NSW GOVERNMENT
Department of Planning

MAJOR PROJECT ASSESSMENT: Shoalhaven Starches Expansion Project

Director-General's
Environmental Assessment Report
Section 75I of the
Environmental Planning and Assessment Act 1979

December 2008

Cover photo: Aerial view of Shoalhaven Starches Factory and Environmental Farm

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EXECUTIVE SUMMARY

Shoalhaven Starches Pty Limited, a subsidiary of the Manildra Group, operates a factory at Bomaderry in Shoalhaven for the production of starch and related products for the food and paper industry, and ethanol for use as a renewable fuel.

The factory has been operating on the site since 1979, and is a significant contributor to the local and regional economy. However, the factory has had a history of odour problems. Offensive odours are produced as a result of processing emissions at the factory, and associated with the disposal of process wastewater (via spray irrigation) on the company's 'Environmental Farm'.

Shoalhaven Starches is proposing to undertake a range of substantial odour control measures at the factory and the Environmental Farm, in conjunction with a proposed expansion in ethanol production from the currently approved level of 126 megalitres a year, to 300 megalitres a year.

The project has a capital investment value of $200 million, and would generate an additional 25 jobs at the factory. Importantly, the project would significantly decrease odour emissions from the facility and the resultant odour impacts on residents of Nowra, Bomaderry and surrounding areas. Further, the project would boost supplies of ethanol for the fuel industry, and help to meet the NSW Government's biofuels target.

The project constitutes a 'major project' under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act), and consequently requires the Minister's approval.

During the exhibition period, the Department received 21 submissions on the project: 6 from government authorities and 15 from the general public. Six of the public submissions objected to the project, on grounds including odour, noise and flooding impacts, and the potential for ethanol production to displace food supplies. None of the public authorities objected to the project.

The Department has assessed the merits of the project in detail, and has sought the advice of an independent expert to review the odour impacts of the project.

This assessment found that the project would significantly reduce (by some 90%) the longstanding odour impacts of the existing factory, to a level that would comply with established odour criteria. The assessment also found that the proposed increase in ethanol production would not significantly increase odour emissions, provided that certain odour controls are implemented prior to the production increase.

The Department has recommended conditions requiring such measures to be implemented before production increases, or within one year, whichever is sooner. This would ensure that the substantial odour controls are implemented at an early stage to greatly reduce the existing impacts on the community.

Together with a range of other recommended conditions to control and manage odour and other environmental impacts, the Department is satisfied that the project can be managed in accordance with applicable criteria and guidelines, and to an acceptable level of environmental performance.

On balance, the Department is satisfied that the project's benefits significantly outweigh any residual costs, and that it is in the public interest and should be approved, subject to conditions.

1. PROPOSED PROJECT

1.1 Background

Shoalhaven Starches Pty Ltd (Shoalhaven Starches), a subsidiary of the Manildra Group, operates a factory at Bomaderry in the Shoalhaven local government area (see Figure 1).

The factory is located on a 12.5 hectare (ha.) site on the southern side of Bolong Road and northern bank of the Shoalhaven River. The site is approximately 500 metres (m) from Bomaderry and 2km north east of Nowra, and is located within an industrial precinct with neighbouring facilities including the Bomaderry Wastewater Treatment Plant, the Shoalhaven Paper Mill, Cleary Bros Cement and numerous smaller industrial premises. The nearest residences are located approximately 200m to the north-west of the factory on the border of the Bomaderry industrial precinct.

The factory began operating in 1979 to produce starch, gluten and glucose products from wheat and sorghum supplied from Manildra Group mills in Manildra, Gunnedah and Narrandera. These products are used in the food, paper and brewing industries. Since 1992 the factory has also produced ethanol from waste starch for use in the motor transport industry, and the by-product dried distillers grain (DDG) for use as feed stock.

The factory produces a significant amount of wastewater which is disposed of via spray irrigation on Shoalhaven Starches' 'Environmental Farm'.

The Environmental Farm is currently 1,000 ha in size and extends several kilometres north of Bolong Road to Jaspers Brush and east to a tributary of the Shoalhaven River. It contains 6 wastewater storage ponds, along with an additional storage pond under construction (Pond 7) that have a combined storage capacity of 1,145 mega litres (ML). It is used for pasture cultivation and cattle grazing. A number of rural residences are located on the western boundary of the Environmental Farm off Hanigans Lane, with the closest residence being approximately 350m from the wastewater storage ponds.

The factory and Environmental Farm are identified in Figure 1. Key existing development consents and project approvals for the facility are outlined in Table 1 below:

Table 1: Key Consents and Approvals

Year	***Development Consent/Project Approval***
1991	Construction & operation of three wastewater storage ponds with a combined capacity of 49ML and cessation of wastewater discharge into the Shoalhaven River.
1992	Construction of a 125ML covered storage pond and production of up to 20ML/year of ethanol.
1994	Construction and operation of an ethanol distillery to produce up to 90ML/yr of ethanol, Installation of a new spray irrigation system on the Environmental Farm.
1999-2001	Construction of two new wastewater storage ponds with 250ML capacity (Pond 5) and 500ML capacity (Pond 6).
2002	Approval for an additional wastewater storage pond (Pond 7) with 220ML capacity, however, construction did not commence until 2007 and is continuing.
2003	Pollution Reduction Program 7 (PRP 7) to reduce odour by expanding the irrigation area to 1000 ha. and installing additional dryers and an evaporation plant to remove BOD and COD in the wastewater.
2007	Construction of a flour mill to produce flour on-site. Construction is yet to be completed.

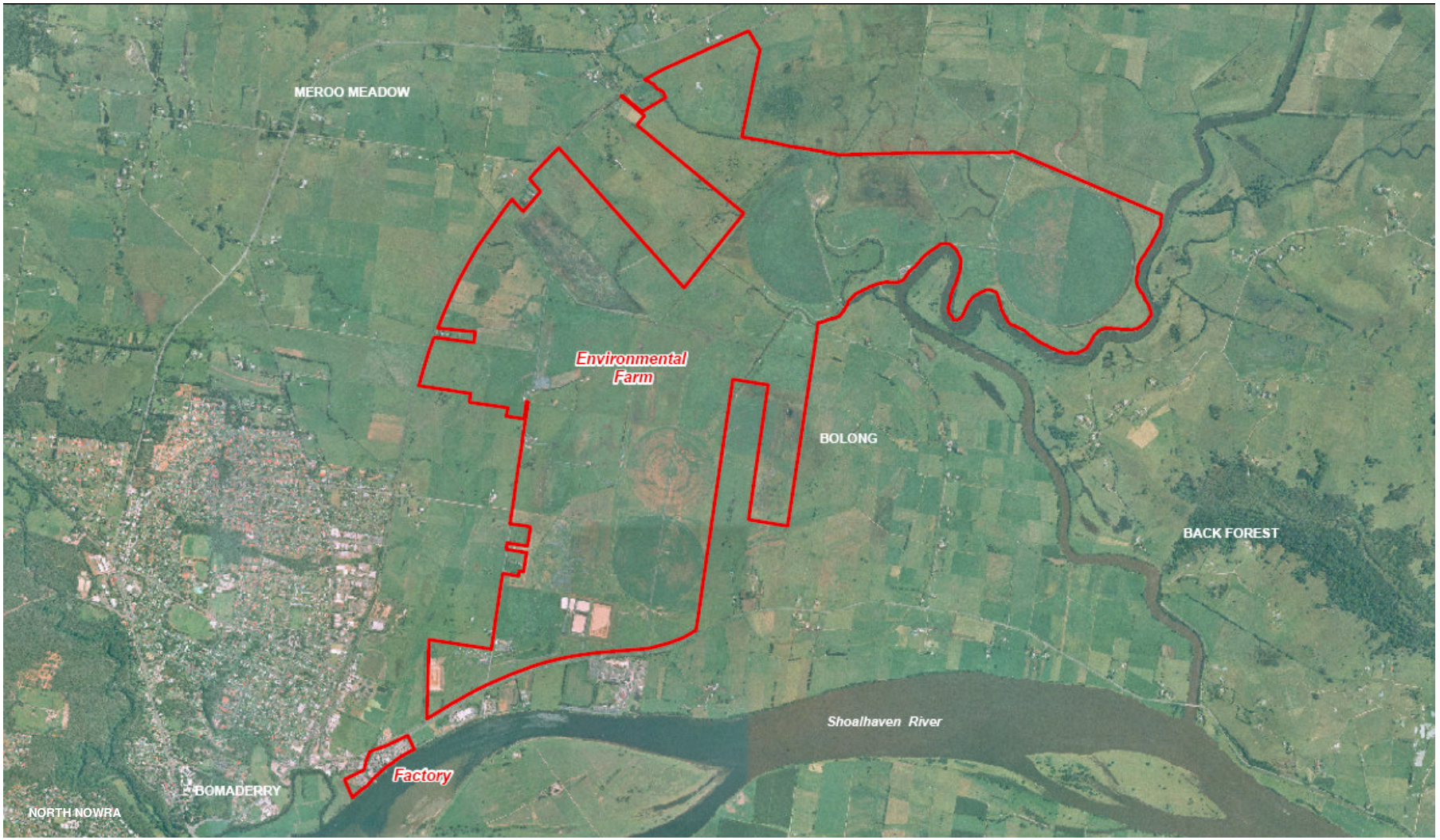

Figure 1: Shoalhaven Starches Factory and Environmental Farm

1.2 Existing Operations

Wheat, sorghum grain, industrial grade flour and mill feed (husk material) are currently transported from western NSW to the factory by train. The raw materials are processed through the factory's grain, starch, ethanol and stillage recovery plants to produce starch, gluten, glucose, ethanol and DDG. Shoalhaven Starches is currently constructing a flour mill at the factory site to reduce the quantity of flour required to be transported to the site.

Annually, the factory currently processes 200,000 tonnes (t) of wheat and sorghum grain and 520,000t of flour to produce:

- approximately 100ML of ethanol (with approval to produce 126ML);
- 105,000t of DDG;
- 260,000t of flour;
- starch, in dried and liquid forms;
- gluten; and
- glucose syrup (sold to confectioners and brewers).

Figure 2 shows a layout of the existing factory. It also includes components that have been approved and are currently being constructed.

The factory has a history of odour problems. In 2006, Shoalhaven Starches was prosecuted in the Land and Environment Court. The company was fined and required to undertake a comprehensive audit of all odour sources at the premises to identify options to prevent or treat odours.

This odour audit (conducted in 2007) found that emissions from the factory and Environmental Farm substantially exceeded relevant odour criteria at rural residences near the Environmental Farm and at residences in Bomaderry and the northern fringes of Nowra.

The audit recommended that odour could be minimised through a number of measures. These measures – together with a proposed expansion in ethanol production – form the basis for the current application.

1.3 Project Description

Shoalhaven Starches proposes to implement odour control measures and expand ethanol production at the Bomaderry facility. The major components of the project are summarised in Table 2, depicted in Figures 3 and 4 and described in full in the Environmental Assessment (EA), attached as Appendix G.

Table 2: Major components of the project

Aspect	***Description***
Project Summary	***Installation of key odour control measures and expansion of ethanol production to 300ML a year.***

Odour Control Measures	Odour control measures including:
	• a bioscrubber to collect and treat emissions from the DDG plant;
	• wet legs on tanks in the DDG, ethanol and glucose plants;
	• decommissioning of cooling towers in the ethanol plant;
	• enclosure of buildings and application of negative air pressure to contain fugitive emissions;
	• a tall emission stack to service the gluten and starch dryers and dry gluten bin; and
	• a biological wastewater treatment plant (WWTP) on the Environmental Farm, involving
	  o conversion of Pond 7 into a covered anaerobic pond, for use as a 90ML bulk volume fermenter, and an aerobic pond for use as a 130ML sulphur oxidation basin;
	  o a 4ML membrane bioreactor; and
	  o a reverse osmosis plant.

Ethanol Expansion	Additional infrastructure to increase ethanol production from 126ML to 300ML a year, as detailed below.

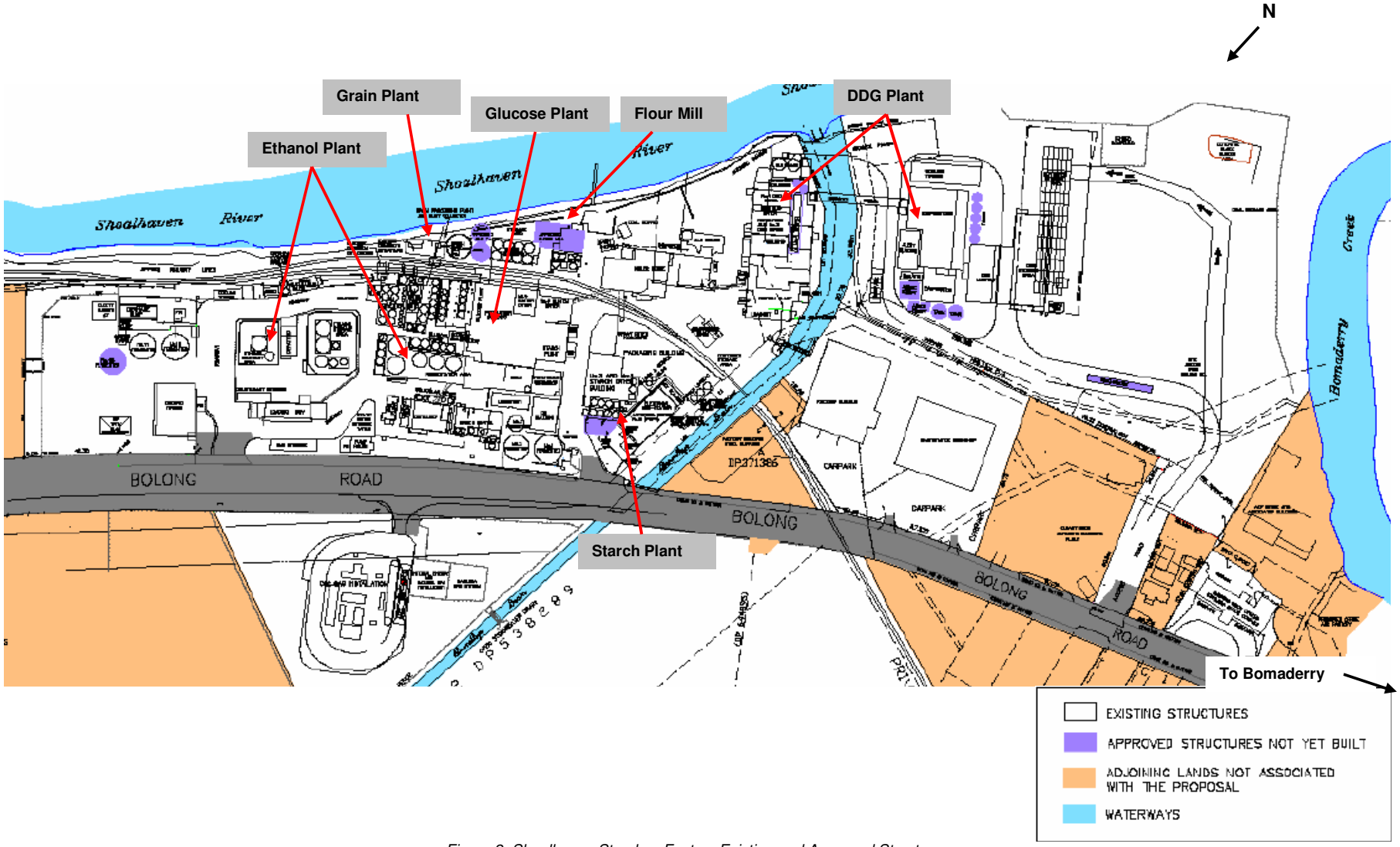

Figure 2: Shoalhaven Starches Factory Existing and Approved Structures

Table 2 (cont'd)

Aspect	Description
Stillage Recovery (DDG Plant)	New infrastructure, including: • six DDG dryers; • 10 decanters; • two evaporators; • two additional storage tanks (15m high); • a DDG pelletiser plant; • an extension to the DDG loadout shed; • a 200m long overhead services gantry across Abernethys drain; • a chemical storage area; • motor control room; and • additional cooling towers.
Starch Plant	A new dryer and grinder.
Ethanol Plant	Three fermenters, molecular sieves and four associated cooling towers.
Packing Plant	Construction of a new packing plant and container storage area on the northern side of Bolong Road, including: • a 270m long rail siding off the existing private rail line; • a pedestrian and service overbridge over Bolong Road and Abernethys drain from the factory to the packing plant; • a heavy vehicle ingress off Bolong Road and a heavy vehicle egress and light vehicle ingress and egress onto Railway Street; and • a weighbridge near the Railway Street exit.
Power Generation	A gas fired boiler adjacent to the existing boiler house and a new gas-fired co-generation facility at the western edge of the factory site.
Pipelines	A product pipeline between the factory and new packaging plant on the new pedestrian and service overbridge, and three new pipelines under Bolong Road, including: • a pipeline to carry treated water from the nearby Paper Mill to the factory; • a pipeline to transfer methane gas from the WWTP to the factory; and • an electricity line between the WWTP and the factory.
Fire System	Two 1.5ML water reservoir tanks and a pump shed on the northern side of Bolong Road adjacent to the BOC gas facility.
Production	300 million litres of ethanol a year; 330,000 tonnes of dried distillers grain a year.
Jobs	25 operational and 150 construction.
Capital Value	$200 million.
Construction Period	12 months.
Hours of Operation	24 hours a day, seven days a week.
Consent	Consolidation of all consents and project approvals for the facility.

1.4 Project Need

The implementation of odour control measures at the factory and Environmental Farm is required to address the long-term adverse odour impacts experienced by neighbouring residences. A full assessment of the odour control measures and the impacts of increased ethanol production is provided in Section 4.1.

The expansion of ethanol production from 126ML to 300ML a year is proposed in order to meet the NSW Government target for 2 percent ethanol content in all petroleum sold in NSW, as required by the *Biofuel (Ethanol Content) Bill 2007*, which would be equivalent to 315ML of ethanol based on the Australian Bureau of Agriculture and Resource Economics (ABARE) estimated volume of petroleum products used in NSW in 2006-07. Shoalhaven Starches is therefore seeking to largely meet the requirements of the *Biofuel (Ethanol Content) Bill 2007* and place itself in a position to meet any additional future requirements.

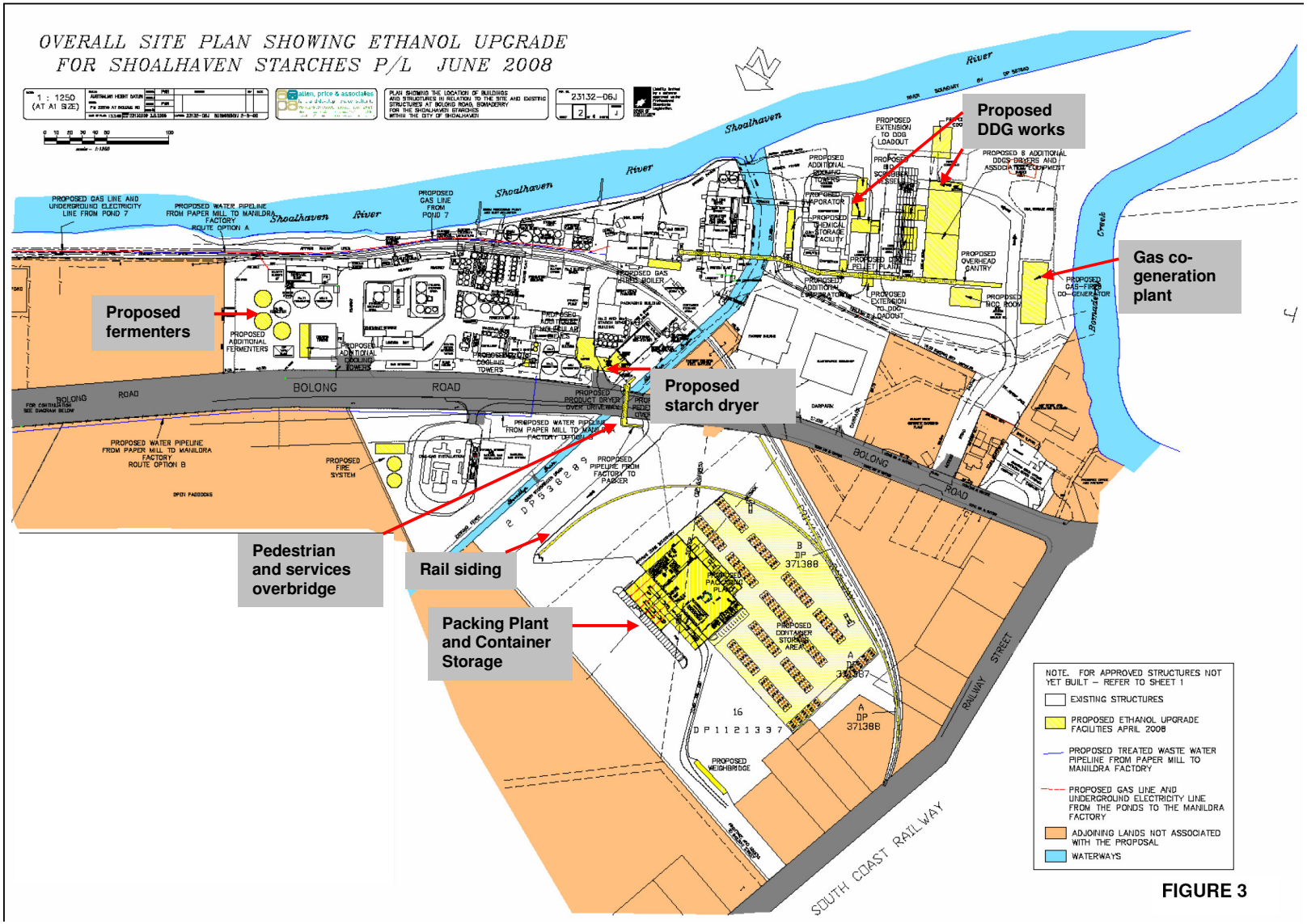

FIGURE 3

Figure 3: Proposed Facilities for Ethanol Expansion (new facilities shown in yellow)

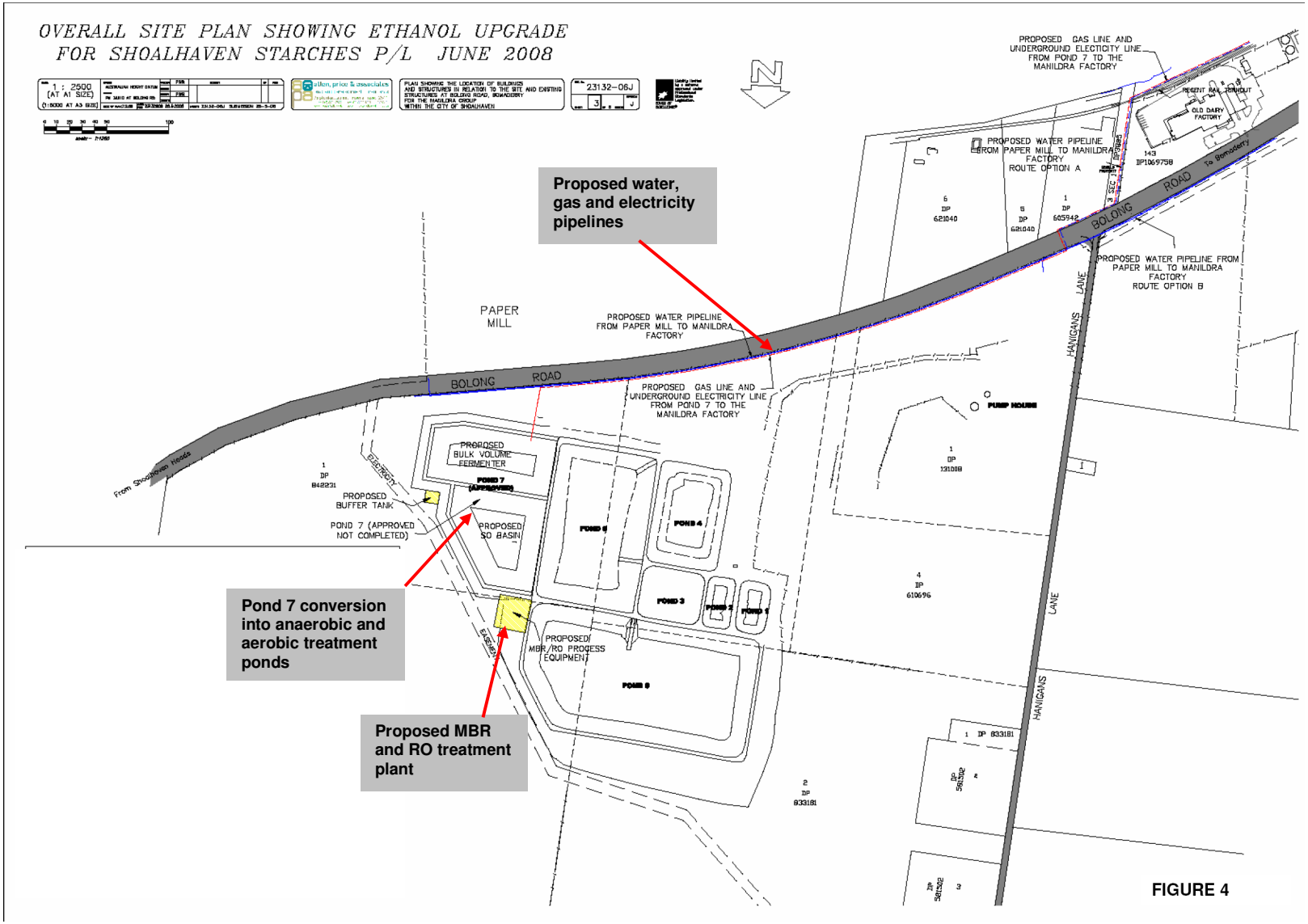

Figure 4: Proposed Wastewater Treatment Plant and Pipelines on Environmental Farm

2. STATUTORY CONTEXT

2.1 Major Project

The proposal is classified as a major project under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act), because it is development for the purpose of an agricultural produce industry, including ethanol plants that employ 100 or more people or has a capital investment value of more than $30 million, and therefore triggers the criteria in Clause 3(b) of Schedule 1 of *State Environmental Planning Policy (Major Projects) 2005*.

Consequently, the Minister for Planning is the approval authority for the project.

2.2 Permissibility

The land subject to the application is situated on two zones under the Shoalhaven Local Environmental Plan 1985, including:

- 4(e) Industrial "E" (Restricted Development) zone; and
- 1(g) Rural "G" (Flood Liable) zone.

The relevant components of the project are permissible with consent in these zones.

Consequently, the Minister can approve the project.

2.3 Exhibition and Notification

Under Section 75(3) of the EP&A Act, the Director-General is required to make the Environmental Assessment (EA) of a project publicly available for at least 30 days.

After accepting the EA for the project, the Department:

- made it publicly available from 15 August 2008 until 17 September 2008:
  - on the Department's website, and
  - at the Department's Information Centre, and the offices of Shoalhaven City Council and the Nature Conservation Council;
- notified landowners in the vicinity of the site about the exhibition period by letter;
- notified relevant State government authorities and Council by letter; and
- advertised the exhibition in the South Coast Register and Shoalhaven and Nowra News.

This satisfies the requirements in Section 75H(3) of the EP&A Act.

During the assessment process the Department also made a number of documents available for download on the Department's website. These documents included the:

- project application;
- Director-General's environmental assessment requirements;
- EA; and
- Shoalhaven Starches' response to issues raised in submissions.

2.4 Environmental Planning Instruments

Under Section 75I of the EP&A Act, the Director-General's report is required to include a copy of or reference to the provisions of environmental planning instruments that substantially govern the carrying out of the project.

The Department has assessed the proposal against the relevant provisions of several environmental planning instruments and is satisfied that, subject to the implementation of the recommended conditions of approval, the proposal is generally consistent with the aims, objectives and provisions of these instruments (see Appendix G).

2.5 Objects of the Environmental Planning and Assessment Act 1979

The Minister's consideration and determination of the application must be consistent with the relevant provisions of the EP&A Act, including the objects set out in the Act's section 5. The objects of most relevance to the Minister's decision on whether or not to approve the project are found in section 5(a)(i), (ii), (vi) and (vii). They are:

'The objects of this Act are:

(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,

(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".

The Department has fully considered the objects of the EP&A Act, including the encouragement of ESD, in its assessment of the application. The assessment integrates all significant economic and environmental considerations and seeks to avoid any potential serious or irreversible damage to the environment, based on an assessment of risk-weighted consequences. Shoalhaven Starches has undertaken an environmental assessment of the project, and considered the project in the light of the principles of ESD.

The Department is satisfied that the project can be conducted in a manner that is broadly consistent with the objects of the EP&A Act.

2.6 Statement of Compliance

Under Section 75I of the EP&A Act, the Director-General's report is required to include a statement relating to compliance with the environmental assessment requirements with respect to the project.

The Department is satisfied that the environmental assessment requirements have been complied with.

3. ISSUES RAISED IN SUBMISSIONS

During the exhibition period, the Department received a total of 21 submissions on the project (see Appendix F):

- 6 from public authorities (Council, DECC, DWE, RTA, DPI, and Railcorp); and
- 15 submissions from the general public.

Both Council and the RTA raised concerns about traffic, access and parking, including the need for Shoalhaven Starches to satisfy previous development consents in this regard. The recommended conditions of approval therefore require that outstanding road upgrades be undertaken prior to expansion of ethanol production and that proposed accesses and pedestrian pathways be approved by Council and the RTA. Council's requirements relating to soil and water, odour, riparian zone, and waste have been incorporated the recommended conditions of approval.

DECC advised that key odour management controls should be installed and verified, prior to expanding ethanol production, and outlined recommendations relating to soil, water, noise and greenhouse gas management. These recommendations have been incorporated into the recommended conditions of approval.

Both DWE and DPI provided recommendations in relation to soil, water and riparian zone management. These issues have been considered in the Department's assessment (see Section 4).

RailCorp raised concern that its infrastructure could not adequately cater for Shoalhaven Starches needs and insufficient space was available on Shoalhaven Starches site for trains required under this proposal. This issue is discussed in Section 4.3.

Six submissions from the public supported the project, due to employment and improved environmental management. Three other submissions stated that they would support the project provided predictions relating to odour, noise and wastewater impacts in the EA could be met. The

remaining six submissions opposed the project due to odour, noise and flooding impacts, with one submittor also raising concern about use of grains for fuel rather than food.

3.1 Response to Submissions

Shoalhaven Starches has provided responses to the issues raised in submissions (see Appendix E), as well as a revised Statement of Commitments for the project. These have been made publicly available on the Department's website.

The Department has considered the issues raised in submissions, and Shoalhaven Starches' responses to these issues, in its assessment of the project.

4. ASSESSMENT

4.1 Odour

Background

Odour emissions from the existing Shoalhaven Starches operations have been an on-going concern for many years. The communities of Bomaderry, North Nowra, Terara and Nowra have recorded numerous complaints regarding odour from the factory and the Environmental Farm. Records indicate that complaints have progressively reduced since 2003 when 473 were recorded, to 2007 when 166 complaints were recorded.

Initially, the primary source of odour emissions from the facility related to the wastewater irrigation at the Environmental Farm, due to high levels of Chemical Oxygen Demand (COD) and Biological Oxygen Demand (BOD). The Pollution Reduction Program No. 7 (PRP 7), that was approved in 2003, sought to reduce odour emissions in the wastewater through a stillage recovery process at the factory whereby decanters, evaporators and dried distillers grain (DDG) dryers were used to remove coarse and suspended solids from the wastewater stream to thereby reduce BOD and COD levels. The solids were used as DDG.

Implementation of the stillage recovery process in 2004 improved the quality of the wastewater and resulted in a reduction in odour complaints. The odour assessment conducted for the PRP7 project, however, identified that the factory itself was a significant odour source and treatment of only the wastewater component would not sufficiently reduce odour levels to enable compliance with Section 129 of the *Protection of the Environment Operations Act, 1997*, which makes it an offence to emit offensive odour. Furthermore, the tanks, cooling towers and storage areas in the stillage recovery process also introduced new odour sources at the factory site. Complaints have reported a yeast or vegemite like smell. This type of odour is generally a result of the DDG component of the stillage recovery process, as well as processes in the starch and gluten plants, and is quite distinct from other odours generated by irrigation.

Odour Audit

Continued adverse odour emission from the site culminated in DECC's successful prosecution in the Land and Environmental Court of Shoalhaven Starches for offensive odour in 2006. A key component of the court order was the production of a site odour audit to:

- identify all odour sources; and
- identify measures to prevent or minimise the generation of odour.

Shoalhaven Starches subsequently commissioned GHD to conduct the audit, which was completed and submitted to the Court in October 2007.

The odour audit indicated that an odour criteria of 2 odour units (OU) for residential areas of Bomaderry, and 7 OU for the isolated rural residences surrounding the Environmental Farm, was applicable. Modelling undertaken for the odour audit, however, indicated that emissions from the factory and Environmental Farm exceeded the odour criteria at all residential locations, with 100 OU at rural residences near the Environmental Farm and 25-50 OU at Bomaderry and the northern fringes of Nowra, as outlined in Figure 5.

The audit indicated that the wastewater treatment process was the highest odour emission source. The audit also identified that the DDG plant contributed between 50 to 60 percent of odour impacts at

residential areas and the hedonic tone of this odour, that being its level of pleasantness or unpleasantness, was described as being highly unpleasant.

The audit recommended that the facility could minimise odour through better housekeeping and implementation of a number of key odour management controls that form part of the current project.

EA Odour Assessment

The odour assessment in the EA built on the findings of the odour audit and:

- identified odour emissions from the existing facility;
- predicted emissions from the ethanol expansion project;
- detailed odour control measures as outlined in the EA, as well as additional measures required for an expanded facility;
- estimated how much odour could be reduced by the odour control measures; and
- identified a staged approach for implementation of the odour control measures.

The odour control measures identified in the Odour Audit were further considered in light of the proposed ethanol expansion project, with measures prioritised on the basis of achieving maximum reductions in odour impact from the primary sources at the factory and Environmental Farm. Shoalhaven Starches thereby proposed to implement the prioritised control measures within a staged implementation process, with the Stage 1 processes being implemented upfront, whilst Stage 2 and 3 would subsequently be implemented, if required. The staging process is outlined Table 3.

Table 3: Odour Control Measures – Staged Implementation

Odour Source	***Odour Control***
Stage 1	***Proposed to commence April 2009, subject to date of approval***
DDG Plant	Install a bioscrubber and duct key odour sources to the bioscrubber
	Install wet legs on tanks to condense vapour emissions. Wet legs to be installed on odour sources not ducted to the bioscrubber at this stage
	Undertake housekeeping such as ductwork cleaning and maintenance to prevent the build up of putrescent contamination
	Install a Pelletiser Plant for the DDG product
Ethanol Plant	Decommission cooling towers
	Install wet legs on tanks to condense vapour emissions
Starch Plant	Undertake housekeeping such as ductwork cleaning and maintenance
	Decommission kestner dryer
Glucose Plant	Install wet legs on enzyme tanks to condense vapour emissions
Flour Mill	Improve dispersion from cyclone and fabric filters
Environmental Farm	Install a biological wastewater treatment plant
Stage 2	***To assess within 6 months of completing Stage 1 controls***
DDG Plant	Duct condenser drain decanters to bioscrubber
Ethanol Plant	Install a bioscrubber and duct propagation and farm tanks to bioscrubber
Glucose Plant	Install a bioscrubber and duct enzyme tanks to bioscrubber
Stage 3	***If required, depending on the outcomes of Stage 2 implementation***
DDG Plant	Duct light phase tank to bioscrubber
Ethanol Plant and Distillery	Duct remaining odour sources to bioscrubber
Glucose Plant	Duct remaining odour sources to bioscrubber
Starch Plant	Duct remaining odour sources to bioscrubber
	Install a common tall stack for emissions from gluten and starch dryers and the dry gluten bin

The odour assessment modelled the odour impacts of a number of scenarios. These scenarios, and the results of the modelling, are summarised in the following table, and shown on Figures 6 to 9.

Table 4: Odour Modelling Results (Factory controls only, excluding Environmental Farm controls)

Scenario	***Predicted Odour Level (OU)***			
	Bomaderry	***North Nowra***	***Nowra***	***Terara***
Existing Operations	40	13	20	18
Stage 1 Odour Controls	5	3	5	5

Scenario	*Predicted Odour Level (OU)*			
	Bomaderry	***North Nowra***	***Nowra***	***Terara***
Stage 1 Odour Controls with Ethanol Expansion	6	3	5	5
Stage 2 Odour Controls with Ethanol Expansion	3	2	3	3
Stage 3 Odour Controls with Ethanol Expansion	2	1	<2	<2
Criteria	**2**	**2**	**2**	**2**

Additional modelling was undertaken to assess the Stage 1 odour controls on the Environmental Farm (ie, installing a wastewater treatment plant). The assessment found that the 7 OU criterion would be met at all the isolated rural residences in proximity to the farm.

Consideration

Given the complex odour issues associated with the site and project, the Department engaged Kerry Holmes of Holmes Air Sciences to conduct an independent review of the odour assessment and odour impacts. The independent assessment report is attached as Appendix B.

The independent assessment concluded that the odour audit and the odour impact assessment in the EA are sound studies and comply with the regulatory requirements in terms of modelling and impact assessment. The proposed odour control measures are considered appropriate and should provide the benefit predicted.

The independent assessment considered that the proposed Stage 1 odour controls would significantly reduce the odour impacts of the facility to a point where any increase in odour due to increased ethanol production would be effectively offset.

However, the independent assessment noted that, given the impacts that the factory has caused in the community in the past, a very substantial reduction in odour impacts is required before any increase in production commences. Consequently, the independent assessment recommends that the Stage 1 odour controls be made mandatory and be required to be implemented before any increase in production.

The Department agrees, and has recommended conditions requiring Shoalhaven Starches to implement the Stage 1 odour controls prior to increasing ethanol production, or within 12 months of the date of approval, whichever is sooner.

Consistent with the independent assessor's recommendations, the Department has also recommended conditions requiring Shoalhaven Starches to undertake an independent odour audit following the implementation of the Stage 1 odour controls, to assess and verify the findings and predictions in the EA. Additional odour audits would also be required on an ongoing (annual) basis.

Further, the Department has recommended a condition requiring Shoalhaven Starches to prepare and implement a comprehensive Odour Management Plan for the project, to plan and manage the implementation of ongoing odour controls and odour monitoring.

With the implementation of these measures, the Department is satisfied that the project would facilitate a marked improvement in odour performance of the Shoalhaven Starches factory. The Department is satisfied that the proposed staged approach to the implementation of the odour controls represents a reasonable and orderly approach to management of odour impacts from the factory.

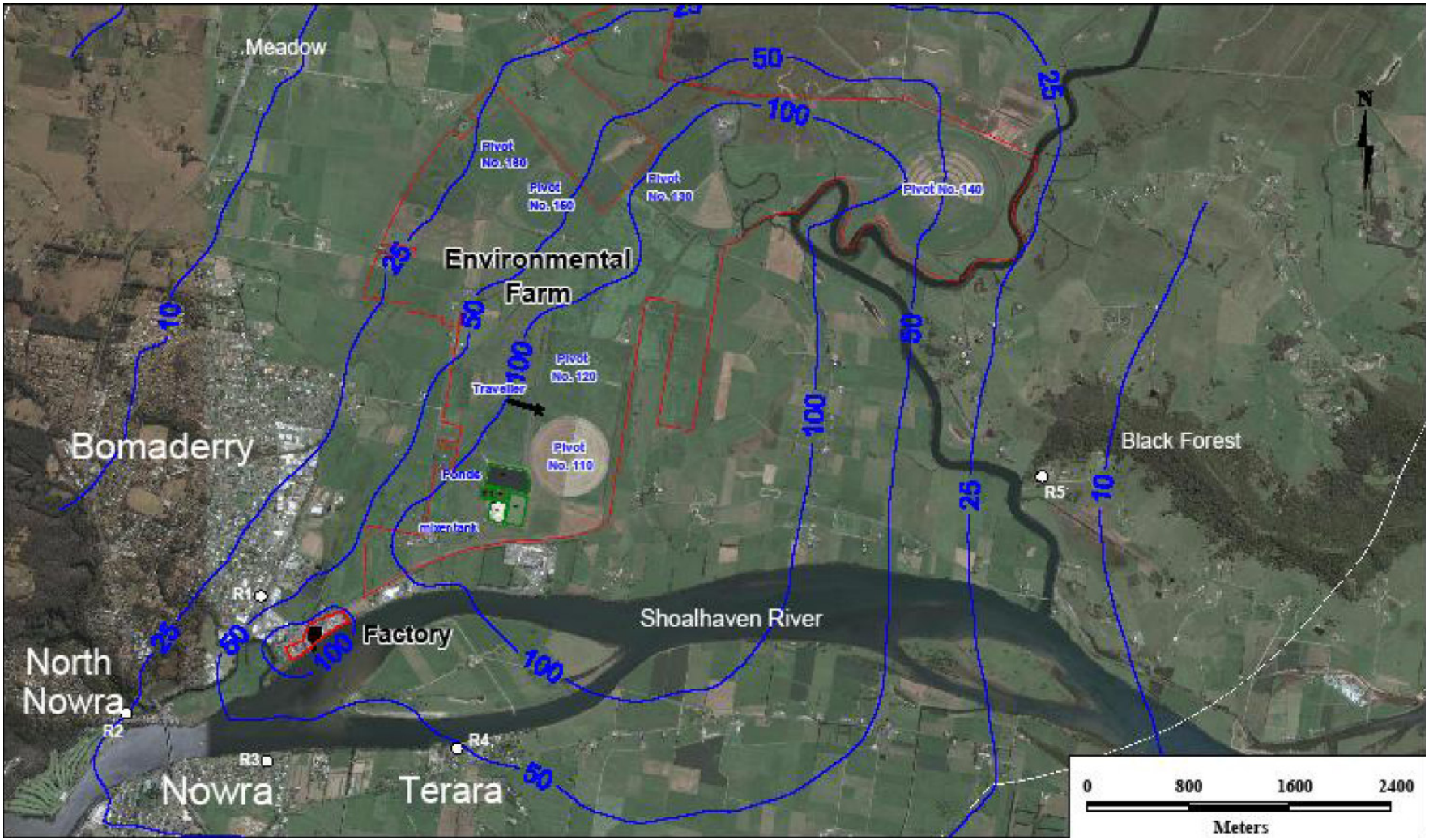

Figure 5: Odour Levels from the Factory and Environmental Farm without odour controls (Odour Audit 2007)

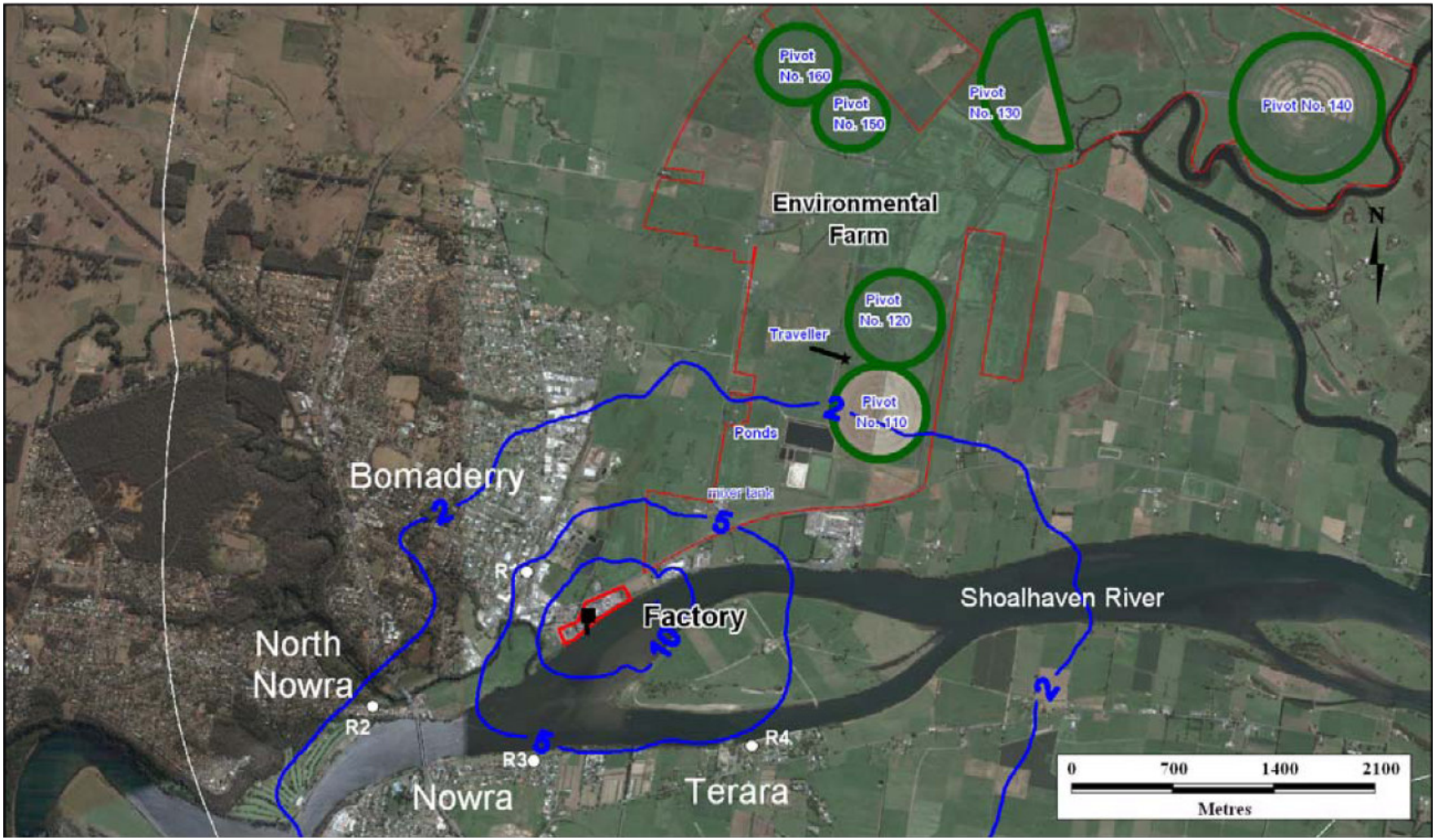

Figure 6: Odour Levels from the Existing Factory with Stage 1 Odour Controls

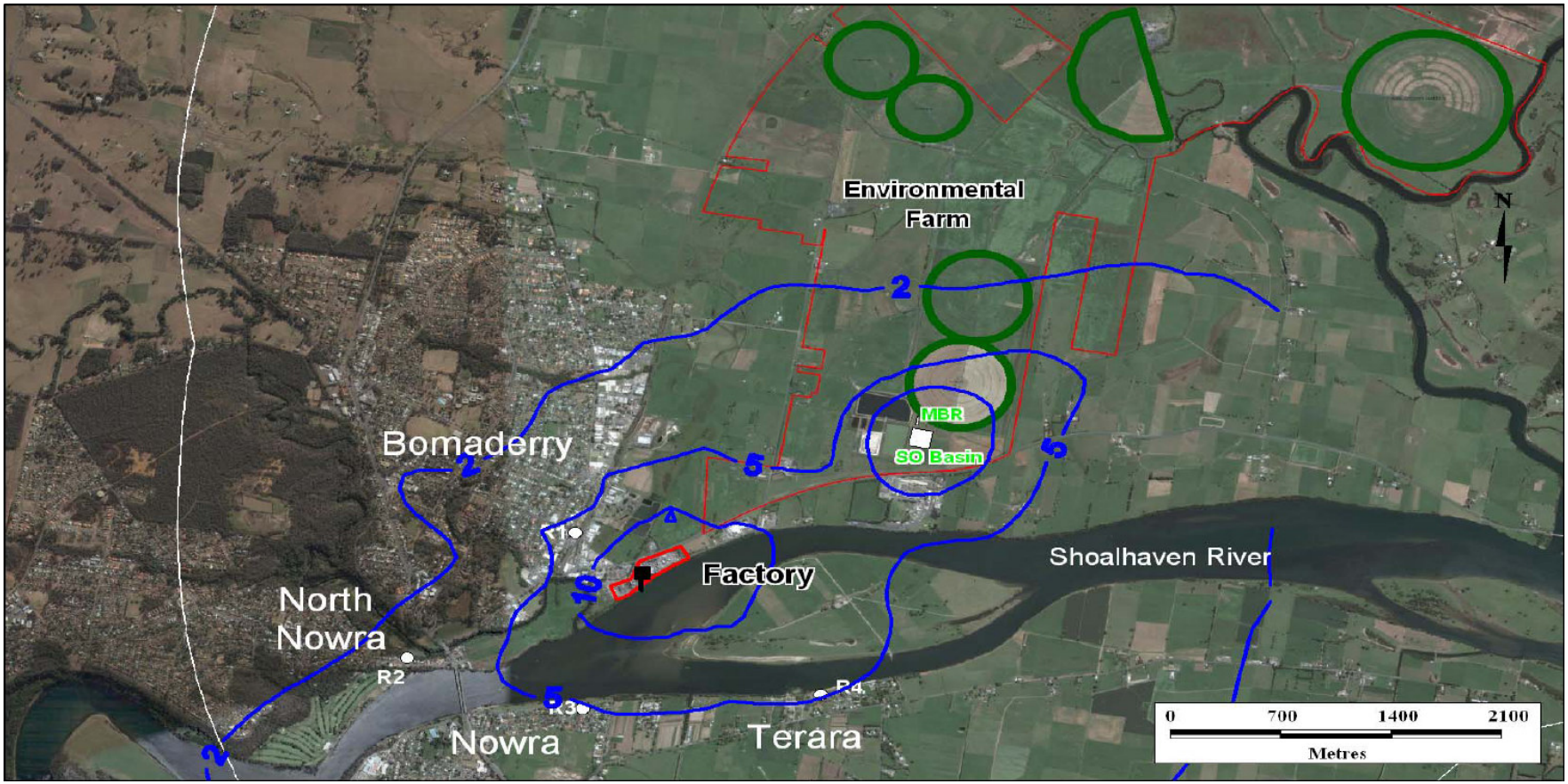

Figure 7: Odour Levels from the Expanded Factory and Environmental Farm with Stage 1 Odour Controls

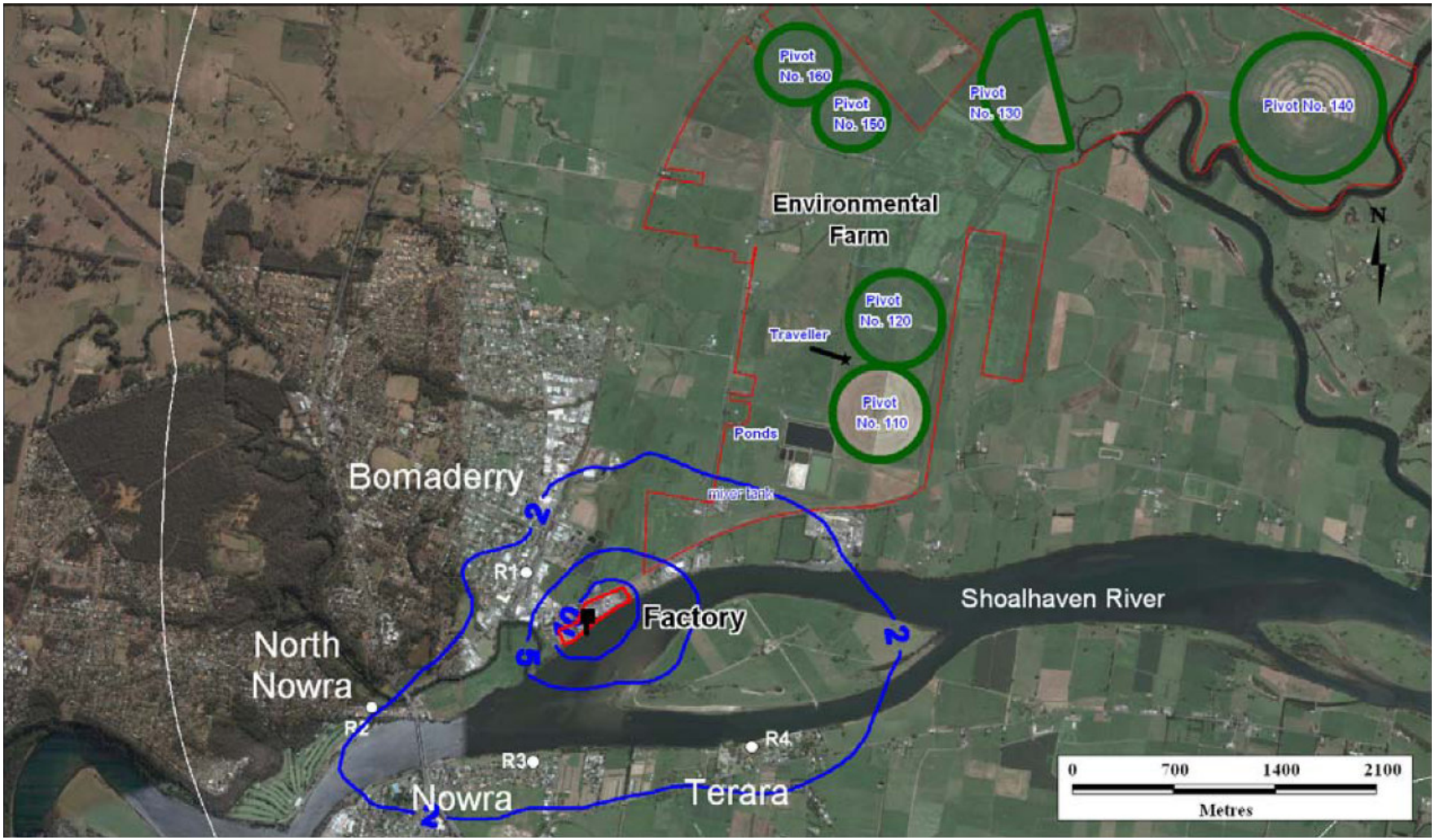

Figure 8: Odour Levels from the Expanded Factory with Stage 2 Odour Controls

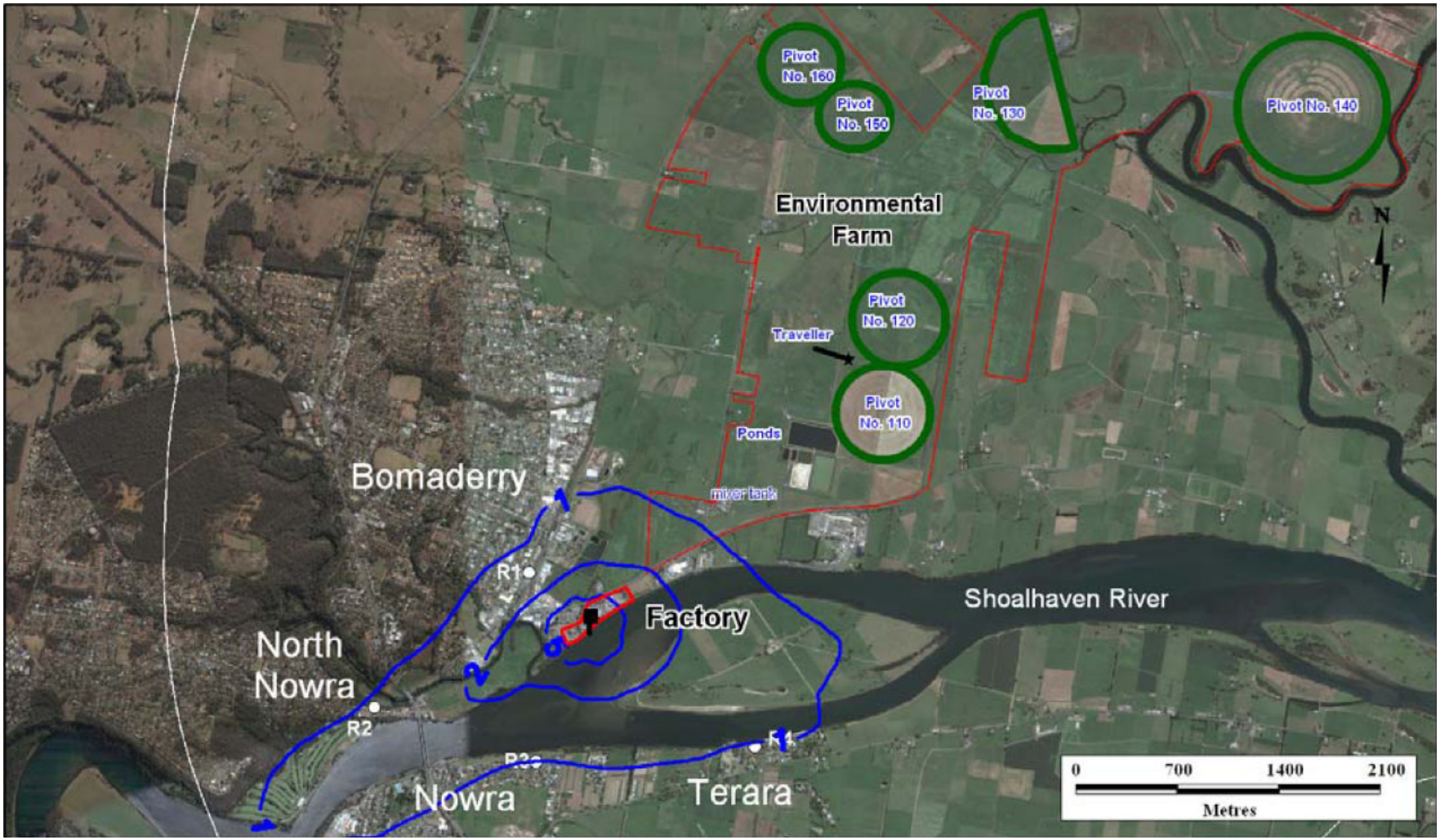

Figure 9: Odour Levels from the Expanded Factory with Stage 3 Odour Controls

4.2 Wastewater

Background

As noted in Section 1, wastewater has been managed in a variety of ways since the commencement of operations at the facility including discharge to the river and storage and irrigation on the Environmental Farm. The irrigation and wastewater storage ponds have been found to be a significant source of odour due to the COD and BOD levels in the wastewater from ethanol production.

The Court-required odour audit indicated that the Environmental Farm had an odour emission rate (OER) of 3,500,000 OUm^3/s including 3,090,000 OUm^3/s from irrigation, compared with a total OER from all factory sources of 670,800 OUm^3/s. The hedonic tone of odour from wastewater was described as mildly pleasant to mildly unpleasant, whilst odour from the mixer tank and Pond 4 had very unpleasant hedonic tones.

The odour audit recommended installation of a biological wastewater treatment plant and low mist nozzles on spray irrigators to significantly reduce odour. Shoalhaven Starches subsequently installed the low mist nozzles in 2007, reducing the OER by approximately 1,600,000 OUm^3/s.

Expansion Proposal

Shoalhaven Starches proposes to install a wastewater treatment plant (WWTP) by converting the approved Pond 7 into anaerobic and aerobic treatment ponds comprising a bulk volume fermenter and sulphur oxidation basin. A membrane bioreactor (MBR) plant and a reverse osmosis (RO) plant would also be installed.

Wastewater would be treated to varying levels throughout the process. Wastewater for use in irrigation would be treated through the anaerobic and aerobic ponds. Wastewater for use in the factory would be also treated in the MBR plant. Some of this wastewater would receive further treatment in the RO plant to achieve a suitable standard for use in the food production process. Retentate from the RO plant would be combined with the irrigation wastewater for use on the Environmental Farm. The proposed wastewater treatment system is outlined in Figure 10.

The wastewater treatment plant would substantially reduce the concentrations of pollutants in the wastewater as outlined in Table 5 below. It would also reduce the OER generated by the Environmental Farm to an estimated 27,500 OUm^3/s which should thereby comply with DECC's odour criteria at nearby residences.

Table 5: Pollutant Concentrations of Wastewater

Contaminants (parts per million)	***Existing Wastewater Quality***	***Predicted Wastewater Quality***		
		For Irrigation (An/aerobic treatment)	***For reuse in factory – Non food (MBR)***	***For reuse in factory – Food (RO)***
Chemical Oxygen Demand	3000	240	18	Will meet NHMRC[1] Drinking Water Guidelines 2004
Biological Oxygen Demand	2800	70	14	
Total Suspended Solids	2700	190	3	
Total Nitrogen	44	-	-	
Total Phosphorus	20	-	-	
pH	3.0-3.5	-	-	

[1] National Health and Medical Research Council

The EA indicated that changes to the composition of wastewater would impact soil in the following ways:

- soil salinity would be in the same or lesser range than under current irrigation conditions;
- the production level of ryegrass and kikuyu would not change, whilst the production of white clover would reduce by 25 to 48 percent; and
- soil nutrient levels would change and nitrogen and potassium fertilisers would need to be added.

The EA indicated that any adverse changes to soil quality would occur gradually, and could therefore be identified via routine monitoring. There are a number of management measures that could then be developed, including changing the volume of retentate used for irrigation. Shoalhaven Starches

therefore proposes to implement a monitoring program to identify any long term changes to soil quality and pasture productivity. The program would include monthly monitoring of wastewater quality and annual monitoring of soil, pastures and groundwater.

DECC has indicated that the proposed wastewater treatment plant is acceptable provided that detailed monitoring and operational processes are established. As part of this DECC has recommended that:

- baseline soil and groundwater conditions be identified;
- sustainability indicators for soil, groundwater and analytes be identified for monitoring, with groundwater monitoring to include other analytes than just magnesium;
- trends in soil and groundwater conditions be identified, and appropriate operational responses developed; and
- crop type, yield and irrigation techniques are consistent with the proposal, with changes to the current soil and crop system practices outlined in a management plan.

The recommended conditions of approval therefore require the development of a Wastewater Management Plan outlining the operational and monitoring practices to be undertaken. The plan is to address the requirements of the DECC. The Department considers that the wastewater treatment system should result in improved wastewater quality and reduced odour impacts, provided that it is developed in accordance with the EA, its impacts monitored and appropriate responses developed.

The facility currently generates approximately 4.6ML/day of wastewater. The proposal would generate approximately 8.1ML/day of wastewater, of which 4.5ML/day would be reused in the factory and 3.6ML/day would be discharged to the Environmental Farm for storage and irrigation. A water balance analysis in the EA indicated that the Environmental Farm had sufficient wastewater storage capacity for a range of rainfall conditions, and discharges to the Shoalhaven River would not be required.

Both the DECC and Department agree that at this stage, the Environmental Farm has sufficient storage capacity to cater for the current proposal.

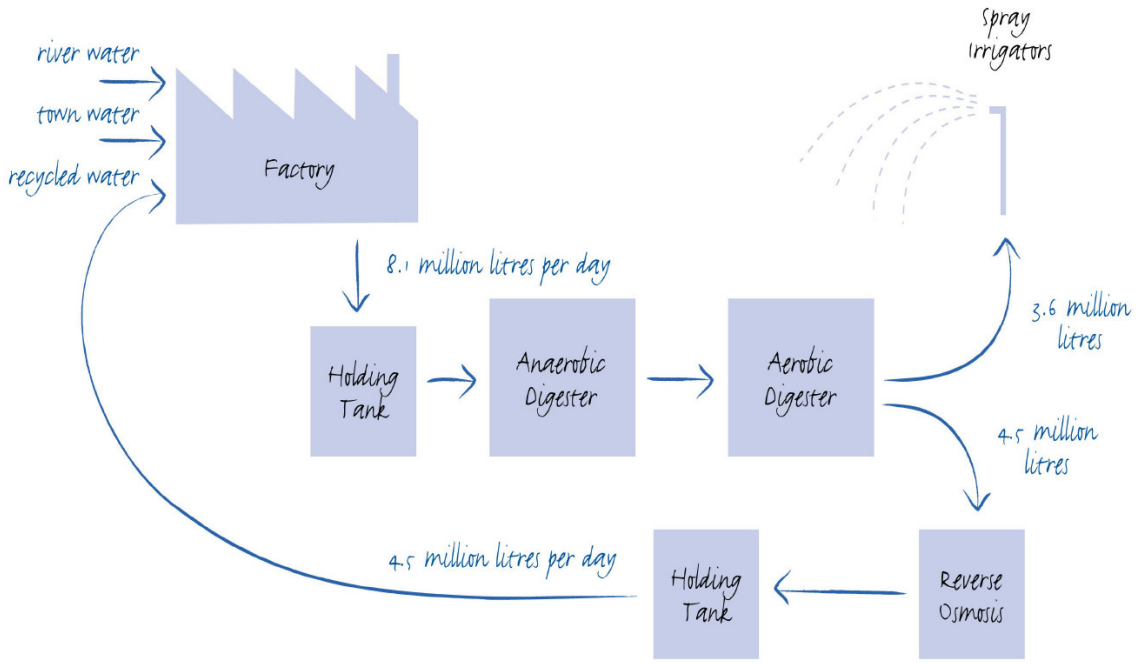

Figure 10: Proposed Wastewater Treatment System

4.3 Access and Transport

Traffic Generation

Shoalhaven Starches is located on the southern side of Bolong Road. The majority of heavy vehicles access the site from the Princes Highway from via Meroo Road, Cambewarra Road, Railway Street and Bolong Road, and a smaller number of restricted heavy vehicles accessing the site from Bolong Road (see Figure 11).

The EA estimates that the facility currently generates 150 heavy vehicle movements per day and approximately 900 light vehicle movements per day. A traffic survey undertaken in August 2007, however, indicated there were 1400 light vehicles movements and 300 heavy vehicle movements per day associated with the facility, including 113 light vehicle movements and 40 heavy vehicles movements in the AM peak.

The EA estimates that the proposal would result in an increase of 40 heavy vehicles movements and 50 light vehicle movements. These vehicles would continue to use the existing regional road network and would access the site via the four existing access points and proposed new access and egress points into / out of the packaging plant. The assessment has demonstrated that the increased vehicle movements, along with the existing vehicles identified in the August 2007 survey, can be accommodated by the existing road network and that key regional intersections would continue to operate satisfactorily.

Access

Access to the factory is currently provided from four points along the southern side of Bolong Road, namely:

- Access Point 1 (Eastern) which is a Type C intersection due to its proximity to the transition point of speed zones on Bolong Road from 100 to 60km/hr;
- Access Point 2 (Central), which is unpaved. It is not of sufficient width to allow eastbound vehicles on Bolong Road to pass a vehicles turning into the site;
- Access Point 3 (Western) which is designed as a paved Type A intersection; and
- Access Point 4 (Carpark) which provides a separate access egress into the carpark. The access point is utilised by staff vehicles and minor service/workshop demands. The accesses are not formally designed as Type A intersections.

These access points are outlined in Figure 11.

Shoalhaven Starches' traffic assessment indicates that the existing access points and proposed new intersection would operate at a satisfactory standard. Both the RTA and Council, however, have raised concern about the existing safety of Access Point 2, Access Point 3 and Access Point 4. Furthermore, the Department notes that requirements to upgrade these access points in a number of Council development consents since 1997, and in the Department consent in 2003 and the flour mill in 2007, are yet to be addressed. Whilst Shoalhaven Starches has been working to resolve these safety concerns, the Department understands that it has yet to reach an agreement with Council and the RTA about an appropriate standard required for each of these accesses.

To ensure that Shoalhaven Starches has sufficient time to resolves these safety issues, and ensure that the access points are upgraded to an appropriate standard for existing and proposed operations, the Department recommends that Shoalhaven Starches upgrade the access points to a standard approved by Council and the RTA within 12 months of the date of project approval.

Shoalhaven Starches also proposes to construct a heavy vehicle ingress off the northern side of Bolong Road, and a heavy vehicle egress, and light vehicle ingress and egress off Railway Road, to access the new packaging plant. Both the RTA and Council have raised concern about the location and design of the new heavy vehicle ingress due to its proximity to existing access points, and as it may restrict access into Council's pumping station. Both Council and RTA have therefore recommended that the Railway Road access point be used by heavy vehicles.

Shoalhaven Starches does not support the use of the Railway Road access point for both ingress and egress of heavy vehicles, as it would mean that a truck turning circle would be required to be provided. Shoalhaven Starches has indicated that there is insufficient space to provide this turning circle at the Railway Road part of the site without impacting on the proposed rail siding to be provided on this site. Furthermore, recent discussions between Council and the Department indicate that provision of a heavy vehicle ingress of Bolong Road may be feasible, if shared access to Council's pumping station could be provided.

The Department has therefore recommended that Shoalhaven Starches be required prepare a design for a heavy vehicle ingress off Bolong Road to the proposed packaging plant to the satisfaction of Council and the RTA, prior to the commencement of operations at the packaging plant.

Figure 11: Existing Site Access Points

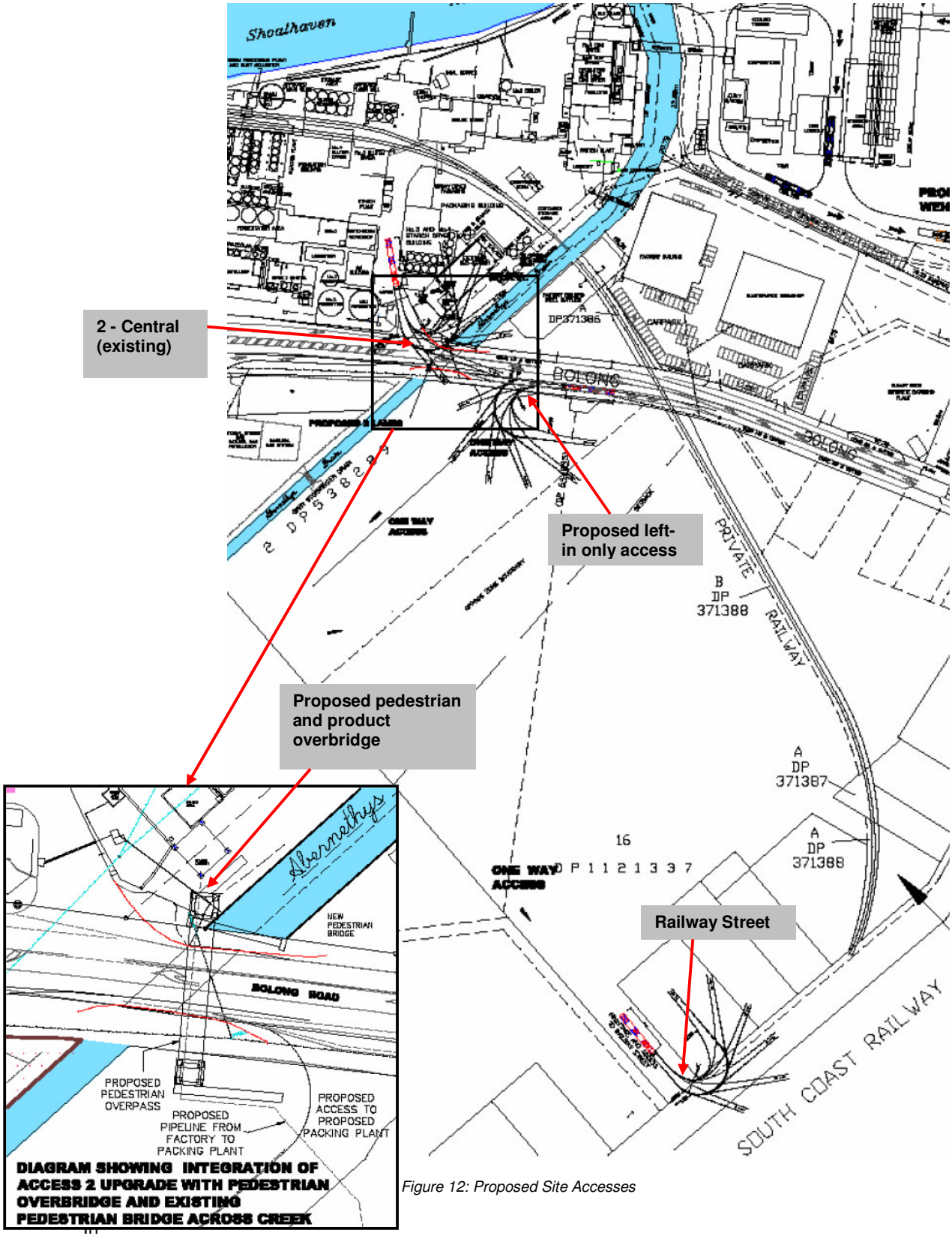

Figure 12: Proposed Site Accesses

Pedestrian Access

The facility currently generates pedestrian movements along the southern side of Bolong Road between the factory and office buildings towards the western boundary of the site. A pedestrian footpath, however, is only provided along part of Bolong Road, with pedestrians required to walk along the verge of Bolong Road in certain sections. A temporary pedestrian bridge across Abernethy's Creek does not meet appropriate pedestrian standards and is located across a number of lots owned by different entities including Council. The facility also currently generates pedestrian movements across Bolong Road between the factory and CO_2 gas plant, however, no formal pedestrian crossings are provided. Pedestrian access to Bomaderry shops is also via the northern side of Bolong Road.

The proposed upgrade to the facility would generate additional pedestrian movements including:

- movements across Bolong Road, between the factory and the proposed packaging plant site; and
- east west movements along the northern side of Bolong Road between the existing CO_2 plant and the proposed packaging plant and to access Bomaderry shops.

The Department understands that Shoalhaven Starches has been consulting with Council to design appropriate pedestrian facilities. As a result of these discussions, Council has recommended that the following pedestrian facilities be built by Shoalhaven Starches:

- a new pedestrian bridge over Abernathy Creek that meets the Australian Standards and AUSROADs best practice guidelines for pedestrian access;
- a 1.2 metre wide pedestrian pathway between Access Point 2 and the facilities offices;
- a pedestrian refuge on Bolong road between the factory and the CO_2 gas plant;
- a pedestrian refuge on Bolong Road between the factory and the new packaging plant; and
- a 1.2 metre wide pedestrian pathway on the northern side of Bolong Road between the CO_2 gas plant to the western boundary of Shoalhaven Starches land.

The Department considers that these pedestrian facilities should be provided by Shoalhaven Starches to adequately cater for the pedestrian movement of its staff. The Department has therefore included a recommended condition of approval requiring that Shoalhaven Starches design and provide these pedestrian facilities to the satisfaction of Council.

Rail Transport

The factory is serviced by a private rail spur that departs from the Bomaderry line passing from Railway Street across Bolong Road into the centre of the factory. The majority of raw materials are transported to the site via rail and some products are also exported via rail. Currently there are 20 train movements a week; 10 inbound and 10 outbound to the site. However, as the rail siding on the factory site is too short to a accommodate full length train, it is generally divided on the northern side of Bolong Road, with parts of it being shunted across Bolong Road to the factory for unloading. As a result there are currently 40-50 movements across Bolong Road per week.

The current project includes construction of a new 270m long rail siding on the northern side of Bolong Road to directly service the proposed packing plant and container storage area, and lengthening of the current rail siding on the main factory site and providing a new loop siding to enable full length trains to access the factory site thereby reducing shunting.

The proposed expansion project would result in an additional 4 train movements a week. The proposed alterations to rail infrastructure, however, would result in an overall reduction of 16-24 movements a week across Bolong Road, reducing traffic disruptions and noise impacts on nearby residences.

Council raised concerns about the safety of the existing rail level crossing of Bolong Road, in particular the absence of boom gates and concerns about the safety of Shoalhaven Starches employees who currently guide trains across Bolong Road.

Whilst the reduced train movements along Bolong Road should significantly improve the safety of this rail crossing, the Department considers that current and future operation of the rail crossing must be managed so that the safety of both road users and Shoalhaven Starches employees who guide the train, are maximised. The Department has therefore recommended that Shoalhaven Starches develop and implement a safety study of the rail crossing, in consultation with relevant stakeholders.

RailCorp raised concern that proposed new trains of 800 metres in length would be unable to fit within the Shoalhaven Starches site. Shoalhaven Starches, however, has indicated that sufficient space is available on the southern side of Bolong Road to cater for the longer trains.

RailCorp has also raised concern about the timetabling of trains in the EA is incorrect and its infrastructure may not be able to cater for longer trains required by Shoalhaven Starches. The Department understands that RailCorp and Shoalhaven Starches are currently negotiating about these matters, including new infrastructure that may be required to service these trains. The Department is satisfied that these commercial arrangements can be managed through existing rail access approvals.

Parking

The provision of adequate off-street parking for factory workers has been raised as a concern by Council for a number of years. Council has noted the occurrence of illegal parking along the verge of Bolong Road adjacent the factory and has installed 'no parking' signs along this section of the road. The transport assessment also noted that parking along the road verge does occur and recommended that Shoalhaven Starches continue to reinforce to its workers and contractors the need to park within allocated spaces on site.

Shoalhaven Starches estimates that there is a current operational peak parking demand for 180 car parking spaces, based on daytime shift and staff numbers and visitor requirements. The proposal would increase peak parking demand by 15 spaces during operation, and by an additional 150 car spaces during the peak construction period. A total of 345 car spaces are therefore required to be provided on site to meet peak construction and operational parking demand.

Shoalhaven Starches has indicated that there are currently 259 parking spaces on site and that the proposal include the provision of 94 more car spaces. Approximately 345 car spaces would therefore be provided on site.

Whilst a preliminary review of the parking proposal indicates that sufficient parking should be available on-site to address construction and operational demand, neither Council nor the Department have been provided with a parking plan for the facility that demonstrates that sufficient and adequate parking is provided. Furthermore, Council has raised concern that most on-site parking is not formally provided or marked. The Department has therefore recommended conditions requiring Shoalhaven Starches to provide at least 90 additional parking spaces on site, to ensure that all parking complies with relevant Australian Standards, and to ensure that all vehicles associated with the project do not park or queue on the public road network at any time.

4.4 Noise

Noise limits for existing operations are contained in the facility's Environment Protection Licence (EPL). Bi-annual noise monitoring of the facility indicates that it currently complies with these licence limits. The noise assessment in the EA indicates that the EPL noise limits would continue to be met provided that that noise emissions from the proposed plant and equipment are at least 15dB(A) below the current license limits. The EPL noise limits and project specific noise levels are outlined in Table 6 below.

Table 6: EPL Limits and Project Specific Noise Levels

Location	***EPL Limit dB(A) $LA_{10(15minute)}$***	***Project Specific Noise Level dB(A) $LA_{10(15minute)}$***
Locations in Terara on south side of Shoalhaven River	38	23
Locations in Nowra on south side of Shoalhaven River	38	23
Locations in Meroo Street, Bomaderry	42	27
Other residential locations in Bomaderry	40	25

An initial noise assessment indicated that the project would exceed the project specific noise levels without noise mitigation. The assessment therefore identified mitigation measures that would need to be implemented to ensure compliance with the project levels and the EPL limits. Mitigation measures include:

- housing of identified equipment in buildings constructed of Ultrapanels with specific Rw values;
- housing equipment with high sound power levels in separate rooms;
- reduction of fan speed in cooling towers during night time periods; and
- construction of solid masonry walls around the north, west and east perimeters of the container loading area.

The assessment also identified management requirements for on-site train movements and the new container loading area, including:

- prohibition of train movements on the new spur line between 10pm and 7am;
- prohibition on the loading of trains in the new container loading area between 10pm and 7am; and
- restricting the number of containers stacked near to the wall of the container loading area during the night time period.

Both the DECC and the Department consider that there is some uncertainty about the predicted noise levels from the proposal, as they were only based on conceptual designs of new plant and equipment, and associated mitigation measures. Furthermore, neither the existing noise limits in the EPL, nor the current noise assessment, were developed strictly in accordance with the contemporary criteria under DECC's *Industrial Noise Policy*.

Notwithstanding this, the DECC has advised that at this stage, the existing EPL noise limits should continue to be applied for the project, and is satisfied that that these limits would be met, provided that the project specific levels outlined in Table 6 are met. The recommended conditions of approval therefore require compliance with these noise limits. The Department has also recommended a condition requiring Shoalhaven Starches to develop and implement a detailed Noise Management Plan for the project, including a program to investigate ways of reducing noise impacts, and a comprehensive noise monitoring program.

Construction Noise

The project would be constructed over a 12 month period. Noise would be generated by a variety of activities, most notably from the piling and foundation works and pouring of concrete for concrete slabs which would take approximately 4 months to complete. The noise assessment identified the DECC's construction noise goal for works under 26 weeks for this project. The assessment indicated that this noise goal could be met for all construction activities, excluding piling activities for the packaging plant, however, no noise predictions were provided.

Whilst the Department acknowledges that this construction noise assessment lacks sufficient data to quantify the likely noise impacts from construction, it considers that the construction activities proposed are unlikely to result in adverse amenity impacts at surrounding residences provided that construction hours are limited to day-time only, and no construction is undertaken on Sundays and Public Holidays.

Road Traffic Noise

The project would generate up to 40 additional heavy vehicle movements per day, which would be evenly spread across day and night time periods. In particular, the assessment indicated that there would be 19 additional heavy vehicle trips between 10pm and 7am including up to 14 heavy vehicle movements utilising Railway Street, Cambewarra Road and Meroo Road to access the Princes Highway.

The noise assessment indicates that noise emissions from increased heavy vehicle movements would not exceed the road traffic noise criteria outlined in the *Environmental Criteria for Road Traffic Noise* (ECRTN) criteria on all routes. In particular, the assessment demonstrated that as increased heavy vehicle use of Railway Street, Cambewarrra and Merro Roads would not increase existing traffic noise levels by more than 2dB(A), the ECRTN criteria would continue to be met.

Notwithstanding this, Council has requested that all heavy vehicles from the facility utilise the Bolong Road to Princes Highway route only at night-time, as it is the designated heavy vehicle route through Bomaderry. The Department supports this and has incorporated this requirement in to the recommended conditions of approval.

Rail Traffic Noise

The proposed ethanol expansion would result in four additional train movements per week, however, movements across Bolong Road would reduce by approximately 50 percent. In order to minimise rail traffic noise, Shoalhaven Starches has committed to ensuring that no night-time train movements occur along the new spur line at the container loading area.

Several submissions from the general public raised concern about noise from night operations. The noise assessment indicated, however, that the increase in train movements along the main line would be minimal and unlikely to significantly increase noise impacts at residences.

4.5 Flooding

The Shoalhaven Starches factory and Environmental Farm are located on the floodplain of the lower Shoalhaven River. The EA included an assessment of the potential impacts of the proposed expansion on flooding, including the loss of floodplain storage volume and the loss of flow area.

The assessment built on previous flood modelling undertaken for the area and focussed on the cumulative impacts of all development on the floodplain since 1990.

The impacts of all development on the floodplain since 1990 would have the greatest effect at the Shoalhaven Starches factory site, with an increase in flood depth of +0.11m experienced during a 1 in 20 year flood event. Off-site impacts would occur immediately west of the factory to a lesser degree, (+0.02m during a 1 in 20 year event); at the Paper Mill during a 1 in 50 year and 1 in 100 year event; at five residences in Hannigans Lane during the 1 in 100 year event (+0.04m) and at some commercial and industrial properties north-west of the factory during the 1 in 20 year event (+0.04m). It is important to note that all these properties would be affected by floodwaters, however, regardless of these developments.

The assessment estimated the economic impacts of incremental increases in flood levels as a result of all development on the floodplain since 1990, concluding that the net present value of damages for all affected properties (excluding Shoalhaven Starches factory) would be $12,900. Whilst this value is attributed to all developments since 1990, Shoalhaven Starches would be responsible for a reasonable portion of this.

Two submissions raised concern about the economic impacts of increased flood depths on properties in Hannigans Lane and raised the issue of compensation for the potential economic impacts. The Department notes that earlier consents issued by the Department addressed the impact of flooding via a requirement to provide compensation for any impacts of flooding arising from the proposal. To address flooding associated with the project, the Department has recommended a condition requiring Shoalhaven Starches to prepare and implement a Flood Mitigation and Management Plan, which provides for:

- implementation of reasonable and feasible measures to minimise onsite and offsite flooding;
- procedures for monitoring, assessment and compensation of flood impacts; and
- contribution toward local flood initiatives including the ALERT Flood Warning System operated by the Council and Bureau of Meteorology.

4.6 Other Issues

Other issues raised during the assessment process and the Department's consideration of each are summarised in Table 7 below.

Table 7: Other Issues

Issue	Consideration	Recommendations
Hazards and Risks	• The preliminary hazard analysis indicated that potential hazards associated with the existing and expanded project would not have an offsite impact. • The Department considers that proposal is unlikely to generate off-site hazardous risks, provided conditions are met.	• A Fire Safety Study, Hazard and Operability Study, a Final Hazard Analysis and a Construction Safety Study must be prepared prior to the commencement of construction to minimise hazard impacts. • A Transport of Hazardous Materials Plan, an Emergency Plan and Safety Management System must be prepared prior to the operation to ensure adequate systems are in place to manage hazardous risks.
Greenhouse gas emissions	• The facility currently generates 571,190 t CO_2-e/yr Scope 1, 2 and 3 greenhouse gas (GHG) emissions which would increase to 801,206 t CO_2-e/yr for operation and construction averaged over 30 years with the project; • The project includes processes to reduce GHG emissions including an increased reliance of natural gas, and reuse of methane from the wastewater treatment plant; • The Department considers that the proposal would result in a minor addition to GHG emissions in Australia and that GHG emissions could be minimised through implementation of an Energy Savings Action Plan.	• An Energy Savings Action Plan must be prepared to outline greenhouse gas monitoring, abatement and energy efficiency measures.
Impact on Food Supply	• One public submission raised concerns about the impact of ethanol production on food production and supply. • The Department acknowledges these concerns and the wider debate on this issue with respect to biofuel production. • However, the ethanol produced at the plant is produced from lower grade starch and waste products from the plant. In this regard, the ethanol produced at the plant is value adding, turning a waste product (which was formerly discharged to the Shoalhaven River) into a valuable resource. The process also improves or creates a market for low value or damaged crops and crop waste. • The Department is satisfied that the project would not significantly affect food supply, and that the project is consistent with the NSW Government's mandate on biofuel production.	• The Department is satisfied that the project would not significantly affect food production and supply.
Acid sulphate soils	• The area of the factory, packaging plant, and Environmental Farm have been identified as having a low to high probability of Acid Sulphate Soils (ASS); • ASS was found at the site of the packaging plant, fire and gas system and water treatment plant; • Shoalhaven Starches has committed to prepare and implement an ASS Management Plan during construction.	• An ASS Management Plan is to be implemented.

Issue	Consideration	Recommendations
Contamination	• As soil containing asbestos and petroleum hydrocarbon were detected at the proposed packaging plant site , Shoalhaven Starches has committed to prepare and implement an asbestos management plan, train staff in the detection and management of contaminated soils, and to appropriately dispose of excess soil; • Shoalhaven Starches has also committed to test and appropriately manage groundwater intersected during construction, as elevated zinc levels have been detected in the groundwater. • Shoalhaven Starches has committed install bunding around the new ethanol facilities and to identify areas of the site where appropriate bunding has not been installed, and to install, if necessary	• A site auditor is to be commissioned to assess, if necessary remediate, and verify that the site is suitable for the intended purpose; • A Construction Safety Study is to be implemented, excess soil is to be disposed of in accordance with DECC's Waste Classification Guidelines (2008) and groundwater intersected during construction is to be appropriately tested and managed. • Appropriate bunding is to be installed at new ethanol facilities on the site, and that Shoalhaven Starches is to identify and provide bunding for older section of the site, if required, within 12 months of this approval.
Riparian vegetation and riverbank stability	• Site riparian zones are in poor condition due to clearing, poor setbacks, inappropriate planting and weeds; • The proposed cogeneration plant would be located within 20 metres of Bomaderry Creek and the proposed chemical storage facility and Dryer No.5 would be located within 10m and 15m of Abernethy Creek respectively; • DWE has recommended that a minimum average 20m wide riparian corridor be provided across the site and a 15m minimum stock exclusion zone be provided around Broughton Creek; • Shoalhaven Starches has committed to provide a minimum average 20m wide riparian corridor, excluding the factory site, however, a 15m minimum stock exclusion zone is not considered feasible as 5kms of electrical fencing setback has been installed since 2003 which is 5m to 100m from Broughton Creek; • The Department agrees that a 20m wide riparian corridor excluding the factory site, and the existing stock exclusion zone, is acceptable provided Shoalhaven Starches rehabilitates riparian zones within the site.	• A vegetation management plan must be prepared and implemented outlining rehabilitation and maintenance of the riparian zone.
Flora and fauna	• The factory, Environmental Farm and packaging plant site are heavily cleared for industrial and grazing use; • No green and golden bell frogs were identified during a targeted survey; • The EA indicated that the proposal would have little impact of flora and fauna; • The EA recommended that native plants should be used for screen planting and additional planting undertaken around Shoalhaven River.	• Endemic trees and shrubs are to be used in landscaping of the site; • A Vegetation Management Plan, including a Landscape Plan, is to be prepared and implemented outlining ways to restore the waterways and riparian zones through the site.

Issue	Consideration	Recommendations
Visual impact	• The site is clearly visible from Bolong Road and parts of Bomaderry, and more distantly from the Princes Highway and Terara; • Earlier consents have required the planting of landscaping along Bolong Road to offset the visual impact of the proposal; • The proposal includes construction of a new packaging plant on a vacant site of Bolong Road linked by a bridge over Bolong Road; • The Department considers that the visual impacts of the proposal would be offset along Bolong Road and the Shoalhaven River, provided that Shoalhaven Starches prepare a Landscaping Plan to offset the visual impact of the existing and proposed facility, and it designs the pedestrian and product overbridge in consultation with the RTA and Council to provide a suitable entrance into Bomaderry.	• A Landscape Plan is to be prepared in consultation with Council, to identify screen planting to be undertaken to reduce the visual impact of the proposal; • Lighting is to be designed, so that it does not create a nuisance for surrounding properties or the public road; and • The pedestrian and product overbridge must be designed to provide a gateway to the Bomaderry-Nowra area. The design of the pedestrian and product overbridge must be approved by Council.
Air quality	• Shoalhaven Starches would implement steps to minimise dust generation during construction; • Nitrogen dioxide, sulphur dioxide, carbon monoxide, heavy metals, volatile organic compounds and polycyclic aromatic hydrocarbons that would be generated by the proposal would comply with the relevant DECC criteria at the closest receivers; • As in-stack TSP concentration for coal burners currently exceed regulations, Shoalhaven Starches has committed to initially clean and repair existing emission control system, and subsequently install a baghouse or gas burner, if required;	• Dust is to be minimised during construction; • In addition, Shoalhaven Starches is required to comply with applicable air quality criteria, and prepare and implement an Air Quality Monitoring Program for the project.
Waste	• The proposal would generate a variety of wastes including 2.8 tonnes of carbon filteraid for offsite disposal, and up to 474 tonnes of boiler and fly ash which is used on the Environmental Farm and sold for use in a compost mixture.	• A Waste Management Plan is to be prepared for the project; • Waste generated on the site is to be classified in accordance with the DECC's Environmental Guidelines: *Assessment, Classification and Management of Liquid and Non-Liquid Wastes* and disposed of lawfully.
Heritage and archaeology	• Shoalhaven Starches conducted a survey of the site, in consultation with a relevant indigenous representative. • The EA concluded that there is a low likelihood of indigenous heritage artefacts at the proposed site, due to the high level of land use change; • No non-indigenous heritage items would be impacted by the works, including the weatherboard iron farm house on the Environmental Farm which was identified in Council's Heritage Study.	• The Department considers that the proposal is unlikely to impact indigenous or non-indigenous heritage items.
S.94 contributions	• Council has recommended that s.94 contributions of $700,346.95 be paid by Shoalhaven Starches in accordance with its contributions plan. • The Department understands that Council is currently reviewing its contribution rates.	• The Department has recommended a condition requiring Shoalhaven Starches to pay a contribution in accordance with the applicable s.94 contributions plan.

5. RECOMMENDED CONDITIONS

The Department has prepared recommended conditions of approval for the project (see Appendix B), and summarised these conditions in Appendix A. These conditions are required to:

- prevent, minimise, and/or offset adverse impacts of the project;
- set standards and performance measures for acceptable environmental performance;
- ensure regular monitoring and reporting; and
- provide for the ongoing environmental management of the project.

6. CONCLUSION

The Department has assessed the project application, EA, submissions on the project and Shoalhaven Starches' response to submissions, in accordance with the relevant statutory requirements.

This assessment has found that the project would significantly reduce (by some 90%) the longstanding odour impacts of the existing Shoalhaven Starches facility, to a level that would comply with established odour criteria. The assessment also found that the proposed increase in ethanol production would not significantly increase odour emissions, provided that certain odour controls are implemented prior to the production increase.

The Department has recommended conditions requiring such measures to be implemented before production increases, or within one year, whichever is sooner. This would ensure that the substantial odour controls are implemented at an early stage to greatly reduce the existing odour impacts on the community.

Together with a range of other recommended conditions to control and manage odour and other environmental impacts, the Department is satisfied that the project can be managed in accordance with applicable criteria and guidelines, and to an acceptable level of environmental performance.

The Department also recognises that the project also has a number of significant socio-economic benefits, including a direct capital investment in the factory of $200 million, and the generation of an additional 25 jobs on the South Coast. Further, the project would boost supplies of ethanol for the fuel industry, and help to meet the NSW Government's renewable fuels target.

On balance, the Department is satisfied that the project's benefits significantly outweigh any residual costs, and that it is in the public interest and should be approved, subject to conditions.

7. RECOMMENDATION

It is RECOMMENDED that the Minister:

- consider the findings and recommendations of this report;
- approve the project application, subject to conditions, under section 75J of the *Environmental Planning and Assessment Act 1979*; and
- sign the attached project approval (see Appendix B).

Signed 10 January 2009
Chris Ritchie
A/Director
Major Development Assessment

Signed 10 January 2009
Chris Wilson
Executive Director
Major Project Assessment

Sam Haddad
Director-General

APPENDIX A: SUMMARY OF CONDITIONS OF APPROVAL

Aspect	Condition	Requirement
Schedule 2: Administrative Conditions		
Limits on Approval	6	Restrict ethanol production to 300ML/yr and flour production to 265,000t/yr
	7	Requirement to seek Director-General's approval before increasing ethanol production, including requirement to assess odour
	13	Requirement to pay development contributions
Schedule 3: Specific Environmental Conditions		
Odour	1	Restriction on causing offensive odour
	2-3	Requirement to implement mandatory odour controls within 12 months, or before ethanol production increase, whichever is sooner
	4	Requirement to prepare Odour Management Plan
	5-6	Requirement to undertake Independent Odour Audits
Air Quality	7-9	Requirements to monitor and manage air quality
	10	Requirement to prepare and implement an Air Quality Monitoring Management Program
Noise	11	Restriction on hours of operation
	12	Noise limits
	13-14	Minimisation of construction noise and requirement to prepare and implement Noise Management Plan
Soil, Water and Energy	15	Restriction on polluting water
	16	Requirement to prepare a Water Savings Action Plan and an Energy Savings Action Plan
	19-26	Requirements for Erosion and Sediment Control Management Plan, Site Audit Statement, Acid Sulfate Soils Management Plan, Stormwater Management Plan, Wastewater Management Plan and Flooding Management Plan
Transport	27	Requirement to upgrade existing accesses to factory
	28-29	Requirement to undertake road works to the packing plant and prepare a Construction Traffic Management Plan.
	30	Requirement to upgrade pedestrian facilities
	31-35	Requirements on internal roads and parking, night-time heavy vehicle restrictions, railway crossings
Hazards	36-37	Requirement to prepare Pre-construction Hazard Studies
	38-39	Requirement to prepare Pre-commissioning Hazard Studies
Waste	41	Requirement to prepare a Waste Management Plan
Landscape	42	Requirements on lighting
	43	Requirement to prepare a Vegetation Management Plan including a Landscape Plan
Schedule 4: Additional Procedures		
Environmental Management	1	Requirement to prepare Environmental Management Strategy
Environmental Reporting	2	Requirement to report incidents
	3	Requirement to report annually
Auditing	4-6	Requirement to undertake environmental audits
Access to Information	7	Requirement to make information publically available

APPENDIX B: CONDITIONS OF APPROVAL

APPENDIX C: INDEPENDENT ODOUR REVIEW

APPENDIX D: CONSIDERATION OF ENVIRONMENTAL PLANNING INSTRUMENTS

Section 75I(2) of the *Environmental Planning and Assessment Act 1979* requires that reference be made to the provisions of any environmental planning instrument that would (but for Part 3A of the Act) substantially govern the carrying out of the project. Consideration of the project in the context of the objectives and provisions of the relevant environmental planning instruments is provided below.

State Environmental Planning Policy (Infrastructure) 2007
State Environmental Planning Policy (Infrastructure) 2007 (Infrastructure SEPP) commenced in January 2008, consolidating and updating a number of State planning instruments, including the SEPP 11 – Traffic Generating Developments. The Infrastructure SEPP details planning provision and development controls for infrastructure works and development located adjacent to particular types of infrastructure development. However, the Infrastructure SEPP does not apply to project applications which were lodged but not determined before the commencement of the policy. As the project application was lodged prior to the commencement of the Infrastructure SEPP, the provisions of this SEPP do not apply to the project. Notwithstanding this, the project was referred to the RTA for comment in accordance with the Infrastructure SEPP.

State Environmental Planning Policy No. 14 – Coastal Wetlands
SEPP 14 aims to protect coastal wetlands within NSW outside of the Sydney Metropolitan Area. There is one SEPP 14 wetlands on the Environmental Farm. The project would not impact on this SEPP 14 wetland.

State Environmental Planning Policy No. 33 – Hazardous and Offensive Development
SEPP 33 aims to identify proposed developments with the potential for significant off-site impacts, in terms of risk and/ or offence (odour, noise etc). A development is defined as potentially hazardous and/ or potentially offensive if, without mitigating measures in place, the development would have a significant risk and/ or offence impact, on off-site receptors. SEPP 33 was considered as part of the project. A number of hazard related conditions have been recommended in accordance with the provisions of the SEPP.

State Environmental Planning Policy No. 44 – Koala Habitat Protection
SEPP 44 aims to manage and conserve koala habitat to prevent declines in current populations. Under clause 9 of the SEPP, the consent authority is not to grant consent unless it is satisfied that any "potential koala habitat" is not "core koala habitat" as defined under the SEPP. The Department is satisfied that the project would not affect any potential or core koala habitat.

State Environmental Planning Policy No. 55 – Remediation of Land
SEPP 55 deals with the remediation of contaminated land. The EA indicates that the site is generally not contaminated, however a small area of petroleum hydrocarbon and asbestos contamination was identified. The Department is satisfied that the project can be undertaken in a manner that is consistent with SEPP 55, subject to remediation (if necessary) and certification from a site auditor that the site is suitable for its intended use. The Department has recommended a condition in this regard.

State Environmental Planning Policy No. 71 – Coastal Protection
State Environmental Planning Policy No. 71 – Coastal Protection (SEPP 71) applies to the site as it is within the coastal zone. SEPP 71 aims to protect and manage the NSW coast through improving public access, protecting Aboriginal cultural heritage, protecting visual amenity and coastal habitats and managing the scale, bulk and height of development along the coast. The Department is satisfied that the project is broadly consistent with the aims and other matters for consideration in the SEPP 71. The project would significantly decrease the odour impacts of the existing facility, and can be undertaken in a manner which would not result in any other significant environmental impacts.

Illawarra Regional Environmental Plan (REP)
The REP applies to the site. Key provisions relevant to the project include those in Division 2 of Part 2 (Development applications – rural lands), Part 6 (Provisions relating to industry), Part 11 (Provisions relating to waste disposal), Part 13(Provisions relating to coastal lands, wetlands and other water bodies), and Part 17 (Provisions relating to high rise buildings). The Department is satisfied that the project is broadly consistent with these and other provisions of the REP. In particular, clause 139 of the REP requires the Director-General to consider a range of environmental matters for proposed buildings greater than 11 metres in height. The Department has reviewed these matters and is satisfied that the project would not result in any significant impacts.

Shoalhaven Local Environmental Plan 1985
The *Shoalhaven Local Environmental Plan 1985* is applicable to the site and provides development controls for development in the Shoalhaven local government area. The project is located in the 4(e) Industrial "E" (Restricted Development) and 1(g) Rural "G" (Flood Liable) zones under the LEP, and the relevant project components are permissible with consent in these zones. The Department is satisfied that the project can be conducted in a manner that is consistent with the relevant environmental and special provisions of the LEP.

APPENDIX E: SHOALHAVEN STARCHES' RESPONSE TO SUBMISSIONS & ADDITIONAL INFORMATION

APPENDIX F: SUBMISSIONS

APPENDIX G: ENVIRONMENTAL ASSESSMENT