has taken into account the surrounding coastal and built environment, and the bulk, scale and size of the proposed development.*

Comment:

- The proposal will not impact on existing safe access to the foreshore. The proposal is not near a beach, headland or rock platform and as such does not impact on public access to these areas.
- The works associated with this modification proposal will not cause overshadowing of the foreshore area or wind funnelling. The development will not block views from public places. The proposal will not adversely impact on the visual amenity and scenic qualities of the coast.
- As detailed above, the proposal will not adversely impact on Aboriginal cultural heritage and places.
- The works associated with this modification proposal are of a bulk, scale and size that are consistent with existing industrial development on the site and will not create an adverse visual impact in this locality.

Under these circumstances the proposal is considered to be consistent with the objectives

Hazardous & Offensive Development

Chapter 3 of this SEPP deals with Hazardous and offensive development. Clause 3.11 of this SEPP requires that a person who proposes to carry out development for the purposes of a potentially hazardous industry must prepare a preliminary hazard analysis in accordance with the current circulars or guidelines published by the Department of Planning and submit the analysis with the development application.

The Modification Proposal is supported by a Preliminary Hazard Analysis prepared by Pinnacle Risk Management Pty Ltd. This matter is further addressed in Section 8.3.1 of this Modification Report.

7.1.2 LOCAL ENVIRONMENTAL PLAN

Shoalhaven Local Environmental Plan 2014

The parcels of land associated with this modification application are all zoned E4 General Industrial under the provisions of the Shoalhaven LEP 2014 (refer **Figure 9**).

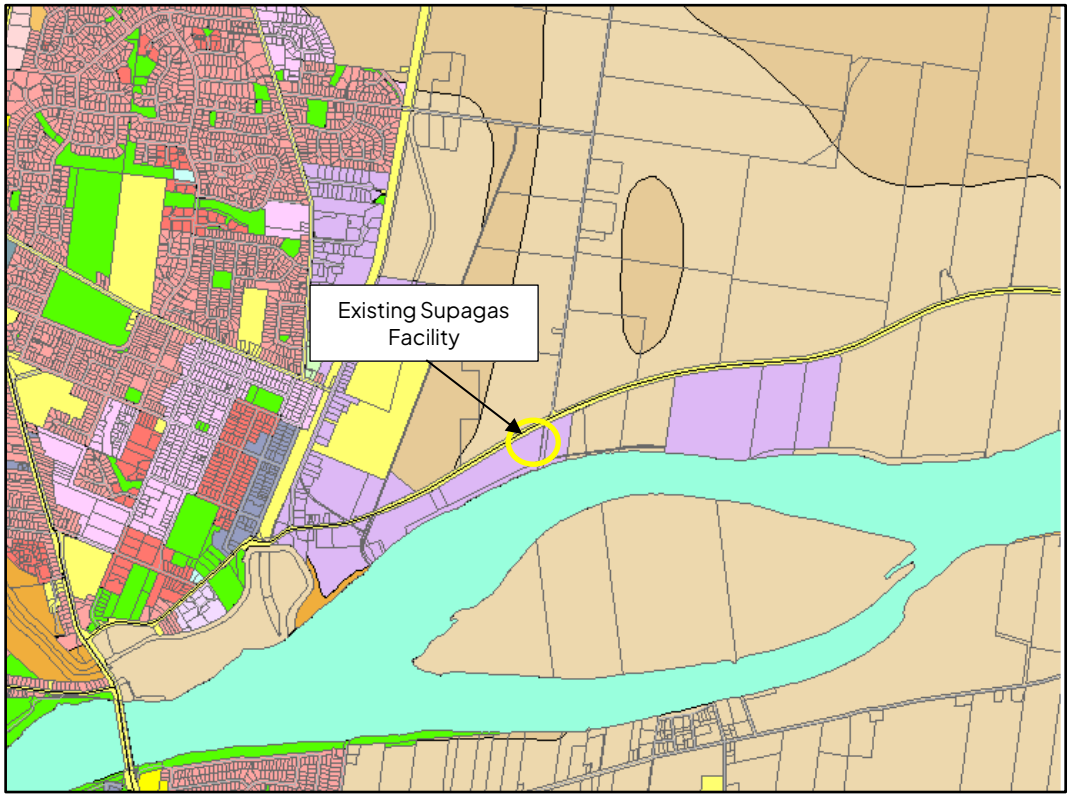

Figure 9: Extract of zoning map under the SLEP 2014.

The objectives of the E4 zone are:

- *To provide a range of industrial, warehouse, logistics and related land uses.*
- *To ensure the efficient and viable use of land for industrial uses.*
- *To minimise any adverse effect of industry on other land uses.*
- *To encourage employment opportunities.*
- *To enable limited non-industrial land uses that provide facilities and services to meet the needs of businesses and workers.*
- *To allow a diversity of activities that do not significantly conflict with the operation of existing or proposed development.*

It is our view that the proposal is consistent with these objectives as the proposal involves modifications to an existing industrial facility.

"*General industries*" are permissible within the E4 zone subject to consent (**Table 3**). The proposal involves modifications to an existing industrial development and is therefore permissible with consent.

Table 3
Land Use Permissibility – E4 Zone (Shoalhaven LEP 2014)

Permitted without consent	Nil.
Permitted with consent	Depots; Freight transport facilities; Garden centres; **General industries**; Goods repair and reuse premises; Hardware and building supplies; Industrial retail outlets; Industrial training facilities; Kiosks; Landscaping material supplies; Light industries; Local distribution premises; Markets; Neighbourhood shops; Oyster aquaculture; Plant nurseries; Specialised retail premises; Take away food and drink premises; Tank-based aquaculture; Timber yards; Warehouse or distribution centres; Any other development not specified in item 2 or 4
Prohibited	Agriculture; Air transport facilities; Airstrips; Amusement centres; Animal boarding or training establishments; Camping grounds; Caravan parks; Cemeteries; Centre-based child care facilities; Charter and tourism boating facilities; Correctional centres; Crematoria; Eco-tourist facilities; Educational establishments; Environmental facilities; Exhibition villages; Extractive industries; Farm buildings; Forestry; Function centres; Health services facilities; Heavy industries; Highway service centres; Home businesses; Home occupations; Home occupations (sex services); Home-based child care; Information and education facilities; Marinas; Mooring pens; Moorings; Office premises; Open cut mining; Registered clubs; Residential accommodation;

	Respite day care centres; Restricted premises; Retail premises; Sex services premises; Tourist and visitor accommodation; Water recreation structures; Wharf or boating facilities.

The SLEP 2014 also has a number of specific provisions that apply to the land. The implications that these provisions have in relation to this proposal are discussed in **Table 4** below:

Table 4
Shoalhaven Local Environment Plan Provisions

SLEP Clause	*Provisions*	Comments
Clause4.3 *Height of Buildings*	*(1) The objectives of this clause are as follows:* *(a) to ensure that buildings are compatible with the height, bulk and scale of the existing and desired future character of a locality,* *(b) to minimise visual impact, disruption of views, loss of privacy and loss of solar access to existing development,* *(c) to ensure that the height of buildings on or in the vicinity of a heritage item or within a heritage conservation area respect heritage significance.* *(2) The height of a building on any land is not to exceed the maximum height shown for the land on the Height of Buildings Map.* *(2A) If the Height of Buildings Map does not show a maximum height for any land, the height of a building on the land is not to exceed 11 metres.*	Although there is no maximum height specified for the subject land, Clause 4.3(2A) imposes a maximum building height of 11 m where no specific height limit is designated. The Modification Proposal includes the erection of CO_2 storage vessels which will have a height above ground level of 20 metres. Under these circumstances, the proposal involves structures that will exceed the maximum building height limit of 11 m. The Modification Report is supported by a Written Request made pursuant to Clause 4.6 justifying non-compliance with this maximum building height limit.

Clause 4.6 *Exceptions to development standards*	*(1) The objectives of this clause are as follows:* *(a) to provide an appropriate degree of flexibility in applying certain development standards to particular development,* *(b) to achieve better outcomes for and from development by allowing flexibility in particular circumstances.* *(2) Development consent may, subject to this clause, be granted for development even though the development would contravene a development standard imposed by this or any other environmental planning instrument. However, this clause does not apply to a development standard that is expressly excluded from the operation of this clause.* *(3) Development consent must not be granted for development that contravenes a development standard unless the consent authority has considered a written request from the applicant that seeks to justify the contravention of the development standard by demonstrating:* *(a) that compliance with the development standard is unreasonable or unnecessary in the circumstances of the case, and* *(b) that there are sufficient environmental planning grounds to justify contravening the development standard.* *(4) Development consent must not be granted for development that contravenes a development standard unless:* *(a) the consent authority is satisfied that:* *(i) the applicant's written request has adequately addressed the matters required to be demonstrated by subclause (3), and* *(ii) the proposed development will be in the public interest because it is consistent with the objectives of the particular standard and the objectives for development within the zone in which the development is proposed to be carried out, and*	The proposal will involve the erection of structures that will exceed the 11 metres building height limit set by Clause 4.3(2A). As the proposed works will be built within the existing industrial complex it is not expected that the new structures will have an undue effect due to its height. The proposed development will be erected within the broader approved Shoalhaven Starches factory site. This Modification Application is supported by a Clause 4.6 Written Request justifying a departure to Clause 4.3(2A) under the specific circumstances of this case. While it is held that a written request pursuant to Clause 4.6 is not required for the contravention of a development standard arising as a result of a modification application per *SDHA Pty Ltd v Waverley Council [2015] NSWLEC 65* at [34] – [35], the Clause 4.6 written request that supports this Modification Application serves to justify the contravention of a development standard and assess the impacts of the proposed variation to the maximum height of building control under Shoalhaven LEP 2014.

4.6 continued	*(b) the concurrence of the Director-General has been obtained.* *(5) In deciding whether to grant concurrence, the Director-General must consider:* *(a) whether contravention of the development standard raises any matter of significance for State or regional environmental planning, and* *(b) the public benefit of maintaining the development standard, and* *(c) any other matters required to be taken into consideration by the Director- General before granting concurrence.* *(6) Development consent must not be granted under this clause for a subdivision of land in Zone RU1 Primary Production, Zone RU2 Rural Landscape, Zone RU3 Forestry, Zone RU4 Primary Production Small Lots, Zone RU6 Transition, Zone R5 Large Lot Residential, Zone E2 Environmental Conservation, Zone E3 Environmental Management or Zone E4 Environmental Living if:* *(a) the subdivision will result in 2 or more lots of less than the minimum area specified for such lots by a development standard, or* *(b) the subdivision will result in at least one lot that is less than 90% of the minimum area specified for such a lot by a development standard.* *Note. When this Plan was made it did not include all of these zones.* *(7) After determining a development application made pursuant to this clause, the consent authority must keep a record of its assessment of the factors required to be addressed in the applicant's written request referred to in subclause (3).*	

Clause 5.10 *Heritage Conservation* *5.10*	*(1) The objectives of this clause are:* *(a) to conserve the environmental heritage of Shoalhaven; and* *(b) to conserve the heritage significance of heritage items and heritage conservation areas including associated fabric, settings and views; and* *(c) to conserve archaeological sites; and* *(d) to conserve Aboriginal objects and Aboriginal places of heritage significance.* *(2) Development consent is required for any of the following:* *(a) demolishing or moving any of the following or altering the exterior of any of the following (including, in the case of a building, making changes to its detail, fabric, finish or appearance):* *(i) a heritage item,* *(ii) an Aboriginal object* *(iii) a building, work, relic or tree within a heritage conservation area,* *(b) altering a heritage item that is a building by making structural changes to its interior or by making changes to anything inside the item that is specified in Schedule 5 in relation to the item,* *(c) disturbing or excavating an archaeological site while knowing, or having reasonable cause to suspect, that the disturbance or excavation will or is likely to result in a relic being, discovered, exposed, moved damaged or destroyed,* *(d) disturbing or excavating an Aboriginal place of heritage significance,* *(e) erecting a building on land:* *(i) on which a heritage item is located or that is within a heritage conservation area;*	There are no heritage items within the subject land, and the subject site is not located within a heritage conservation area.

	(ii) on which an Aboriginal object is located or that is within an Aboriginal place of heritage significance, *(f) subdividing land:* *(i) on which a heritage item is located or that is within a heritage conservation area, or* *(ii) on which an Aboriginal object is located or that is within an Aboriginal place of heritage significance.*	

Clause 5.21 *Flood Planning*	*(1) The objectives of this clause are as follows—* *(a) to minimise the flood risk to life and property associated with the use of land,* *(b) to allow development on land that is compatible with the flood function and behaviour on the land, taking into account projected changes as a result of climate change,* *(c) to avoid adverse or cumulative impacts on flood behaviour and the environment,* *(d) to enable the safe occupation and efficient evacuation of people in the event of a flood.* *(2) Development consent must not be granted to development on land the consent authority considers to be within the flood planning area unless the consent authority is satisfied the development—* *(a) is compatible with the flood function and behaviour on the land, and* *(b) will not adversely affect flood behaviour in a way that results in detrimental increases in the potential flood affectation of other development or properties, and* *(c) will not adversely affect the safe occupation and efficient evacuation of people or exceed the capacity of existing evacuation routes for the surrounding area in the event of a flood, and* *(d) incorporates appropriate measures to manage risk to life in the event of a flood, and* *(e) will not adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of riverbanks or watercourses.* *(3) In deciding whether to grant development consent on land to which this clause applies, the consent authority must consider the following matters—*	The Modification Application is supported by a Flood Compliance Report prepared by WMAwater. Flooding is further addressed in Section 8.3.5 of this Modification Report:

	(a) the impact of the development on projected changes to flood behaviour as a result of climate change, *(b) the intended design and scale of buildings resulting from the development,* *(c) whether the development incorporates measures to minimise the risk to life and ensure the safe evacuation of people in the event of a flood,* *(d) the potential to modify, relocate or remove buildings resulting from development if the surrounding area is impacted by flooding or coastal erosion.* *(4) A word or expression used in this clause has the same meaning as it has in the Considering Flooding in Land Use Planning Guideline unless it is otherwise defined in this clause.* *(5) In this clause—* ***Considering Flooding in Land Use Planning Guideline** means the Considering Flooding in Land Use Planning Guideline published on the Department's website on 14 July 2021* ***Flood planning area** has the same meaning as it has in the Floodplain Development Manual.* ***Floodplain Development Manual** means the Floodplain Development Manual (ISBN 0 7347 5476 0) published by the NSW Government in April 2005.*	

<table>
<tr>
<td>Clause 7.1
Acid sulphate soils</td>
<td>
(1) The objective of this clause is to ensure that development does not disturb, expose or drain acid sulphate soils and cause environmental damage.
(2) Development consent is required for the carrying out of works described in the Table to this subclause on land shown on the Acid Sulphate Soils Map as being of the class specified for those works, except as provided by this clause.
<table>
<tr><th>Class of Land</th><th>Works</th></tr>
<tr><td>1</td><td>Any works.</td></tr>
<tr><td>2</td><td>Works below the natural ground surface.
Works by which the water table is likely to be lowered.</td></tr>
<tr><td>3</td><td>Works more than 1 metre below the natural ground surface.
Works by which the water table is likely to be lowered more than 1 metre below the natural ground surface.</td></tr>
<tr><td>4</td><td>Works more than 2 metres below the natural ground surface.
Works by which the water table is likely to be lowered more than 2 metres below the natural ground surface.</td></tr>
<tr><td>5</td><td>Works within 500 metres of adjacent Class 1, 2, 3 or 4 land that is below 5 metres Australian Height Datum by which the water table is likely to be lowered below 1 metre Australian Height Datum on adjacent Class 1, 2, 3 or 4 land.</td></tr>
</table>
(3) Development consent must not be granted under this clause for the carrying out of works unless an acid sulphate soils management plan has been prepared for the proposed works in accordance with the Acid Sulphate Soils Manual and has been provided to the consent authority.
(4) Despite subclause (2), development consent is not required under this clause for the carrying out of works if:
(a) a preliminary assessment of the proposed works prepared in accordance with the Acid Sulphate Soils Manual indicates
</td>
<td>The Modification Application is supported by an assessment of ASS prepared by GHD. Based on the results of previous investigations and limited information on subsurface conditions at the site, GHD identify that an Acid sulphate Soil Management Plan (ASSMP) would not be required provided that less than 1,000 tonnes of material is disturbed and soils were of medium texture (i.e. clayey sand to light clays as described by Sullivan, Ward, Toppler, & Lancaster (2018))</td>
</tr>
</table>

	that an acid sulphate soils management plan is not required for the works, and *(b) the preliminary assessment has been provided to the consent authority and the consent authority has confirmed the assessment by notice in writing to the person proposing to carry out the works.* *(5) Despite subclause (2), development consent is not required under this clause for the carrying out of any of the following works by a public authority (including ancillary work such as excavation, construction of access ways or the supply of power):* *(a) emergency work, being the repair of the works of the public authority required to be carried out urgently because the works have been damaged, have ceased to function or pose a risk to the environment or to public health and safety,* *(b) routine management work, being the periodic inspection, cleaning, repair or replacement of the works of the public authority (other than work that involves the disturbance of more than 1 tonne of soil).* *(c) minor work, being work that costs less than $20,000 (other than drainage work).* *(6) Despite subclause (2), development consent is not required under this clause to carry out any works if:* *(a) the works involve the disturbance of less than 1 tonne of soil, and* *(b) the works are not likely to lower the watertable.*	

Clause 7.4 *Coastal Risk Planning*	*(1) The objectives of this clause are as follows:* *(a) to avoid significant adverse impacts from coastal hazards,* *(b) to ensure uses of land identified as coastal risk are compatible with the risks presented by coastal hazards,* *(c) to enable the evacuation of land identified as coastal risk in an emergency,* *(d) to avoid development that increases the severity of coastal hazards.* *(2) This clause applies to the land identified as "Coastal Risk Planning Area" on the Coastal Risk Planning Map.* *(3) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that the development:* *(a) will avoid, minimise or mitigate exposure to coastal processes, and* *(b) is not likely to cause detrimental increases in coastal risks to other development or properties, and* *(c) is not likely to alter coastal processes and the impacts of coastal hazards to the detriment of the environment, and* *(d) incorporates appropriate measures to manage risk to life from coastal risks, and* *(e) is likely to avoid or minimise adverse effects from the impact of coastal processes and the exposure to coastal hazards, and* *(f) provides for the relocation, modification or removal of the development to adapt to the impact of coastal processes and coastal hazards, and* *(g) has regard to the impacts of sea level rise.* *(4) A word or expression used in this clause has the same meaning as it has in the NSW Coastal Planning Guideline: Adapting to Sea Level Rise (ISBN 978-1-74263-035-9) published by the NSW*	The *Coastal Risk Planning Map* that accompanies the SLEP 2014 does <u>not</u> identify the subject land as a "*Coastal Risk Planning Area*". The provisions of this clause therefore do not apply to the subject site.

	Government in August 2010, unless it is otherwise defined in this clause. *(5) In this clause:* ***coastal hazard** has the same meaning as in the Coastal Protection Act 1979.*	

Clause 7.5 *Terrestrial Biodiversity*	*(1) The objective of this clause is to maintain terrestrial biodiversity, by:* *(a) protecting native flora and fauna,* *(b) protecting the ecological processes necessary for their continued existence, and* *(c) encouraging the recovery of native flora and fauna, and their habitats.* *(2) This clause applies to land:* *(a) identified as "Biodiversity—habitat corridor" or "Biodiversity—significant vegetation" on the Terrestrial Biodiversity Map, and* *(b) situated within 40m of the bank (measured horizontally from the top of the bank) of a natural waterbody.* *(3) Before determining a development application for development on land to which this clause applies, the consent authority must consider:* *(a) whether the development is likely to have:* *(i) any adverse impact on the condition, ecological value and significance of the fauna and flora on the land, and* *(ii) any adverse impact on the importance of the vegetation on the land to the habitat and survival of native fauna, and* *(iii) any potential to fragment, disturb or diminish the biodiversity structure, function and composition of the land, and* *(iv) any adverse impact on the habitat elements providing connectivity on the land, and* *(b) any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.* *(4) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that:*	The Terrestrial Biodiversity Map that accompanies the SLEP 2014 does <u>not</u> identify the subject land as including areas of Biodiversity - habitat corridor and/or Biodiversity - significant vegetation. The Modification Application is supported by a Flora and Fauna Assessment prepared by Ecoplanning. Ecological issues are further addressed in Section 8.4.1 of this report.

	(a) the development is designed, sited and will be managed to avoid any significant adverse environmental impact, or *(b) if that impact cannot be reasonably avoided by adopting feasible alternatives—the development is designed, sited and will be managed to minimise that impact, or* *(c) if that impact cannot be minimised—the development will be managed to mitigate that impact.* *(5) For the purpose of this clause:* ***bank** means the limit of the bed of a natural waterbody.* ***bed,** of a natural waterbody, means the whole of the soil of the channel in which the waterbody flows, including the portion that is alternatively covered and left bear with an increase or diminution in the supply of water and that is adequate to contain the waterbody at its average or mean stage without reference to extraordinary freshets in the time of flood or to extreme droughts.*	
Clause 7.6 *Riparian land and watercourses*	*(1) The objective of this clause is to protect and maintain the following:* *(a) water quality within watercourses,* *(b) the stability of the bed and banks of watercourses,* *(c) aquatic and riparian habitats,* *(d) ecological processes within watercourses and riparian areas.* *(2) This clause applies to all of the following:* *(a) land identified as "Riparian Land" on the Riparian Lands and Watercourses Map,* *(b) land identified as "Watercourse Category 1", "Watercourse Category 2" or "Watercourse Category 3" on that map,* *(c) all land that is within 50 metres of the top of the bank of each watercourse on land identified as "Watercourse Category 1", "Watercourse Category 2" or "Watercourse Category 3" on that map.*	The Riparian Lands and Watercourses Map that accompanies the SLEP 2014 identifies a category 1 watercourse (Shoalhaven River), adjacent to the southern boundary of the Shoalhaven Starches factory site and a category 2 watercourse Abernethy's Creek flowing through the factory site (north south) The Modification Application is supported by an assessment of the impacts that the proposed works will have on the riverbank stability of the Shoalhaven Rover prepared by GHD. This assessment also provides an assessment of the proposed works on the riparian areas of this watercourse. This issue is further discussed in Section 8.3.3 of this report. The Modification Application is supported by a Flora and Fauna Assessment prepared by Ecoplanning. Ecological issues are further addressed in Section 8.4.1 of this report.

	(3) Before determining a development application for development on land to which this clause applies, the consent authority must consider: *(a) whether or not the development is likely to have any adverse impact on the following:* *(i) the water quality and flows within the watercourse,* *(ii) aquatic and riparian species, habitats and ecosystems of the watercourse,* *(iii) the stability of the bed and banks of the watercourse,* *(iv) the free passage of fish and other aquatic organisms within or along the watercourse,* *(v) any future rehabilitation of the watercourse and its riparian areas, and* *(b) whether or not the development is likely to increase water extraction from the watercourse, and* *(c) any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.* *(4) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that:* *(a) the development is designed, sited and will be managed to avoid any significant adverse environmental impact, or* *(b) if that impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise that impact, or* *(c) if that impact cannot be minimised—the development will be managed to mitigate that impact* *(5) For the purpose of this clause:* ***bank** means the limit of the bed of a watercourse.* ***bed**, of a watercourse, means the whole of the soil of the channel in which the watercourse flows, including the portion that is*	The Modification Application is also supported by an Integrated Water Cycle Management Strategy prepared by Allen Price which addresses measures to protect water quality of the Shoalhaven River.

	alternatively covered and left bear with an increase or diminution in the supply of *water and that is adequate to contain the watercourse at its average or mean stage without reference to extraordinary freshets in the time of flood or to extreme droughts.*	

Clause 7.7 *Landslide risk and other land degradation*	*(1) The objective of this clause is to maintain soil resources and the diversity and stability of landscapes, including protecting land:* *(a) comprising steep slopes, and* *(b) susceptible to other forms of land degradation.* *(2) This clause applies to the following land:* *(a) land with a slope in excess of 20% (1:5), as measured from the contours of a 1:25,000 topographical map, and* *(b) land identified as "Sensitive Area" on the Natural Resource Sensitivity—Land Map.* *(3) Before determining a development application for development on land to which this clause applies, the consent authority must consider any potential adverse impact, either from, or as a result of, the development in relation to:* *(a) the geotechnical stability of the site, and* *(b) the probability of increased erosion or other land degradation processes.* *(4) Before granting consent to development on land to which this clause applies, the consent authority must be satisfied that:* *(a) the development is designed, sited and will be managed to avoid any significant adverse environmental impact, or* *(b) if that impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise that impact, or* *(c) if that impact cannot be minimised – the development will be managed to mitigate that impact.* *(5) In this clause, topographical map means the most current edition of a topographical map, produced by Land and Property Information division of the Department of Finance and Services, that identifies the Council's local government area and boundary.*	The proposed works involve land identified as sensitive land under the SLEP 2014 mapping. Under these circumstances the provisions of this clause will apply to this proposal. As outlined above in GHD have undertaken a geotechnical assessment of in relation to the rail line extension. This is addressed further in Section 8.3.3 of this Modification Report.

Clause 7.8 *Scenic protection*	*(1) The objective of this clause is to protect the natural environmental and scenic amenity of land that is of high scenic value.* *(2) This clause applies to land identified as "Scenic Protection" on the Scenic Protection Area Map.* *(3) In deciding whether to grant development consent for development on land to which this clause applies, the consent authority must:* *(a) consider the visual impact of the development when viewed from a public place and be satisfied that the development will involve the taking of measures that will minimise any detrimental visual impact, and* *(b) consider the number, type and location of existing trees and shrubs that are to be retained and the extent of landscaping to be carried out on the site, and* *(c) consider the siting of the proposed buildings.*	The subject land is <u>not</u> identified as being within a "*Scenic Protection*" area by *Scenic Protection Area Mapping* that accompanies the SLEP 2014. The provisions of this clause therefore do not apply to the subject site. The visual impact associated with this proposal are discussed in Section 8.6 of this Modification Report.
Clause 7.9 *HMAS Albatross airspace operations*	*(1) The objectives of this clause are as follows—* *(a) to provide for the effective and on-going operation of the HMAS Albatross Military Airfield by ensuring that such operation is not compromised by proposed development that penetrates the Limitation or Operations Surface for that airport,* *(b) to protect the community from undue risk from that operation.* *(2) If a development application is received and the consent authority is satisfied that the proposed development will penetrate the Limitation or Operations Surface, the consent authority must not grant development consent unless it has consulted with the relevant Commonwealth body about the application.*	The proposed works do not involve structures or uses that are likely to penetrate the Limitation or Operations Surface for HMAS Albatross.

	(3) The consent authority may grant development consent for the development if the relevant Commonwealth body advises that— *(a) the development will penetrate the Limitation or Operations Surface but it has no objection to its construction, or* *(b) the development will not penetrate the Limitation or Operations Surface.* *(4) The consent authority must not grant development consent for the development if the relevant Commonwealth body advises that the development will penetrate the Limitation or Operations Surface and should not be carried out.* *(5) In this clause—* ***Limitation or Operations Surface** means the Obstacle Limitation Surface or the Procedures for Air Navigation Services Operations Surface as shown on the Obstacle Limitation Surface Map or the Procedures for Air Navigation Services Operations Surface Map for the HMAS Albatross Military Airfield.* ***Relevant Commonwealth body** means the body, under Commonwealth legislation, that is responsible for development approvals for development that penetrates the Limitation or Operations Surface for the HMAS Albatross Military Airfield*	

7.1.3 DEVELOPMENT CONTROL PLANS (DCP) AND POLICIES

Shoalhaven Development Control Plan (DCP) 2014

Chapter G2 Sustainable Stormwater Management and Erosion / Sediment Control

The purpose of this chapter of the DCP is to provide guidance about how to implement sustainable stormwater management and design principles for stormwater management.

The Modification Application is supported by an Integrated Water Cycle Management Strategy (ICMS) that has been prepared to address the provisions of this chapter of the DCP. The IWCMS concludes that during operation the Modification Proposal is unlikely to generate stormwater pollutants within the site.

Allen Price indicates that potential short term stormwater quality impacts arising from the construction works can be mitigated by the implementation of erosion and sediment control plan and staging earthworks.

Allen Price consider the Modification Proposal is adequate from a stormwater management perspective.

Chapter G9: Development on Flood Prone Land

The provisions of *Chapter G9: Development on Flood Prone Land* of the Shoalhaven DCP 2014 have relevance to this proposal.

This Modification Application is supported by a Flood Compliance Report prepared by WMAwater (**Annexure 6**).

Tables 5 and **6** below addresses the relevant provisions (Sections 5.1 and 5.2 respectively) of Chapter G9 of the Shoalhaven DCP 2014 having regard to the findings of the Flood Compliance Report prepared by WMAwater in relation to this Modification Proposal.

Table 5

Performance Criteria – General (Section 5.1 DCP 2014)

Performance Criteria	*Response*
P1 Development or work on flood prone land will meet the following:	
The development will not increase the risk to life or safety of persons during a flood event on the development site and adjoining land.	*The works are such that the construction will require approximately 40 additional contractors and possibly one additional full-time worker. Thus, there will not be a significant increase in the permanent workforce on the site or provide an additional threat to the safety of any worker during a flood.*
The development or work will not unduly restrict the flow behaviour of floodwaters.	*Refer Section 3 (Flood Compliance Assessment).*
The development or work will not unduly increase the level or flow of floodwaters or stormwater runoff on land in the vicinity.	*Refer Section 3 (Flood Compliance Assessment). As the majority of local catchment runoff is entirely contained within land owned by Shoalhaven Starches, so also are any affectations.*
The development or work will not exacerbate the adverse consequences of floodwaters flowing on the land with regard to erosion, siltation and destruction of vegetation.	*The works are largely within existing built up industrial land clear of vegetation. All runoff under existing and future conditions will reach the ground in nearly identical locations, the works will have no significant impact on erosion or siltation*
The structural characteristics of any building or work that are the subject of the application are capable of withstanding flooding in accordance with the requirements of the Council.	*A separate structural report will be provided for the rail line.*
The development will not become unsafe during floods or result in moving debris that potentially threatens the safety of people or the integrity of structures.	*A separate structural report will be provided for the rail line.*
Potential damage due to inundation of proposed buildings and structures is minimised.	*Structural failure of the works during a flood will potentially increase the rate of inflow of floodwaters from the Shoalhaven River to the northern floodplain. However, the increased rate of inflow is unlikely to cause damage to surrounding buildings or structures outside Shoalhaven Starches lands*
The development will not obstruct escape routes for both people and stock in the event of a flood.	*The works will not occupy escape routes or cause workers to become trapped.*
The development will not unduly increase dependency on emergency services.	*The works are such that their construction will not significantly increase the number of workers on the site or provide an additional threat to the safety of any worker during a flood*

Interaction of flooding from all possible sources has been taken into account in assessing the proposed development against risks to life and property resulting from any adverse hydraulic impacts.	*Refer Section 3.*
The development will not adversely affect the integrity of floodplains and floodway's, including riparian vegetation, fluvial geomorphologic environmental processes and water quality.	*The works will be constructed on land designated as part high hazard floodway in the 1% AEP event. The site is industrial land with nil existing vegetation (apart from grass) and is beyond the influence of normal fluvial geomorphic processes. The works will have no impact on water quality or the integrity of the floodplain and floodways.*

Table 6
Performance Criteria – General (Section 5.2 of DCP)

Performance Criteria	***Response***
P2 Filling or excavation on flood prone land will meet the following:	
High hazard floodway areas are kept free of fill and/or obstructions.	*Part of the works may be in a high hazard floodway as that is the only possible location for the works within the existing plant layout*
The proposed fill or excavation will not unduly restrict the flow behaviour of floodwaters.	*Refer Section 3.*
The proposed fill or excavation will not unduly increase the level or flow of floodwaters or stormwater runoff on land in the vicinity, including adjoining land.	*Refer Section 3.*
The proposed fill or excavation will not exacerbate erosion, siltation and destruction of vegetation caused by floodwaters flowing on the land.	*The works are largely within existing built-up industrial land clear of vegetation. The works will not exacerbate erosion, siltation and destruction of vegetation caused by floodwaters flowing on the land.*
The proposed fill or excavation will not be carried out on flood prone land if sufficient flood free area is available for development within the subject property.	*The proposed locations of the works are the only possible locations within the existing plant layout.*
The proposed excavation does not create new habitable rooms, non-habitable storage areas or carparks with floor levels below the existing ground level.	*No excavation will be undertaken apart for creation of foundations or similar. There are no proposed habitable rooms. All non-habitable and the storage of hazardous or similar material which will be flood proofed to the 1% AEP flood level or above. Any floor levels will be set as high as practical for safe access in an industrial plant.*

7.2 PROTECTION OF THE ENVIRONMENT OPERATIONS ACT AND ASSOCIATED REGULATIONS

The existing Supagas operation is subject to an Environmental Protection Licence (EPL) under the Protection of the Environment Operations Act 1997 (POEO Act) (EPL No. 21178) issued by the EPA.

If approved, the proposed modification may necessitate the terms/provisions of this licence to be also reviewed.

8.0 THE LIKELY IMPACTS OF THE DEVELOPMENT, INCLUDING ENVIRONMENTAL IMPACTS ON BOTH NATURAL AND BUILT ENVIRONMENTS, AND SOCIAL AND ECONOMIC IMPACTS IN THE LOCALITY

8.1 RISK ASSESSMENT OF POTENTIAL ENVIRONMENTAL IMPACTS

The purpose of this section of the SEE is to provide a risk assessment of the potential environmental impacts associated with the modification proposal. This section (**Table 7**) compares the potential impacts from the proposed modification against the approved project. The comparison uses the key environmental impacts assessed in the original EA that supported the original MP06_0228 and summarises the relative change in environmental impacts associated with the proposed modification.

Table 7

Risk Assessment

Relative Change in Environmental Impact	*Additional Management or Mitigation Measures Required*	*Significance of Issue with this Modification Proposal*
Air Quality (including Odour) Assessment		
One of the primary issues that was addressed in the original EA for the Shoalhaven Starches Expansion Project concerned the need for a comprehensive air quality assessment (including odour assessment) and reduction of odours as part of the project. Mod 15 for the existing Supagas facility was supported by an Air Quality Assessment (AQIA) undertaken by GHD. The AQIA prepared by GHD concluded: *"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".* Supagas operate on the subject site under Environmental Protection Licence (EPL) Number 21178. EPL 21178 does not impose any requirements in terms of air quality impacts or monitoring. Since commencement of operations at the site Supagas have not received any complaints in terms of their existing operations, particularly in terms of air quality or odours. Given the above circumstances it is considered that an Air Quality Assessment is not required to be prepare din support of this Modification Application.	No additional management or mitigation measured are proposed.	Not a key issue.
Transport and Traffic		

Shoalhaven Starches have undertaken comprehensive upgrades to existing vehicle entrances to the Shoalhaven Starches factory site as well as the former Dairy Farmers site (the subject of this particular project) to Bolong Road in accordance with the Project Approval as well as other approvals granted by Shoalhaven City Council. This Modification Report is supported by a Traffic Impact Assessment prepared by ARC Traffic & Transport ("ARC"). that identified there would be no access, traffic or parking impacts associated with the proposal – either during operation or construction – that would significantly impact on the efficiency and/or safety of the local traffic environment or existing on-site operations. The trip generation of the proposal during construction would be extremely minor, while once operational the proposal is not expected to generate any additional trips to the local road network. The current Modification Proposal will result in an increase in processing rates from the site over that which has been previously approved for this operation and will therefore involve an increase in traffic movements over that which was envisaged by the original Mod 15 and 20 approvals. Thi9s Modification Report is therefore supported by a further Transport Impact Assessment prepared by ARC Traffic & Transport. ARC conclude this Modification Proposal is entirely supportable further to access, traffic and parking considerations.	The Transport Impact Assessment prepared by ARCV includes a Construction Traffic Management Plan (CTMP) which indicates that the construction of the proposed new infrastructure can be undertaken safely and efficiently without impacting the local road network. The CTMP may be revised further to consideration of any future Conditions of Consent in a Modification approval	This issue is further addressed in Section 8.5 of this Modification Report.
Site Contamination		
The Modification Report is supported by a site contamination assessment prepared by GHD. Based in historical information and previous investigations, potential for contamination was identified by GHD in five Areas of Environmental Concern (AECs) potentially impacting soil, groundwater and / or surface water, which including:	Based on the results of this assessment GHD indicate that , a Targeted Site Investigation (TSI) is recommended for AECs where the likelihood of contamination to exist is assessed as low to moderate (i.e. Fill Mound 1), to assess the suitability of the fill material for re-use on site, or pre-classify it for off-site re-use (e.g. under the Resource Recovery framework) or disposal if required.. AECs where the likelihood of contamination was assessed as very	This issue is further addressed in Section 8.3.2 in this Modification Report.

• AEC 1: Fill of unknown quality and origin, notably three fill mounds (Fill Mounds 1 to 3), imported gravel used in hardstand areas, and fill at depth in the eastern portion of the site • AEC 2: Storage and use of chemicals as part of the operation of the Stage 1 plant. • AEC 3: Former rural land use, including potential historical use of pesticides and herbicides across the site during farming activities, possible storage/use of fuels/other chemicals. • AEC 4: Electrical transformers located in the south and north-west of the site. • AEC 5: Surrounding industrial activities including Manildra main plant (former Dairy Farmers milk processing operations) and the Stage 1 gas plant, both west of the site; and fabrication, welding and electrical workshops to the east. The likelihood of contamination in Fill Mound 1 (AEC 1) was assessed by GHD as low to moderate as there has only been limited direct assessment of the fill material. The likelihood of contamination to exist for remaining fill occurrences and other AECs was assessed by GHD as low or very low.	low can be managed at the time of construction should contamination be encountered. GHD also recommend that: • *A Construction Environmental Management Plan (CEMP) be prepared to manage the potential contaminant exposure risks during construction activities, and manage potential unexpected finds (e.g. buried waste, demolition waste, ACM, etc.) that could be encountered. Therefore, the CEMP should also include an Unexpected Finds Protocol (UFP) and site-specific Work Health Safety and Environment (WHSE) plan, to inform site workers of potential contamination risks and appropriate personal protective equipment (PPE) required to work at the site.* • *Assess waste classification of soils excavated as part of the development to allow off-site disposal of surplus materials to an appropriately licenced waste facility.* • *For general contamination risk management, a contamination register should be prepared which clearly documents where contamination has been identified at the site, or is likely to be encountered based on previous investigation results.*	
Acid Sulphate Soils		
The Modification Report is supported by an assessment of Acid Sulphate Soils carried out by GHD.	Based on the results of previous investigations and limited information on subsurface conditions at the site, GHD identify that an Acid Sulphate Soil Management Plan (ASSMP) would not be required provided that less than 1,000 tonnes of material is disturbed and soils were of medium texture (i.e. clayey sand to light clays as described by Sullivan, Ward, Toppler, & Lancaster (2018)	This issue is further addressed in Section 8.3.4 in this Modification Report.
Noise		

This Modification Report is supported by an Environmental Noise Impact Assessment prepared by GHD. GHD undertook a construction noise assessment to determine potential for increased noise levels at sensitive receiver and the requirement for management and mitigation measures. Construction noise management levels were established using the background noise monitoring conducted. Construction noise impacts were modelled for four construction scenarios, with results indicating compliance with noise management levels for majority of construction activities. However, GHD indicate that impact piling works may exceed management levels at one receiver (R6). The operation of the existing site and the proposed expansion were modelled and assessed by GHD against the operational noise limits applied in the environmental protection licence (EPL) and the project noise trigger levels (PNTLs). The results indicate compliance with the PNTLs at all sensitive receivers. At receiver R6 (39 Hanigans Ln, Bolong) the cumulative noise level is predicted to be 45 dBA during the worst 15-minute period during the day, with an existing noise level of 44 dBA, which is 5 dB above the existing EPL limit. With respect to cumulative noise levels of the Supagas and Shoalhaven Starches sites, GHD indicate that these are predicted to exceed the EPL limits. **The contribution of the Supagas site is however considered negligible at most of the receivers due to the Shoalhaven Starches site contributing significantly**. This is consistent with the findings of the Shoalhaven Starches Noise PRP. A mitigation strategy has been developed within the Noise PRP to address these exceedances and the Noise PRP should be referred to for details on the mitigation measures to be implemented.	Section 6.1 of the Environmental Noise Impact Assessment prepared by GHD includes recommendation to mitigate construction noise. IN terms of operation noise impacts, GHD recommend that to o mitigate the exceedance at receiver R6, Supagas will implement mitigation measures to reduce noise from truck pressure releases as described in Section **Error! Reference source not found.**. After implementation of the mitigation measures, the predicted noise level from the Supagas site at receiver R6 (39 Hanigans Ln, Bolong) during the day is below the EPL noise limit. GHD indicate that no additional operational mitigation is required for the Supagas site; however, monitoring should be undertaken at the completion of the project to confirm consistency with modelling assumptions made for this assessment.	Noise impacts are further addressed in Section 8.2 of this SEE.

Hazards		
The Modification Application is supported by a Preliminary Hazard Analysis (PHA) prepared by Pinnacle Risk Management which assesses the risks associated with the proposed modifications and compares against relevant risk criteria. The PHA identifies that the proposed modifications will comply with all risk criteria. Further Pinnacle also identifies that societal risk, area cumulative risk, propagation risk, transport risk and environmental risk are also concluded to be acceptable. The primary reasons for the low risk levels from the site according to Pinnacle, are the separation distances between the hazards to the nearest place of residence and that high levels of carbon dioxide are required to cause fatality.	As the proposed alterations and additions to the existing carbon dioxide plant involve plant and equipment that are very similar in design to the existing plant and that the proposed modifications have already been reviewed using the HAZOP technique then Pinnacle does not make any further recommendations in relation to this Modification Proposal.	The Modification Report is supported by a PHA prepared by Pinnacle Risk Management addressing this issue. This issue is further addressing Section 8.3.1 of this SEE.
Flooding		
The subject site is inundated during the 1% Annual Exceedance Probability (AEP) flood event by floodwaters from the Shoalhaven River. The sites are categorised as high hazard floodway and high hazard flood storage. This Modification Application is supported by an assessment submission prepared by WMAwater ("WMA"). The submission prepared by WMAwater concludes: the maximum cumulative increases in flood level since 1990 associated with this modification proposal will only experience a maximum increase of up to 0.1m. - 5% AEP – up to 0.1m, - 1% AEP – up to 0.2m, - PMF – up to 0.3m WMA Water identify that the maximum incremental increases in flood level since February 2025 are predominantly within land owned by Shoalhaven Starches. - 5% AEP – less than 0.01m,	WMA water indicates that there are no viable means of reducing the increase in peak flood levels resulting from these works. One of the most beneficial and practical means of reducing flood damages to existing buildings and risk to life is to improve the awareness and preparedness of the occupants or employees. There are several ways of undertaking such a scheme and these are outlined in the flood assessment prepared by WMA water and most require involvement by Council and / or the SES. Funding a scheme would assist in improving the community's flood awareness and consequently reducing flood damages for all floodplain occupiers.	The SEE is supported by a submission prepared by WMAwater addressing this issue. This issue is further addressing Section 8.3.5 of this SEE.

- 1% AEP – up to 0.1m, - PMF – up to 0.1m Those owned by Shoalhaven Starches. Consequently, WMA Water advise it is not necessary to consider the cumulative effects of existing / proposed works as there is no significant incremental increase because of these works.		
Riverbank Stability		
The Modification Report is supported by a geotechnical assessment carried out by GHD. Based on the results of the previous slope stability analysis conducted by GHD for Manildra to the west of the site, the proposed location of the proposed Supagas Stage 2 gas storage vessels (i.e. 60 m to 65 m north of the riverbank), GHD have assessed that the proposed development of the gas storage vessels, when supported on a piled footing system, would not contribute to instability of the riverbank or riparian corridor	GHD recommend that piles should be extended to a suitable bearing stratum below riverbed level, i.e. either very stiff to hard clays or dense to very dense sandy soils, or to weathered rock. The pile design and founding depth of the piles will be subject to the findings of a geotechnical investigation.	This issue further addressed in Section 8.3.3 of this Modification Report.
Waste Management		
The CO_2 Plant did not alter the way waste is managed on the site. All waste will be directed to Manildra Wastewater Treatment Plant pursuant to a Trade Waste Agreement with Shoalhaven Water or other authorised facility.	No additional management or mitigation measures proposed	Not a key issue. This issue is not further addressed in this SEE.
Site Stormwater Management		
All site stormwater from the existing CO_2 Facility is collected and pumped to the Manildra Waste Water Treatment Plant via a Trade Agreement with Shoalhaven Water. This proposal will involve an expansion of the footprint of the CO_2 plant within this site. Under these circumstances the Modification Report is supported by an Integrated Water Cycle Management Strategy prepared by Allen Price which concludes that during operation the	Allen Price indicate that potential short term stormwater quality impacts arising from the construction works can be mitigated by the implementation of erosion and sediment control plan and staging earthworks.	This issue further addressed in Section 8.4.2 of this Modification Report.

Modification Proposal is unlikely to generate stormwater pollutants within the site. Allen Price consider the Modification Proposal is adequate from a stormwater management perspective.		
Visual Impact		
The majority of the works associated with this modification will be situated within the vicinity of existing industrial development of a similar scale to that which is proposed. The proposal will however include additional storage vessels that will rise higher than existing structures associated with this existing plant.	No additional management or mitigation measures proposed.	The visual impacts associated with this modification proposal are addressed in Section 8.6 of this SEE.
Flora and Fauna		
The proposed works associated with this modification will be located within an existing disturbed industrial site however will involve the disturbance of existing native vegetation located within proximity of the boundary of the subject site. This Modification Report is supported by a Flora and Fauna Assessment prepared by Ecoplanning. The Flora and Fauna Assessment considers the biodiversity values, including threatened fauna, flora, and ecological communities, which are present or that are considered likely to be present within the study area. The Florea and Fauna Assessment assesses the potential impacts of the proposed development. The removal of up to 0.12 ha of planted native vegetation is required as part of this proposal. Vegetation within the study area has been subject to considerable historical disturbance. Planted native vegetation within the subject site was identified as having potential habitat for the GHFF, a threatened species under the BC Act and EPBC Act. A Test of Significance applied to this species according to both Commonwealth and State government criteria	Potential indirect impacts associated with the proposal can be minimised and mitigated through measures recommended in Section 4.3 of the Flora and Fauna Assessment. These measures include: • Measures which seek to avoid and minimise impacts to vegetation and habitat. • The formulation of a site-specific Construction Environmental Management Plan. • The formulation of more-clearance protocols.	This issue further addressed in Section 8.4.12 of this Modification Report.

determined that the development would not result in a significant impact to the GHFF.		
Heritage and Archaeological		
The proposed works associated with this Modification Proposal are located upon land which has not been identified or listed as Aboriginal or European cultural heritage significance. The proposed works will have no additional impact in terms of indigenous or non-indigenous heritage.	No additional management or mitigation measures proposed.	Not a key issue. This issue is not further addressed in this SEE.
Effluent Irrigation and Storage		
This Modification Proposal will not increase waste waters that will need to be generated, treated and disposed. This Modification Application does not seek to alter the existing approve wastewater treatment and disposal measures for the existing site operations.	No additional management or mitigation measures proposed.	Not a key issue. This issue is not further addressed in this SEE.
Wastewater Treatment		
Water Discharges The Shoalhaven Starches Factory and Environmental Farm are licensed premises under the Protection of the Environmental Operations Act. Wastewater discharges from the site are licensed by the DEC (EPL 883). The plant has a licensed outfall into the Shoalhaven River. The outfall point is a 50 cm diameter metal pipe discharging at the end of an existing jetty. It also has a cooling water discharge comprising a 50 cm diameter pipe which discharges onto a gabion spillway. Under the terms of the Company's EPL discharge streams associated with the plant include: • river water passed through the boiler condensers and the primary side of the heat exchangers; • boiler water treatment plant regeneration waters; and • pH adjusted glucose plant ion exchange unit regeneration waters.	No additional management or mitigation measures.	Not a key issue. This issue is not further addressed in this SEE.

All these must be discharged from the cooling water discharges. The limiting conditions in relation to these discharges include: • The volume of water discharged from the cooling water discharges must not exceed 100,000 kilolitres per day. • The wastewaters discharged at both points shall not exceed a temperature of 32°C. • This Modification Proposal will not involve any changes to these discharge waters.		

8.2 NOISE IMPACTS

The Modification Report is supported by a Noise Impact Assessment (NIA) prepared by GHD that assesses the construction and operational impacts arising from the Modification Proposal. This section of the Modification Report is based upon the findings of the Noise Impact Assessment prepared by GHD.

8.2.1 SENSITIVE RECEIVERS

To assess potential noise impacts from the Modification Proposal, noise sensitive receivers within 1.5 km were considered and representative receivers in each direction have been identified by GHD. A total of six receivers have been included in GHD's NIA. Details of these receivers are shown on Figure 10.

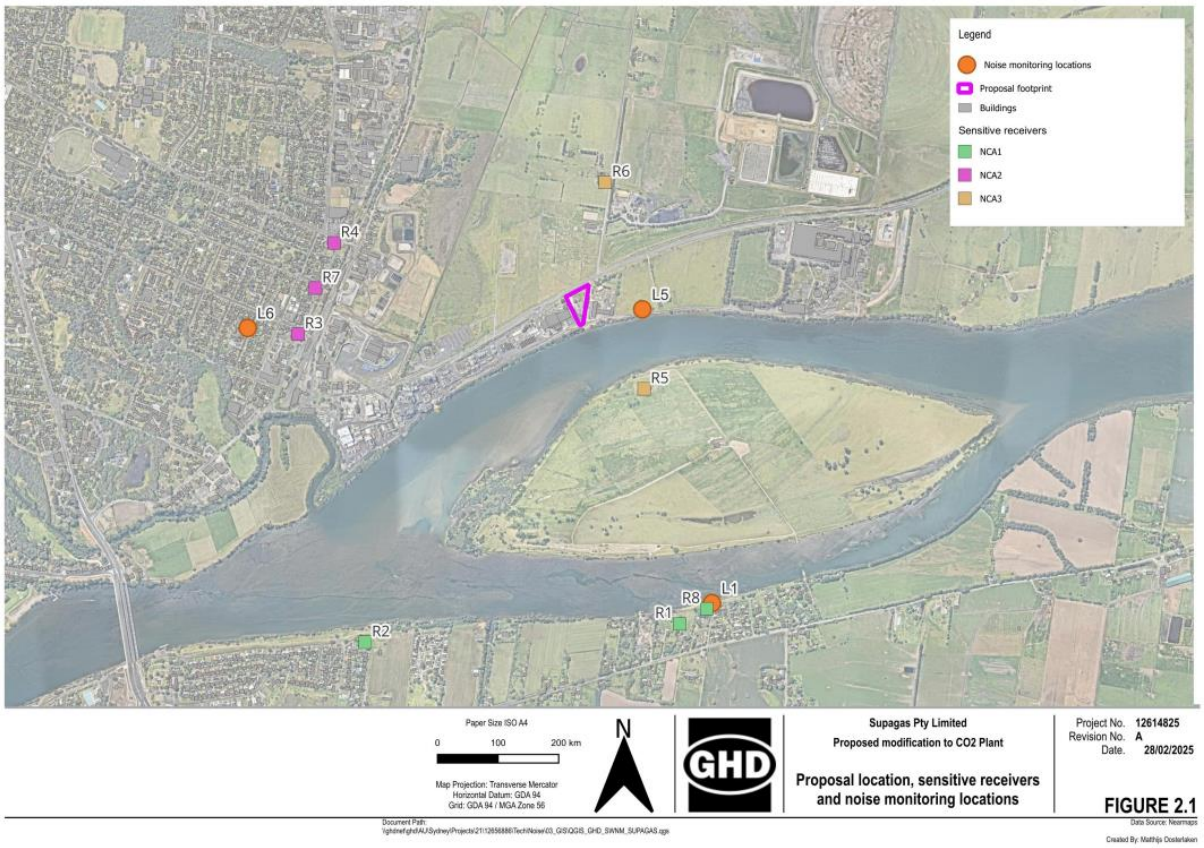

Figure 10: Proposal location, sensitive receivers and noise monitoring locations source GHD

8.2.2 CONSTRUCTION NOISE MANAGEMENT LEVELS

The NIA outlines the following construction noise management levels (Table 8) apply to this Modification Proposal:

Receiver type	Construction noise management levels, $L_{Aeq,15\ min}$ dBA				
	Standard recommended hours		Outside recommended hours		
	Noise affected	Highly noise affected	Day	Evening	Night
Residential – NCA01	48	75	43	37	38
Residential – NCA02	51	75	46	46	40
Residential – NCA03	53	75	48	43	43

Table 8 Project Construction Noise Management Levels source GHD

8.2.3 OPERATIONAL NOISE CRITERIA

The NIA outlines the following operation noise criteria (Table 9) that apply to this Modification Proposal:

Receiver ID	Address	NCA	EPL Noise limit, $L_{Aew\ (15\ min)}$ dBA	Project noise trigger level $L_{Aeq,15min}$ dBA		
			All periods	Day	Evening	Night
R1	135 Terara Road, Terara	NCA01	38	43	37	37
R2	45 Ferry Lane, Terara	NCA01	38	43	37	37
R3	41A Meroo St, Bomaderry	NCA02	42	46	43	38
R4	1-3 Meroo St, Bomaderry	NCA02	42	46	43	38
R5	Burraga Island, Terara	NCA03	NA[1]	48	43	38
R6	39 Hanigans Ln, Bolong	NCA03	40[2]	48	43	38
R7	19 Meroo St, Bomaderry	NCA02	42	46	43	38
R8	1 Nobblers Ln, Terara	NCA01	38	43	37	37

Table 9: Summary of operation noise criteria dBA source GHD

Notes:

1. No EPL limit is specified for Burraga Island, as the dwelling at this location is uninhabited and no impact assessment has been completed for this receiver

2. No EPL limit is specified for locations in Bolong. The limit for residential locations other than Meroo Street in Bomaderry has been used, however this limit is to apply to dwellings further from existing industry than those on Meroo Street

8.2.4 CONSTRUCTION NOISE MODELLING RESULTS

Construction scenarios for the purposing of noise modelling have been developed and are presented below in Table 10 below.

Noise modelling of these scenarios has been conducted to determine the potential construction noise levels at the surrounding noise sensitive receivers. The magnitude of off-site noise impacts associated with construction is dependent upon a number of factors, including:

- The intensity and location of construction activities
- The type of equipment used
- Existing background noise levels
- Intervening terrain and structures
- Weather conditions during construction works.

To determine the worst-case noise levels likely to be experienced during construction, an activity sound power level has been calculated based on all activity plant items and have been modelled operating simultaneously within the project site (Table 10).

SID	Scenario	Equipment	Activity SWL, dBA $L_{Aeq(15min)}$
CS1	Earth works	Excavator, truck	113
CS2	Foundation works	Impact hammer piling rig, trucks	126
CS3	Equipment skid and pipe bridge installation	Crane, truck, steel construction	116
CS4	Electrical installation and commissioning	Steel construction	108

Table 10Construction scenarios source GHD

Construction noise levels have been predicted by GHD at the sensitive receivers with consideration to the noise management levels (NML) derived from the Interim Construction Noise Guidelines (ICNG). The predicted LAeq noise levels along with the standard hours NMLs for each receiver is presented in Table 11 below.

Received noise levels shown in red indicate an exceedance of the NML. Exceedances are predicted for impact piling works (CS2) at three receivers with a maximum exceedance of 4 dB predicted at receiver R6. All other construction works are predicted to comply with the noise management levels. Impact piling works are expected to occur for only a short portion of the six-month construction period with majority of the works comprising equipment installation (CS3) and testing and commissioning (CS4), which are predicted to be below the respective NMLs.

Receiver ID	NCA	Address	NML	Predicted construction noise level $L_{Aeq\ (15min)}$ (dBA)			
				CS1	CS2	CS3	CS4
R1	NCA01	135 Terara Road, Terara	**48**	34	47	36	29
R2	NCA01	45 Ferry Lane, Terara	**48**	34	47	36	29
R3	NCA02	41A Meroo St, Bomaderry	**51**	35	48	37	30
R4	NCA02	1-3 Meroo St, Bomaderry NSW 2541	**51**	40	53	42	35
R5	NCA03	Burraga Island, Terara	**NA**	50	63	53	45
R6	NCA03	39 Hanigans Ln, Bolong NSW 2540	**53**	44	57	47	39
R7	NCA02	19 Meroo St, Bomaderry NSW 2541	**51**	38	51	41	33
R8	NCA01	1 Nobblers Ln, Terara NSW 2540	**48**	35	48	37	30

Table 11: Predicted noise levels during construction activities dBA, source GHD

8.2.5 OPERATIONAL NOISE IMPACT ASSESSMENT

Operational Noise Modelling Results

The predicted $L_{Aeq(15min)}$ noise levels at each sensitive receiver for the existing and expansion modelling scenarios are presented in Table 12 below and compared against both the project noise trigger levels and the EPL limits.

Third octave results have been analysed by GHD for tonal and low frequency characteristics. GHD indicate that the triggers for low frequency noise are met at receivers R5 and R6 during the night and evening periods. Two triggers are required to be met for low frequency noise, an exceedance of the unweighted thresholds as well as the difference between the A- and C-weighted levels being greater than 15 dB. Introduction of other noise sources in the ambient environment, such as noise from other industrial sites in the surrounding area, are, according to GHD, likely to increase the A-weighted levels and reduce the difference between the A- and C-weighted levels at the receiver location. As such the correction for low frequency noise has not been included by GHD in the noise modelling results presented.

Based on the presented noise levels in **Error! Reference source not found.**, GHD conclude:

- The noise levels of the existing operation of the Supagas site are predicted to exceed the EPL limit during the daytime at a single receiver (R6, 39 Hanigans Ln, Bolong). However, during the evening and nighttime the predicted noise levels are below the EPL limit at all receivers.
- The noise levels of the proposed expansion are predicted to be below the PNTLs and the EPL limits at all receivers during all time periods.
- The cumulative noise levels (existing plus proposed expansion of the Supagas site) are predicted to be below the PNTLs and EPL limits, with the exception of receiver R6 (39 Hanigans Ln, Bolong). At this receiver, the predicted noise levels

are below the PNTLs; however, the EPL limit is exceeded by during the daytime. Noise levels at this receiver are:

- 45 dBA during the daytime period, which is 5 dBA above the EPL limit
- 40 dBA during the evening period, which achieves the EPL limit
- 38 dBA during the nighttime period, which is 2 dB below the EPL limit.

No maximum noise level events are expected during the night period and therefore sleep disturbance impacts are unlikely.

Figure 11 shows the contribution of the modelled noise sources at receiver R6 during the operation of the expansion. The contribution levels have been shaded to illustrate the existing and proposed noise sources. The results indicate that the truck pressure release (an existing noise source) contributes significantly to the daytime predicted noise level, this would typically occur approximately 5 times per day. The proposed expansion and existing cooling towers contribute to the predicted noise level in all periods, particularly during the evening and night, followed by the CO_2 compressor for the expansion.

Noise contours for the day and night periods are shown on Figure 12 and Figure 13, respectively.

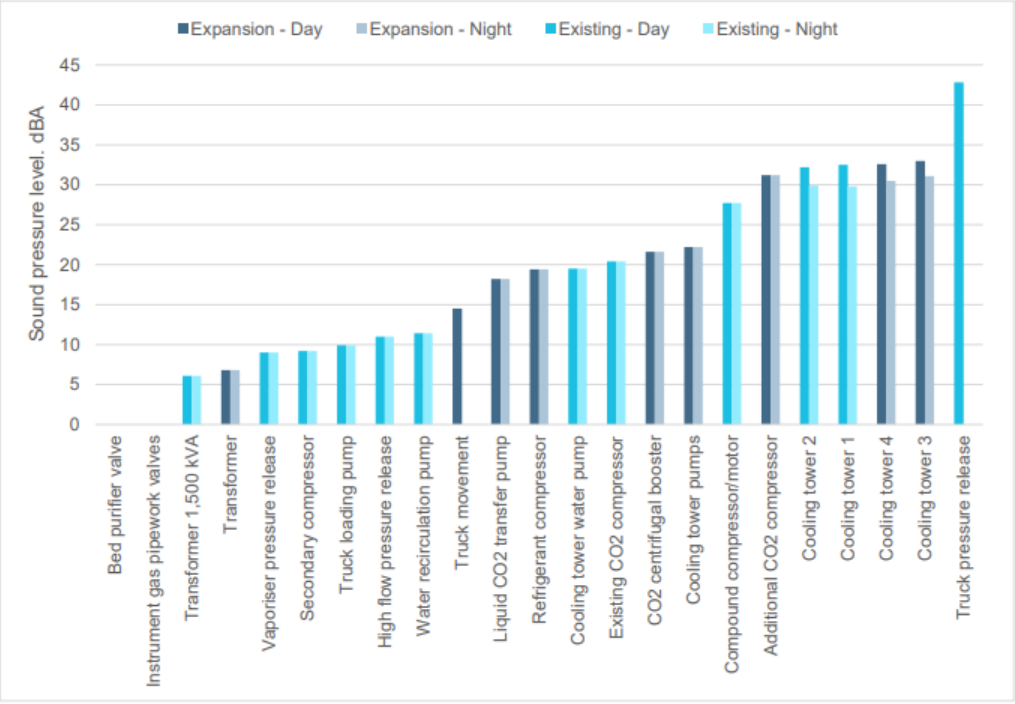

Figure 11: Contribution of the modelled noise source at R6

Table 5.5 Operational noise results, $L_{Aeq,15min}$ dBA

Receiver ID	Address	EPL Limit	Project noise trigger level $L_{Aeq,15min}$ dBA			Predicted operational noise level[5] $L_{Aeq,15min}$ (dBA)														
						Supagas existing[3]			Supagas expansion[3]			Supagas cumulative (existing plus expansion)[3]			Cumulative Supagas and Shoalhaven Starches[4]			Cumulative Supagas and Shoalhaven Starches ANYC[4]		
		All periods	D	E	N	D	E	N	D	E	N	D	E	N	D	E	N	D	E	N
R1	135 Terara Rd, Terara	38	43	37	37	33	30	28	29	29	29	35	33	32	45	48	48	45	48	48
R2	45 Ferry Ln, Terara	38	43	37	37	35	30	29	31	31	29	36	33	32	50	53	53	51	53	53
R3	41A Meroo St, Bomaderry	42	46	43	38	28	27	27	28	28	27	31	31	30	52	55	55	51	54	54
R4	1-3 Meroo St, Bomaderry	42	46	43	38	33	32	31	32	32	30	35	35	33	51	54	54	52	55	54
R5	Burraga Island, Terara	NA[1]	NA[1]	NA[1]	NA[1]	53	42	41	41	41	40	54	44	43	57	55	55	57	55	55
R6	39 Hanigans Ln, Bolong	40[2]	48	43	38	44	36	34	38	38	36	45	40	38	48	48	47	48	48	47
R7	19 Meroo St, Bomaderry	42	46	43	38	32	31	30	32	32	30	35	35	33	51	54	54	51	54	54
R8	1 Nobblers Ln, Terara	38	43	37	37	34	30	29	30	30	29	35	33	32	45	48	48	45	48	48

Table 12: Operational noise results $L_{Aeq(15min)}$ dBA source GHD

Notes:

1. No EPL limit or PNTL is specified for Burraga Island, as the dwelling at this location is uninhabited no impact assessment has been completed for this receiver
2. No EPL limit is specified for locations in Bolong. The limit for residential locations other than Meroo Street in Bomaderry has been used, however this limit is to apply to dwellings further from existing industry than those on Meroo Street.
3. Not inclusive of modifying corrections for low frequency noise
4. The presented noise levels include corrections for low frequency noise as described in Section ***Error! Reference source not found.****. The corrections are +2 dB during the day and +5 dB during the evening and night.*
5. The colour shading applied to the cells is described in ***Error! Reference source not found.****..*

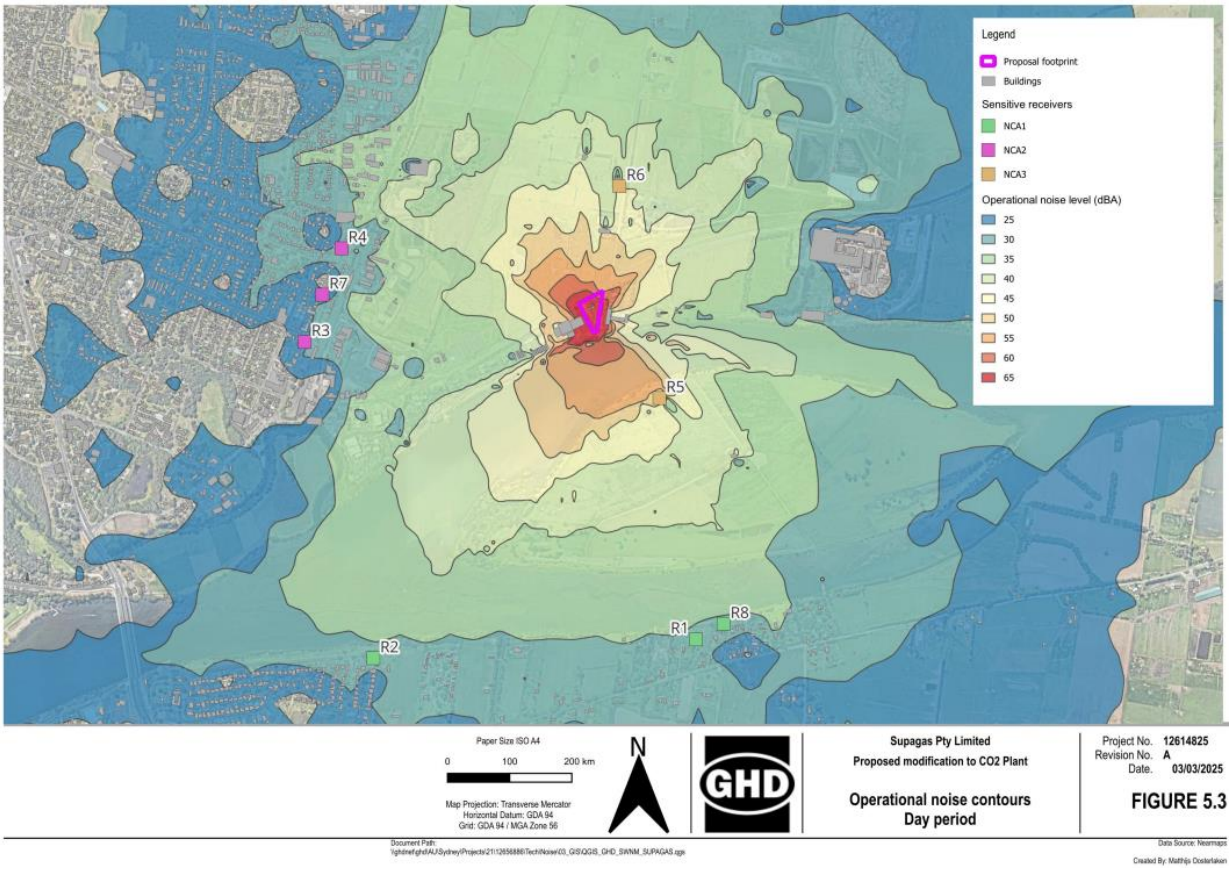

Figure 12: Operational noise contours, Day period source GHD

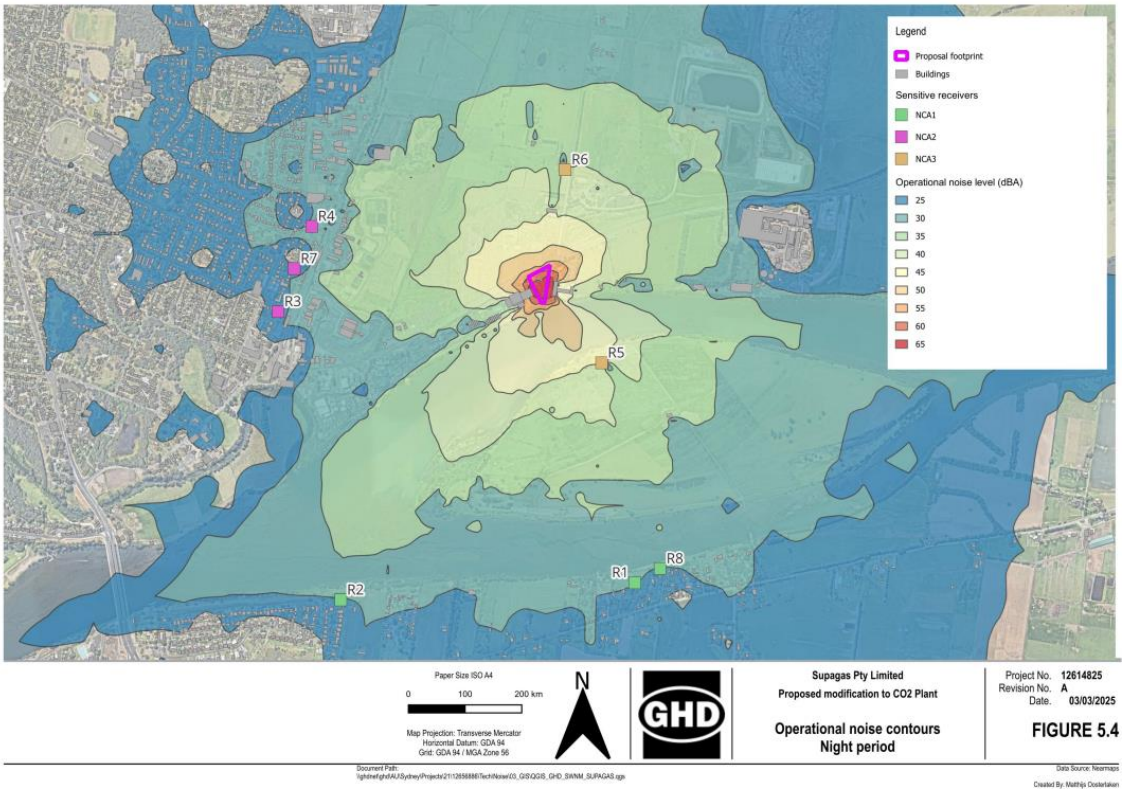

Figure 13: Operational noise contours, Night period source GHD

Truck pressure release context

GHD indicate the truck pressure release contributes significantly to the predicted noise levels at receiver R6 and only occurs during the daytime period. Prior to connecting the trucks fill hoses to the site's bulk storage, the trucks are vented down to match the site's process pressure of 15 Barg. The truck depressurisation is required to avoid disturbing the CO2 plant's steady operating pressure during the filling process.

Mitigation requirement and effectiveness

To achieve the daytime limit of 40 dBA at receiver R6, GHD indicate the sound power level of the truck pressure release would require a 12 dB reduction. This would reduce the sound power level to 120 dBA (108 dBA after applying the time correction for 1 minute within a 15-minute period).

An overview of the predicted noise levels after implementation of a mitigation option which achieves a 12 dB reduction is shown in Table 13. The table shows that the reduction in noise level from the truck pressure releases reduces the noise levels to be below the EPL noise limits.

Receiver ID	Address	EPL Limit	Project noise trigger level $L_{Aeq,15min}$ dBA			Predicted operational noise level[5] $L_{Aeq,15min}$ (dBA)														
						Supagas existing[3]			Supagas expansion[3]			Supagas cumulative (existing plus expansion)[3]			Cumulative Supagas and Shoalhaven Starches[4]			Cumulative Supagas and Shoalhaven Starches ANYC[4]		
		All periods	D	E	N	D	E	N	D	E	N	D	E	N	D	E	N	D	E	N
R1	135 Terara Rd, Terara	38	43	37	37	30	30	28	29	29	29	33	33	32	45	48	48	45	48	48
R2	45 Ferry Ln, Terara	38	43	37	37	30	30	29	31	31	29	33	33	32	50	53	53	50	53	53
R3	41A Meroo St, Bomaderry	42	46	43	38	27	27	27	28	28	27	31	31	30	52	55	55	51	54	54
R4	1-3 Meroo St, Bomaderry	42	46	43	38	32	32	31	32	32	30	35	35	33	51	54	54	52	55	54
R5	Burraga Island, Terara	NA[1]	NA[1]	NA[1]	NA[1]	44	42	41	41	41	40	46	44	43	52	55	55	52	55	55
R6	39 Hanigans Ln, Bolong	40[2]	48	43	38	37	36	34	38	38	36	40	40	38	45	48	47	45	48	47
R7	19 Meroo St, Bomaderry	42	46	43	38	31	31	30	32	32	30	35	35	33	51	54	54	51	54	54
R8	1 Nobblers Ln, Terara	38	43	37	37	30	30	29	30	30	29	33	33	32	45	48	48	45	48	48

Table 13: Operational noise results after implementation of the truck pressure release mitigation, $L_{Aeq,\ 15\ min}$ dBA source : GHD

Cumulative Supagas and Shoalhaven Starches noise levels

Based on the presented noise levels in **Error! Reference source not found.**, GHD concludes:

- *The cumulative noise levels (cumulative and cumulative ANYC) are predicted to exceed the EPL limit and PNTLs at all sensitive receivers, except for receiver R6 (39 Hanigans Ln, Bolong) during the daytime. At this receiver, the predicted noise level achieves the daytime PNTL but does exceed the EPL limit.*
- ***The contribution of the Supagas site is considered negligible at most of the receivers due to the Shoalhaven Starches site contributing significantly**. However, during the daytime at receiver R6, the truck pressure release of the Supagas site is one of the main contributing sources.*
- *Implementing mitigation measures to the Supagas truck pressure release as described in Section **Error! Reference source not found.**, would reduce the cumulative daytime noise levels at receiver R6 from 48 dBA to 45 dBA.*
- *The exceedances of the EPL limits are consistent with the findings of Stage 1 of the Noise PRP outcomes of the site Shoalhaven Starches. A mitigation strategy has been developed within the Noise PRP to address these exceedances. Nonetheless, noise monitoring should be relied on to determine whether the site noise levels achieve the EPL limits.*

8.2.6 MITIGATION MEASURES

Construction noise mitigation measures

Table 14 outlines noise management measures where reasonable and feasible to reduce potential impact on surrounding receivers and sensitive land uses during construction. GHFD recommend that these measures should be incorporated into the Construction Noise Management Plan developed for the Modification Proposal.

Action required	Details
General controls	
Site inductions	All employees, contractors and subcontractors are to receive an environmental induction. The induction should include: – All relevant project specific and standard noise and vibration mitigation measures – Relevant licence and approval conditions – Permissible hours of work – Location of nearest sensitive receivers – Construction employee parking areas – Designated loading/unloading areas and procedures – Site opening/closing times (including deliveries) – Environmental incident procedures.
Behavioural practices	No swearing or unnecessary shouting or loud stereos/radios on site. No dropping of materials from height, throwing of metal items and slamming of doors.
Implement community consultation measures	Contact will be established with the local residents and the construction program and progress communicated on a regular basis, particularly when noisy or vibration-generating activities are planned. Affected receivers will be notified of the intended work, its duration and times of occurrence. This may include a local community update letters for specific construction activities and a Project info line.
Implement complaints management measures	Complaints will be managed in accordance with the procedure outlined below. Signage at each site will clearly and visibly provide a contact number and name to receive complaints and enquiries about construction. In this instance the response would be to: – Verbally respond to complainant – Provide a written response within seven calendar days if the complaint cannot be resolved verbally – Log the complaint, and any actions taken with regards to the complaint within a complaints register – Undertake monitoring at the complainant's residence(s) – Investigate the nature and reasons of the impact – Investigate and implement further mitigation measures to minimise the impact
Source controls	
Construction hours and scheduling	Comply with the recommended standard construction hours outlined by the ICNG, unless out of hours work has been approved. No truck movements before 7.00 am or after 6.00 pm. For any work that would take place outside of normal construction hours: Undertake an assessment of the potential noise and vibration impacts associated with the proposed activities and outline specific mitigation measures.

Action required	Details
	Residents potentially affected by such activities will be notified at least five days before hand. Minimise consecutive night activities in the same locality and provide periods of quiet if activities occur for extended periods during the night. Conduct activities in a manner that eliminates or minimises the need for audible warning alarms.
Construction respite period	High noise and vibration generating activities may only be carried out in continuous blocks, not exceeding three hours each, with a minimum respite period of one hour between each block. High noise refers to construction noise impacts which exceed the highly affected noise management level of 75 dB(A) $L_{Aeq(15\text{-}min)}$ during standard construction hours.
Equipment selection	Use quieter and less vibration emitting construction methods where reasonable and feasible.
Use and siting of plant	Simultaneous operation of noisy plant within discernible range of a sensitive receiver is to be avoided. The offset distance between noisy plant and adjacent sensitive receivers is to be maximised. Plant used intermittently to be throttled down or shut down. Noise-emitting plant to be directed away from sensitive receivers.
Plan worksites and activities to minimise noise and vibration	Plan traffic flow, parking and loading unloading areas to minimise reversing movements within the site.
Minimise disturbance arising from delivery of goods to construction sites	Loading and unloading of materials/deliveries is to occur during standard construction hours. Contractors are to avoid dropping materials from height where practicable, during loading and unloading. Delivery vehicles to be fitted with straps rather than chains for unloading, wherever possible.

Table 14: Management measures for construction noise and vibration

Operation noise mitigation measures

Receiver R6 is predicted by GHD to experience noise levels above the EPL limit by 5 dB during the day however all receivers are compliant with the project noise trigger levels. According to GHD, the contribution analysis indicates that the top contributing sources at receiver R6 are the truck pressure release during the day period.

To mitigate noise emission from the truck pressure release, GHD indicate the following mitigation measures will be implemented:

1. **Removable muffler at site**: a removable muffler will be provided on the site for attachment to the gas hose connection port of the tanker during venting to reduce noise emissions.

2. **Off-site venting where practical**: where feasible, tankers will be vented down to approximately 14 Barg at Supagas depots in Ingleburn, NSW and

Dandenong, VIC before arriving at the Bomaderry site. This will significantly reduce or eliminate the need for on-site venting.

3. **Permanent mufflers on Supagas CO2 tankers**: within the next six months (medium to long term), Supagas plans to install purpose-designed mufflers on all Supagas CO_2 tankers. This will ensure only third-party vehicles (approximately 1 in 5 trucks) require venting on site with the removable muffler (refer to option 1 of this list).

GHD recommends no additional mitigation should the design of the project be consistent with the assumptions outlined in the NIA. GHD indicate that monitoring should be conducted upon completion of the project to confirm consistency with the layout and the noise levels of plant and equipment have an operating sound power level lower or equal to the levels presented in the NISA. Additionally, attended measurements at the receivers should be undertaken to confirm the presence of low frequency noise.

The cumulative noise levels of the Supagas and Shoalhaven Starches sites are predicted by GHD to exceed the EPL limits. GHD indicate that **the contribution of the Supagas site is however considered negligible at most of the receivers due to the Shoalhaven Starches site contributing significantly**. This is consistent with the findings of the Shoalhaven Starches Noise PRP. A mitigation strategy has been developed within the Noise PRP to address these exceedances and the Noise PRP should be referred to for details on the mitigation measures to be implemented.

The NIA prepared by GHD concludes:

> *"GHD has prepared this noise impact assessment (NIA) report to support the modification application to MP06_0228 allowing the increase in production capacity of the Supagas Carbon Dioxide (CO2) Plant. The proposed expansion to the Supagas CO2 Plant aims to increase the production capacity from the present processing capacity of 90 tonnes to 165 tonnes per day of CO2. The construction and operational noise impacts of the proposed modification have been assessed.*

A construction noise assessment was undertaken to determine potential for increased noise levels at sensitive receiver and the requirement for management and mitigation measures. Construction noise management levels were established using the background noise monitoring conducted. Construction noise impacts were modelled for four construction scenarios, with results indicating compliance with noise management levels for majority of construction activities. However, impact piling works may exceed management levels at one receiver (R6).

The operation of the existing site and the proposed expansion were modelled and assessed against the operational noise limits applied in the environmental protection licence (EPL) and the project noise trigger levels (PNTLs). The results indicate compliance with the PNTLs at all sensitive receivers. At receiver R6 (39 Hanigans Ln, Bolong) the cumulative noise level is predicted to be 45 dBA during the worst 15-minute period during the day, with an existing noise level of 44 dBA, which is 5 dB above the existing EPL limit.

To mitigate the exceedance at receiver R6, Supagas will implement mitigation measures to reduce noise from truck pressure releases as described in Section 6.2. After implementation of the mitigation measures, the predicted noise level at receiver R6 (39 Hanigans Ln, Bolong) during the day is below the EPL noise limit. No additional operational mitigation is required; however, monitoring should be undertaken at the completion of the project to confirm consistency with modelling assumptions made for this assessment.

The cumulative noise levels of the Supagas and Shoalhaven Starches sites are predicted to exceed the EPL limits. ***The contribution of the Supagas site is however considered negligible at most of the receivers due to the Shoalhaven Starches site contributing significantly****. This is consistent with the findings of the Shoalhaven Starches Noise PRP. A mitigation strategy has been developed within the Noise PRP to address these exceedances and the Noise PRP should be referred to for details on the mitigation measures to be implemented."*

8.3 HAZARDS

8.3.1 PRELIMINARY HAZARDS ANALYSIS

The Modification Report is supported by a Preliminary Hazard Analysis (PHA) undertaken by Pinnacle Risk Management ("Pinnacle"). This section of the Modification Report is based upon the findings of the PHA prepared by Pinnacle.

The risks associated with the Modification Proposal have been assessed by Pinnacle and compared against the relevant risk criteria.

Table 15 below outlines the results of Pinnacle's assessment and demonstrates compliance with all risk criteria (**Table 15**).

Table15: Compliance with Risk Criteria

Description	Risk Criteria	Risk Acceptable?
Fatality risk to sensitive uses, including hospitals, schools, aged care	0.5×10^{-6} per year	Y
Fatality risk to residential and hotels	1×10^{-6} per year	Y
Fatality risk to commercial areas, including offices, retail centres, warehouses	5×10^{-6} per year	Y
Fatality risk to sporting complexes and active open spaces	10×10^{-6} per year	Y
Fatality risk to be contained within the boundary of an industrial site	50×10^{-6} per year	Y
Injury risk – incident heat flux radiation at residential areas should not exceed 4.7 kW/m^2 at frequencies of more than 50 chances in a million per year or incident explosion overpressure at residential areas should not exceed 7 kPa at frequencies of more than 50 chances in a million per year	50×10^{-6} per year	Y
Toxic exposure - Toxic concentrations in residential areas which would be seriously injurious to sensitive members of the community following a relatively short period of exposure	10×10^{-6} per year	Y
Toxic exposure - Toxic concentrations in residential areas which should cause irritation to eyes or throat, coughing or other acute physiological responses in sensitive members of the community	50×10^{-6} per year	Y
Propagation due to Fire and Explosion – exceed radiant heat levels of 23 kW/m^2 or explosion overpressures of 14 kPa in adjacent industrial facilities	50×10^{-6} per year	Y

Pinnacle also identifies that societal risk, area cumulative risk, propagation risk, transport risk and environmental risk are also concluded to be acceptable. The primary reasons for the low risk levels from the site according to Pinnacle, are the separation distances between the hazards to the nearest place of residence and that high levels of carbon dioxide are required to cause fatality.

As the proposed alterations and additions to the existing carbon dioxide plant involve plant and equipment that are very similar in design to the existing plant and

that the proposed modifications have already been reviewed using the HAZOP technique then Pinnacles does not make any further recommendations in relation to this Modification Proposal.

8.3.2 SITE CONTAMINATION

This Modification Report is supported by a report titled "*Proposed Stage 2 Carbon Dioxide Plant – Geotechnical – river bank stability, contamination, riparian and acid sulfate soil assessmen*t" prepared by GHD (the "*GHD Geotechnical Assessment*").

According to the GHD Geotechnical Assessment, site history information indicates that the site and surrounding areas have been used for rural/agricultural purposes since at least 1903. Historical title search results indicate that the site was owned by individuals with occupations listed as farmers and/or dairy farmers up to 1970, then contractors and a company executive up to 1980. Between 1980 and 2012 the registered proprietors were various dairy co-ops and Dairy Farmers. Manildra acquired the site in 2012. The site, apart from a fill mound (Fill Mound 1), remained undeveloped until 2019. In 2019, the Supagas Stage 1 plant was constructed and has been operational since October 2019.

Supagas has an Environmental Protection Licence (EPL) to produce, store and distribute carbon dioxide. The carbon dioxide is distributed via truck. Carbon dioxide is sourced from Manildra (a byproduct of producing ethanol) via a direct pipeline. Wastewater generated by Supagas in the production of carbon dioxide is discharged to the Manildra wastewater treatment facility via an underground pipeline. Supagas maintain a relatively small quantity of chemicals on-site as part of operations, which are generally stored in bunded and/or covered areas.

GHD indicate that previous investigations have identified several Areas of Environmental Concern (AECs) and associated Contaminants of Potential Concern (COPCs) where potentially contaminating activities were carried out within or close to the site. Limited soil and groundwater sampling and analysis has previously been undertaken, assessing some of the identified AECs that could also

affect the subject site. COPCs in soil samples did not exceed adopted human health assessment criteria for industrial / commercial land use (NEPC, 2013). Groundwater was not directly assessed at the site. Groundwater was assessed approximately 290 m west of the site, where concentrations of anthracene in groundwater marginally exceeded adopted ecological assessment criteria (ANZECC/ARMCANZ, 2000) (Coffey, 2015).

Based on historical information and previous investigations, potential for contamination was identified by the GH Geotechnical Assessment in five AECs potentially impacting soil, groundwater and / or surface water, which include:

- AEC 1: Fill of unknown quality and origin, notably three fill mounds (Fill Mounds 1 to 3), imported gravel used in hardstand areas, and fill at depth in the eastern portion of the site
- AEC 2: Storage and use of chemicals as part of the operation of the Stage 1 plant.
- AEC 3: Former rural land use, including potential historical use of pesticides and herbicides across the site during farming activities, possible storage/use of fuels/other chemicals.
- AEC 4: Electrical transformers located in the south and north-west of the site. –
- AEC 5: Surrounding industrial activities including Manildra main plant (former Dairy Farmers milk processing operations) and the Stage 1 gas plant, both west of the site; and fabrication, welding and electrical workshops to the east.

Figure 14 below identifies the location of the above AECs in relation to the subject site.

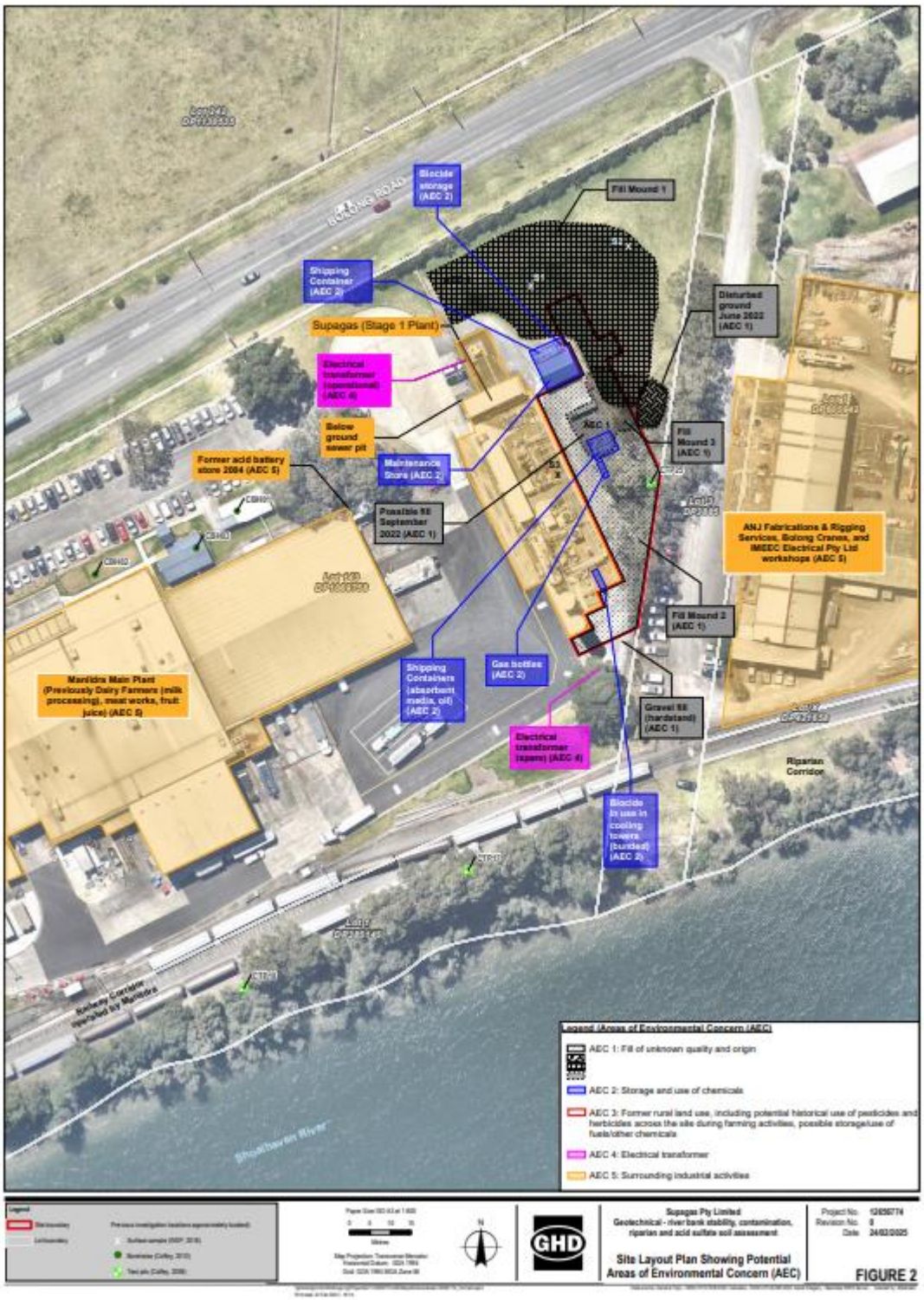

Figure 14: Areas of Environmental Concern (AECs) Source GHD

The likelihood of contamination in Fill Mound 1 (AEC 1) was assessment by the GHD Geotechnical Assessment as low to moderate as there has only been limited direct assessment of the fill material. The likelihood of contamination to exist for

remaining fill occurrences and other AECs was assessed by the GHD Geotechnical Assessment as low or very low.

Based on the results of this PSI for contamination, a Targeted Site Investigation (TSI) is recommended by the GHD Geotechnical Assessment for AECs where the likelihood of contamination to exist is assessed as low to moderate (i.e. Fill Mound 1), to assess the suitability of the fill material for re-use on site, or pre-classify it for off-site re-use (e.g. under the Resource Recovery framework) or disposal if required. AECs where the likelihood of contamination was assessed as very low can, according to the GHD Geotechnical Assessment, be managed at the time of construction should contamination be encountered.

The GHDF Geotechnical Assessment also recommends that:

- A Construction Environmental Management Plan (CEMP) be prepared to manage the potential contaminant exposure risks during construction activities, and manage potential unexpected finds (e.g. buried waste, demolition waste, ACM, etc.) that could be encountered. Therefore, the CEMP should also include an Unexpected Finds Protocol (UFP) and site-specific Work Health Safety and Environment (WHSE) plan, to inform site workers of potential contamination risks and appropriate personal protective equipment (PPE) required to work at the site.

- Assess waste classification of soils excavated as part of the development to allow off-site disposal of surplus materials to an appropriately licenced waste facility.

- For general contamination risk management, a contamination register should be prepared which clearly documents where contamination has been identified at the site or is likely to be encountered based on previous investigation results.

8.3.3 RIVERBANK STABILITY

The GHD Geotechnical Assessment referred to in Section 8.3.2 above, included an assessment of the potential impacts of the Modification Proposal, and notably the proposed gas storage vessels to impact the stability of the bank of the Shoalhaven River.

The Modification Proposal includes the construction of two gas storage vessels located between 60 m and 65 m from the northern bank of the Shoalhaven River.

GHD has previously carried out slope stability analyses to assess the potential effects of a proposed development (to the west of the Supagas site) on the stability of the riverbank (GHD, 2024). Three inferred subsurface profiles, located between 200 m and 380 m west of the current investigation site, were used to assess the Factor of Safety (FoS) in regard to potential for failure of the river bank for three groundwater conditions (i.e. groundwater at normal condition, raised water level (flood induced), rapid drawdown (tidal induced)) for the planned developments.

The findings of this previous assessment, according to the GHD Geotechnical Assessment, based on critical case factors of safety from the stability analyses, indicated that the most likely failure event would be wedge collapse of the over steepened or undercut sections of the river bank extending one to two metres back from the crest of the existing bank. Potentially worst case failures may extend into the existing rail line closest to the top of the river bank. Instability, should it occur, is most likely to be triggered by rainfall and flooding of the river rather than additional loads imposed by nearby buildings or storage. In addition to the results of the slope stability analysis and site observations it was recommended and assumed that all structures would be supported on piles extending to a suitable bearing stratum below river bed level, i.e. either very stiff to hard clays or dense to very dense sandy soils, or to weathered rock.

Based on the results of the previous slope stability analysis conducted by GHD for Manildra to the west of the site, the proposed location of the proposed Supagas Stage 2 gas storage vessels (i.e. 60 m to 65 m north of the riverbank) and single railway line, the GHD Geotechnical Assessment has assessed that the proposed development of the gas storage vessels, when supported on a piled footing system, would not contribute to instability of the riverbank or riparian corridor. The GHD Geotechnical Assessment

recommends that piles should be extended to a suitable bearing stratum below river bed level, i.e. either very stiff to hard clays or dense to very dense sandy soils, or to weathered rock. The pile design and founding depth of the piles will be subject to the findings of a geotechnical investigation.

8.3.4 ACID SULPHATE SOILS

The GHD Geotechnical Assessment referred to in Sections 8.3.2 and 8.3.2 above, includes an assessment in terms of Acid sulphate Soils (ASS).

The GHD Geotechnical Assessment identifies that the Burrier/Berry 1:25,000 Acid sulphate Soil Risk Map (1997) Edition 2, prepared by the Department of Land and Water Conservation (DLWC) (DLWC, 1997), indicates that site is mapped within an area having a low probability of ASS occurrence. The depositional environment is described as an alluvial levee landform (Al4) where the ASS occurrence is at depths greater than 3 m below the ground surface. The site surface elevation is greater than 4 m AHD.

Two ASS assessments were carried out by Coffey in 2008 and 2010 at locations 55 m south-west (proposed pipeline) and 50 m west (proposed processing plant and storage tank at the former Dairy Farmers site) of the site.

The GHD Geotechnical Assessment indicates that the Coffey (2008) investigation encountered alluvial soils described as very stiff silty clay. A sample representing alluvial soils was collected at test pit location CTP17 at a depth interval of 1.5 to 1.6 m bgl and selected for chromium reducible sulphur suite testing to assess potential acid generation. Concentrations of Reduced Inorganic Sulphur (RIS) in the form of potential sulfidic acidity (Scr%), Total Actual Acidity (TAA) and Net Acidity concentrations did not exceed action criteria of 18 moles H+ /tonne and 0.03%S. Results were also consistent with pH field screening results which suggested hyposulfidic (i.e. non-ASS).

The Coffey (2010) investigation according to the GHD Geotechnical Assessment, encountered deep alluvial soils to depths greater than 19.45 m bgl generally

comprising clay, low to medium plasticity, brown, yellow, orange, grey and very stiff to hard consistency. Five soil samples from two boreholes (CBH01 and CBH02) collected at depths of 1.5 m to 1.95 m, 2.0 m to 2.45, and 2.5 m to 2.95 m, were selected for pH field screening. The boreholes were located 80 m (CBH01) and 115 m (CBH02) west of the site. The field screening indicated that soils were hyposulfidic (i.e. non-ASS). Based on field screening results, two samples (CBH01/2.0-2.45m and CBH02/1.5- 1.95m) were selected for chromium reducible sulphur suite testing to assess potential acid generation.

Based on a medium texture (described as clayey sand to light clays (Sullivan, Ward, Toppler, & Lancaster, 2018), which is consistent with soils encountered at the Dairy Farmers site) concentrations of RIS in the form of potential sulfidic acidity (Scr%) and Net Acidity did not exceed action criterion of 0.06%S for less than 1,000 tonnes of soil to be disturbed. It is noted that concentrations of Net Acidity were higher (i.e. 0.06%S) in CBH01/2.0-2.45m.

Based on the results of the assessment, the GHD Geotechnical Assessment identifies that an ASS Management Plan (ASSMP) is not required provided that soil disturbance is less than 1,000 tonnes. However, Total Actual Acidity (TAA) and Net Acidity concentrations marginally exceeded the 0.03%S action criterion for disturbance of soils greater than 1,000 tonnes. Therefore, the GHD Geotechnical Assessment recommends that an ASSMP would be required if greater than 1,000 tonnes of soil are to be disturbed

8.3.5 FLOODING

The Modification Report is supported by a Flood Compliance Report prepared by WMA water. This section of the Modification Report is based upon the findings of this Flood Compliance Report.

The proposed works are on land inundated in the 1% Annual Exceedance Probability (AEP) flood event by floodwaters from the Shoalhaven River (as determined in the November 2022 Shoalhaven River Flood Study). The

construction of any works on the floodplain will cause a loss of temporary floodplain storage and a loss of hydraulic conveyance. The resulting increase in flood levels will depend upon the magnitude of these losses. Prior to construction of the Shoalhaven Starches plant at Bomaderry there would have been significant flow through the site and adjoining land during a flood, as there is across any riverbank. Since approximately 1970 the ongoing construction of the plant has reduced the flow path through a large part of Shoalhaven Starches lands on the northern bank. Floodwaters are therefore diverted to other parts of the floodplain, and this may increase flood levels on these lands.

It should be noted that other works on the Shoalhaven River floodplain (e.g. completed new bridge at Nowra and upgrading of the Terara levee) will also have contributed to changes in flood level in parts of the floodplain over time. The impacts of these works have not been determined as part of this report.

Past Flood Studies

Several previous flood studies have been undertaken for Shoalhaven City Council and Shoalhaven Starches. The key ones are listed below.

1. Lower Shoalhaven River Flood Study, November 2022 (for Council,).
2. Shoalhaven River Flood Study, March 2013 (for Shoalhaven Starches,).
3. Lower Shoalhaven River Flood Study, April 1990 (for Council).

WMAwater has also undertaken many (more than 10) flood impact assessment / compliance reports for Shoalhaven Starches in the last 15+ years. These past flood impact assessments by WMAwater were undertaken using hydraulic models prepared initially in terms of the Lower Shoalhaven River Flood Study and subsequently in terms Shoalhaven River Flood Study. With completion of the November 2022 Lower Shoalhaven River Flood Study, the hydrologic and hydraulic models established in that study have been adopted for use in the Flood Compliance Report prepared by WMAwater.

These reports determined the incremental changes in peak flood levels due to ongoing proposed works by Shoalhaven Starches. It is only since 2023/2024, with the adoption of the computer models provided in the Lower Shoalhaven River Flood Study, that the cumulative effects of all works by Shoalhaven Starches have been quantified.

A comparison between the peak 1% AEP flood levels from the March 2013 (Shoalhaven River Flood Study) flood study and the November 2022 (Lower Shoalhaven River Flood Study) flood study indicates a significance reduction in flood levels. This has occurred due to many factors including the adoption of the 2019 Australian Rainfall and Runoff guidelines in Lower Shoalhaven River Flood Study whilst the earlier flood studies adopted the prior 1987 edition of ARR)

Development on the Floodplain

Each development on the floodplain has the potential to cause an impact upon flood levels. The impacts of works within the floodplain on hydraulic characteristics are twofold, firstly, a loss of temporary floodplain storage volume and secondly a loss / restriction of flow area or conveyance. It is the loss of flow area which produces the greatest impact, as the area of floodplain storage lost due to all works by Shoalhaven Starches since 1990, represents less than 1% of the total available floodplain storage area of the northern floodplain of the Shoalhaven River (say 3000+ hectares).

Scope of Work

The scope of work adopted by WMA water in the Flood Compliance Report was to use up to date hydraulic modelling taken from Lower Shoalhaven River Flood Study (November 2022) to assess the impacts on flooding of the proposed works. The Flood Compliance Report provides an assessment of the implications of the proposed works on surrounding flood levels and considers both the incremental effect (i.e. the change compared to that previously approved up to February 2025 that includes built and not yet built), as well as the cumulative effects of all past

approved works (built and not yet built) by Shoalhaven Starches and Supagas since 1990.

The hydraulic modelling assumes the same topography for 1990 and February 2025 conditions outside the lands owned by Shoalhaven Starches. However, within the Shoalhaven Starches lands, including the Supagas facility, the Lower Shoalhaven River Flood Study, November 2022 TUFLOW model has been revised to create the following three model scenarios.

1. The works as present in 1990 (termed the 1990 Existing model).
2. Those approved (built and not yet built) as of February 2025 (termed the Feb2025SupagasExisting model).
3. Those approved (built and not yet built) as of February 2025 plus including the Supagas Stage 2 proposed works as shown on Figure 2 (termed the Feb2025SupagasDesign or Proposed model).

Thus, for example, the constructed new bridge over the Shoalhaven River at Nowra is included in all three scenarios as are all works on the Riverview Road / Terara levee. This approach therefore only determines the cumulative effects of the works by Shoalhaven Starches and Supagas since 1990 and has not assessed the impacts of other works on the floodplain in that time.

Assessment of Impacts of Proposed Development

The impacts of the proposed development on flooding have been evaluated for the following two scenarios.

- Comparison of the Proposed with the Feb2025SupagasExisting model. This determines the incremental impact of the proposed Supagas Stage 2 development application.
- Comparison of the Proposed with the 1990 Existing model. This provides the cumulative effects of the proposed development (Supagas Stage 2 works) plus all

approved (built and not yet built) works by Shoalhaven Starches and Supagas since 1990.

Results of Flood Compliance Assessment

The Modification Proposal will result in increased flood levels. In summary, WMA water indicates that the maximum cumulative increases in flood level since 1990 are shown below. However, in all three events most areas only experience a maximum increase of up to 0.1m.

- 5% AEP – up to 0.1m (Figure 15),
- 1% AEP – up to 0.2m (Figure 16),
- PMF – up to 0.3m (Figure 17).

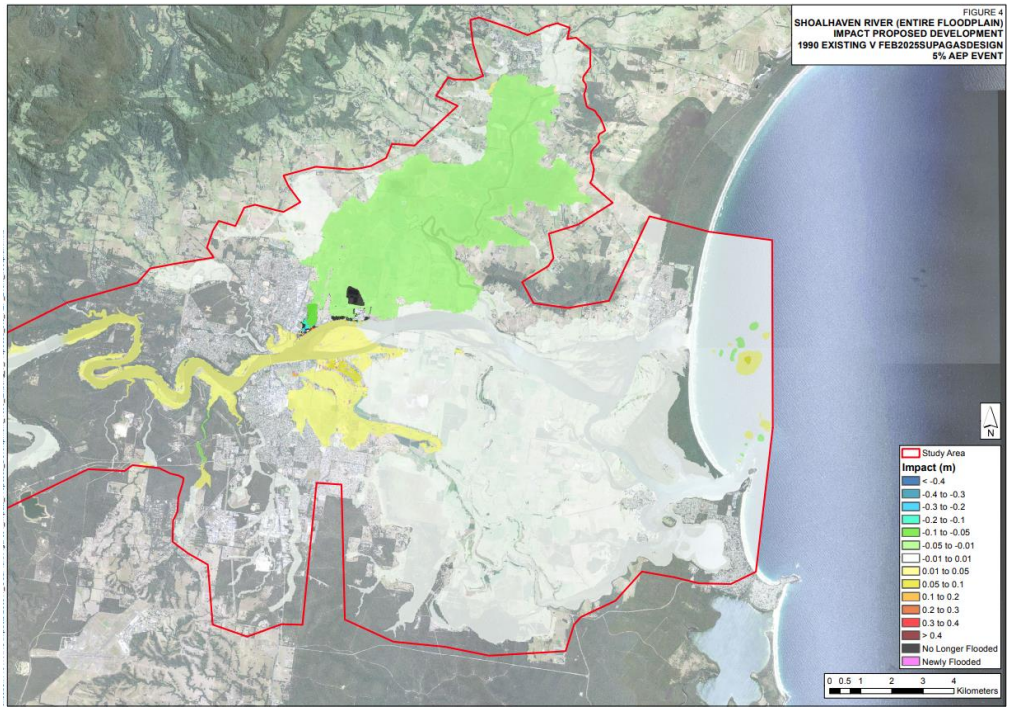

Figure 15: Shoalhaven River (Entire Floodplain) Impact Proposed Development 1990 Existing v Feb2025SupagasDesign 5% AEP Event Source WMA water

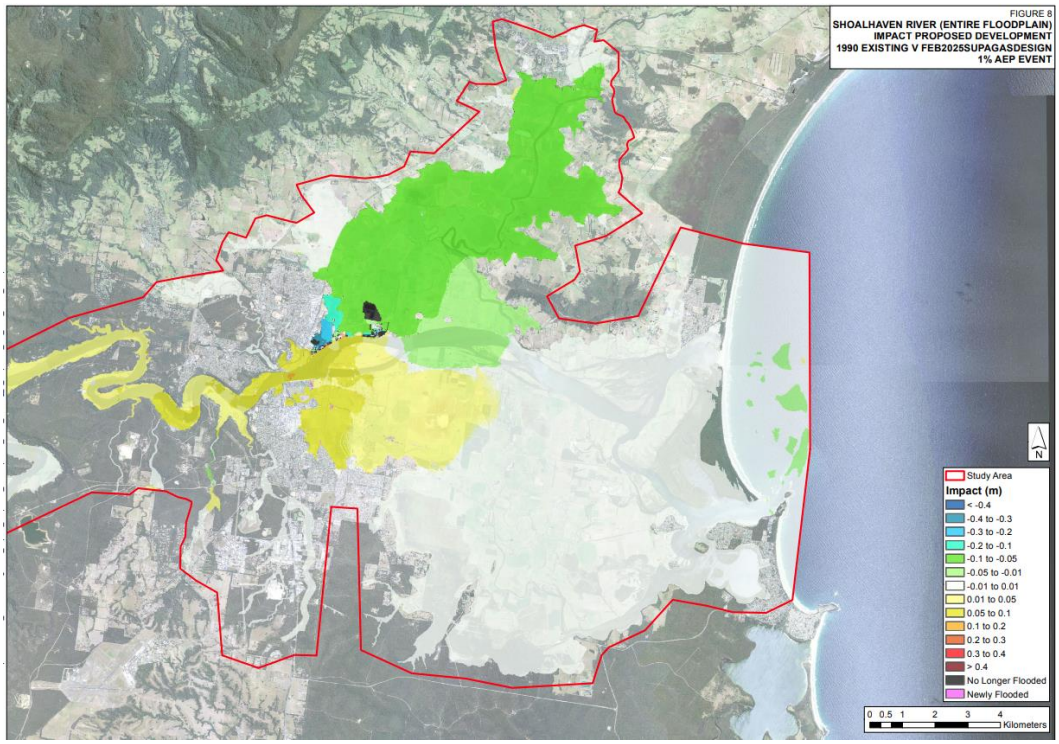

Figure 16: Shoalhaven River (Entire Floodplain) Impact Proposed Development 1990 Existing v Feb2025SupagasDesign 1% AEP Event Source WMA water

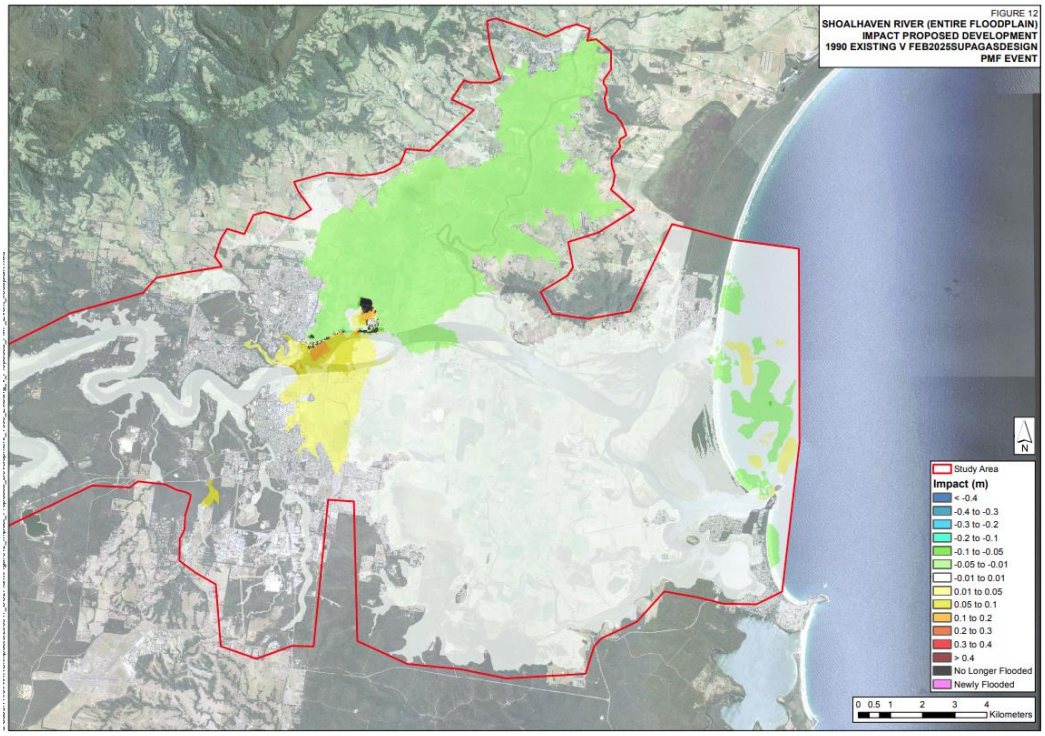

Figure 17: Shoalhaven River (Entire Floodplain) Impact Proposed Development 1990 Existing v Feb2025SupagasDesign PMF Event Source WMA water

The maximum incremental increases in flood level since February 2025 are shown below. However, WMAwater indicate that the increases are predominantly within land owned by Shoalhaven Starches.

- 5% AEP – less than 0.01m (Figure 18),
- 1% AEP – up to 0.1m (Figure 19),
- PMF – up to 0.1m (Figure 20).

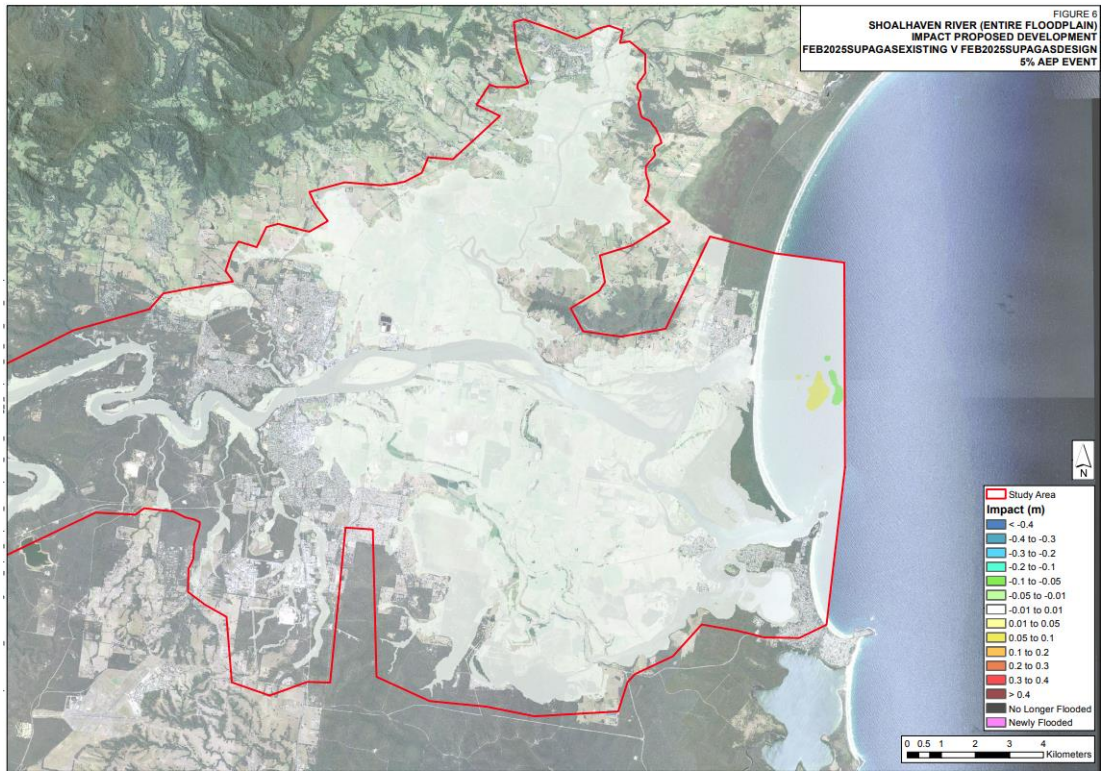

Figure 18: Shoalhaven River (Entire Floodplain) Impact Proposed Development Feb2025SupagaswExisytyingf v Feb2025SupagasDesign 5% AEP Event Source WMA water

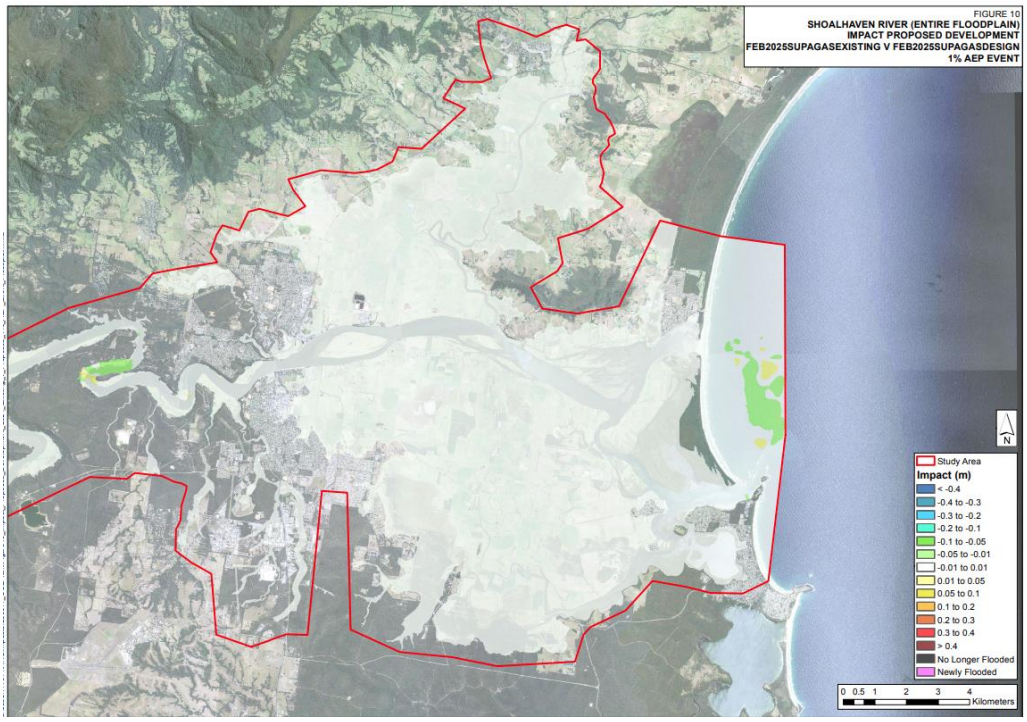

Figure 19: Shoalhaven River (Entire Floodplain) Impact Proposed Development Feb2025SupagaswExisytyingf v Feb2025SupagasDesign 1% AEP Event Source WMA water

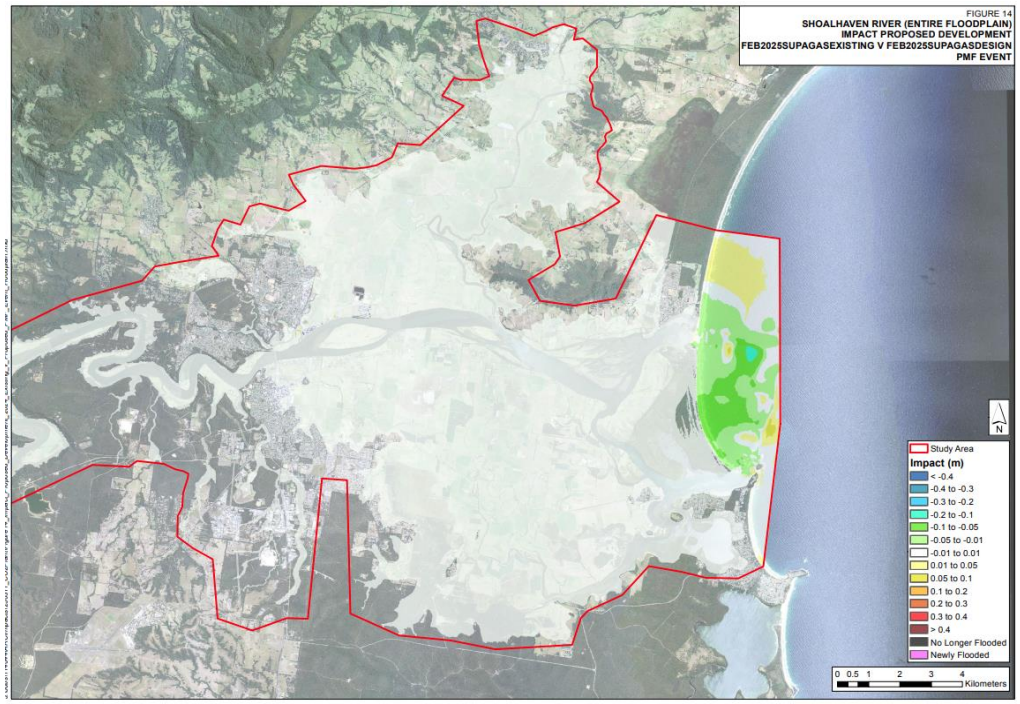

Figure 20: Shoalhaven River (Entire Floodplain) Impact Proposed Development Feb2025SupagaswExisytyingf v Feb2025SupagasDesign PMF Event Source WMA water

Possible Mitigation Measures:

WMA water indicates that there are no viable means of reducing the increase in peak flood levels resulting from these works. One of the most beneficial and practical means of reducing flood damages to existing buildings and risk to life is to improve the awareness and preparedness of the occupants or employees. There are several ways of undertaking such a scheme and these are outlined in Table 16 and most require involvement by Council and / or the SES. Funding a scheme would assist in improving the community's flood awareness and consequently reducing flood damages for all floodplain occupiers.

Method	Comment
Letter/pamphlet from Council	These may be sent (annually or biannually) with the rate notice or separately. A Council database of flood liable properties/addresses makes this a relatively inexpensive measure which can be effective if residents take the time to absorb and apply the suggestions. The pamphlet can inform residents of ongoing implementation of the flood studies or similar on Council's web site, changes to flood levels, climate change or any other relevant information.
Council website	Council should continue to update and expand their website to provide both technical information on flood levels as well as qualitative information on how residents can make themselves flood aware. This would provide an excellent source of knowledge on flooding within the study area (and elsewhere in the LGA) as well as on issues such as climate change.
Community Working Group	Council could initiate a Community Flood Working Group framework (undertaken in other catchments elsewhere) and this would provide a valuable two-way conduit between the local residents and Council.
School project or local historical society	This provides an excellent means of informing the younger generation about flooding, waterway management and climate change. It may involve talks from various authorities and can be combined with other related topics such as water quality.
Displays at key locations or similar	This is an inexpensive way of informing the community and may be combined with related displays.
Historical flood markers and flood depth markers	Signs or marks can be prominently displayed on telegraph poles or such like to indicate the level reached in previous floods. Depth indicators advise of potential hazards. These are inexpensive and effective but in some flood communities are not well accepted as it is considered that they may affect their property values.
Articles in local newspapers	Ongoing articles in the newspapers will ensure that the flood and climate change issues are not forgotten. Historical features and remembrance of the anniversary of past events are interesting for residents.
Collection of peak water level data from future floods	Collection of data (photographs) assists in reinforcing to the residents that Council is aware of the problem and ensures that the design flood levels are as accurate as possible. This might also include establishment of peak water level marker poles and which house floors are inundated.
Types of information available	A recurring problem in many flood liable areas is that new owners consider they were not adequately advised that their property was flood affected on the 10.7 Certificate during the purchase process. Council may wish to advise interested parties, when they inquire during the property purchase process, regarding flood information currently available, how it can be obtained and the cost. This information also needs to be provided to all tenants and visitors who may rent for a period. Some Councils have conducted "briefing" sessions with real estate agents and conveyancers.
Establishment of a flood affectation effects database	A database would provide information on (say) which houses require evacuation, which public structures will be affected (e.g., telephone or power cuts). This database should be updated following each flood with input from the community.
Flood preparedness program	Providing information to the community regarding flooding helps to inform it of the problems and associated implications. However, it does not necessarily adequately prepare people to react effectively to the problem. A Flood Preparedness Program would ensure that the community is adequately prepared. The SES would take a lead role in this.
Develop approaches to foster community ownership of the problem	Flood damages in future events can be minimised if the community is aware of the problem and takes steps to find solutions. The development of approaches that promote community ownership should therefore be encouraged. For example, residents should be advised that they have a responsibility to advise Council if they see a problem such as debris blockage or such like. This process can be linked to water quality or other water related issues including estuary management. The specific approach can only be developed in consultation with the community.

Table 16: Flood Awareness Methods, source WMA water

8.4 ENVIRONMENTAL IMPACTS

8.4.1 FLORA AND FAUNA

This Modification Report is supported by a Flora and Fauna Assessment prepared by Ecoplanning. This section of the Modification Report is based upon the findings of this Flora and Fauna Assessment.

8.4.1.1 VEGETATION COMMUNITIES

The identification of Plant Community Types (PCTs) within the study area was undertaken by Ecoplanning in accordance with the NSW PCT classification as described in the BioNet Vegetation Classification (NSW DCCEEW 2025b). Determination of the most appropriate PCT for the vegetation community within the study area used the BioNet Vegetation Classification database to identify/confirm PCT types which matched the geographic distribution (based on IBRA subregions), vegetation formation and floristics of vegetation within the subject site.

Planted vegetation

Field survey by Ecoplanning identified a mixture of planted native vegetation within the subject site, predominately located along the southeastern boundary of the subject site and along the northern boundary of the study area, which borders Bolong Road. The modified state of the planted vegetation did not, according to Ecoplanning, conform to any PCT. Analysis of historic aerial and satellite imagery of the study area indicates that all trees within the study area were planted in 1991 (NSW Spatial Services 2025b). Although hollow bearing trees typically indicate remanent vegetation, one planted hollow bearing tree was identified by Ecoplanning, during the field survey. This tree was also planted in 1991, likely producing hollows due to disturbances.

The planted vegetation within the subject site consists, according to Ecoplanning, primarily of a canopy of Eucalyptus botryoides X saligna and Corymbia maculata (Spotted Gum), with interspersed Lophostemon confertus (Brush Box), Casuarina glauca (Swamp Oak) and Eucalyptus fibrosa (Red Ironbark). Shrub species were only present along the northern boundary of the study site, bordering Bolong Road. These shrubs, which were mainly cultivar species, were all planted within the last 10 years. Ground cover within the subject site contained a mix of native and exotic grasses and forbs and was generally dominated by Cenchrus clandestinus (Kikuyu Grass), Modiola caroliniana (Red-flowered Mallow), Microleana Stipoides (Weeping Grass), and Dichondra repens (Kidney Weed). Although this vegetation

is planted and disturbed, it still provides potential foraging and habitat for flora and fauna.

Exotic grasslands

Ecoplanning indicate that areas of exotic grasslands covered the northeastern corner of the subject site. This patch of exotic vegetation was dominated by the high threat weed species Cenchrus clandestinus (Kikuyu Grass) and Ehrharta erecta (Panic Veldtgrass), and were actively mown, therefore, limiting habitat and foraging potential for threatened flora and fauna species.

The extent of each vegetation type present within the study area and subject site is provided Table 17.

Table 17: Validated vegetation and infrastructure within study area

Vegetation type	**Extent within study area (ha)**	**Extent within subject site (ha)**
Planted native vegetation	0.15	0.12
Exotic grassland	0.24	0.09
Vegetation total	**0.39**	**0.21**
Vegetation type	**Extent within study area (ha)**	**Extent within subject site (ha)**
Infrastructure	5.39	0.25
Total	**5.78**	**0.45**

8.4.1.2 FLORA SPECIES

A total of 33 flora species were recorded by Ecoplanning in the study area during the field survey, of which 15 (48%) are native. This is not likely to be a comprehensive list of all flora species present within the study area, but rather represents those species identified whilst undertaking searches for threatened species, including their habitat. No individuals or populations of threatened flora species were recorded or are expected by Ecoplanning to occur in the study area.

8.4.1.3 FAUNA AND FAUNA HABITAT

A total of nine fauna species were observed by Ecoplanning, within or proximate to the study area during the field survey. No threatened fauna species were observed, although surveys were limited to opportunistic observations at the time of the survey. Given historic disturbance and lack of a continuous canopy or shrub layer across the study area, fauna habitat is limited. Fauna habitat observed included one hollow bearing tree (HBT), with a hollow entrance between 5 cm – 10 cm diameter. This HBT was located on the southern boundary of the subject site and will be impacted by proposed works.

Although limited canopy species, within the study area, may provide foraging and nesting opportunities for highly mobile species that inhabit semi-urban landscapes. Ecoplanning indicate that marginal foraging habitat for the GHFF is present in the form of scattered native and exotic trees. GHFF feed trees including Eucalyptus fibrosa, Eucalyptus botryoides X saligna, Melaleuca quinquenervia, and Corymbia maculata are proposed for clearance. Similar potential foraging habitat exists on the northern boundary and to the east of the study area.

8.4.1.4 IMPACT ASSESSMENT

Direct impacts

Direct impacts associated with the proposed development including the clearing of vegetation within the subject site.

Assessment of impacts to vegetation

Impacts to native vegetation as part of the proposal are anticipated by Ecoplanning through direct clearing of 0.12 ha of Planted native vegetation. A 0.09 ha area of exotic grassland will also be impacted.

Loss of fauna habitat

The proposed development will involve the removal of fauna habitat in the form of planted native vegetation (0.12 ha), including one HBT, which may, according to Ecoplanning, provide nesting and foraging habitat for some species.

Additionally, 0.09 ha of exotic grassland and 0.25 ha composed of built infrastructure will be removed.

Indirect impacts

Ecoplanning indicate that it is difficult to quantify the indirect impacts of the proposed development, but these may include impacts such as noise, light spill, erosion, weed spread, stormwater runoff, and edge effects associated with the removal of vegetation and construction. These impacts can be either avoided or mitigated, according to Ecoplanning, through development of a Construction Environmental Management Plan (CEMP).

Given the proximity of the study are to the Shoalhaven River towards the south, indirect impacts such as runoff during construction must be managed through a CEMP. Sediment and erosion controls will be put in place according to best practices (Landcom 2004), the CEMP will restrict access to areas outside the study area to prevent access of construction equipment or people, which could further impact areas outside of the study area.

8.4.1.5 AVOIDANCE AND MITIGATION

Avoidance and minimising impacts to vegetation and habitat

One of the purposes of the Biodiversity Conservation Act is to establish a framework to avoid, minimise and (where required) offset the impacts of proposed development and land use change on biodiversity. The proposed development will remove a total of 0.12 ha of planted native vegetation. Complete avoidance of impacts to planted native vegetation would not permit the development of the proposed footprint, however, the following measures are recommended by Ecoplanning to minimise and mitigate environmental impacts:

- *Areas of beyond the subject site boundary will be 'No Go-Zones" for construction works and equipment and should be clearly delineated with construction fencing.*
- *Lay down areas should not be in areas of planted native vegetation outside the subject site*
- *Any exotic vegetation removed from the study area will be disposed of at an approved facility.*
- *A CEMP will be developed to address pollution and contamination issues, such as silt control, and oil/fuel/chemical-storage/spill management, which could arise during construction.*
- *Erosion and sediment control measures will be established before work begins and maintained in effective working order throughout the duration of the works, and until the study area has been stabilised, to prevent off-site transport of eroded sediments.*
- *The HBT should be inspected prior to clearing for evidence of roosting/nesting fauna species. A suitably qualified ecologist should, where possible, capture and relocate resident fauna species prior to clearing. Appropriate capture, release and relocation protocols should be in place prior to clearing works.*

Construction Environmental Management Plan

To avoid potential indirect offsite impacts during construction, an appropriate erosion and sedimentation control plan (ESCP) should be in place following best practice protocol such as that detailed in Landcom (2004). It is recommended by

Ecoplanning, the ESCP be included in a site-specific Construction Environmental Management Plan (CEMP), prior to any construction works taking place.

The CEMP must specify lay down, site office, access tracks and plant equipment storage areas; these areas are not to be outside the study area, where further native flora may be impacted.

A number of non-threatened fauna species such as birds, arboreal mammals and amphibians are likely to be present at the study area. Therefore, an appropriate pre-clearance and fauna management protocol, and unexpected finds procedure will be put in place at the time of construction to avoid and mitigate any potential harm or injury to these individuals.

Pre-clearance protocols

One HBT 5-10 cm in diameter was identified by Ecoplanning within the subject site, which could be used by fauna species. Removal of the HBT must be supervised by a qualified ecologist, as the tree may provide suitable breeding/roosting habitat for fauna species.

Ecoplanning recommend that appropriate pre-clearance protocols are to be put in place at the time of vegetation and building clearing to mitigate and avoid potential harm or injury to these individuals. These protocols should be included as a component of the CEMP. They should include, as a minimum, soft felling techniques and clearing supervision where habitat trees are to be removed.

Soft-felling techniques as part vegetation clearing encourage fauna to relocate outside of the disturbance footprint prior to habitat clearing or alternatively provide an opportunity to move fauna during vegetation clearing works. Soft-felling techniques Ecoplanning indicate should be adaptive depending on site-specific conditions but typically would include:

- *Marking all habitat trees to be cleared,*

- *Removal of ground-layer and mid-storey vegetation (underscrubbing) around the habitat trees, 24 hours before the felling of habitat trees*
- *Tapping/nudging of habitat trees by heavy machinery prior to the proposed removal of the habitat trees,*
- *'Slow dropping' of habitat trees, involving the gentle lowering of habitat trees with hollows intact, and*
- *Inspection of lowered habitat trees and capture and release of any fauna species present. Injured fauna is to be taken to WIRES or a veterinary clinic.*

The Flora and Fauna Assessment prepared by Ecoplanning concludes:

> *This Flora and Fauna Assessment has been prepared to consider the biodiversity values, including threatened fauna, flora, and ecological communities, which are present or that are considered likely to be present within the study area.*
>
> *The FFA has assessed the potential impacts of the proposed construction of additional Carbon Dioxide processing facilities for Supagas, located on Lot 143 // DP 1069758, 220 Bolong Road, Bomaderry 2541. The removal of up to 0.12 ha of planted native vegetation is required as part of this proposal. Vegetation within the study area has been subject to considerable historical disturbance.*
>
> *Planted native vegetation within the subject site was identified as having potential habitat for the GHFF, a threatened species under the BC Act and EPBC Act. A Test of Significance applied to this species according to both Commonwealth and State government criteria determined that the development would not result in a significant impact to the GHFF.*
>
> *Potential indirect impacts associated with the proposal can be minimised and mitigated through measures recommended in Section 4.3 of this report. These measures include the preparation of a site-specific CEMP prior to construction taking place and the implementation of erosion and sediment control measures*

8.4.2 WATER QUALITY

The Modification Report is supported by an Integrated Water Cycle Management Strategy (IWCMS) prepared by Allen Price. This section of the Modification Report is based upon the findings of this IWCMS.

Stormwater Quality

The works associated with Modification Proposal are wholly situated within the existing Shoalhaven Startches site and immediately adjacent to the Manildra Maintenance Facility (former Dairy Factory site.

Allen Price indicated that runoff from all components of the Modification Proposal will drain to the existing stormwater system and stormwater quality improvement device within the former dairy factory. Post development runoff will be mitigated to maintain the existing peak discharge. Therefore, Allen Price indicate that no additional permanent stormwater quality measures are proposed.

Short term, temporary stormwater quality impacts are likely during the construction phase. Allen Price indicates that conventional sediment and erosion controls in close proximity to the individual components during construction will mitigate the potential for sediment export from the site

Stormwater Quantity Modelling

Catchment Characteristics

The existing Supagas site discharges to the existing stormwater system within the Manildra Maintenance facility. This stormwater system discharges to the Shoalhaven River through an existing stormwater quality improvement device and outfall.

The Modification Proposal will connect to this existing stormwater system. The pre-development and post development characteristics of the site are presented in Table 18 and Table 19 below.

EXISTING SITE				
Catchment Description	Sub-Catchment Area		Imperv	Remarks
	m^2	ha	%	
Turning Area	874	0.087	100	Existing part of Stage #1 works
Stage #1 Plant	1,455	0.145	60	Existing plant with gravel infill between components
Stage #1 Access	159	0.016	100	Existing access
Grass	1,705	0.170	0	Undeveloped Stage #2 area
Catchment Total	4,192	0.419		
Imperv area (m^2)	1,905			
Imperv %	45.5			

Table 18: Existing Site Conditions Source Allen Price

PROPOSED DEVELOPMENT				
Catchment Description	Sub-Catchment Area		Imperv	Remarks
	m^2	ha	%	
Turning Area	874	0.087	100	Existing part of Stage #1 works
Stage #1 Plant	1,455	0.145	60	Existing plant with gravel infill between components
Stage #1 Access	159	0.016	100	Existing concrete access
Stage #2 Plant expansion	775	0.077	60	New plant with gravel infill between components
Stage #2 Access	930	0.093	100	New concrete access
Catchment Total	4,192	0.419		
Impervious area (m^2)	3,141			
Impervious %	74.9			

Table 19: Developed Site Characteristics

Site Retention Requirements

The retention requirement calculations are presented in Table 21 below. The site retention requirement can be achieved by way of one 8kL rainwater tank accepting roof runoff from the MCC building.

RETENTION REQUIREMENT DCP G2 Table 2 *(Industrial Development)*	
Additional Imperv Area (m^2)	1,236
Retention depth (m)	0.006
Retention volume (m^3)	7.42

Table 20: Retention Requirement

Runoff Mitigation

resulting from the incremental increase in the impervious area. The DRAINS hydrological parameters are as follows:

- Impervious depression storage: 1mm
- Pervious depression storage: 5mm
- Soil Type: 3

The DRAINS model estimates the pre-development site discharge from the site and the post development discharge from the site with and without Onsite Detention (OSD).

The increase in site discharge can be mitigated by way of an OSD system comprising using 3 x 525mm diameter pipes approximately 34.2m long with a 100mm diameter outlet pipe.

The DRAINS model results are presented in Table 21 below.

SITE CONDITION	SITE DISCHARGE (m^3/s)				
	4EY	20% AEP	10% AEP	5% AEP	1% AEP
Pre - Development	0.020	0.086	0.109	0.136	0.220
Post Development (No OSD)	0.035	0.113	0.138	0.166	0.241
Post-Development (with OSD)	0.025	0.075	0.088	0.104	0.199

Table 21: DRAINS model results

The IWCMS prepared by Allen Price concludes:

"Operational activity SupaGas Facility and associated works are unlikely to generate stormwater pollutants within the site.

Potential short term stormwater quality impacts from the construction works can be mitigated by the implementation of erosion and sediment control plan and staged earthworks such that the performance objectives and criteria in Ch G2 can be satisfied.

The proposal is considered adequate from a stormwater management perspective and is recommended to be supported by the NSW Department of Planning, Housing and Infrastructure."

8.5 TRAFFIC IMPACTS

8.5.1 EXISTING CONDITIONS

8.5.1.1 TRIP GENERATION

According to ARC the existing trip generation associated with the existing CO_2 Plant is very minor, being a total of some 8 truck trips per day, augmented by up to 6 staff/contractor trips per day. Truck trips are generally evenly split between B-Doubles and articulated vehicles. With reference to the MOD 15 TA, it is estimated that the existing facility generates no more than 2 truck trips in any single hour, though given the capacity of the on-site loading facilities (i.e. the time to fill a truck tankers) it is rare that 2 truck trips would actually be generated in a single hour, noting that the Facility is approved to operate (and generate truck trips) 24 hours a day, 7 days a week.

8.5.1.2 PARKING

The existing facility provides 4 parking spaces, 2 of which are reserved for staff, and 2 for contractors and other visitors.

8.5.1.3 EXISTING ROAD NETWORK

According to ARC trip generation associated with the existing facility following the Modification Proposal will continue to be minimal, with peak hour truck trip generation not anticipated to increase above the estimated 2 truck trips per hour as approved in the MOD 15. As such, the only intersection with any potential to be impacted by additional truck movements would be that of Bolong Road & Gate 1. All other roads and intersections would essentially be unaffected by the existing or proposed operation of the Facility.

Bolong Road

Bolong Road is a local road which generally runs east-west from Gerroa Road at Coolangatta and the Princes Highway at Bomaderry. In the vicinity of the subject site, it provides 1 traffic lane in each direction, and has a posted speed limit of 50km/h.

Bolong Road between Jennings Lane (east of the Site) and Princes Highway is an approved Restricted Access Vehicle (RAV) Route providing for vehicles up to and include 26m B-Doubles. Railway Street, Cambewarra Road and Meroo Road between Bolong Road and Princes Highway are approved for General Access Vehicles (GAVs) only; as such, it is generally the case that B-Doubles will only use Bolong Road and Princes Highway for regional access, while articulate vehicles can use both routes.

Bolong Road & Gate 1 Intersection

The intersection of Bolong Road & Gate 1 has been extensively upgraded over the past 10 years in accordance with past Modification approvals, and includes the following:

- A Channelised Right (CHR) lane from Bolong Road to Gate 1;
- A Channelised Left (CHL) lane from Bolong Road to Gate 1;
- A large internal apron area within the DF Site to provide for U-Turns from other Shoalhaven Starches driveway along Bolong Road given right turn restrictions at a number of these driveways;
- An acceleration lane from Gate 1 to Bolong Road west; and
- Geometry providing for the movement of the largest vehicle accessing the DF Site, again being a 26m B-Double.

ARC notes that the ability for the geometry of the intersection of Bolong Road & Gate 1 to provide for 26m B-Doubles was confirmed by both Council and TfNSW prior to its construction, and again the Modification would not provide for any larger vehicles either during the construction or operation of the Facility further to an approval of the Modification.

Internal Access

Access between Bolong Road and the Facility is provided via wide internal roads within the DF Site, which again have been designed to accommodate the swept paths of vehicles up to and including 26m B-Doubles. A turning head providing for a B-Double to enter the Facility and turn to the Facility's loading facility is also provided, such that all movements to/from the Facility and Gate 1 are in a forward direction.

According to ARC all internal access infrastructure has been previously approved by DPHI and will be unchanged further to the Modification.

8.5.1.4 ROAD NETWORK OPERATIONS

Existing Intersection Operations

The operation of the intersection of Bolong Road & Gate 1 has been assessed using the SIDRA intersection model. Further to the SIDRA analysis, the intersection of Bolong Road & Gate 1 was determined to operate well, reporting:

- A Level of Service (LOS) A in both the AM and PM peaks;
- A worst delay of 13.1 seconds (in the AM peak); and
- Degree of Saturation (DOS) of less than 0.171 in both the AM and PM peaks.

Base 2024 Traffic Volumes

According to ARC it is standard practice to provide an assessment of future conditions based on a 10 year forecast, and as such the existing through traffic volumes in Bolong Road at the intersection of Bolong Road & Gate 1 have been factored to represent Base 2034 traffic volumes.

In determining the Base 2034 traffic volumes, ARC has referenced the average annual growth rates identified in Table 13 of the Nowra Bridge Upgrade Transport & Traffic Assessment (TfNSW 2018), which are 1.7% per annum (linear) along Bolong Road; this growth rate has been applied to the existing through traffic volumes in Bolong Road at the Gate 1 intersection.

In addition, the Base 2034 traffic volumes include all approved Project Approval Modifications which have yet to be completed, or yet to generate the level of additional trips provided for in their approvals.

SIDRA analysis has again been undertaken by ARC to determine the operation of the intersection of Bolong Road & Gate 1 under Base 2034 conditions; SIDRA Movement Summary reports are provided in Appendix A, but in summary SIDRA reports:

- A LOS B in the AM peak and LOS A in the PM peak;

- A worst delay of 18.7 seconds in the AM peak; and
- DOS of less than 0.210 in both the AM and PM peaks

In summary, ARC indicate the intersection will continue to operate at a more that satisfactory LOS under Base 2034 conditions further to all approved Project Approval Modifications.

8.5.1.5 THE MODIFICATION PROPOSAL

Access

Access to the facility will be unchanged from its current access provisions, with all access via the intersection of Bolong Road & Gate 1, and then via internal roads within the subject site. All interface (Bolong Road & Gate 1 intersection), and internal access infrastructure has been designed to accommodate the largest vehicle accessing the Facility (B-Double), and previously approved by Council and TfNSW. Again, these access routes will be unchanged further to the Modification.

Traffic

The additional trips generated by the facility following the Modification Proposal according to ARC are anticipated to be proportional to the trips generated by the approved facility operations based on the amount of CO_2produced each day, and the capacity of the tanker trucks. As a worst case, if all of the additional CO_2 was transported using smaller articulated vehicles (20t capacity) then according to ARC the plant would generate an additional 4 tanker trucks (8 tanker truck trips) each day.

The majority of trucks access the Facility between 6:30am and 3:00pm (when Supagas staff are onsite), though the Plant does have approvals for the movement of trucks 24/7. Again therefore, there is little potential for the Facility to generated more than 2 truck trips (an arrival trip and departure trip) in a single hour.

Notwithstanding, as a worst case the total additional daily trips have been assigned by ARC to the Base 2034 AM and PM peak hours for the traffic analysis,

resulting in an additional 4 arrival trips to Gate 1 and 4 departure trips to Bolong Road, in a single hour. All truck trips would be to/from the west of Gate 1

8.5.1.6 INTERSECTION OPERATIONS

SIDRA has been used by ARC to determine the future operation of the intersection of Bolong Road & Gate 1 under Base 2034 including the Modification Proposal. In summary according to ARC the SIDRA reports:

- A LOS B in the AM peak and LOS A in the PM peak;
- A worst delay of 19.0 seconds in the AM peak; and
- DOS of less than 0.210 in both the AM and PM peaks.

In summary, ARC states the intersection will continue to operate at a more that satisfactory LOS even under these worst case Base 2034 and including the Modification Proposal.

8.5.1.7 PARKING

According to ARC the Modification Proposal will not increase the existing number of operation staff at the Facility, and as such the available parking will continue to appropriately provide for the Facility's parking demand

8.5.1.8 CONSTRUCTION

According to ARC the construction of the proposed Modification Proposal will have no impact on the operation of the key intersections along Bolong Road, with staff trips both minimal and occurring outside of commuter peak periods; and truck trips being fewer than the Facility would generate further to an approval of the Modification.

ARC also indicate that parking for construction staff will be provided within the subject site in close proximity to the existing facility, noting that there are significant areas available to accommodate what would be a very minor and temporary additional parking demand.

The Transport Assessment prepared by ARC concludes:

Further to a detailed assessment of Modification, arc traffic + transport has determined that:

- *All access to the Facility will be provided via the existing intersection of Bolong Road & Gate 1, and via existing internal roads through the DF Site between Bolong Road and the Facility. The Bolong Road & Gate 1 intersection, and these internal roads, have all been designed to accommodate the movements of the largest trucks accessing the Facility (B-Doubles) and approved by Council and TfNSW.*

- *All roads providing access between the DF Site and sub-regional road network are approved by TfNSW and NHVR for use by the maximum sized trucks that will be generated by the Facility.*

- *The additional trip generation of the Facility further to the Modification is very minimal, and the total trip generation of the Site during a peak hour of 2 truck trips would be no different than the 2 truck trips per hour as approved under MOD 15. This level of trip generation would have no impact on the operation of the Bolong Road & Gate 1 intersections, nor on any roads or intersections in the local road network.*

- *On-site parking is provided within the Facility that meets peak staff and contractor demand.*

- *A CTMP has been prepared which indicates that the construction of the proposed new infrastructure can be undertaken safely and efficiently without impacting the local road network. The CTMP may be revised further to consideration of any future Conditions of Consent in a Modification approval.*

In summary, arc traffic + transport has determined that the Modification is entirely supportable further to access, traffic and parking considerations.

8.6 AIR QUALITY IMPACTS

The Modification Report is supported by an Air Quality Assessment carried our by GHD. This section of the Modification Report is based upon the findings of the Air Quality Assessment carried out by GHD.

GHD Pty Ltd have previously undertaken two assessments of the CO2 Plant:

- *Shoalhaven Starches Mod 15 Air Quality Assessment* (2017)
- *Proposed modification to CO2 Plant (Supagas): Air Quality Assessment* (2021) (Mod 20)

8.6.1 SENSITIVE RECEPTORS

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 the existing CO2 Plant. Nowra is situated south of the CO2 Plant. Figure 21 below identifies the nearest receptors identified by the Air Quality Assessment carried out by GHD.

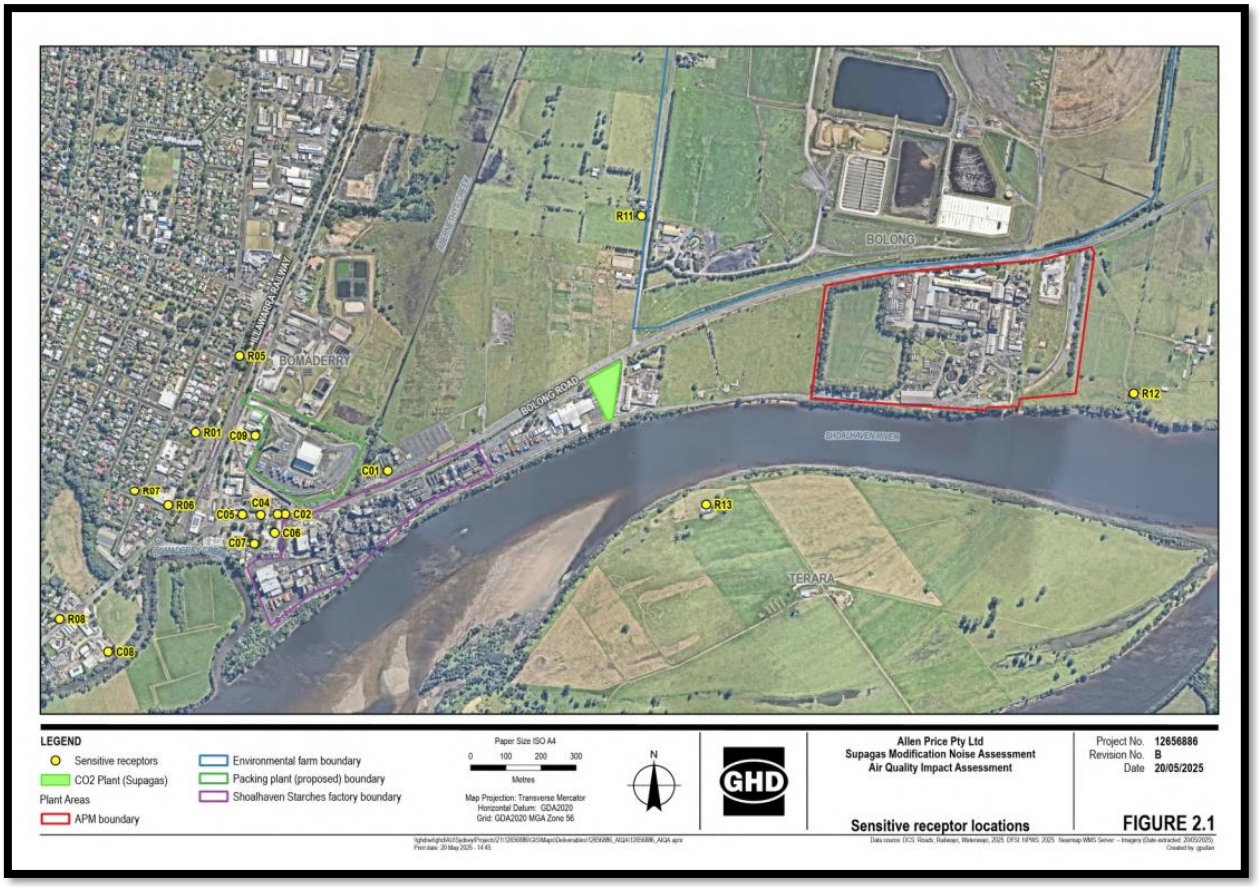

Figure 21: Sensitive Receptor Locations Source – GHD

8.6.2 EMISSIONS

Existing Emissions

GHD's Air Quality Assessment provides a summary of emissions form the existing Supagas plant (Table 23). The existing system is primarily enclosed, and only minor quantities of emissions are anticipated.

Table 22: Summary of existing emissions.

Description	Flowrate	Temperature (°C)	Concentration (Mole %)						
			CO_2	O_2	N_2	H_2O	**Oxygenates	pH	Odour
Cold scrubber **(stream 1)**	1,028 LPH	17.7	0.1	0	0	99.57	0.33	6.2	Probable
CO_2 compressor after-cooler condensate drain **(stream 2)**	1.8 LPH	35	0.3	Trace	Trace	99.7	Trace	3.0	Nil
Dehydration unit cooler condensate drain **(stream 3)**	10.2 LPH	9.5	0.3	Trace	Trace	99.7	Trace	3.0	Nil
Drier regeneration gas vent **(stream 4)**	60 sm^3/hr	0-240	65.2	5.52	29.28	Nil	Nil	NA	Nil
CO_2 liquefier gas vent **(stream 5)**	128 sm^3/hr	-28.7	65.2	5.52	29.28	Nil	Nil	NA	Nil
Cooling tower blow-down **(stream 6)**	90 LPH	30	Trace	Trace	Trace	100	Nil	6.8	Nil
**oxygenates comprises of a mixture of compounds given below in varying proportions with the predominate species being ethanol									

Proposed Modification

GHD's Air Quality Assessment provides a summary of emissions form the proposed Supagas plant (Table 23). Where changes are anticipated form the existing plant emissions in Table 24 below, they are shown blue bold.

Table23: Summary of proposed plant emissions

Description	Flowrate	Temperature (°C)	Concentration (Mole %)						
			CO_2	O_2	N_2	H_2O	**Oxygenates	pH	Odour
Cold scrubber **(stream 1)**	3,206 LPH	17.7	0.1	0	0	99.57	0.33	6.2	Probable
CO_2 compressor after-cooler condensate drain **(stream 2)**	3.6 LPH	35	0.3	Trace	Trace	99.7	Trace	3.0	Nil
Dehydration unit cooler condensate drain **(stream 3)**	20.4 LPH	9.5	0.3	Trace	Trace	99.7	Trace	3.0	Nil
Drier regeneration gas vent **(stream 4)**	120 sm^3/hr	0-240	65.2	5.52	29.28	Nil	Nil	NA	Nil
CO_2 liquefier gas vent **(stream 5)**	256 sm^3/hr	-28.7	65.2	5.52	29.28	Nil	Nil	NA	Nil
Cooling tower blow-down **(stream 6)**	180 LPH	30	Trace	Trace	Trace	100	Nil	6.8	Nil
**oxygenates comprises of a mixture of compounds given below in varying proportions with the predominate species being ethanol									

8.6.3 POTENTIAL IMPACTS

Construction

The key emissions to air from the construction of the proposed modification were identified by GHD upon review of the construction methodology. Low levels of dust emissions (TSP and PM10) are expected during construction efforts, primarily from:

- Earthworks – civil works
- Construction – installation of the equipment skid, installation of the pipe bridge and interconnection of the skid
- Track-out – Wheel generated dust from truck delivery supplies to the construction area. Construction traffic generation is expected to comprise of no more than 4 truck trips generated per day.

GHD expect minor vehicle exhaust emissions throughout the construction period; however, sources will be discontinuous, transient, and mobile, and therefore the air quality risk associated with vehicle emissions during construction is low.

No significant demolition works are proposed

Assessment Approach

A risk-based approach in accordance with IAQM guidance was adopted by GHD to assess potential particulate matter impacts during the construction of the proposed modification. The IAQM guidance recommends that a detailed risk assessment be undertaken where there is a human receptor within 250 m or an ecological receptor within 50 m of the construction footprint, or where there is a human or ecological receptor within 50 m of any haulage routes up to 250 m from the site entrance.

Given there are no human receptors within 250 m of the construction footprint GHD advise that a detailed risk assessment has not been undertaken.

Risk Summary

Due to the distance between the construction works and the nearest sensitive receptors, the risk for all construction activities is considered by GHD to be negligible and specific mitigation measures are not required.

Operation

GHD reviewed the project information and potential emissions associated with the modification. Although flow rates are proposed to increase through all streams, GHD indicate that no changes to the outlet gas composition from each stream are proposed.

GHD indicate that emissions from the cold scrubber (stream 1) are the only source with potential for odour impacts. The vapour exiting the cold scrubber is piped to the purification plant via a closed pipe. The gas is then purified using a number of absorbers and a reactor is used to removed 'low level' impurities. No gas is vented until it gets to the distillation section. All possible odours have been removed at that point. Therefore, GHD indicate that an increase in flow to the cold scrubber is not anticipated to lead to odour impacts at the nearby sensitive receptors.

Based on the information provided, GHD indicate that there will be no construction or operational air quality impacts on any nearby sensitive receptors.

The air quality assessment carried out by GHD concludes:

> *GHD has undertaken a review of the proposed changes to the CO2 Plant including any impacts on site emissions. Air quality impacts during construction (dust) and operation (odour and other pollutants) are not anticipated and there is no expected increase to the cumulative levels in the local area.*

8.7 VISUAL IMPACTS

The Scenic Character and Environment

The subject site is situated on Bolong Road, the gateway to Bomaderry, within an area currently containing a mixture of rural and industrial land uses. These different land uses contrast with each other and result in a mixed visual character.

The rural areas, much of which comprises the Shoalhaven Starches Environmental Farm, are generally flat to gently undulating and planted with pasture grasses. These areas have a typical rural/agricultural character, common throughout the region. To the north and forming a background to the rural landscape are the timbered slopes of the Cambewarra escarpment.

The subject site is characterised by typical industrial structures with an overall bulk and scale that dominates the surrounding locality.

The most relevant vantage points from where the proposed CO_2 Plant is visible would include:

The Princes Highway – views of the existing factory site are possible from selected locations along the Princes Highway north of Bomaderry, travelling in both a northerly and southerly direction. Whilst the location of the CO_2 Plant is slightly visible in the landscape, its overall visual impact is reduced by virtue of the distance between the plant; the intermittent nature of the views; a rise in topography which screens the site from view; and vegetation.

Burraga (Pig) Island – Burraga Island is situated in the middle of the Shoalhaven River and provides the closest vantage point to the southern boundary of the CO_2 Plant site. The island however is privately owned and not accessible to the public. Vegetation screening along the riverbank adjacent to the site reduces the visibility of existing buildings and structures.

Bolong Road – Bolong Road runs along the frontage of both the main and raw CO_2 treatment plant sites. Views of the CO_2 Plant will be readily visible when travelling in both an easterly and westerly direction. Attempts have been made to provide

some tree planting along the boundaries of 220 Bolong Road and 171 Bolong Road to "soften" the appearance of the development.

Nowra Bridge – The Nowra Bridge crosses the Shoalhaven River and provides limited opportunities for views of the Shoalhaven factory site. The dominant visual elements from the bridge are the river, vegetation along the riverbanks and the escarpment.

Bomaderry urban area – The existing plant is visible from a number of locations within the eastern outskirts of Bomaderry. Bomaderry is slightly elevated and some locations within the urban area do have extensive views of the site.

Terara – Distant views of the proposed CO_2 Plant on the former Dairy Farmers' site are possible from a number of vantage points in and around the village of Terara on the southern bank of the River. The visual impact of the site however is reduced by distance, the intervening landform of Burraga (Pig) Island and the vegetated riverbanks.

Riverview Road – Views of the site are available from residential development on the southern bank of the Shoalhaven River. Vegetation along both the northern and southern banks of the river partially screen the site from view.

Cambewarra Lookout – Cambewarra lookout is a popular tourist lookout providing panoramic views over the Shoalhaven floodplain and estuary. Shoalhaven Starches and the former Dairy Farmers' factory, like the other significant industrial sites, is visible from the lookout.

Visual Impact of Proposal

The Modification Proposal will involve the erection of structures with varying dimensions and height adjacent to existing industrial facilities. The proposed works will include:

- Installation of two (2) Liquid CO_2 storage vessels. Which will have a height above ground level of 20 metres.

- Installation of associated plant including new Carbon Vessells and new CO2 Liquification vessel, which will have a maximum height above ground level of 8.285 m.
- Interconnecting pipework from the process to the new equipment.
- Concrete bases for the above equipment items. This will include piling due to the substandard grade of the existing soil.

The proposed modifications reflect a similar character and scale that is consistent with existing structures associated with the existing CO_2 Plant; the former Dairy Farmers' factory; the adjacent Boweld factory to the east; and the overall Shoalhaven Starches operations.

The visual impact of these works from the identified vantage points (refer **Figure 2** is described as follows:

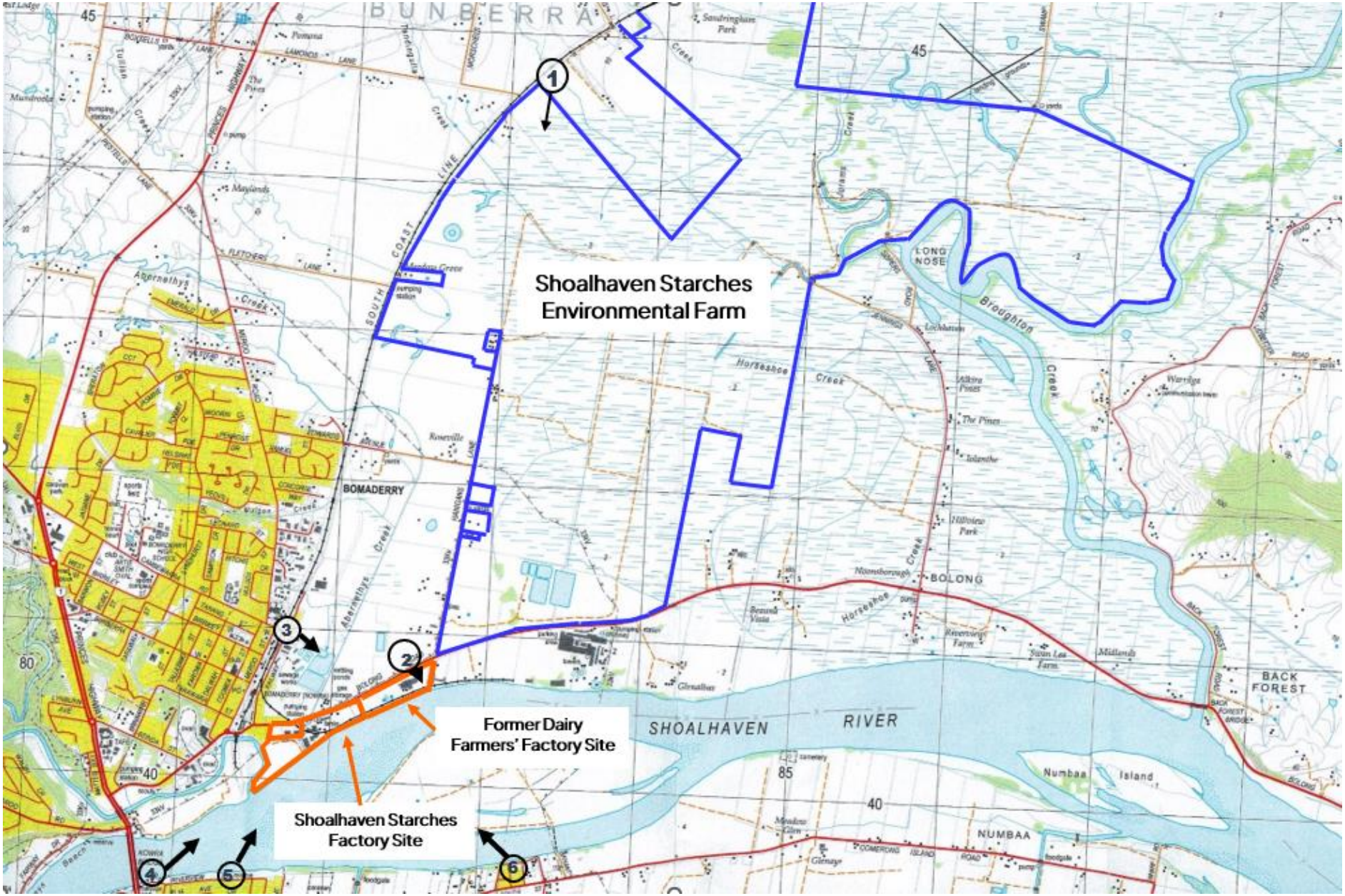

Figure 22: Vantage points for Plates

The Princes Highway

The Shoalhaven Starches sites (predominantly the factory) are mainly visible from a section of the Princes Highway between Boxsells Lane and Devitts Lane, Jaspers Brush (refer **Plate 1**). Due to the configuration of the highway and the siting of the Shoalhaven factory, only southbound vehicles view the site. Vantage points along this section of the highway are 4.5 to 5.0 km from the site. The site becomes less exposed and is eventually obscured by a rise in topography further south of Boxsells Lane.

Given the distance from these vantage points the factory site is only barely visible. The rising topography upon which Bomaderry is sited screens the western portion of the site, as does intervening vegetation.

Given the distance of these views, the screening of the site attributed to terrain and existing infrastructure and vegetation, the Modification Proposal will not be visible from these vantage points.

Plate 1: View of Shoalhaven Starches Factory from Princes Highway (within vicinity of Boxsells Lane). The Supagas facility is not visible.

Bolong Road

The existing Shoalhaven factory site and former Dairy Farmers' factory site are clearly visible from Bolong Road by vehicles approaching from the east, and along the frontage of the site refer (**Plate 2**).

The works associated with this Modification Proposal will comprise structures of a similar height (the storage vessels will be slightly taller), bulk and scale as the existing structures on the former Dairy farmers' site as well as those located on adjoining property to the east of the site (Boweld Constructions) and the overall Shoalhaven Starches factory site. The proposed works will also be setback over 27 metres from the Bolong Road frontage.

Landscape screening has also been established along the road frontage which over time will further soften the appearance of the existing and proposed development from view from along Bolong Road (**Plate 3).**

Under these circumstances it is considered the works will not dominate the view or streetscape along this section of Bolong Road and will not result in an adverse visual impact within the broader landscape.

Plate 2: View of former Dairy Farmers factory and Shoalhaven Starches from Bolong Road frontage of subject land.

Plate 3: View of CO_2 Plant site from Bolong Road. Landscape screen established and softens appearance of existing development when viewed from Bolong Road.

Bomaderry Urban Area

The township of Bomaderry is slightly elevated and some locations within this urban area have extensive views of the Shoalhaven factory site and partial view of the former Dairy Farmers' factory site (refer **Plate 3**).

The existing CO_2 Plant is partially visible from this vantage point.

Whilst the proposed works may be visible from this vantage point, the works will be in context of the existing former Dairy Farmer factory building as well as the existing Supagas CO_2 plant. Furthermore, the structures will also be partially screened by the existing CO_2 plant and within a backdrop of existing trees.

Under these circumstances it is considered the works will not dominate the view from this vantage point and will not result in an adverse visual impact within the broader landscape.

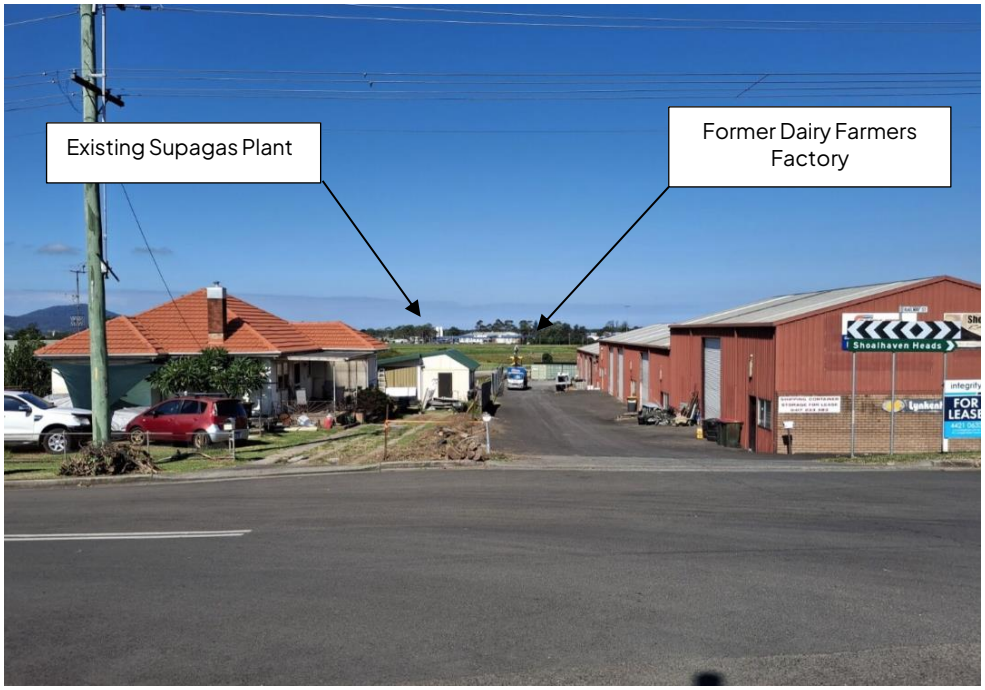

Plate 4: View of the former Dairy Farmers' factory site from the intersection of Railway Street and Cambewarra Road, Bomaderry.

Nowra Bridge

As a result of the construction of the new bridge across the Shoalhaven River, access to the old bridge, and in particular the pedestrian access along the old bridge is presently not possible. Access is available to the river foreshore below the bridge. The view from a position immediately below the Nowra Bridge to the east is mainly dominated by the river, riparian vegetation and the floodplain (refer **Plate 4**).

The Supagas facility and proposed modification works are not visible from this vantage point due to a bend in the river which obscures the former Dairy Farmers' factory site from view of Nowra Bridge. The proposed works will not be visible from within the vicinity of the Nowra bridge.

Plate 5: View of site from Nowra Bridge

Riverview Road

The vantage point from Riverview Road is shown in **Plate 5**. This view is from a distance of about 2 kilometres. Riverside vegetation along both the northern and southern banks will obstruct the view of the existing Supagas site. The tops of the existing storage vessels are barely perceptible from this vantage point. The proposed new storage vessels being taller than the existing vessel may protrude further above the riverside vegetation, however given the distance between this vantage point and the site such structures will not be visually prominent especially given the sites context in relation to the existing Shoalhaven Starches operations.

Plate 6: View from Riverview Road area. The storage vessels at the existing Supagas facility are barely perceptible from this vantage point.

Terara

The village of Terara is approximately 1.4 kilometres due south from both the Shoalhaven Starches factory site and former Dairy Farmers' factory site. The view of both factory sites as seen from Berry Street, Terara is shown in **Plate 6**.

Plate 7: View of Shoalhaven Starches factory and former Dairy Farmers' factory from Berry Street, Terara.

The existing CO_2 Plant is obscured from view from this vantage point by substantial vegetative screening in the south-east corner of the site, in addition to riparian vegetation along the Shoalhaven River. Overall, the modification proposal will not create an adverse visual impact from this vantage point.

Cambewarra Lookout

Cambewarra Lookout is situated about 7 km to the northwest of the subject sites. Views from the lookout are from an elevation over 620 m ASL and encompass the Shoalhaven River floodplain and the coast including Jervis Bay. Whilst both factory sites for the Shoalhaven Starches are visible from this vantage point, due to scale of the view, it would be considerably difficult to make out the works associated with CO_2 Plant from this vantage point.

9.0 CONCLUSION

Shoalhaven Starches is a member of the Manildra Group of companies. The Manildra Group is a wholly Australian owned business and the largest processor of wheat in Australia. It manufactures a wide range of wheat-based products for food and industrial markets both locally and internationally.

The Shoalhaven Starches factory located on Bolong Road, Bomaderry produces a range of products for the food, beverage, confectionary, paper and motor transport industries including starch, gluten, glucose and ethanol.

Project Approval MP06_0228 was granted by the Minister for Planning on the 28th January 2009 for the Shoalhaven Starches Expansion Project. This approval also encapsulated previous approvals for the site into one overall approval for the site (at that time).

The Shoalhaven Starches Expansion Project sought to increase ethanol production at the Bomaderry plant in a staged manner from 126 million litres per year to 300 million litres per year. To accomplish the increase in ethanol production, this project required a series of plant upgrades and increase in throughput of raw materials, principally flour and grain.

Following the Minister's determination Shoalhaven Starches have been implementing and commissioning works in accordance with this Project Approval.

On the 7 August 2018 the Independent Planning Commission granted a Modification Approval (Mod 15) to Project Approval MP-06_0228 enabling Supagas to construct a Carbon Dioxide (CO_2) Plant adjacent to the former Dairy Farmers factory site that now belongs to the Manildra Group of companies and which forms part of the Shoalhaven Starches operations. On the 16 October 2021 the Minister for Planning approved a further modification to the Mod 15 approval enabling the installation of additional CO_2 storage vessels and other plant and equipment (Mod 20).

The site is located at 220 Bolong Road Bomaderry (Lot 143 DP 1069758) ("the subject site").

Supagas have now established the CO_2 Plant on the subject land in accordance with Mods 15 and 20. This facility takes CO_2 from the Shoalhaven Starches operations and processes this gas to food grade quality for the food and beverage market. CO_2 taken directly from Shoalhaven Starches operations under these existing approvals reduce emissions from their operations at present by up to 90 tonnes per day (TPD) under these approvals.

The existing plant was approved in two stages, i.e. initially 50 TPD and then this was increased to the present day 90 TPD. Supagas propose to undertake alterations and additions to this existing carbon dioxide plant to process and additional 75 TPD of carbon dioxide bringing the total capacity of the plant at the site up to 165 TPD.

This Modification Report has been prepared to address the above Modification Proposal.

The Shoalhaven Starches Expansion Project was a 'transitional Part 3A Project" for the purposes of Schedule 6A of the Environmental Planning & Assessment Act. As of the 1st March 2018 the transitional arrangements for former Part 3A projects have been discontinued. The discontinuation of the transitional arrangements for Part 3A projects and concept plans means that modifications are assessed through the State Significant Development (SSD) pathway. As such this Modification Application is made pursuant to Section 4.55(1A) of the Environmental Planning & Assessment Act 1979.

This Modification Report is supported by the following expert consideration:

- A Preliminary Hazard Analysis prepared by Pinnacle Risk Management ("Pinnacle"). Pinnacles assessment and demonstrates compliance with all relevant risk criteria.

  Pinnacle also identifies that societal risk, area cumulative risk, propagation risk, transport risk and environmental risk are also concluded to be acceptable. The primary reasons for the low risk levels from the site according to Pinnacle, are the separation distances between the hazards to the nearest place of residence and that high levels of carbon dioxide are required to cause fatality.

As the proposed alterations and additions to the existing carbon dioxide plant involve plant and equipment that are very similar in design to the existing plant and that the proposed modifications have already been reviewed using the HAZOP technique then Pinnacles does not make any further recommendations in relation to this Modification Proposal.

- A Noise Impact Assessment prepared by GHD

A construction noise assessment was undertaken to determine potential for increased noise levels at sensitive receiver and the requirement for management and mitigation measures. Construction noise management levels were established using the background noise monitoring conducted. Construction noise impacts were modelled for four construction scenarios, with results indicating compliance with noise management levels for majority of construction activities. However, impact piling works may exceed management levels at one receiver (R6).

The operation of the existing site and the proposed expansion were modelled and assessed against the operational noise limits applied in the environmental protection licence (EPL) and the project noise trigger levels (PNTLs). The results indicate compliance with the PNTLs at all sensitive receivers. At receiver R6 (39 Hanigans Ln, Bolong) the cumulative noise level is predicted to be 45 dBA during the worst 15-minute period during the day, with an existing noise level of 44 dBA, which is 5 dB above the existing EPL limit.

To mitigate the exceedance at receiver R6, Supagas will implement mitigation measures to reduce noise from truck pressure releases as described in Section 6.2. After implementation of the mitigation measures, the predicted noise level at receiver R6 (39 Hanigans Ln, Bolong) during the day is below the EPL noise limit.

No additional operational mitigation is required; however, monitoring should be undertaken at the completion of the project to confirm consistency with modelling assumptions made for this assessment.

The cumulative noise levels of the Supagas and Shoalhaven Starches sites are predicted to exceed the EPL limits. ***The contribution of the Supagas site is however considered negligible at most of the receivers due to the Shoalhaven Starches site contributing significantly****. This is consistent with the findings of the Shoalhaven Starches Noise PRP. A mitigation strategy has been developed within the Noise PRP to address these exceedances and the Noise PRP should be referred to for details on the mitigation measures to be implemented.*

- A Flood Assessment prepared by WMAwater . According to WMA water as a result of the proposal works the maximum cumulative increases in flood level since 1990 will only experience a maximum increase of up to 0.1m.

  - 5% AEP – up to 0.1m ,
  - 1% AEP – up to 0.2m ,
  - PMF – up to 0.3m

  WMA Water identify that the maximum incremental increases in flood level since February 2025 are predominantly within land owned by Shoalhaven Starches.

  - 5% AEP – less than 0.01m ,
  - 1% AEP – up to 0.1m ,
  - PMF – up to 0.1m

  WMA water indicates that: *There are no viable means of reducing the increase in peak flood levels resulting from these works. One of the most beneficial and practical means of reducing flood damages to existing buildings and risk to life is to improve the awareness and preparedness of the occupants or employees. There are several ways of undertaking such a scheme and these are outlined in Table 3 and most require involvement by Council and / or the SES. Funding a scheme would assist in improving the community's flood awareness and consequently reducing flood damages for all floodplain occupiers.*

- A traffic assessment prepared by Anton Reisch Consulting concludes:

Further to a detailed assessment of Modification, arc traffic + transport has determined that:

- *All access to the Facility will be provided via the existing intersection of Bolong Road & Gate 1; and via existing internal roads through the DF Site between Bolong Road and the Facility. The Bolong Road & Gate 1 intersection, and these internal roads, have all been designed to accommodate the movements of the largest trucks accessing the Facility (B-Doubles) and approved by Council and TfNSW.*
- *All roads providing access between the DF Site and sub-regional road network are approved by TfNSW and NHVR for use by the maximum sized trucks that will be generated by the Facility.*
- *The additional trip generation of the Facility further to the Modification is very minimal, and the total trip generation of the Site during a peak hour of 2 truck trips would be no different than the 2 truck trips per hour as approved under MOD 15. This level of trip generation would have no impact on the operation of the Bolong Road & Gate 1 intersections, nor on any roads or intersections in the local road network.*
- *On-site parking is provided within the Facility that meets peak staff and contractor demand.*
- *A CTMP has been prepared which indicates that the construction of the proposed new infrastructure can be undertaken safely and efficiently without impacting the local road network. The CTMP may be revised further to consideration of any future Conditions of Consent in a Modification approval.*

In summary, arc traffic + transport has determined that the Modification is entirely supportable further to access, traffic and parking considerations.

- A flora and fauna assessment carried out by Ecoplanning which concludes:

  This Flora and Fauna Assessment has been prepared to consider the biodiversity values, including threatened fauna, flora, and ecological communities, which are present or that are considered likely to be present within the study area.

  The FFA has assessed the potential impacts of the proposed construction of additional Carbon Dioxide processing facilities for Supagas, located on Lot 143 //

DP 1069758, 220 Bolong Road, Bomaderry 2541. The removal of up to 0.12 ha of planted native vegetation is required as part of this proposal. Vegetation within the study area has been subject to considerable historical disturbance.

Planted native vegetation within the subject site was identified as having potential habitat for the GHFF, a threatened species under the BC Act and EPBC Act. A Test of Significance applied to this species according to both Commonwealth and State government criteria determined that the development would not result in a significant impact to the GHFF.

Potential indirect impacts associated with the proposal can be minimised and mitigated through measures recommended in Section 4.3 of this report. These measures include the preparation of a site-specific CEMP prior to construction taking place and the implementation of erosion and sediment control measures.

- An Integrated Water Cycle Management Strategy prepared by Allen Price which concludes that during operation the Modification Proposal is unlikely to generate stormwater pollutants within the site.

  Allen Price indicates that potential short term stormwater quality impacts arising from the construction works can be mitigated by the implementation of erosion and sediment control plan and staging earthworks.

  Allen Price consider the Modification Proposal is adequate from a stormwater management perspective.

- The GHD Geotechnical Assessment which concludes:

  <u>*Contamination*</u>

  Based in historical information and previous investigations, potential for contamination was identified by GHD in five Areas of Environmental Concern (AECs) potentially impacting soil, groundwater and / or surface water, which including:

- AEC 1: Fill of unknown quality and origin, notably three fill mounds (Fill Mounds 1 to 3), imported gravel used in hardstand areas, and fill at depth in the eastern portion of the site
- AEC 2: Storage and use of chemicals as part of the operation of the Stage 1 plant.
- AEC 3: Former rural land use, including potential historical use of pesticides and herbicides across the site during farming activities, possible storage/use of fuels/other chemicals.
- AEC 4: Electrical transformers located in the south and north-west of the site.
- AEC 5: Surrounding industrial activities including Manildra main plant (former Dairy Farmers milk processing operations) and the Stage 1 gas plant, both west of the site; and fabrication, welding and electrical workshops to the east.

The likelihood of contamination in Fill Mound 1 (AEC 1) was assessed by GHD as low to moderate as there has only been limited direct assessment of the fill material.

The likelihood of contamination to exist for remaining fill occurrences and other AECs was assessed by GHD as low or very low.

Based on the results of this PSI for contamination, GHD recommend that a Targeted Site Investigation (TSI) for AECs where the likelihood of contamination to exist is assessed as low to moderate (i.e. Fill Mound 1), to assess the suitability of the fill material for re-use on site, or pre-classify it for off-site re-use (e.g. under the Resource Recovery framework) or disposal if required.. AECs where the likelihood of contamination was assessed as very low can be managed at the time of construction should contamination be encountered.

GHD also recommend that:

- A Construction Environmental Management Plan (CEMP) be prepared to manage the potential contaminant exposure risks during construction activities, and manage potential unexpected finds (e.g. buried waste, demolition waste, ACM, etc.) that could be encountered. Therefore, the CEMP should also include an Unexpected Finds Protocol (UFP) and site-specific Work Health Safety and Environment (WHSE) plan, to inform site workers of potential

contamination risks and appropriate personal protective equipment (PPE) required to work at the site.

- Assess waste classification of soils excavated as part of the development to allow off-site disposal of surplus materials to an appropriately licenced waste facility.
- For general contamination risk management, a contamination register should be prepared which clearly documents where contamination has been identified at the site or is likely to be encountered based on previous investigation results.

Acid Sulphate Soils (ASS)

GHD indicate that based on the results of previous investigations and limited information on subsurface conditions at the site, an Acid sulphate Soil Management Plan (ASSMP) would not be required provided that less than 1,000 tonnes of material is disturbed and soils were of medium texture.

Riparian Stability

Based on the results of previous slope stability analysis that they have undertaken, GHD indicate that the location of the proposed gas storage vessels (i.e. 60 m to 65 m north of the riverbank) when supported on a piled footing system, would not contribute to instability of the riverbank or riparian corridor. GHD recommend that piles should be extended to a suitable bearing stratum below river bed level, i.e. either very stiff to hard clays or dense to very dense sandy soils, or to weathered rock. The pile design and founding depth of the piles will be subject to the findings of a geotechnical investigation.

- GHD were also engaged to undertake an air quality impact assessment in relation to this Modification Proposal. The air quality impact assessment undertaken by GHD concludes that air quality impacts during construction (dust) and operation (odour and other pollutants) are not anticipated and there is no expected increase to the cumulative levels in the local area.

The Modification Report concludes that the proposed modifications will have not have significant adverse environmental impacts and the development to which Project

Approval MP06_0228 as modified by the Modification Application relates, will be substantially the same development as the development for which this consent was originally granted and before that consent as originally granted was modified.

The Modification Application will not involve changes to the size, scale or intensity of the existing Shoalhaven Starches operations. The modification proposal will not result in any increases in production rates from the site, nor will it involve any changes in level of impacts arising from the approved development.

It is considered that this Modification Application; will have minimal environmental impact; and the development to which Project Approval MP06_0228 as modified relates will be substantially the same development as the development for which this consent was originally granted and before that consent as originally granted was modified.

The SEE includes an assessment of the proposal having regard to the relevant matters for consideration as listed under Section 4.15 of the Environmental Planning and Assessment Act, 1979. The assessment concludes that the modification proposal, within its local context, is satisfactory and should be approved.

Approval for this Modification Application is sought.

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