SHOALHAVEN STARCHES

ROUNDTABLE on SUSTAINABLE BIOMATERIALS (RSB) ENVIRONMENTAL & SOCIAL MANAGEMENT PLAN (ESMP)

Table of Contents

1 Introduction 2
2 Background Information 3
2.1 Environmental Assessment Process 4
2.2 Licences and Approvals 5
3 Project Description 7
3.1 ESMP Scope 7
4 Description of the Affected Environment 7
5 Environmental and Social Policies, legislation & standards 10
6 Structure, content and implementation schedule for specific ESMP's 11
6.1 RSB Principles & Criteria ESMP's 11
7 Roles and Responsibilties 13
8 Environmental & Social Monitoring Programme 13
9 Conclusion 13
Appendix A: RSB Scope 14

1 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. The history of the Shoalhaven Starches site and major developments are described below:

- 1970 - The Shoalhaven Starches site was first established in 1970 to processes wheat flour into a starch & gluten.
- 1973 - Glucose Plant established as an adjunct to the starch plant.
- 1985 -Environmental Farm established.
- 1991 - Construction & operation of effluent storage ponds on Environmental Farm and cessation of wastewater discharge into the Shoalhaven River.
- 1991 -Ethanol Plant was constructed to process low grade starch and wastage from the starch and glucose syrup production processes.
- 1999 - additional ethanol distillery was constructed and the company began to supply ethanol blended fuel to the New South Wales fuel market.
- 2001 - Installation of BOC plant adjacent to the Shoalhaven Starches site to collect carbon dioxide emissions from the ethanol plant.
- 2003 - Installation of Stillage Recovery, expansion of grain, glucose, starch and ethanol plants and extension of environmental farm irrigation area.
- 2011 -Installation of Flour Mill on the Shoalhaven Starches site.
- 2011 -Ethanol expansion, installation of waste water treatment and odour reduction measures.
- 2012 – 2023 – Ongoing installation of approved plant modifications in accordance with Shoalhaven Starches Development Consent 06_0228.

Shoalhaven Starches processes flour into a range of products including specialty starches, gluten, glucose syrups, ethanol and Dried Distillers Grain.

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

The Shoalhaven Starches Expansion Project sought to increase ethanol production at the Bomaderry plant in a staged manner from 126 million litres per year to 300 million litres per year.

To accomplish the increase in ethanol production, this project required a series of plant upgrades and increase in throughput of raw materials, principally flour and grain.

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

A comprehensive Environmental Assessment has been completed for the ethanol upgrade project and approval received from the New South Wales Government Department of Planning & Environment.

The Environmental Assessment Report, *Proposed Ethanol Production Upgrade Including Proposed Odour Reduction & Waste Water Treatment Measures for Existing Shoalhaven Starches Operations*, Cowman Stoddart Pty Ltd, 2008, is located on the Manildra Group website at Community Documents - Manildra Group

The purpose of this Environmental and Social Management Plan (ESMP) is to describe how Shoalhaven Starches plans to mitigate impacts identified during the environmental impact assessment process and

provide continual environmental improvement to ensure compliance with the Roundtable of Sustainable Biomaterials (RSB) Principles & Criteria standard.

2 Background Information

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 installation of a flour mill on site enables 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 gluten & starch separation 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 starch processing required to produce high grade starch results in waste starch which is used in the ethanol production process.

Starch is also used in the production of glucose 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. Ethanol production is inclusive of fuel, industrial, pharmaceutical, food and beverage grades of ethanol. Industrial grade ethanol is used in producing pharmaceuticals, printer's ink and methylated spirits.

Other ethanol manufacturers produce ethanol directly from grain and thereby compete with other users of grain such as food manufacturers and stock feed lots. At Shoalhaven Starches it is the lower grade starch and wastage from the starch, gluten and syrup production processes that when combined feed the fermentation and distillation stages of ethanol production. In this way ethanol produced at Shoalhaven Starches is a value added product processed from the Company's waste stream.

Ethanol production results in some solid and waste water wastage, which is processed through the stillage recovery process plant. 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 BOC and Supagas gas plant's adjacent to the Shoalhaven Starches site collects carbon dioxide emissions from the ethanol fermentation process. These gas plant produces both industrial and beverage grade liquefied carbon dioxide for use in various industries.

The waste water resulting from the ethanol production was previously pumped to holding tanks and pH corrected, before being irrigated onto Shoalhaven Starches Environmental Farm. This farm land is used for fodder crops, pasture and cattle grazing.
The ethanol upgrade project includes odour reduction measures for the Factory and Environmental Farm which has been based upon the findings of the Environmental Odour Audit that has been undertaken for the site. The odour reduction measures, primarily the Waste Water Treatment Plant & Biofilter, have substantially reduced odours that are generated from the site.

The Waste Water Treatment Plant has the volumetric and operational capacity to treat the total waste water flow and organic load from the factory site. This plant incorporates sequential anaerobic and aerobic digestion facilities, microfiltration and reverse osmosis. This treatment process enables around 75% of the waste waters generated by the site to be re-used within the factory processes. The remainder is irrigated onto the Company's Irrigation Farm.

The ability to re-use treated waste waters within the factory process has resulted in a significant reduction in demand in the amount of water (treated and raw water) that is currently imported to the site from the Council's water system.

In addition, the amount of treated waste waters that will be required to be irrigated onto the Environmental Farm has been reduced & the quality of the treated waste waters has been significantly improved. This provides the additional benefit of reducing the potential for odours to be generated from the Environmental Farm.

Biogas (methane) generated from the anaerobic waste water treatment processes is captured and used as a heating fuel in the Company's boilers. This will reduce the amount of Natural Gas and Coal that will be required to be used on site; thereby reducing greenhouse gas emissions that would otherwise be created.

The majority of production output from the Shoalhaven Starches' plant following the ethanol upgrade project will continue to involve food related production. Ethanol production will involve only approximately 30% of the total production output from the Shoalhaven Starches' plant.

Unlike other ethanol producers which utilise food grain crops to solely produce ethanol fuel – Manildra's operations seeks to mainly produce food (and other) products from flour. In effect the Shoalhaven Starches' operations seek to value add along their production processes, including the processing of what would otherwise be a waste stream into a valuable biofuel such as ethanol.

Apart from the important role that the Shoalhaven Starches Plant plays in the NSW economy, the factory plays a particularly important role in the local Shoalhaven (and South Coast) economy. The Shoalhaven Starches factory site at Bomaderry directly employs over 300 employees. It is also estimated that up to 150 jobs were created during the 12 month construction phase of the ethanol expansion project.

This ethanol expansion project will ensure the on-going operations of the Shoalhaven Starches plant at Bomaderry in a commercially, environmentally and socially sustainable manner.

2.1 Environmental Assessment Process

The preparation of the Environmental Assessment has been undertaken pursuant to Part 3A of the *NSW Environmental Planning and Assessment Act (EPAA) 1979*, and following consultation with relevant Government agencies, including:

- The NSW Department of Planning
- The NSW Environment Protection Authority (EPA)
- The Department of Water and Energy

- The Roads & Traffic Authority; and
- Shoalhaven City Council.

Community Consultation groups, members of the public and aboriginal stakeholders were also consulted.

The Environmental Assessment (EA) has been prepared to address issues raised by the requirements of the Director-General of the Department of Planning as well as the issues raised by government agencies and the local community.

The EA includes the following assessments completed by independent consultants:

- Aboriginal Impact Assessment (South East Archaeology Pty Ltd)
- Flora & Fauna Assessment (Kevin Mills & Associates)
- Preliminary Hazard Analysis (GHD Pty Ltd)
- Traffic Impact Assessment (Christopher Stapleton Consulting Pty Ltd)
- NSW Coastal Policy 1997 Compliance Checklist for the Preparation of Development Proposals (Cowman Stoddart Pty Ltd)
- Riparian Assessment (Coffey Environments Pty Ltd)
- Environmental Site Assessment (Coffey Environments Pty Ltd)
- Hydraulic, Economic and Social Impacts of Flooding (Webb McKeown & Associates Pty Ltd)
- Waste Management Report (Stephenson Environmental Management Australia)
- Air Quality Assessment Report (GHD Pty Ltd)
- Greenhouse Gas Assessment (GHD Pty Ltd)
- Agronomic Investigations– Fitness for Purpose of Treated Wastewater (Dr John Murtagh, Roy Lawrie and Glenys Lugg)
- Agronomic Investigations– Fitness for Purpose of Treated Wastewater Supplementary Information including Monitoring Program (Dr John Murtagh, Roy Lawrie and Glenys Lugg)
- Environmental Management Report (GHD Pty Ltd)
- Acoustical Assessment (The Acoustic Group)
- Acoustic Assessment of Site Operations (The Acoustic Group)
- Report on Community Consultation (Twyford Consulting)
- Site Audit Report No.1 – Shoalhaven Starches Plant Expansion (ENVIRON Australia Pty Ltd)

The Environmental Assessment undertaken for the Shoalhaven Starches ethanol plant expansion project is consistent with the RSB requirements for a full Environmental and Social Impact Assessment (ESIA).

On-going environmental assessments occur as new plant and equipment are installed as modifications (MODs) under the site's Consolidated Project Approval 06_0228 (refer to Table 1).

2.2 Licences and Approvals

Shoalhaven Starches operates primarily under one consolidated Project Approval 06_0228 issued by the NSW Department of Planning on the 28th January 2009. The Project Approval consolidated all previous approvals for the site into the one Project Approval. Table 1 lists the site's current approvals and licences.

Compliance with the site's Environment Protection Licence (EPL) is reported annually to the NSW Environment Protection Authority (EPA) via the EPA Annual Return and EPA Annual System Performance Report.

Table 1 Project Approvals and Licences

Approval Number	Description	Date Issued
06_0228	Shoalhaven Starches Expansion Project	28-1-2009
06_0228 MOD 1	Deletion of Dried Distillers Grain (DDG) Pelletiser	30-9-2011
06_0228 MOD 2	Operational & Energy Efficiency Improvements	14-9-2012
06_0228 MOD 3	Relocation of car park	9-10-2012
06_0228 MOD 4	Modification to the footprint, design and location of Dried Distillers Grain (DDG) Pelletising Plant	25-3-2014
06_0228 MOD 5	Modification to the footprint, design and odour controls on the Dried Distillers Grain (DDG) Pelletising Plant	16-9-2015
06_0228 MOD 6	Modification to demolish a building and construct a temporary car park	25-11-2015
06_0228 MOD 7	Relocation of Starch Dryer No.5	18-1-2016
06_0228 MOD 8	Alterations to Existing Flour Mill	1-3-2016
06_0228 MOD 9	Packing Plant	8-3-2017
06_0228 MOD 10	Flour Mill B	18-4-2017
06_0228 MOD 11	DDGS Dryers	1-9-2017
06_0228 MOD 12	Beverage Grade Ethanol	1-9-2017
06_0228 MOD 13	Conversion of Boilers	18-1-2018
06_0228 MOD 14	Use of paper Mill Site	27-4-2018
06_0228 MOD 15	Carbon Dioxide Plant	7-8-2018
06_0228 MOD 16	Flour, Gluten and Starch Increase	18-6-2019
06_0228 MOD 17	Relocation of the approved No.5 Starch Dryer baghouse, installation of a service lift, alterations to the Specialty Products Building and Product Dryer Building including increase of building footprint, elevation of service conduit and alternative woodchip fuel source for Boilers 2 and 4.	23-10-2020
06_0228 MOD 18	Relocation of gas fired boiler to enable the production of hand sanitiser grade ethanol and the repurposing of existing de-fatting plant for production of hand sanitiser.	4-9-2020
06_0228 MOD 19	Expansion of ethanol distillery plant to facilitate the production of 100 ML of beverage grade ethanol.	8-3-2021
06_0228 MOD 20	Modification to Supagas Carbon Dioxide (CO_2) Plant including installation of two liquid (CO_2) storage vessels, installation of additional NOx removal bed, relocation of ambient vaporisers and associated pipework and infrastructure.	26-10-2021
06_0228 MOD 21	Amendments to packing Plant	16-5-2022
06_0228 MOD 23	Gas Fired Co-Generation Plant	28-4-2022
06_0228 MOD 24	Gluten Dyer No.8 Alterations	15-2-2022
06_0228 MOD 27	Modification to approved Raw Waste Water Buffer Tank	5-10-2022
06_0228 MOD 28	Temporary Emergency Grain Storage	20-06-2023
Licence Number	**Description**	**Version Date**
883	Environment Protection Licence 883	19-12-2023

3 Project Description

The following additions and alterations to the existing factory site as part of the ethanol upgrade approval in 2008 include:

- the provision of an additional dryer for the starch/gluten production plant;
- additional equipment and storage capacity for the ethanol plant including 3 additional fermenters, an additional molecular sieve and associated additional cooling towers;
- upgrades to the Stillage Recovery Plant including 6 additional Dried Distillers Grains Syrup (DDGS) dryers; 10 decanters and chemical storage; and two evaporators.
- the establishment of a new packing plant and container loading area (including new railway spur line). The establishment of the new packing plant on the northern side of Bolong road will require the construction of an overhead bridge structure to allow product and safe pedestrian movement across Bolong Road.
- the biological treatment of waste waters from the factory site. Approximately 75% the treated waste water will be re-used within the factory and the remainder will be irrigated onto the Company's Environmental Farm.

The expansion project also involves an upgrade to services to the site such as electric power, natural gas, etc. The proposal includes the provision of an additional gas fired boiler and a gas fired co-generation plant.

The estimated capital cost of the expansion of the plant is approximately $200 million. Section 5.4 of the EA provides further details on the works associated with the project.

3.1 ESMP Scope

The ESMP scope covers the factory operations located at the Shoalhaven Starches site. The RSB compliant product is ethanol produced from waste water containing starch originating from wheat processing. Ethanol production is inclusive of fuel, industrial, beverage, food and pharmaceutical grades of ethanol.

The RSB certification scope is shown in Appendix A, which shows the operational units, internal processing steps, RSB compliant product, and supply chain structures in place which are involved in the implementation of the RSB standards.

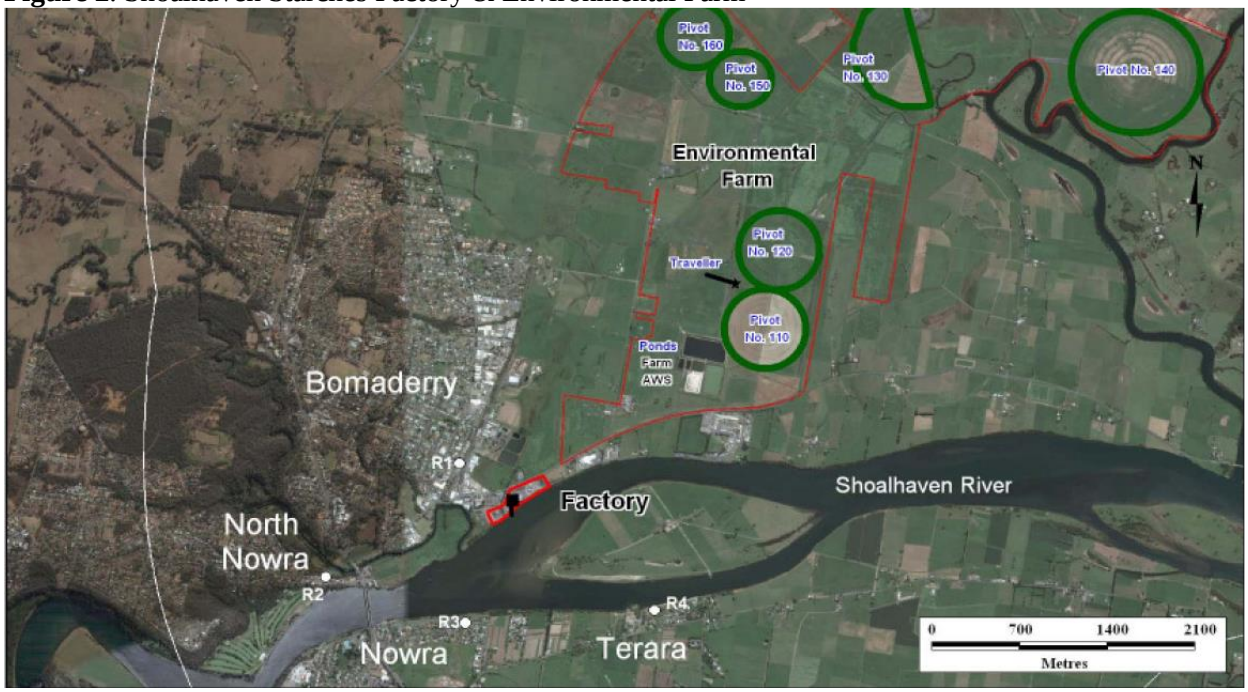
4 Description of the Affected Environment

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 to Figure 1).

Figure 1. Aerial view of Shoalhaven Starches factory site

The Company also has an Environmental Farm over 1000 hectares located on the northern side of Bolong Road. This area is cleared grazing land and contains spray irrigation lines and wet weather storage ponds (refer to Figure 2)

Figure 2. Shoalhaven Starches Factory & Environmental Farm



The latest factory site plan showing the various approved and proposed plant modifications is shown in Figure 3. A more detailed description of the site and its surrounding locality can be found in the relevant Environmental Assessment's.

Figure 3 Factory Site Plan Showing Existing and Proposed Plant Upgrade Facilities 2022

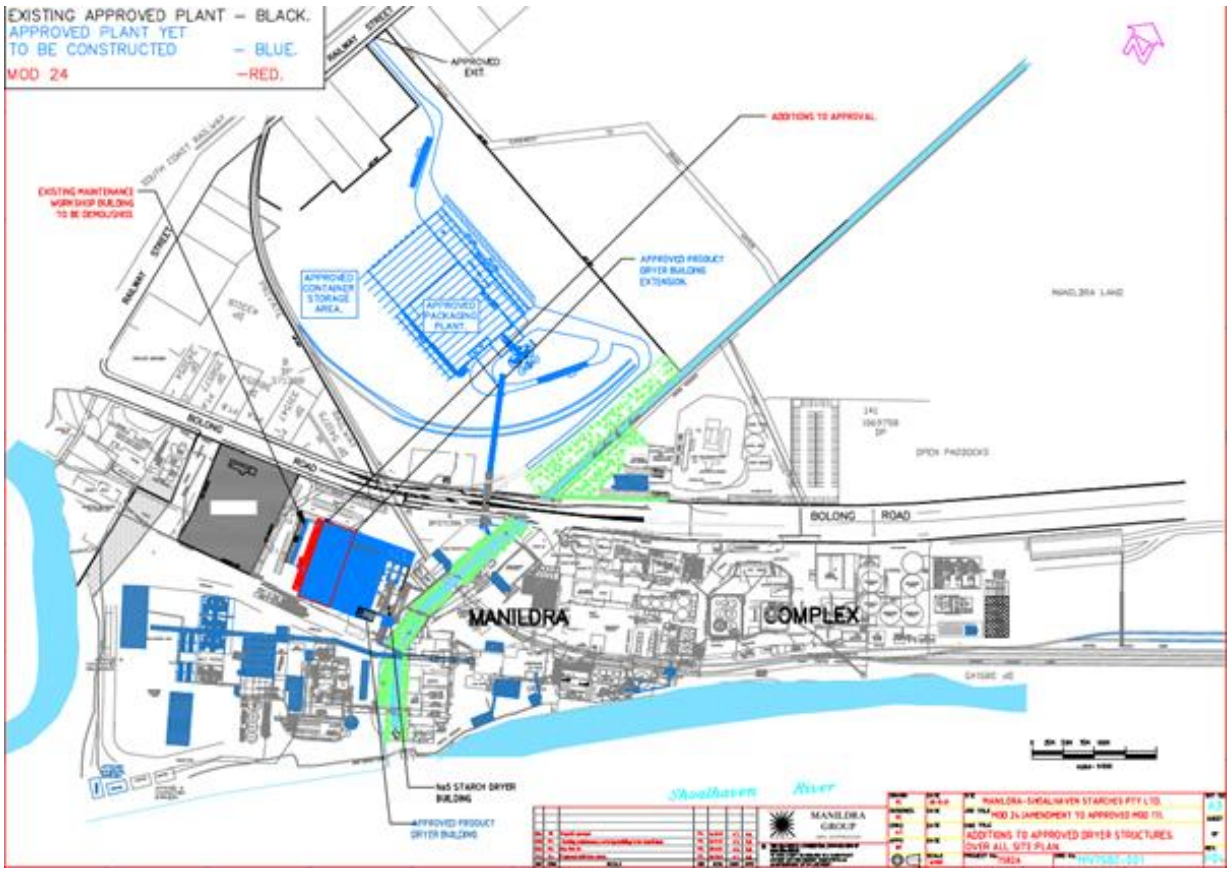
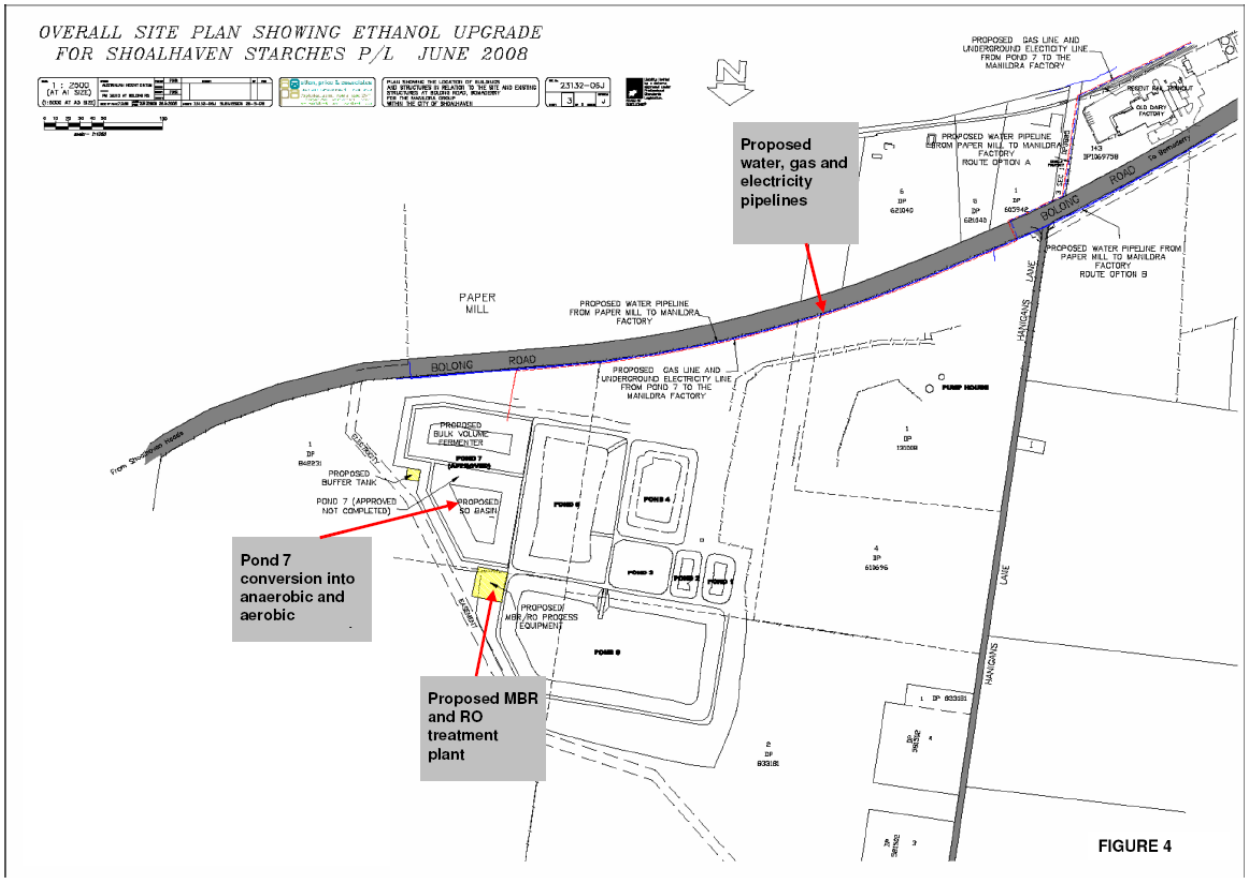


Figure 4 shows the upgrades to the Environmental Farm which were completed in 2011.

Figure 4 Proposed Ethanol Upgrade Facilities – Environmental Farm



5 Environmental and Social Policies, legislation & standards

All activities carried out on site, and in relation to the project, were assessed and found to comply with the relevant provisions of the relevant legislation and regulations, policies and guidelines relating to the construction and operation of the project, which include:

Legislation and Regulations

- Aboriginal and Torres Strait Islander Heritage Protection Act 1984.
- Contaminated Land Management Act 1997.
- Dangerous Goods Act 1975.
- Environment Protection and Biodiversity Conservation Act 1999.
- Environmental Planning and Assessment Act 1979.
- Environmental Planning and Assessment Regulations 2000.
- Environmentally Hazardous Chemicals Act 1985.
- Fisheries Management Act 1994.
- Fisheries Management Amendment Act 2001.
- Heritage Act 1977.
- Heritage Amendment Act 1998.
- Local Government Act 1993.
- National Parks and Wildlife Act 1974.
- National Parks and Wildlife Amendment Act 2002.
- Native Vegetation Act 2003.
- Native Vegetation Conservation Act 1997.
- Noxious Weeds Act 1993.
- Occupational Health and Safety Act 2000.
- Ozone Protection Act 1989.
- Pesticides Act 1999.
- Protection of the Environment Operations Act 1997.
- Protection of the Environment Administration Act 1997.
- Roads Act 1993.
- Rural Fires Act 1997.
- Soil Conservation Act 1938.
- Threatened Species Conservation Act 1995.
- Threatened Species Conservation Amendment Act 2002.
- Waste Avoidance and Resource Recovery Act 2001.
- Waste Recycling and Processing Corporation Act 2001.
- Water Act 1912; and
- Water Management Act 2000.

Policies and Guidelines

- Managing Urban Stormwater: Soils and Construction, NSW Department of Housing (1998).
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Australian and New Zealand Environment and Conservation Council, and the Agriculture and Resource Management Council of Australia and New Zealand (2000).
- National Environment Protection Measures (NEPM) for Ambient Air Quality, NEPC (1998)
- EPA/DECC Bunding and Spill Management Guidelines
- Industrial Noise Policy, DEC (1999).

6 Structure, content and implementation schedule for specific ESMP's

Detailed environmental management plans and procedures have been developed for the ethanol project during the construction phase and for the ongoing environmental management of the sites operations. The plans have been submitted to the NSW Department of Planning Director-General for approval and consist of the following:

- Odour Management Plan (The Odour Unit Pty Ltd)
- Air Quality Monitoring Program (Stephenson Environmental Management Australia)
- Noise Management Plan (The Acoustic Group)
- Water Savings Action Plan (Coffey Environments)
- Energy Savings Action Plan (Energy & Management Services Pty Ltd)
- Acid Sulphate Soil Management Plan (Coffey Environments)
- Stormwater Management Plan – including Erosion & Sediment Control Plan (Stephenson Environmental Management Australia)
- Wastewater Management Plan (Agricultural Water Management & Shoalhaven Starches Pty Ltd)
- Flood Mitigation & Management Plan (WMA Water)
- Emergency Plan (Shoalhaven Starches Pty Ltd)
- Waste Management Plan (Stephenson Environmental Management Australia)
- Landscape & Vegetation Management Plan (Coffey Environments)
- Environmental Management Strategy (Stephenson Environmental Management Australia)

6.1 RSB Principles & Criteria ESMP's

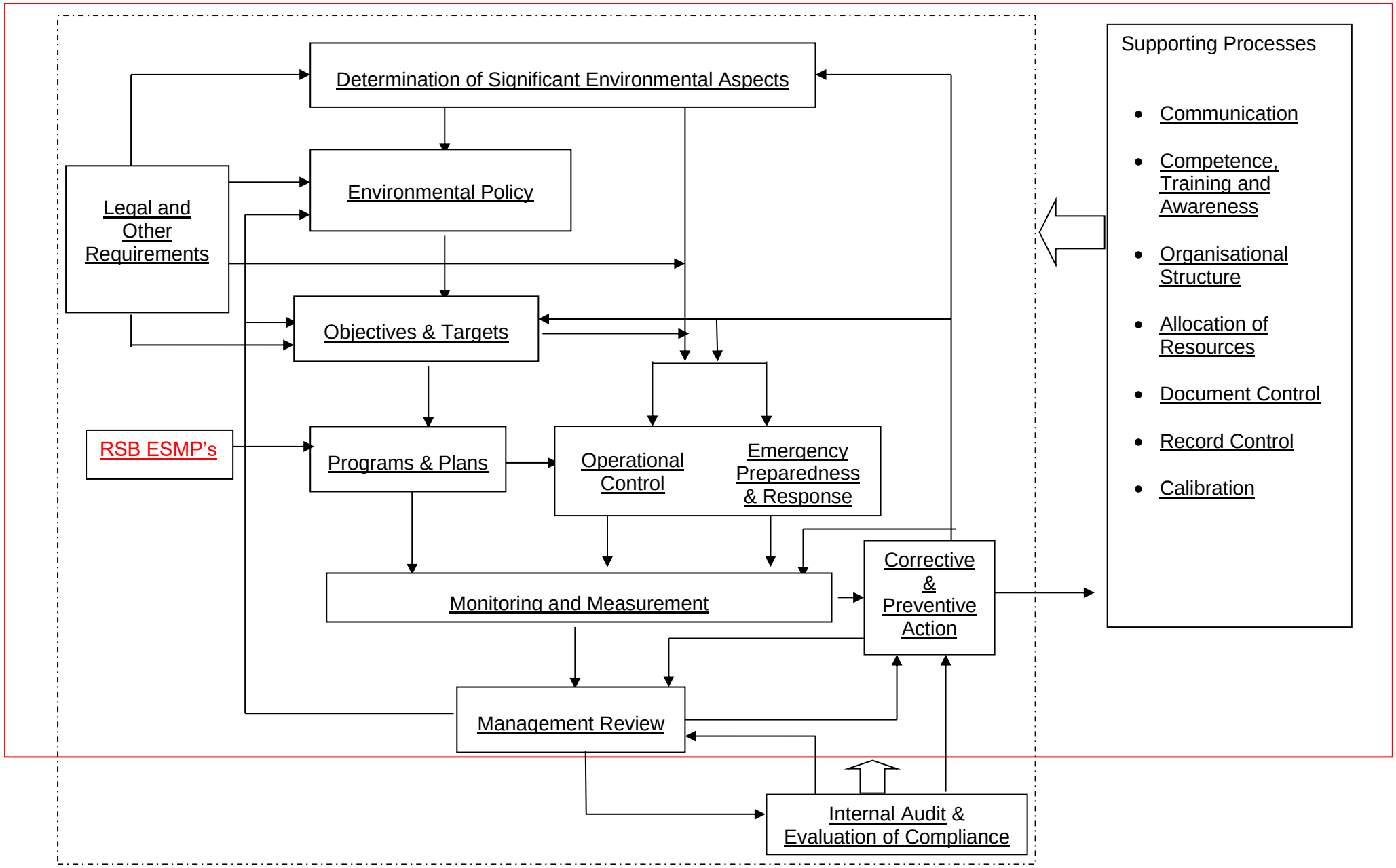
The environmental and social management plans resulting from the environmental assessment are incorporated into the Shoalhaven Starches Environmental Management System (EMS), which is third party certified against AS/NZS ISO14001 (refer to Figure 5).

Many components of the RSB Principles & Criteria have already been developed through the site's existing environmental, human resources & safety management systems. Where applicable, requirements of the RSB standards will be incorporated into Shoalhaven Starches current management systems and procedures.

The Shoalhaven Starches RSB ESMP's are a set of system procedures to describe how the site's biofuel operations comply with the requirements of the RSB Principles & Criteria. The structure of the ESMP's are consistent with the company's existing environmental, quality and safety system procedures.

To avoid duplication, cross-referencing to existing policies, plans and procedures are documented throughout the RSB system procedures. Revisions to these documents are controlled through the Quality Assurance Document Control system.

FIGURE 5. INTERACTIONS BETWEEN THE EMS & RSB ESMP's



7 Roles and Responsibilties

Each specific ESMP describes the various roles and responsibilities required to implement the respective plan / procedure. The following management positions describe the key roles & responsibility for implementation of the RSB standards and RSB certifications systems:

- Site Manager - has overall responsibility for the sites environmental & social aspects and ensuring sufficient resources are available to implement and maintain the RSB certification systems.

- Group Quality Assurance Manager - has overall responsibility for implementation and maintenance of all the Manildra Group's management systems certifications.

- Compliance Manager - is the management representative responsible for the implementation of all applicable requirements of the RSB standards.

- Site Accountant - has responsibility for calculating site production yields and chain of custody requirements.

8 Environmental & Social Monitoring Programme

Monitoring programmes are incorporated into the specific ESMP's as required. The ESMP may contain details of the monitoring requirements or make cross-reference to a particular monitoring plan or procedure already implemented as part of the sites Environmental Management System.

9 Conclusion

Following an assessment of the key issues associated with the ethanol upgrade project the Environmental Assessment concludes that the proposal is suitable for the site and this locality.

The project received approval by the New South Wales Government Department of Planning in January 2009. All existing approvals for the site have been surrendered and replaced by a single development approval to cover the overall Shoalhaven Starches site.

The Manildra Group Shoalhaven Starches site is committed to implementing the required environmental management, mitigation and monitoring measures to minimise potential environmental and social impacts associated with its operations.

PREPARED BY: J. Studdert AUTHORISED BY: J. Studdert

DATE:29-1-2024 DATE: 29-1-2024

Appendix A: RSB Scope