Town Planning, Agricultural & Environmental Consultants

ENVIRONMENTAL ASSESSMENT

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APPLICATION PURSUANT TO SECTION 75W OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

SHOALHAVEN STARCHES PROPOSED AMENDMENT TO MANDATORY ODOUR CONTROLS IN PROJECT APPROVAL MP06_0228

Prepared for

Shoalhaven Starches Pty Ltd

March 2010

Prepared by:

COWMAN STODDART PTY LTD

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SHOALHAVEN STARCHES
PROPOSED AMENDMENT TO MANDATORY ODOUR CONTROLS
IN PROJECT APPROVAL MP06_0228

SHOALHAVEN STARCHES EXPANSION PROJECT

Ref. 10/07

Town Planning, Agricultural & Environmental Consultants

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COWMAN STODDART PTY LTD

CERTIFICATION OF ENVIRONMENTAL ASSESSMENT
PREPARED PURSUANT TO PART 3A OF THE *ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979*

ENVIRONMENTAL ASSESSMENT PREPARED BY

Name:	S. D. Richardson
Qualifications:	M. Appl. Sc., B.T.P., Grad. Dip. Env. Mgt, CPP, MPIA
Address:	Cowman Stoddart Pty Ltd 31 Kinghorne Street NOWRA NSW 2541

in respect of

PROJECT TO WHICH PART 3A APPLIES

Proponent Name:	Shoalhaven Starches Pty Ltd
Proponent Address:	Bolong Road, Bomaderry
Land to be developed: Address	Bolong Road, Bomaderry
Lot No., DP/MPS, Vol/Fol etc.	Lot 62 DP 1078788
Project Development:	Shoalhaven Starches Expansion Project (MP 06_0228)
Proposed Modification to Project:	Proposed modifications to amend the mandatory odour controls required under the Project Approval (MP06_0228) to remove requirement to install a Dried Distillers Grain Pelletiser Plant and to install heavy plastic curtain to the DDG load out tent.

Environmental Assessment — An Environmental Assessment is attached

Certification

I certify that I have prepared this environmental assessment and to the best of our knowledge

- It has been prepared in accordance with Section 75W of the *Environmental Planning and Assessment Act 1979,*
- The information contained in the Environmental Assessment is neither false nor misleading.

Signature: Stephen Richardson.

Name: S. D. Richardson

Date: March 2010

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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.

The use of ethanol as a fuel (or fuel additive) has many benefits including:

- it is a renewable fuel and lessens reliance on fossil fuels;
- it reduces greenhouse gas emissions and other air pollutants such as carbon monoxide and particulates;
- it reduces imports of oil and stimulates regional and local economies if produced locally.

Given the above benefits, the Federal and State Governments have introduced a range of initiatives to encourage the increased use of ethanol as a fuel additive.

The NSW Government recently mandated the blending of 2% of ethanol into the total volume of petrol sold in NSW as a first step towards a10% ethanol content by 2011.

In 2009 the Minister for Planning issued Project Approval for an application made by Shoalhaven Starches to increase its ethanol production capacity to meet the expected increase in demand for ethanol arising from the abovementioned initiatives by upgrading the existing ethanol plant located at the Shoalhaven Starches Plant at Bomaderry. This Project Approval will enable Shoalhaven Starches to increase its ethanol production in a staged manner at its Bomaderry Plant from the current approved 126 million litres per year to 300 million litres per year.

In issuing approval for the Shoalhaven Starches Expansion Project, the Minister imposed condition 7 which required the staged implementation of the Shoalhaven Starches Expansion project. Essentially this condition initially enables ethanol production to be increased up to 200 million litres per annum provided that certain mandatory odour controls are implemented.

One of these mandatory odour controls stipulated within the approval includes:

> *"Pelletise DDG products and fit heavy curtains to openings in the DDG product storage shed and load-out tent"*

This application seeks to modify the Project Approval to remove the above requirement from the mandatory odour controls listed within the Project Approval for the site.

The proposal does not seek to remove approval for the DDGS Pelletiser from the Shoalhaven Starches Expansion Project. Shoalhaven Starches still wish to be able to pelletise DDG Product should market conditions in the future dictate that there is a demand for pelletised DDG product.

In addition, rather than fit heavy curtains to openings in the DDG Product Storage Shed and load out tent as referred to in this condition, it is proposed that the DDG Product Storage Shed should be fully enclosed with sliding doors with air extracted from it and directed to the approved biofilter system. Enclosing the DDG Storage Shed and load out tent with sliding doors and ventilating it to the biofilter system represents a significant improvement over the use of heavy curtains, and will result in a lower likelihood of fugitive odour releases.

The application is made pursuant to Section 75W of the Environmental Planning & Assessment Act 1979.

The preparation of this Environmental Assessment has been undertaken following consultation with relevant Government agencies, including:

- The Department of Planning;
- The Department of Environment, Climate Change and Water (DECCW); and
- Shoalhaven City Council.

Representatives from the Shoalhaven Starches Community Consultative group have also been consulted.

This Environmental Assessment has been prepared to address issues detailed in the requirements issued by the Director-General of the Department of Planning (**Annexure 1**), and specifically:

- The EA is supported by a quantitative assessment prepared by The Odour Unit (TOU) of predicted changes to odour emissions as a result of the proposed modification.
- The EA is also supported by a traffic assessment prepared by Stapleton Transportation & Planning that assesses whether the proposed modification would result in any changes to traffic volumes as a result of the proposed modification.

Following an assessment of the key issues associated with this proposal, this Environmental Assessment concludes that the proposal is suitable for the site and this locality. The Environmental Assessment includes a Statement of Additional Commitments outlining environmental management, mitigation and monitoring measures that should be implemented to minimise potential impacts associated with the proposal.

The Minister's approval is sought for the proposal.

1.0 INTRODUCTION

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.

The use of ethanol as a fuel (or fuel additive) has many benefits including:

- it is a renewable fuel and lessens reliance on fossil fuels;
- it reduces greenhouse gas emissions and other air pollutants such as carbon monoxide and particulates;
- it reduces imports of oil and stimulates regional and local economies if produced locally.

Given the above benefits, the Federal and State Governments have introduced a range of initiatives to encourage the increased use of ethanol as a fuel additive.

The NSW Government recently mandated the blending of 2% of ethanol into the total volume of petrol sold in NSW as a first step towards a10% ethanol content by 2011.

In 2009 the Minister for Planning issued Project Approval for an application made by Shoalhaven Starches to increase its ethanol production capacity to meet the expected increase in demand for ethanol arising from the abovementioned initiatives by upgrading the existing ethanol plant, located at the Shoalhaven Starches Plant at Bomaderry. Subject to certain conditions this Project Approval will enable Shoalhaven Starches to increase its production in a staged manner at its Bomaderry Plant from the current approved 126 million litres per year to 300 million litres per year.

In issuing approval for the Shoalhaven Starches Expansion Project, the Minister imposed Condition 7 which required the staged implementation of the Shoalhaven Starches Expansion project. Essentially this condition enables ethanol production to be increased up to 200 million litres per annum provided that certain mandatory odour controls are implemented.

One of these mandatory odour controls (refer Appendix 3 to the Project Approval) stipulated within the approval includes:

> *"Pelletise DDG products and fit heavy curtains to openings in the DDG product storage shed and load-out tent"*

This application seeks to modify the Project Approval to remove the above requirement from the mandatory odour controls listed within the Project Approval for the site.

In this regard the proposal does not seek to remove the DDGS Pelletiser Plant from the Shoalhaven Starches Expansion Project Approval entirely. The demand for DDG in pellet form, both domestic and export, has not eventuated as the Company had originally envisaged. Shoalhaven Starches customers, both domestic and overseas, currently prefer the existing granular DDG Product. It is therefore not necessary at this stage to install the DDGS Pelletiser Plant to meet market requirements. Shoalhaven Starches however still wish to be able to pelletise DDG Product should market conditions in future dictate that there is a demand for pelletised DDG product.

The capital cost associated with the installation of the DDGS Pelletiser Plant is estimated by Shoalhaven Starches to be approximately $4 million. Given the above it is the Company's view that there is no justification at present, both in terms of environmental or market terms, to commit to this component of the project especially in the present financial climate.

In addition rather than fitting fit heavy curtains to openings in the DDG Product Storage Shed and load out tent it is proposed to fully enclose these areas with sliding doors with air extracted from it and directed to the biofilter system. Enclosing the DDG Storage Shed and load out tent with sliding doors and ventilating it to the approved biofilter system represents a significant improvement over the use of heavy curtains, and will result in a lower likelihood of fugitive odour releases.

The application is made pursuant to Section 75W of the Environmental Planning & Assessment Act 1979.

2.0 THE SITE AND SURROUNDING LOCALITY

The Shoalhaven Starches factory site is situated on various allotments of land on Bolong Road, Bomaderry within the City of Shoalhaven. The factory site, which is located on the south side of Bolong Road on the northern bank of the Shoalhaven River, has an area of approximately 12.5 hectares (refer **Plate 1**).

Plate 1: Aerial view of Shoalhaven Starches factory site.

The Project Approval issued by the Minister related to the following parcels of land (**Table 1**):

Table 1
Shoalhaven Starches Property

Lot	***Deposited Plan (DP) / FP.***
Factory	
1	838753
A	334511
B	334511
B	376494
62	1078788
201	1062668
1	385145
241	1130535
Packing Plant	
16	1121337
2	538289

Table 1 (continued)

Lot	*Deposited Plan (DP) / FP.*
Wastewater Treatment Plant & Environmental Farm	
4	610696
	131008
1	842231
2	842231
3	235705
1	235705
2	235705
Part 2	854837
4	1109510
22	811233
164	4469
2	854764
210	6131
211	6131
PT 212	6131
213	6131
214	6131
248	6131
2	955009
42	751268
63	751268
PT 2	854837
3	1109510
2	1109510
1	1109510
2	833181
Overhead Bridge – Bolong Road Reserve	
2	538289
Fire Services	
241	1130535

Subject to market demand in the future the proposed DDG Pelletiser Plant is to be sited on Lot 62 DP 1078788, within the western part of the factory site.

The town of Bomaderry is located 0.5 km (approx.) to the west of the factory site, and the Nowra urban area is situated 2.0 km to the south west of the site. The “Riverview Road” area of the Nowra Township is situated approximately 600 metres immediately opposite the factory site across the Shoalhaven River.

The village of Terara is situated approximately 1.5 kilometres to the south east of the site, across the Shoalhaven River. Pig Island is situated between the factory site and the village of Terara and is currently used for dairy cattle grazing.

There are a number of industrial land uses, which have developed on the strip of land between Bolong Road and the Shoalhaven River. Industrial activities include a metal fabrication factory, the Shoalhaven Starches site, Shoalhaven Dairy Co-op (formerly Australian Co-operative Foods Ltd – now owned by the Manildra Group) and the Shoalhaven Paper Mill (Australian Papers). The industrial area is serviced by a privately owned railway spur line that runs from just north of the Nowra-Bomaderry station via the starch plant and Dairy Co-op site to the Paper Mill.

The state railway terminates at Bomaderry Railway Station with a separate, privately owned spur line to the factory site. Shoalhaven City Council sewerage treatment works is situated between the railway station and the factory.

The Company also has an Environmental Farm located over 1000 hectares on the northern side of Bolong Road. This area is cleared grazing land and contains spray irrigation lines and wet weather storage ponds (total capacity 925 Mega litres). There are at present 6 wet weather storage ponds on the farm that form part of the waste water management system for the factory. A seventh pond approved in 2002 was converted into the biological section of the new wastewater treatment plant which is currently being commissioned.

The Environmental Farm covers a broad area of the northern floodplain of the Shoalhaven River, stretching from Bolong Road in the south towards Jaspers Brush in the north. Apart from its use as the Environmental Farm, this broad floodplain area is mainly used for grazing (dairy cattle). The area comprises mainly large rural properties with isolated dwellings, although there is a clustering of rural residential development along Jennings Lane (approximately 1 kilometre away) and Back Forest Road (approximately between 500 metres to 1.2 kilometres away) to the west of the Environmental Farm; and Jaspers Brush Road, approximately 1.2 kilometres to the north of the Environmental Farm.

Figure 1 is a site locality plan depicting the location of the factory site and Environmental Farm as well as the surrounding locality.

Figure 2 is a plan of the existing factory site depicting the layout of existing plant on the site as well as plant that has been previously approved as part of the Shoalhaven Starches Expansion Project (MP06_0228). This figure shows the location of the DDG Storage area including the proposed DDG Pelletiser Plant.

Plate 1 provides an aerial view over the factory site.

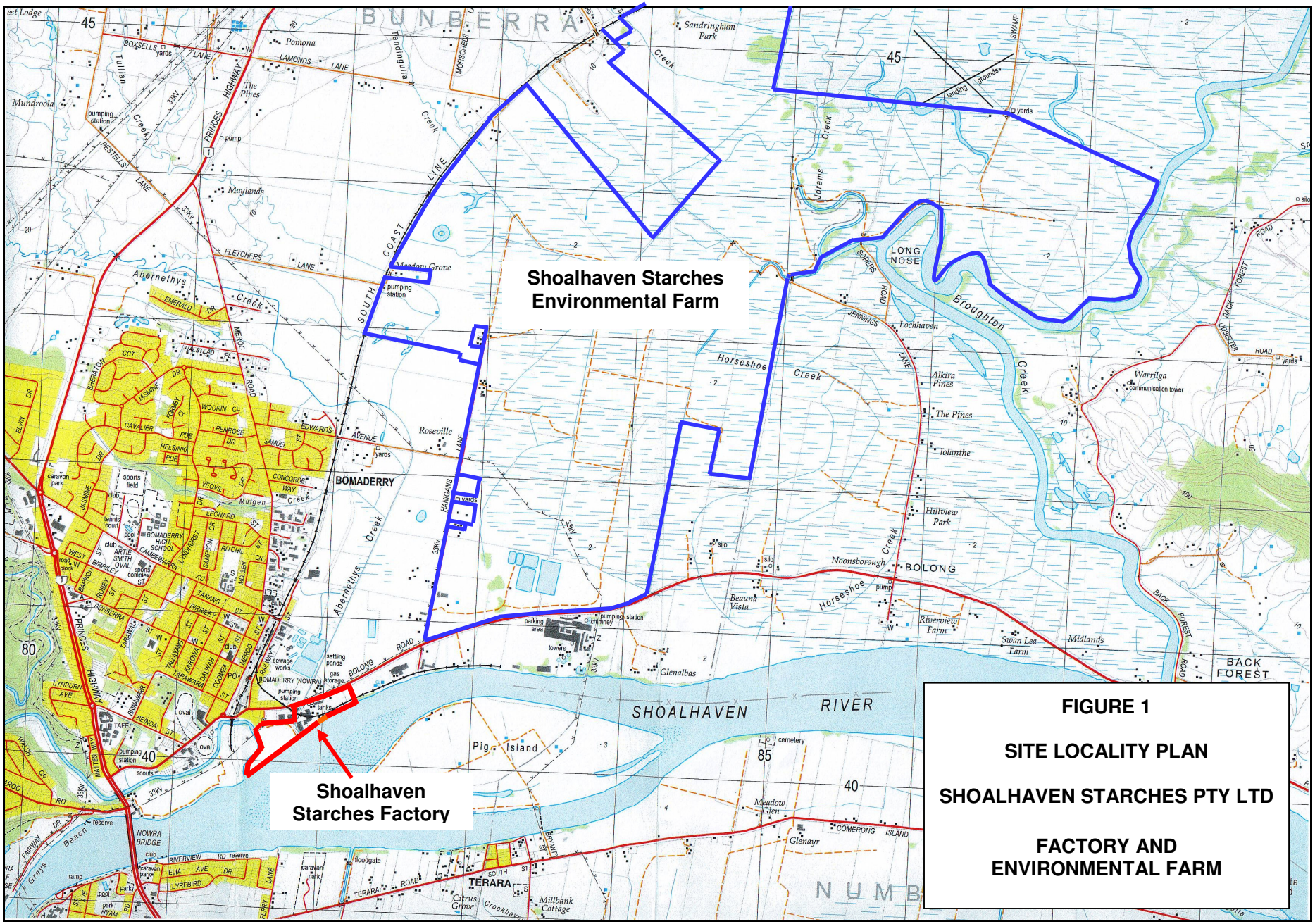

FIGURE 1

SITE LOCALITY PLAN

SHOALHAVEN STARCHES PTY LTD

FACTORY AND ENVIRONMENTAL FARM

OVERALL SITE PLAN SHOWING ETHANOL UPGRADE
FOR SHOALHAVEN STARCHES P/L JUNE 2008

1 : 1250 (AT A1 SIZE)

PLAN SHOWING THE LOCATION OF BUILDINGS AND STRUCTURES IN RELATION TO THE SITE AND EXISTING STRUCTURES AT BOLONG ROAD, BOMADERRY FOR THE SHOALHAVEN STARCHES WITHIN THE CITY OF SHOALHAVEN

23132–06J

This application covers works within this area of the site.

PROPOSED GAS LINE AND UNDERGROUND ELECTRICITY LINE FROM POND 7

PROPOSED WATER PIPELINE FROM PAPER MILL TO MANILDRA FACTORY ROUTE OPTION A

PROPOSED GAS LINE FROM POND 7

Shoalhaven River

PROPOSED EXTENSION TO DDG LOADOUT

PROPOSED ADDITIONAL COOLING TOWERS

PROPOSED 6 ADDITIONAL DDGS DRYERS AND ASSOCIATED EQUIPMENT

PROPOSED ADDITIONAL EVAPORATOR

PROPOSED CHEMICAL STORAGE FACILITY

PROPOSED DDGS PELLET PLANT

PROPOSED OVERHEAD GANTRY

PROPOSED MCC ROOM

PROPOSED GAS-FIRED CO-GENERATOR

Bomaderry Creek

OPEN PADDOCK

PROPOSED GAS FIRED BOILER

PROPOSED ADDITIONAL FERMENTERS

PROPOSED ADDITIONAL COOLING TOWERS

PROPOSED ADDITIONAL MOLECULAR SIEVES

PROPOSED COOLING TOWERS

BOLONG ROAD

DP371386

CARPARK

PROPOSED PRODUCT DRYER OVER DRIVEWAY

PROPOSED PEDESTRIAN OVERPASS

PROPOSED WATER PIPELINE FROM PAPER MILL TO MANILDRA FACTORY OPTION B

PROPOSED WATER PIPELINE FROM PAPER MILL TO MANILDRA FACTORY ROUTE OPTION B

PROPOSED FIRE SYSTEM

PROPOSED PIPELINE FROM FACTORY TO PACKER

2 DP538289

B DP 371388

PROPOSED PACKING PLANT

PROPOSED CONTAINER STORAGE AREA

A DP 371387

16 DP 1121337

A DP 371388

PROPOSED WEIGHBRIDGE

RAILWAY STREET

SOUTH COAST RAILWAY

DIAGRAM SHOWING ENVIRONMENTAL FARM IN RELATION TO MAIN FACTORY

SHOALHAVEN STARCHES FACTORY

MANILDRA ENVIRONMENTAL FARM

SEE SHEET 3

PROPOSED TREATED WASTE WATER PIPELINE FROM PAPER MILL TO MANILDRA FACTORY

PROPOSED GAS LINE AND UNDERGROUND ELECTRICITY LINE FROM THE PONDS TO THE MANILDRA FACTORY

NOTE. FOR APPROVED STRUCTURES NOT YET BUILT – REFER TO SHEET 1

- EXISTING STRUCTURES
- PROPOSED ETHANOL UPGRADE FACILITIES APRIL 2008
- PROPOSED TREATED WASTE WATER PIPELINE FROM PAPER MILL TO MANILDRA FACTORY
- PROPOSED GAS LINE AND UNDERGROUND ELECTRICITY LINE FROM THE PONDS TO THE MANILDRA FACTORY
- ADJOINING LANDS NOT ASSOCIATED WITH THE PROPOSAL
- WATERWAYS

FIGURE 2: Site Plan Depicting Proposed Additions to Factory Site.

3.0 BACKGROUND

3.1 PRODUCTION PROCESSES

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 has received approval from the Minister for Planning for the erection of a flour mill on site to enable the milling of part of the Company's flour requirements to be processed directly on the site. The remainder of the Company's flour requirement 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. The wastage from the starch process 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. The wastage from the liquid starch process 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 also has some wastage that is used in the ethanol process.

The wastage from the starch, gluten and syrup production processes are combined to feed the fermentation and distillation stage of ethanol production. The outputs are fuel

and industrial grade ethanol. Industrial grade ethanol is used in producing pharmaceuticals, printer's ink and methylated spirits.

Ethanol production results in some waste solids and water, which are processed through the stillage recovery process plant (which was approved as part of PRP No. 7 in 2005). The waste solids 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 before being irrigated onto Shoalhaven Starches Environmental Farm to the north of Bolong Road. This farm land is used for fodder crops, pasture and cattle grazing.

3.2 OPERATING WORKFORCE

3.2.1 Operations

The existing factory operates 24 hours per day, 7 days a week, 365 days of the year.

3.2.2 Workforce

The plant employs a total of 250 staff, covering all components of production - operators, administrative personnel and maintenance staff. Employee breakdown and hours of shifts are as follows:

A total of around 250 employees	Management, Technical & Administration	60
	Day Workers	60
	Shift Production (spread over 4 shifts)	130

Hours of Shifts

Plant:	6:00 am to 6:00 pm	- 30 employees	
	6:00 pm to 6:00 am	- 30 employees	
	Day – 7:00 am to 3:00 pm but variable		60 employees, 50 Management, Technical & Administration
Farm:	5:00 am to 5:00 pm	- 2 employees	
	5:00 pm to 5:00 am	- 1 employee	
	7:00 am to 3:00 pm	- 3 employees	

Shift work at both the factory and farm is undertaken on a 2 day, 2 night and 4 day off basis.

3.3 RAW MATERIALS

There are six major raw material components used in the Shoalhaven Starches process. These are flour, grain; coal; natural gas; fresh water and salt water.

Flour is delivered to the site from the Company's mills at Manildra, Gunnedah and Narrandera each day of the week except Sunday. The flour arrives into the plant by Company owned stainless steel rail wagons. The wagons have bottom dumping doors and are unloaded in a building. From the silos, the flour is moved into the plant by air as required. The current approved flour consumption of the plant is 20,000 tonnes per week.

Grain is delivered to the site by rail. At present up to approximately 552 tonnes of grain is delivered to the site per day. The grain is used entirely in the production of ethanol and DDG. The grain is "dumped" from the train into an underground hopper and conveyed by screw conveyors and bucket elevator into a silo.

Coal is delivered by road from Wallerawang near Lithgow. At present 10 trucks of 30 tonnes per truck are delivered daily. The coal storage area is located between the Shoalhaven River and the existing boilers. The transfer of coal from the storage bins to the boilers is undertaken by front-end loader pushing the coal through a grate and into a pneumatic conveying system up to the boilers.

Natural Gas - The Shoalhaven Starches plant operates partly on natural gas. The site is connected to a natural gas reticulation main.

Fresh water is utilised in the starch production process. At present on average a total of 8300 kilolitres of water is used on a daily basis. This comprises 5100 Kl from the town water supply, and 2400 Kl from a raw water supply provided by Shoalhaven City Council via a pipeline from the Shoalhaven Paper Mill.

Salt water from the Shoalhaven River is used to cool items of plant before the water is returned to the river.

In addition the factory operations utilise a range of enzymes, additives, fuels and other products in the overall operations. At present the plant utilises approximately 30 tonnes each of acid and caustic products per week.

3.4 HISTORY OF DEVELOPMENT ON THE SITE

The Shoalhaven Starches wheat starch and gluten plant at Nowra was originally constructed in 1970. The Manildra flour mills, at Manildra, Narrandera and Gunnedah, supply the Shoalhaven Starches factory, which currently produces wheat starch, gluten, syrups and ethanol (industrial and fuel grades). The Shoalhaven Starches operation provides direct on-site employment for 250 employees. Through the use of contractors it also indirectly creates employment for many more people in the local and regional economies.

In order to address the issue of waste water disposal, in 1984 Shoalhaven Starches installed a spray irrigation system, using farmland it owned on the northern side of Bolong Road at Bomaderry.

In June 1991, two storage ponds were built (Ponds No. 1 and 2) resulting in the cessation of waste water discharge to the Shoalhaven River.

To further reduce product wastage, Shoalhaven Starches sought to use excess starch for the production of ethanol. Ethanol production began at the Shoalhaven site in June 1992.

In 1994, the NSW Government approved the installation of a larger ethanol distillery within the existing site. The new distillery and its associated facilities enabled production of ethanol to increase from 20 million litres per annum to a production capacity of 100 million litres per year.

Subsequent to this approval Shoalhaven City Council issued development consent for:

- a protein isolate plant and DDGS Dryer; and
- a sorghum grinding plant.

Shoalhaven City Council issued development approval for the construction of a wet weather storage pond (Pond No. 6) on the 27th April 2001. At present, with the completion of Pond No. 6, Shoalhaven Starches has a combined waste water storage capacity within the existing ponds of 925 ML. A further wet weather storage pond (Pond No. 7) was approved by the Minister for Planning on the 23 December 2002 and construction of the Pond has been completed.

On the 1st June, 2001 the Minister for Urban Affairs & Planning, Dr Andrew Refshauge MP, declared both the Shoalhaven Starches factory and Environmental Farm as being State Significant Development for the purposes of the then Section 76A(7) of the Environmental Planning & Assessment Act.

In 2003 the Minister for Planning issued development consent (D223) for Shoalhaven Starches Pollution Reduction Program (PRP) No. 7. This approval enabled the implementation of the Company's Waste Water Management Strategy, and essentially sought to remove solids (suspended and soluble) from the Company's waste water, prior to its irrigation on the Environmental Farm.

This process, known as Stillage Recovery (to be further discussed in Section 4.1 of this report), essentially involved the introduction of additional decanters, the installation of an evaporation plant and additional dryers, to remove solids from the waste water. It is the

remaining solids in the waste water that when sprayed onto the Environmental Farm, or stored in the wet weather storage ponds, which have the potential to result in the generation of odours.

The recovery of the suspended and soluble solids from the waste water could not be undertaken by the dryers in this process, without firstly providing additional coarse solids. Additional coarse solids (grain) were required to be imported to the site.

As a consequence of the additional grain, the starch contained in the grain resulted in a need to increase ethanol production to 126 million litres per year. This increase in ethanol production required the installation of additional fermenters, associated cooling towers and molecular sieves.

The increase in ethanol production also resulted in an increase in waste water, which was required to be disposed on the environmental farm. In this regard this previous proposal also included an increase in waste water disposal area on the Environmental Farm.

The plant associated with this previous approval has now been substantially installed and commissioned.

Shoalhaven Starches have subsequently received the following development approvals:

- The establishment of a flour mill on the factory site. This proposal provides for the transportation of wheat directly to the site by train for processing into industrial grade flour for the use in the production of starch and gluten at the factory site.
- An application pursuant to Section 96 of the Environmental Planning & Assessment Act seeking to modify the development approval for the PRP No. 7 project to enable a DDGS Dryer to be installed in a slightly different location in the same building as previously approved; and the installation of an additional evaporator (a redundant piece of equipment located at the Company's Altona Plant in Victoria) to provide standby capacity for the existing evaporator plant when sections of the existing plant are out of service or cleaning.
- A Section 96 modification application for a standby fermenter tank to be installed on the site, to enable the existing fermenter tanks to be taken out of service for maintenance one at a time.

A full list of all approvals that apply to the Shoalhaven Starches site are detailed within Section 2.4 of the EA prepared by our firm, in relation to the Shoalhaven Starches Expansion Project (MP 06_0228).

3.5 PROJECT APPROVAL MP 06_0228

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

The primary objective of the Shoalhaven Starches Expansion Project is to increase the Company's ethanol production capacity to meet the expected increase in demand for ethanol arising from Federal and State Government initiatives by upgrading the existing ethanol plant.

The approval will subject to certain conditions enable Shoalhaven Starches to increase ethanol production in a staged manner at its Bomaderry Plant from the current approved 126 million litres per year to 300 million litres per year.

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

The following additions and alterations have been approved to the existing factory site as part of this Project Approval:

- the provision of an additional dryer for the starch/gluten plant;
- additional equipment and storage vessels for the ethanol plant including 3 additional fermenters, additional cooling towers and molecular sieves;
- upgrades to the Stillage Recovery Plant including 6 additional Dried Distillers Grains Syrup (DDGS) dryers; 10 decanters; chemical storage and two evaporators. The proposal includes the installation of a DDGS Pelletiser Plant within this part of the site; and,
- the establishment of a new packing plant, container loading area and a rail spur line. The establishment of this facility on the northern side of Bolong Road will require the provision of an overhead bridge structure to allow product and safe pedestrian movement across Bolong Road.

In addition, as part of the Project Approval Shoalhaven Starches will undertake comprehensive odour reduction measures for both the existing factory site and the works associated with the Expansion Project. In 2006, the Land and Environment Court required Shoalhaven Starches to engage a suitably qualified person to conduct a comprehensive environmental audit of the factory and Environmental Farm. This environmental audit was undertaken GHD Pty Ltd. The audit report includes a number

of recommendations for the implementation of works to the existing site, some of which require development approval. These works were included within this Project Approval.

The Project Approval, through condition 7, enables a staged implementation of the expansion project. Up to 200 million litres of ethanol will be able to be produced at the Bomaderry Plant provided;

- Mandatory odour controls (listed in the approval) are undertaken.
- An Odour Management Plan (required by condition 4 of the Project Approval) has been prepared to the Director-General's satisfaction and is being implemented.
- An independent odour audit is prepared and submitted in accordance with conditions 5 and 6 of the consent.

Under the terms of condition 7(2) of the Project Approval Shoalhaven Starches may apply to the Director-General to increase ethanol production from 200 million litres to 300 million litres provided:

- The site has been producing 200 million litres in accordance with the terms of the Project Approval;
- An independent odour audit of the site is prepared.
- Shoalhaven Starches provides the Director-General with an assessment of the likely odour impacts arising for the proposed increase in ethanol production using odour mentoring and predictive modelling.

One of the mandatory odour controls referred to in condition 7(1) includes the following:

> *"Pelletise DDG products and fit heavy curtains to openings in the DDG product storage shed and load-out tent"*

This application seeks to modify the Project Approval to remove these specific works from the list of mandatory odour controls. In doing so the application does not seek to remove approval for these works from the overall project, but rather to remove them from the list of mandatory odour controls only.

The Project Approval also enables the biological treatment of waste waters from the factory site and the re-use of over half the treated waste water within the factory processes, with the remainder irrigated onto the Company's Environmental Farm.

3.6 PROTECTION OF THE ENVIRONMENT OPERATIONS ACT

The existing Shoalhaven Starches factory site and Environmental Farm has an Environmental Protection Licence (EPL) under the Protection of the Environment

Operations Act 1997 (POEO Act) (EPL No. 883). The licence imposes requirements in terms of:

- discharges to air, water and land;
- irrigation controls;
- management of irrigation;
- maintenance of irrigation reticulation;
- odour control.

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

4.0 DESCRIPTION OF PROPOSAL

4.1 WASTE WATER TREATMENT AND DISPOSAL – STILLAGE RECOVERY

The 2003 approval by the Minister for Planning of the Company's Pollution Reduction Program No. 7 introduced a Stillage Recovery process into the production process at the plant. Stillage recovery essentially seeks to improve the system whereby suspended and soluble solids are removed from the Company's waste water system.

This process includes the use of decanters, evaporators and DDGS dryers.

Decanters are essentially mechanical separation devices, which operate by centrifugal separation process that separates out the unfermented suspended solids in stillage, ie. the waste liquid left over from the distillation of ethanol (refer **Plate 2**). The increase in ethanol production will require the installation of an additional 10 decanters in a new purpose built building to the west of the site.

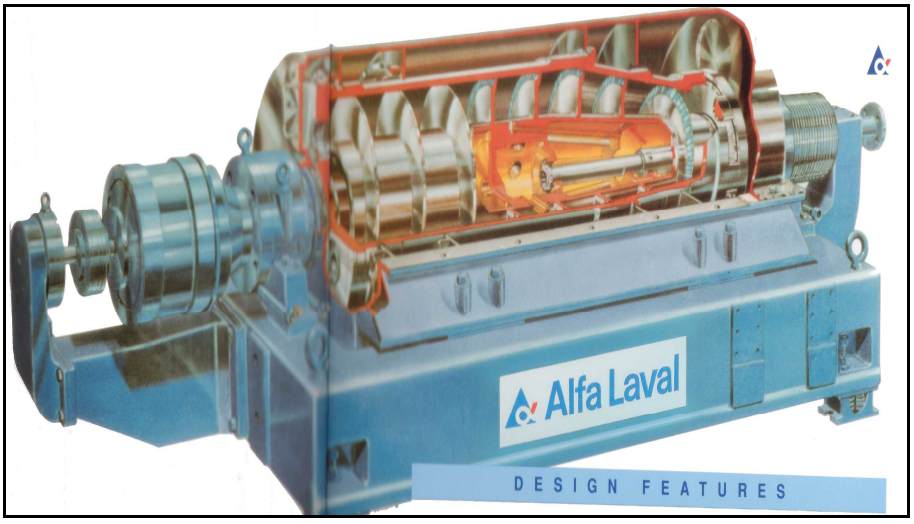

Plate 2: Decanter.

Evaporators (**Plate 3**) are designed to reduce the water content of "thin" stillage after it passes through the decanters and the coarse solids are removed. The evaporators operate by mechanical vapour recompression. The thin stillage from the decanters is fed into tubes within the evaporator and heated by recompressed steam. The water within the overflow is heated to a point where the water evaporates and is separated from the remaining solids, which remain as syrup. The liquid (ie. condensate) is captured and directed to the Environmental Farm for irrigation.

Plate 3: Existing Evaporator.

The evaporation plant located at the factory will largely have sufficient capacity to accommodate the increase in production of ethanol associated with this proposal. Only one additional evaporator will need to be erected within the existing evaporation plant to accommodate this proposal.

The syrup product is directed to DDGS dryers for further drying (refer **Plate 4**). The DDGS dryer is essentially a barrel in which a bundle of steam heated tubes are rotated at low speed. Evaporator concentrate (syrup) and decanter concentrate (wet insoluble solids) are fed into one end of the barrel and traversed through to the other end by shovels. Heat from the tubes removes moisture.

Dried DDGS is removed from the barrel and conveyed to the storage room for loading into trucks.

The proposed increase in ethanol production as a result of the Shoalhaven Starches Expansion Project will require the installation of 6 additional DDGS dryers with the associated 10 new decanters to be installed within the western portion of the site. It is expected that the new plant associated with the stillage recovery process will increase dry DDGS product from the current approved 2030 tonnes per week to 6400 tonnes per week.

Plate 4: Existing Dryer.

The six (6) new dryers and associated decanters will be fitted with the required equipment to meet statutory emission requirements for particulate and odour emissions.

The product from the drying process results in a dry product that is sold for use as stock feed.

The increase in DDGS Product will require the existing DDGS load-out to be extended to enable the storage of the additional product.

The proposed equipment would be housed in a new building located to the west of the existing DDG plant area. The building would be maintained under slight negative pressure in order to minimise fugitive odour emissions from the building.

Discharges to air from the dryers, decanters and associated equipment will be collected and ducted to a biofilter for treatment. The biofilter is situated adjacent the building housing the dryers and associated equipment.

The Shoalhaven Starches Expansion Project includes approval to build a DDGS Pelletiser Plant, which essentially sought to provide the Company with a greater flexibility to meet market demand (particularly export) for this product. It should also be noted that the installation of a DDGS Pelletiser Plant was one of the recommendations of the

Environmental Audit on the basis that it would reduce fugitive odour and dust emissions currently associated with the handling and storage of the granular DDG product.

The DDGS Pelletiser Plant will consist of a series of bins and mills to process the loose DDGS material into pellets.

The DDGS Pelletiser Plant will consist of:

- A pellet mill, housed in an extension to the existing DDG storage area. The pellet mill machinery would include two discharges (through baghouses), each with a discharge rate of approximately 500 m^3/min.
- An internal mill conveyor under negative pressure and vented through a baghouse at a discharge rate of approximately 12 m^3/min.
- An enclosed product conveyor to transport the pelletised DDG from the pellet mill to the existing DDG storage facility; and
- A pellet out-load system, which would be aspirated through a baghouse with a nominal discharge rate of approximately 20 m^3/min.

Given the potential for offensive odour emissions from the DDG plant process, air emissions from the above discharge points will be ducted to the biofilter.

Essentially the Pelletiser Plant would process granular DDGS material into pellets to better enable this product to meet export demand. The existing granular DDGS material is more suited to domestic markets. The processing of this granular material into pellets would enable the Company to export this material overseas during periods when the local demand for DDGS is reduced. This proposal essentially seeks to provide greater flexibility for the processing of DDGS on the site to meet the demands of both the local and export markets.

The Pelletiser Plant provides an alternative means of processing the DDGS material that is processed on the site into a modified form of the product for re-sale and re-use.

Essentially DDGS from the DDGS Dryers that would otherwise be directed to the DDGS load out as granular material will be able to be re-directed to the Pelletiser Plant.

Originally it was considered that an additional benefit of the pelletised DDGS Product could be its role in reducing odours that emanate from this part of the site. The Environmental Audit specifically recommended the installation of a DDGS Pelletiser Plant.

4.2 MANDATORY ODOUR CONTROLS

Condition 7 of the Project Approval issued by the Minister of Planning states:

Staged Implementation of Increased Ethanol Production Rates

7. (1) The Proponent may apply to the Director-General for approval to increase ethanol production up to the rate of 200 million litres of ethanol a year on site if –

a) the mandatory odour controls listed in Appendix 3 to this Approval have been implemented; and

b) the Odour Management Plan required under condition 4 of Schedule 3 has been prepared to the satisfaction of the Director-General and is being implemented; and

c) an independent odour audit has been prepared and submitted in accordance with conditions 5 and 6 of Schedule 3; and

d) the proponent provides the Director-General with an assessment of the likely odour impacts of the proposed increase in ethanol production, using odour monitoring and predictive modelling.

(2) The proponent may apply to the Director-General for approval to increase ethanol production from 200 million litres of ethanol a year on site up to 300 million litres of ethanol a year on site if –

a) the site has been producing 200 million litres per year in accordance with an approval granted by the Director-General under this condition; and

b) an independent odour audit of the site operating at this rate has been prepared and submitted in accordance with conditions 5 and 6 of Schedule 3; and

c) the proponent has provided the Director-General with an assessment of the likely odour impacts of the proposed increase in ethanol production, using odour monitoring and predictive modelling.

(3) An assessment provided to the Director-General in accordance with this condition –

a) must assess the effectiveness of the mandatory odour controls required under this approval; and

b) may assess the effectiveness of implementing additional odour controls (such as those listed in Appendix 3).

(4) In deciding whether to approve an increase in ethanol production under this condition, the Director-General must –

a) assess the odour performance of the premises at its current rate of production; and

b) assess the likely odour impacts from the proposed increase; and

c) consider the requirement not to cause or permit the emission of offensive odours from the site as defined in section 129 of the POEO Act.

The mandatory odour controls referred to within condition 7(1) and referenced within Appendix 3 to the Project Approval include:

"Pelletise DDG products and fit heavy curtains to openings in the DDG product storage shed and load-out tent"

4.3 SECTION 75W OF THE EPA ACT

Section 75W of the EPA Act relates to modifications to approvals issued by the Minister for Planning and states:

75W Modification of Minister's approval

(1) In this section:

***Minister's approval** means an approval to carry out a project under this Part, and includes an approval of a concept plan.*

***modification of approval** means changing the terms of a Minister's approval, including:*

(a) revoking or varying a condition of the approval or imposing an additional condition of the approval, and

(b) changing the terms of any determination made by the Minister under Division 3 in connection with the approval.

(2) The proponent may request the Minister to modify the Minister's approval for a project. The Minister's approval for a modification is not required if the project as modified will be consistent with the existing approval under this Part.

(3) The request for the Minister's approval is to be lodged with the Director-General. The Director-General may notify the proponent of environmental assessment requirements with respect to the proposed modification that the proponent must comply with before the matter will be considered by the Minister.

(4) The Minister may modify the approval (with or without conditions) or disapprove of the modification.

(5) The proponent of a project to which section 75K applies who is dissatisfied with the determination of a request under this section with respect to the project (or with the failure of the Minister to determine

the request within 40 days after it is made) may, within the time prescribed by the regulations, appeal to the Court. The Court may determine any such appeal.

(6) Subsection (5) does not apply to a request to modify:

(a) an approval granted by or as directed by the Court on appeal, or

(b) a determination made by the Minister under Division 3 in connection with the approval of a concept plan.

(7) This section does not limit the circumstances in which the Minister may modify a determination made by the Minister under Division 3 in connection with the approval of a concept plan.

This application is made pursuant to Section 75W of the EPA Act.

4.4 PROPOSED MODIFICATION

4.4.1 Pelletising DDG Product

This application seeks the Minister's approval to modify Appendix 3 to the Project Approval by removing the reference:

"Pelletise DDG products and fit heavy curtains to openings in the DDG product storage shed and load-out tent"

The result of this proposed modification will be to remove the pelletising of DDG product and the fitting of curtains to the DDG Product Storage Shed and load-out tent from the mandatory odour controls listed within Appendix 3 to the Project Approval.

The application does not seek to delete approval of the DDG Pelletiser Plant from the project altogether. The demand for DDG in pellet form, both domestic and export, has not eventuated as originally envisaged by the Company. Shoalhaven Starches' customers, both domestic and export, still prefer the granular DDG currently produced at the plant. It is therefore currently not necessary to install the DDG Pelletiser Plant to meet market requirements. The Company would still seek to retain the flexibility to install the pelletiser plant should there be a market demand for DDGS in pellet form in the future.

Shoalhaven Starches estimate that the capital cost of installing the DDG Pelletiser Plant on the site would be approximately $4 million. The Company cannot justify this level of expenditure given the lack of sufficient environmental and/or market outcomes, especially having regard to present global financial climate.

4.4.2 Enclosing DDG Storage Shed

In addition to the above the modification application seeks to modify the requirement for heavy curtains to be used on openings to the DDG Product Storage Shed.

During detailed design of the DDG odour collection and biofilter system, approved under the Project Approval, an alternative approach has been identified whereby the DDG Product Storage Shed would be fully enclosed with air extracted from it and directed to the biofilter system. The biofilter system has now been installed and is currently being commissioned. The airflow from the Storage Shed represents 37% of the total airflow treated in the biofilter (5,290 m^3/hr in a total airflow of 14,272 m^3/hr).

The new system of enclosing with sliding doors the DDG Storage Shed and ventilating directly it to the biofilter system represents a significant improvement over the use of heavy curtains, and will result in a lower likelihood of fugitive odour releases from the DDG Storage Shed.

5.0 CONSULTATION

During the preparation of this EA consultation has been undertaken with the following:

- Department of Planning;
- Shoalhaven City Council;
- Department of Environment, Climate Change and Water (DECCW);
- Shoalhaven Starches Community Consultative Committee.

Shoalhaven Starches have consulted with staff from the Department of Planning with respect to this proposal. The Director-General of the Department of Planning has issued requirements for this EA. These requirements form **Annexure 1** to this EA.

Shoalhaven Starches staff have also liaised with representatives of DECCW including Julian Thompson and Stefan Press during January and again on the 25th February 2010. DEECW staff indicated that any proposal was to be able to demonstrate that there would not be any increase odours that emanate from the site.

Shoalhaven Starches staff have also discussed the proposed modification with staff from Shoalhaven City Council (Mr Russ Pigg – General Manager and Mr Tim Fletcher, Director – Development & Environment Services) on the 15th February 2009. No specific issues were raised. In addition Shoalhaven Starches have written to Council seeking Council's formal response to this proposal. At the time of preparing this EA Shoalhaven Starches have not yet received a response to this letter from Council.

Shoalhaven Starches staff have also discussed the proposed modification application with representatives of the Shoalhaven Starches Community Consultation Group (SSCCG) (Messrs Chalmers and Taylor). The SSCCG was formed following the Minister's approval of the Pollution Reduction Program (PRP) No. 7 in 2003. The SSCCG includes resident representatives from Nowra, Bomaderry, Terara; and the Backforest Road area to the east of the Company's Environmental Farm. Mr Chalmers indicated he would discuss the project with other members of the Terara community.

6.0 RISK ASSESSMENT OF POTENTIAL ENVIRONMENTAL IMPACTS

The purpose of this section of the EA is to provide a risk assessment of the potential environmental impacts associated with the project. This section (**Table 2**) compares the potential impacts from the proposed modification against the approved project. The comparison uses the key environmental impacts assessed in the EA and summarises the relative change in environmental impacts associated with the proposed modification.

Table 2

Risk Assessment

Issue	*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 odour assessment and reduction as part of the project. The original Environmental Audit undertaken by GHD Pty Ltd in relation to the site; and the subsequent EA for the Expansion Project both identified that the pelletising of DDG Product had the potential to reduce odours generated from the site. The DGR's for this modification proposal requires the preparation of a quantitative assessment of the predicted changes to odour emissions as a result of the proposed modification. The only emissions to the atmosphere from the DDG process emanate from the Palmer Cooler Stack. As will be detailed in this EA (Section 7.1.1) odour emissions from the existing DDG Palmer Cooler stack are most unlikely to impact adversely at ground level at the four discrete receptors previously identified by the original EA for the Shoalhaven Starches Expansion Project and that the ground level odour concentrations will further decrease when the stack is extended by 10 m to a height of 26 m as envisaged by the Project Approval for the Expansion Project. Under these circumstances the removal of the pelletiser as a mandatory odour control is practically superfluous in terms of odours that are emitted from this portion of the plant. The decision to replace the proposed heavy curtains on the openings in the Storage Shed, and fully enclose this shed will result in ventilation of this storage shed direct to the biofilter which will almost certainly result in lower potential for fugitive odour releases.	It is recommended that the emission from the Palmer Cooler Stack be monitored for odour concentration and emission rate, as part of Shoalhaven Starches environmental monitoring program.	This is a key issue that will need to be addressed in the EA. This issue has been identified by DGR's as a Key Issue.

Issue	*Relative Change in Environmental Impact*	*Additional Management or Mitigation Measures Required*	*Significance of Issue with this Modification Proposal*
Greenhouse Gas Emissions	The proposed removal of the pelletiser as a mandatory odour control; and fully enclosing of the DDG Product Storage Shed will have no impact in terms of greenhouse gas emissions emitted from the site. The Greenhouse Gas Assessment prepared by GHD and which supported the original EA did not specifically identify the pelletising of DDGS as a significant contributor to greenhouse gas emissions. No change in environmental impacts from that originally identified in EA.	No additional management or mitigation measures proposed.	Not a key Issue.
Wastewater Treatment	The proposed removal of the pelletiser as a mandatory odour control; and fully enclosing the DDG Product Storage Shed will not result in any change to the amount of wastewater generated from the site nor that will require treatment. No change in environmental impacts from that originally identified in EA.	No additional management or mitigation measures proposed.	Not a key Issue.
Effluent Irrigation and Storage	The proposed removal of the pelletiser as a mandatory odour control; and fully enclosing the DDG Product Storage Shed will not result in any change to the amount of wastewater generated from the site and that will require to be irrigated onto the Company's Environmental Farm. No change in environmental impacts from that originally identified in EA.	No additional management or mitigation measures proposed.	Not a key Issue.
Water & Soils	The proposed removal of the pelletiser as a mandatory odour control; and fully enclosing the DDG Product Storage Shed will have no additional environmental impact in terms of: • Water supply • Stormwater management • Acid sulphate soils • Site contamination No change in environmental impacts from that originally identified in EA.	No additional management or mitigation measures proposed.	Not a key Issue.

Issue	*Relative Change in Environmental Impact*	*Additional Management or Mitigation Measures Required*	*Significance of Issue with this Modification Proposal*
Noise	The original Noise Impact Assessment that accompanied the EA identified that the DDG Pelletiser Plant will be housed within a building constructed of Ultra Panels having an Rw of not less than 35. Furthermore any equipment that has a sound power level above 90 db(A) is required to be enclosed in a separate room with walls and ceiling / floor having an Rw of not less than 40.The proposed removal of the pelletiser as a mandatory odour control; and fully enclosing of the DDG Product Storage Shed will have no additional environmental impact in terms of noise generated from the site. No change in environmental impacts from that originally identified in EA.	No additional management or mitigation measures proposed	Not a key Issue
Transport & Traffic	The DGR's for this modification proposal requires a quantitative assessment of the predicted changes to transport and traffic as a result of the proposed modification. It is anticipated that the transportation of DDG product will generate the same number and type of heavy vehicles to the local traffic network whether in pellet or non-pellet form. As a result, any delay in the construction of the pelletiser as a result of the proposed modification would not alter the vehicle generation of the site, or by association result in any adverse impacts on the local road system.	No additional management or mitigation measures proposed	This issue has been identified by DGR's as Key Issue.
Hazards	The proposed DDG Pelletiser Plant was not identified by the Preliminary Hazard Analysis undertaken by GHD Pty Ltd. that supported the original EA document as comprising a source of major hazard associated with the Shoalhaven Starches Expansion Project and was therefore not considered in detail as part of this assessment. The proposed removal of the pelletiser as a mandatory odour control; and fully enclosing the DDG Product Storage Shed will not raise any additional issues with respect to hazards and risk associated with the site. No change in environmental impacts from that originally identified in EA.	No additional management or mitigation measures proposed	Not a key Issue

Issue	*Relative Change in Environmental Impact*	*Additional Management or Mitigation Measures Required*	*Significance of Issue with this Modification Proposal*
River bank stability and Riparian Management	The proposed modification does not propose any works within the vicinity of the Shoalhaven River or any other watercourse. No change in environmental impacts from that originally identified in EA.	No additional management or mitigation measures proposed	Not a key Issue
Flooding	The DDG Product Storage Shed was included in the original flood assessment for the site carried out by Webb McKeown & Associates The proposed removal of the pelletiser as a mandatory odour control; and fully enclosing the DDG Product Storage Shed will not raise any specific issues in terms of flooding risk associated with the site. No change in environmental impacts from that originally identified in EA.	No additional management or mitigation measures proposed	Not a key Issue
Waste Management	Delaying the installation of the Pelletiser Plant will not alter the level of waste that is required to be managed on site. The Waste Management Assessment carried out by Stephenson Environmental Management Australia (SEMA) did not identify the DDG Pelletiser Plant as a significant contributor to the waste generation, nor did it specify any specific requirements for this component of the Expansion Project. The proposed removal of the pelletiser as a mandatory odour control; and fully enclosing the DDG Product Storage Shed will not alter the way waste is managed on the site. No change in environmental impacts from that originally identified in EA.	No additional management or mitigation measures proposed	Not a key Issue

Issue	*Relative Change in Environmental Impact*	*Additional Management or Mitigation Measures Required*	*Significance of Issue with this Modification Proposal*
Visual Impact	The proposed removal of the pelletiser as a mandatory odour control; and fully enclosing the DDG Product Storage Shed will not have significant impact in terms of the scenic amenity of the locality. The DDG Product Storage Shed was originally proposed to be partly open, with heavy plastic curtains used to contain odours. The full enclosure of this shed will have no discernible visual impact outside the site given the shed is largely screened by existing structures; and the size and scale of the shed will remain as originally approved. No change in environmental impacts from that originally identified in EA.	No additional management or mitigation measures proposed	Not a key Issue
Flora and Fauna	The DDG Product Storage Shed is located within the factory site which is devoid of vegetation. The original Flora and Fauna Assessment carried out by Kevin Mills & Associates for the Expansion Project did not identify any specific ecological constraints with this part of the site. The proposed removal of the pelletiser as a mandatory odour control; and fully enclosing the DDG Product Storage Shed will not require any additional vegetation to be disturbed. No change in environmental impacts from that originally identified in EA.	No additional management or mitigation measures proposed	Not a key Issue
Heritage and Archaeological Issues	The DDG Product Storage Shed is located within the factory site which was not previously identified by the EA for the Shoalhaven Expansion Project as an area subject to either Aboriginal or European cultural heritage significance. The original Aboriginal Archaeological Assessment that supported the EA prepared by South East Archaeology did not identify any constraints with respect to this part of the site or this project. The proposed removal of the pelletiser as a mandatory odour control; and full enclosure of the DDG Product Storage Shed will have no additional impact in terms of indigenous or non-indigenous heritage. No change in environmental impacts from that originally identified in EA.	No additional management or mitigation measures proposed	Not a key Issue

Following the above risk assessment of the potential environmental impacts of the proposed modification the key issues for further assessment (and as identified by the DGR's for this project) are:

- Odour
- Traffic

7.0 KEY ISSUES

7.1 ODOUR

The DGR's for this modification proposal require:

- "*A quantitative assessment of the predicted changes to odour emissions (from the plant and at receptors) as a result of the proposed modification and that demonstrates that odour emissions would be compliant with Section 129 of the Protection of the Environment Operations Act 1997, and also within predictions made for the approved project; and*

- *Details of any additional management measures that may be required to ensure that the requirements relating to odour under the project approval and the Environment Protection Licence are met.*"

Odours emanating from the DDG plant are to be dealt with under the Project Approval by increasing the stack height of the Palmer Cooler Stack from 10 metres to 26 metres; as well as enclosing and ventilating the DDG Storage Shed and load out tent to the biofilter (refer **Plate 5**). Shoalhaven Starches engaged the services of The Odour Unit (TOU) to address this specific matter. A copy of the assessment carried out by TOU forms **Annexure 2** to this EA. This section of the EA is based upon the findings of this report prepared by TOU.

Plate 5: View of recently installed Biofilter.

7.1.1 Palmer Cooler Stack

According to TOU the emissions from the Palmer Cooler Stack are the only emissions emitted to the atmosphere from the DDG processing line. This air stream currently vents to atmosphere through a 16 m high stack. It is proposed to increase the stack height by 10 m to 26 m, as part of the Shoalhaven Starches Expansion Project approved by the Minister.

The original Environmental Audit carried out by GHD in 2007 quantified all significant odour emissions from the factory and the Environmental Farm. The findings of the audit are contained in the GHD report 'Shoalhaven Starches Environmental Audit – Odour Sources, October 2007'. In that study the Palmer Cooler stack emission was found to have an odour concentration of 1,700 ou and an emission rate of 8,800 ou.m3/s.

TOU have undertaken further testing of the stack emissions in August and September 2009, to check the veracity of the single GHD testing result. **Table 3** below summarises the three sets of testing results. Testing results sheets for the TOU testing are appended.

Table 3

Palmer Cooler Stack Odour Testing Results

Testing	***Date***	***Odour Concentration (ou)***	***Odour Emission Rate (ou.m^3/s)***
GHD/ ETC	2008	1,700	8,800
TOU	26/8/2009	10,100 (mean of 2 results)	52,300
TOU	24/9/2009	3,300 (mean of 2 results)	17,080
Mean Result		**5,030**	**26,060**

It is evident from the above results that the there is considerable variation in the odour emission concentrations and rates from the stack, reflecting changing processing conditions in the factory.

In the context of the total odour emissions from the Factory and Environmental Farm, prior to the current upgrade to the wastewater treatment and DDG biofilter systems, the Palmer Cooler Stack emissions represent a very small contribution. **Table 4**, derived from the GHD Odour Audit report, shows this very clearly. As shown below the elevated nature of these emissions further diminishes their significance.

Table 4

Total Odour Emission Rate Contribution

Source	***Sub-source***	***OER (ou.m^3/s)***	***Percent of Total OER***
Environmental Farm		3,500,000	84
Starch Plant Overall		310,000	7.3
DDG Plant Overall		230,000	5.5
	(Palmer Cooler Stack)	*(8,800 – 52,300) mean 26,060*	*(0.2 – 1.25) (0.6)*
Ethanol Plant		120,000	2.9
Glucose Plant		8,900	0.2
Distillation Plant		1,900	< 0.1
Total		**4,170,800**	**100**

7.1.2 Predicted DDG Palmer Cooler Stack Odour Impacts

Odour Emissions

According to TOU it is difficult to assess the extent to which pelletising of the DDG product, prior to the Palmer Cooler, would have affected the odours generated in that unit. As indicated in TOU's letter of 30 November 2009 (appended as Appendix B to TOU Report in **Annexure 2**), the lower exposed surface area of the pelletised product compared to the powdery product could be expected to result in some lowering of emissions, albeit from the very low base shown in **Table 3**. However according to TOU given the amount of moisture driven off in the Palmer Cooler would not change with either product, it could be argued that the mass of volatiles, including odour compounds, would be the same for both products.

While the odours released from the DDG product into the Storage Shed may also have been affected by the pelletising process, according to TOU, the move to fully enclose and ventilate the shed to the biofilter system renders any speculation superfluous.

Dispersion Modelling

The original odour dispersion modelling for the Shoalhaven Starches Expansion Project was carried out by GHD and documented in the report *'Shoalhaven Starches: Report on Ethanol Upgrade – Air Quality Assessment, June 2008'*.

Subsequent to that study GHD were asked by Shoalhaven Starches to re-run the dispersion model, focusing only on the predicted impacts from the Palmer Cooler Stack emissions. The purpose of this modelling was to determine the overall significance of the emission at ground level, as well as to quantify the improvements that could be

expected if the stack height was increased. Because the modelling was carried out by GHD it is not possible to append the Ausplume model configuration and output files to this report. Advice from GHD is that the modelling was carried out using the identical model developed for and used in the previous major study.

The modelling examined a range of stack height and odour emission rate scenarios, and specifically focused on the predicted odour concentration levels at the four nearest sensitive receptors (referred to as R1, R2, R3 and R4, as per the previous GHD assessment). Stack height increases in 5m steps from the current 16 m height were modelled, for odour emission rates of 8,800 ou.m^3/s (the previously measured emission rate), 50,000 ou.m^3/s and 100,000 ou.m^3/s. For the purposes of TOU's assessment the predicted results were interpolated for the mean emission rate of 26,060 ou.m^3/s and the maximum rate of 50,300 ou.m^3/s (from **Table3**). The results of the modelling are shown in **Table 5**.

Table 5

Palmer Cooler Stack Emissions – Predicted Ground Level Odours

Stack Height (m)	***Odour Emission Rate (ou.m^3/s)***	***Predicted Odour Concentration (ou)***			
		R1	***R2***	***R3***	***R4***
16	8,800	0.06	0.05	0.10	0.10
16	50,000	0.33	0.30	0.55	0.55
16	100,000	0.65	0.60	1.10	1.10
21	8,800	0.06	0.05	0.07	0.04
21	50,000	0.35	0.30	0.38	0.24
21	100,000	0.70	0.60	0.75	0.48
26	8,800	0.05	0.04	0.05	0.03
26	50,000	0.28	0.25	0.30	0.18
26	100,000	0.55	0.50	0.60	0.35
31	8,800	0.04	0.04	0.04	0,03
31	50,000	0.25	0.23	0.23	0.18
31	100,000	0.50	0.45	0.45	0.35
36	8,800	0.04	0.04	0.03	0.03
36	50,000	0.23	0.23	0.18	0.15
36	100,000	0.45	0.45	0.35	0.30

It can be seen from **Table 5** that significant reductions in ground level odour concentrations are predicted in the likely operating odour emission range for the four sensitive receptors. It can also be seen that the magnitude of the predicted odour levels are all below odour threshold for that emission and substantially less than the DECCW Odour Guideline concentration of 2 ou.

7.1.3 DDG Product Storage Shed

The original plan for the DDG Product Storage Shed (refer **Plate 6**) included the fitting of flexible heavy curtains to the access openings (as outlined in the Ministerial Consent condition). During the detailed design of the DDG odour collection and biofilter system it was decided to fully enclose the shed and extract air from it and direct this airstream to the biofilter system. This biofilter system has now been installed and is currently being commissioned. The airflow from the Storage Shed represents 37% of the total airflow treated in the biofilter (5,290 m^3/hr in a total airflow of 14,272 m^3/hr).

Plate 6: View of DDG Product Storage Shed and load out tent.

The new system of enclosing the Storage Shed and ventilating it to the biofilter system represents a significant improvement over the use of heavy curtains, and will result in a lower likelihood of fugitive odour releases from the Shed.

TOU has identified that the measured odour emissions from the existing DDG Palmer Cooler stack are most unlikely to impact adversely at ground level at the four discrete

receptors previously identified by GHD and that the ground level odour concentrations will further decrease when the stack is extended by 10 m to a height of 26 m.

Whilst TOU has been unable to conclusively determine whether the decision not to pelletise the DDG product will affect the odour emission rate from the Palmer Cooler Stack, according to TOU, the above findings that there will be no significant adverse impact renders the pelletising issue practically superfluous.

According to TOU, the decision to replace the proposed heavy curtains on the openings in the Storage Shed with full enclosure and ventilation to the biofilter is almost certain to result in lower potential for fugitive odour releases from the shed.

The odour assessment carried out by TOU concludes with respect to the proposed modification:

> *This study has found that the measured odour emissions from the existing DDG Palmer Cooler stack are most unlikely to impact adversely at ground level at the four discrete receptors previously identified by GHD and that the ground level odour concentrations will further decrease when the stack is extended by 10m to a height of 26m.*
>
> *The study has been unable to conclusively determine whether the decision not to pelletise the DDG product will affect the odour emission rate from the Palmer Cooler Stack but the above finding of no significant adverse impact renders the pelletising issue practically superfluous.*
>
> *The decision to replace the proposed heavy curtains on the openings in the Storage Shed with full enclosure and ventilation to the biofilter is almost certain to result in lower potential for fugitive odour releases from the shed.*

In relation to the proposed modification TOU recommend:

> *It is recommended that the emission from the Palmer Cooler Stack be monitored for odour concentration and emission rate, as part of SS's environmental monitoring program.*

7.2 TRAFFIC

The DGR's for this modification proposal require:

> *"Traffic - including an assessment of any changes to traffic volumes as a result of the proposed modification and where required, measures to minimise impacts."*

Shoalhaven Starches have engaged the services of Stapleton Transportation and Planning (ST&P) to address traffic aspects associated with this proposal. ST&P prepared the Traffic Impact Statement that accompanied the original EA associated with the Shoalhaven Starches Expansion Project. A copy of the assessment carried out by

ST&P with respect to this modification proposal forms **Annexure 3** to this EA. This section of the EA is based upon the findings of this report prepared by ST&P.

7.2.1 DDG Traffic Generation Characteristics

DDG product is currently transported from the site in non-pelletised form by heavy vehicles. The DDG Product generates:

- An average of 20 heavy vehicle trips (ie. 10 vehicles arriving and departing) each week day.
- An average of less than 4 heavy vehicle trips (ie. less than 2 vehicles arriving and departing) during the commuter peak hour.
- Approximately 65% of vehicles are articulated vehicles (semi-trailers or truck and trailer), and approximately 35% of vehicles are B-Doubles.

The DDG heavy vehicle generation represents approximately 17% of the total heavy vehicle trip generation associated with the site. All DDG product heavy vehicles exclusively access the site via Access Point 3 (Western).

7.2.2 Approved DDG Product Increase

The Shoalhaven Starches Expansion Project provides for minor heavy vehicle increases associated with increased ethanol production with an additional total average of 38 heavy vehicle trips daily (being 19 vehicles arriving and departing). Eight of these trips (4 vehicles) are DDG Product trips, bringing the total approved DDG Product vehicle generation to approximately 28 heavy vehicle trips per day.

The Shoalhaven Starches Expansion Project also provides for the relocation of the packaging plant, such that the increase in DDG Product vehicle trip generation at Access Point 3 would be totally offset (and more) by the removal of packaging plant trips from Access Point 3.

Notwithstanding, minor increases in overall heavy vehicle generation (Ethanol trucks to Access Point 1) and staff trips were according to ST&P to have no significant impact on the local traffic network pursuant to the upgrade of the access intersections.

Shoalhaven Starches are currently working with Shoalhaven Council and the RTA with respect to these road upgrades to ensure compliance with the Project Approval for the Shoalhaven Starches Expansion Project.

7.2.3 The Pelletiser Modification Proposal

The Modification Proposal seeks to remove the implementation of the Pelletiser from the mandatory odour controls as detailed in Appendix 3 of the Project Approval. As Shoalhaven Starches is nonetheless still committed to the installation of the DDG Pelletiser Plant at some stage in the future, the effect of the Modification would therefore be to delay implementation of the DDG Pelletiser Plant to the later stages of the current approved upgrade.

According to ST&P from an access and traffic perspective, the timing of the implementation of the Pelletiser would have no impact on the heavy vehicle generation, nor alter the existing approved DDG Product traffic generation.

Essentially, the Pelletiser Plant will refine the DDG Product on-site into pellet form, whereas it is currently transported in non-pellet form. In order to test the bulk and handling characteristics of the pelletised DDG, Shoalhaven Starches has conducted preliminary testing of the pelletising process and have determined that the heavy vehicle capacity required to transport the pelletised material is no different to the capacity required to transport the non-pelletised DDG product.

As such the DDG Product (and total site) traffic generation will remain unchanged from the approved heavy vehicle trip generation levels regardless of the timing of the implementation of the Pelletiser.

The traffic assessment prepared by ST&P concludes:

> *Further to our review of the access and traffic generation characteristics of the current transportation of Dried Distillers Grain and the future transportation of Dried Distillers Grain Pellets, STAP has determined that the proposed Modification would have no impact on access or traffic generation.*
>
> *The transportation of the DDG product generates the same number and type of heavy vehicles to the local traffic network whether in pellet or non-pellet form. As such, the proposed delay in construction of the Pelletiser as proposed in the Modification would not alter the vehicle generation of the Site, or by association result in any adverse impacts on the local traffic network.*
>
> *STAP would therefore support the Modification on access and traffic grounds.*

8.0 STATEMENT OF ADDITIONAL COMMITMENTS

Section 8.0 of the EA for the Shoalhaven Starches Expansion Project prepared by our firm provides a Statement of Commitments agreed to by Shoalhaven Starches Pty Ltd outlining environmental management, mitigation and monitoring measures to be implemented to minimise potential impacts associated with the Shoalhaven Expansion Project and having regard to the findings of the EA.

The only additional commitment arising from this modification proposal arises from the odour assessment carried out by the TOU which recommends the emissions from the Palmer Cooler Stack be monitored for odour concentration and emission rate, as part of Shoalhaven Starches environmental monitoring program.

Shoalhaven Starches therefore agree to commit to monitor emissions from the Palmer Cooler Stack for odour concentration and emission rate, as part of the Company's environmental monitoring program.

9.0 CONCLUSION

Condition 7 of the Project Approval for the Shoalhaven Starches Expansion Project requires the staged implementation of the Shoalhaven Starches Expansion Project. Essentially this condition enables ethanol production to be increased up to 200 million litres per annum provided that mandatory odour controls are implemented.

One of these mandatory odour controls stipulated within the approval includes:

> *"Pelletise DDG products and fit heavy curtains to openings in the DDG product storage shed and load-out tent"*

This application seeks to modify the Project Approval to remove the above requirement from the mandatory odour controls listed within the Project Approval for the site.

The application only seeks to remove the DDG Pelletiser Plant from the mandatory odour controls listed within the Project Approval. It does not seek to remove the DDG Pelletiser Plant from the overall Shoalhaven Starches Expansion Project. The demand for pelletised DDG, both domestic and export, has not eventuated. Shoalhaven Starches' customers currently prefer the granular DDG currently produced at the Factory. It is therefore not necessary to install the DDG Pelletiser Plant to meet market requirements.

Shoalhaven Starches however still wish to be able to pelletise DDG Product should market conditions in future dictate a demand for this form of the product.

This application is made pursuant to Section 75W of the Environmental Planning & Assessment Act 1979.

The preparation of this Environmental Assessment has been undertaken following consultation with relevant Government agencies, including:

- The Department of Planning;
- The Department of Environment, Climate Change and Water; and
- Shoalhaven City Council.

Community representatives from the Shoalhaven Starches Community Consultative Group have also been consulted.

This Environmental Assessment has been prepared to address issues detailed in the requirements issued by Director-General of the Department of Planning, and specifically:

- The EA is supported by a quantitative assessment of predicted changes to odour emissions as a result of the modification prepared by The Odour Unit (TOU).

This assessment concludes that the measured odour emissions from the existing DDG Palmer Cooler stack are most unlikely to impact adversely at ground level at the four discrete receptors previously identified by GHD and that the ground level odour concentrations will further decrease when the stack is extended by 10 m to a height of 26 m.

TOU were unable to conclusively determine whether the decision not to pelletise the DDG product will affect the odour emission rate from the Palmer Cooler Stack but the above finding of no significant adverse impact renders the pelletising issue practically superfluous.

In addition the assessment carried out by TOU identifies the replacement of the proposed heavy curtains on the openings in the DDG Product Storage Shed with full enclosure and ventilation to the biofilter is almost certain to result in lower potential for fugitive odour releases from the shed.

- The EA is also supported by a traffic assessment prepared by Stapleton Transportation & Planning that assesses whether the proposed modification would result in any changes to traffic volumes as a result of the proposed modification.

  This assessment has determined that the proposed Modification would have no impact on access or traffic generation.

  The transportation of the DDG product generates the same number and type of heavy vehicles to the local traffic network whether in pellet or non-pellet form. As such, the proposed delay in construction of the DDG Product Pellet Plant as proposed would not alter the vehicle generation of the site, or by association result in any adverse impacts on the local traffic network.

Under the terms of the DGR's for this proposed modification this conclusion is required to justify the project on economic, social and environmental grounds taking into consideration whether the project is consistent with the objects of the EPA Act 1979. The objects of the EPA Act are detailed within Section 5 of the Act and include:

> *(a) to encourage:*
>
> *(i) the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment,*
>
> *(ii) the promotion and co-ordination of the orderly and economic use and development of land,*

(iii) the protection, provision and co-ordination of communication and utility services,

(iv) the provision of land for public purposes,

(v) the provision and co-ordination of community services and facilities, and

(vi) the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and

(vii) ecologically sustainable development, and

(viii) the provision and maintenance of affordable housing, and

(b) to promote the sharing of the responsibility for environmental planning between the different levels of government in the State, and

(c) to provide increased opportunity for public involvement and participation in environmental planning and assessment.

Following an assessment of the key issues associated with this proposal, this Environmental Assessment concludes that the proposal is suitable for the site and this locality and consistent with the above objects of the EPA Act.

- The proposed modification will not result in any increase in odours within the locality. The proposed modification will not result in any adverse environmental impacts within the locality.
- The proposal will also not alter the vehicle generation of the site, or by association result in any adverse impacts on the local traffic network. The proposal will not result in any adverse social impacts to the local community.
- The installation of the DDG Pelletiser Plant will have little overall benefit in terms of odour reduction. Deleting this project from the mandatory odour controls will enable Shoalhaven Starches to commit resources to other mandatory odour controls.
- Deleting the DDG Pelletiser Plant project from the mandatory odour controls will enable Shoalhaven Starches to defer the significant capital expenditure (approximately $4 million) required to undertake this component of the project until there is a market demand for this form of product and thereby making this component economically viable.
- Relevant government agencies and community representatives have been consulted with respect to the proposal.

The Environmental Assessment includes a Statement of Additional Commitments that should be read in conjunction with the Statement of Commitments detailed in the original EA prepared by our firm. This Statement of Additional Commitments outlines environmental management, mitigation and monitoring measures that should be implemented to minimise potential impacts associated with this proposal. In this regard Shoalhaven Starches commit to monitoring emissions from the Palmer Cooler Stack for odour concentration and emission rate, as part of the Company's environmental monitoring program.

The Minister's approval of this proposed modification to Project Approval MP 06_0228 is sought for the proposal.

ANNEXURE 1

ANNEXURE 1

Director-General's Requirements

ANNEXURE 2

ANNEXURE 2

Odour Assessment

prepared by

The Odour Unit

ANNEXURE 3

ANNEXURE 3

Pelletiser Modification Traffic Review

prepared by

Stapleton Transportation and Planning