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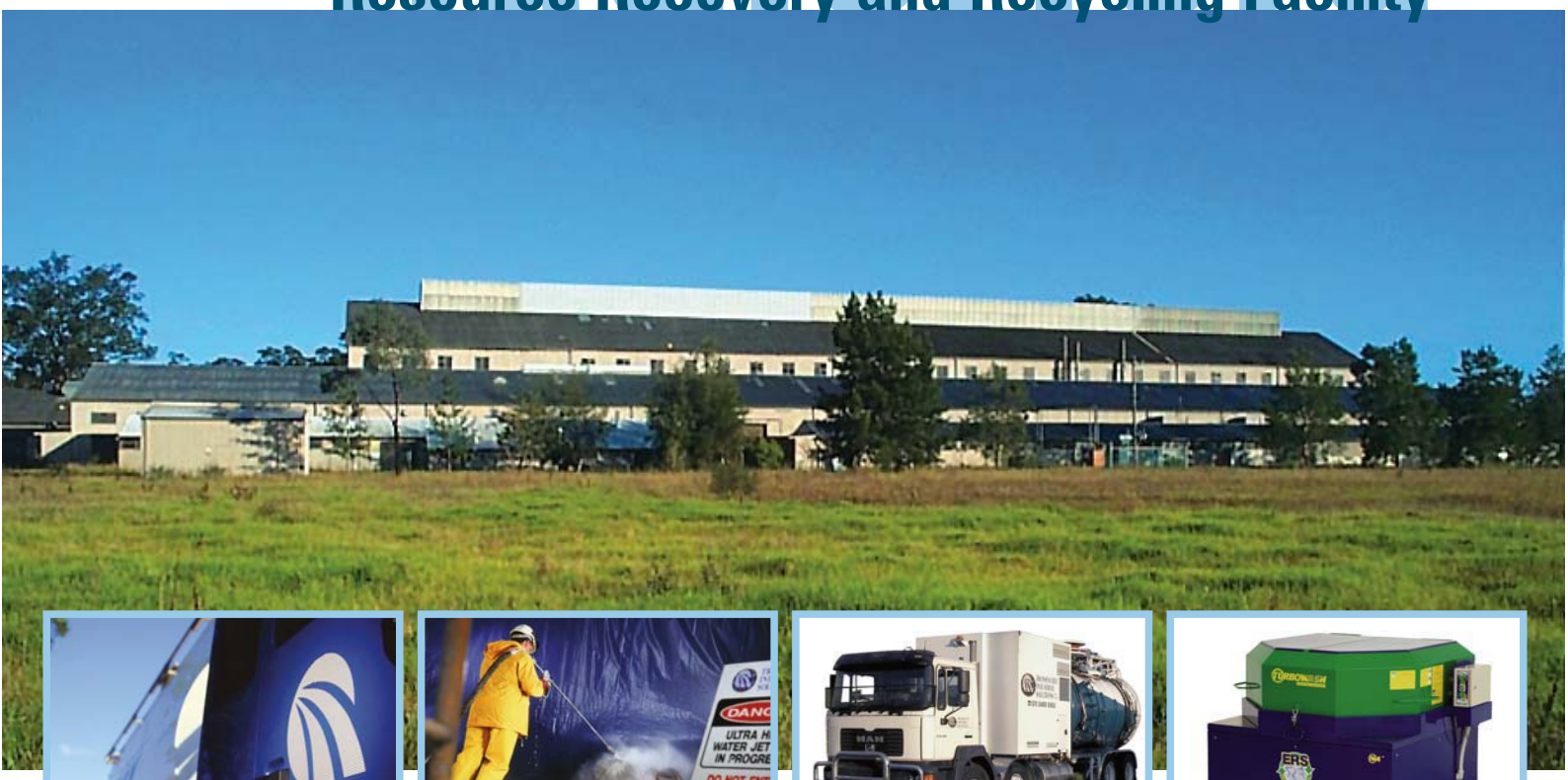
TRANSPACIFIC INDUSTRIES GROUP LTD

Rutherford

Resource Recovery and Recycling Facility



Volume One – Environmental Assessment

January 2006

PB PARSONS BRINCKERHOFF
100 YEARS

Resource Recovery and Recycling Facility Kyle Street Rutherford Environmental Assessment

January 2006

Transpacific Industries Group Ltd

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RP_5443 TPI EA

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Signed: .....

Date: 18 January 2006 .....

Distribution: 1 x CD Department of Planning .....

Submission of Environmental Assessment

Prepared under the Environmental Planning and Assessment Act 1979

EA prepared by

name	Bernice Redman Environmental Scientist/Planner
qualifications	Graduate Diploma of Environmental Management
address	Parsons Brinckerhoff 188 John Street PO Box 115 SINGLETON NSW 2330
in respect of	Resource Recovery and Recycling Facility, Kyle Street Rutherford

Development application

applicant name	Transpacific Industries Group Ltd
applicant address	159 Coronation Drive PO Box 1824 MILTON BC QLD 4064
land to be developed:	Lot 223 DP 1037300 11 Kyle Street RUTHERFORD NSW 2320 Parish of Gosforth, Maitland Local Government Area
proposed development	Construction and operation of a resource recovery and recycling facility including lube oil recycling by hydrogenation, industrial waste treatment, waste oil transfer station, dangerous goods drum store, industrial cleaning operations and truck depot.

Environmental Assessment

An Environmental Assessment is attached

Certificate

I certify that I have prepared the contents of this Environmental Assessment and to the best of my knowledge

- it is in accordance with the Environmental Planning and Assessment Act and Regulations
- it is true in all material particulars and does not, by its presentation or omission of information, materially mislead

signature 

name Bernice Redman

date 18 January 2006

Glossary

Acid sulphate soils	soils containing pyrites which produces sulphuric acid when exposed to oxygen.
Aerobic	in the presence of, or requiring molecular oxygen.
Ambient	surrounding environment.
Anaerobic	in the absence of oxygen.
Aquifer	a deposit of rock that yields a supply of water as a result of its porosity or permeability.
Biodiversity	referring to richness and variety of species.
Biomass	total dry mass of an animal or plant population.
Biota	all animal and plant life in a given area.
Blind sump	a recessed sump or small pit with no outlet point.
Bunds and bunding	an embankment of earth or a wall of brick, stone, concrete or other approved material which may form part or all of the perimeter of a compound.
Chemical fixation Stabilisation and solidification	a chemical process in which metal ions and other waste components are converted to a less soluble or insoluble form through precipitation (fixation) by reacting with pozzolanic materials to produce a chemically and physically stable, solid material (as silicates and/or hydroxides) and then solidified into a monolithic concrete matrix.
Coagulation	addition of a chemical which results in the destabilisation of the forces which keep colloids apart, thereby allowing the formation of larger flocculant suspensions.
Coalescing Plate Separator	a treatment system typically used to separate oil from water by using a series of corrugated plates to provide surface areas for collecting oil globules. As wastewater flows through the separator the lighter oil droplets float upwards towards the corrugation, coalesce into larger drops while rising to the top portion of the plate pack and finally to the surface of the tank where the oil can be removed. Similarly, small particles agglomerate and sink towards the bottom of the unit to be removed as sludge.
Combustible liquid	any liquid other than a flammable liquid that has a flash point. A combustible liquid also has a firepoint less than its boiling point. Combustible liquids are divided into two classes: - *Class C1*: a combustible liquid that has a flash point of 150^{o}C or less. - *Class C2*: a combustible liquid that has a flashpoint exceeding 150^{o}C.
Conservation	the management of natural resources in a way that will benefit both present and future generations.
Corrosive	a strong acid or alkali capable of destroying or eating away by chemical action.

Cultural heritage	collective societal values, tangible and intangible, which are of social significance and considered worthy of preservation.
Cumulative effect	the accumulation of effects over time.
dB(A)	measurement of environmental noise using a sound level meter with an A-weighting filter to simulate the response of the human ear.
Dissolved Air Flotation	small air bubbles released from air-saturated water attach themselves to small particles and flocs. The air-solid mixture rises to the surface where it concentrates and is removed.
Dangerous Goods	chemicals which present a hazard when handled, stored or transported. Dangerous goods are sub-divided into a number of classes according to their hazard and are defined by an international register.
Degrees Celsius (^{o}C)	a measure of temperature.
Demineralisation	the removal of metals and other impurities from a solution (in this case waste oil).
Dry break valves	valves which have a spring-loaded shut-off flap which prevents the run out of product from the valve.
Ecologically sustainable development	the ability of each generation to support its own material needs without denying future generations the same opportunity by using, conserving and enhancing resources so that ecological processes are maintained and the quality of life both now and in the future can be improved.
Ecosystem	an interdependent system of interacting plants, animals and other organisms together with non-living (physical and chemical) components of their surroundings.
Effluent	the treated liquid output from a process or treatment unit.
Emergency response	reaction and activation of mitigation measures to an emergency which may involve public emergency services such as the Fire Brigade, Police or Ambulance Service.
Emulsion	a liquid-liquid colloid in which small particles of one liquid are dispersed in another liquid, e.g., oil dispersed in water. Usually sustained by an emulsifier such as detergent.
Encapsulate	encasing a contaminant in a solid, impenetrable matrix.
Endangered species	those plants and animal species that may become extinct unless action is taken to remove or control the factors that threaten their survival.
Environment	the physical, biological, cultural, economic and social characteristics of a site, area or region.
Environmental Assessment	the orderly and systematic evaluation of a proposal including objectives, benefits and alternatives, and its effects on the environment including the mitigation and management of those effects.
Environmental	an outline of the means of achieving environmental objectives and

Management Plan	targets.
Environmental Management System	that part of the overall management system which includes organisational structure, planning, activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the environmental policy.
Fauna	animals
Filtrate	the clear liquid obtained by filtration.
Filtration	the process of separating solid particles from a liquid using a filter membrane.
Fixation	chemical process by which soluble metals are precipitated as their insoluble metal form (such as metal hydroxides and/or silicates), generally by the addition of alkaline chemicals such as lime or sodium hydroxide.
Fixed waste	the resultant insoluble metal sludge formed by the fixation process.
Flammable liquid	a liquid which gives off a flammable vapor at temperatures no greater than 60.5^{o}C.
Flash point	the temperature at which the vapor above a volatile liquid forms a combustible mixture with air.
Flocculation	process in which particles in a colloid aggregate into larger clumps.
Flora	plants.
Greenhouse effect	a gas that has an effect on the radioactive absorptivity of the earth's atmosphere and the atmosphere's temperature.
Greenhouse gas	predicted global climatic change associated with the build-up of certain gases, e.g., carbon dioxide, methane, chlorofluorocarbons, etc, within the atmospheric environment of the earth.
Groundwater	body of water yielded by the earth due to its porosity or permeability.
Hazard	a source of danger; a condition with potential to cause harm, loss or misfortune.
HAZOP study	Hazard and Operability Study is a formally structured method of systematically investigating each element of a system for all of the ways in which important parameters can deviate from the intended design conditions to create hazards and operability problems. The HAZOP problems are typically determined by a study of the piping and pumping instrument diagrams (or plant model) by a team of personnel who critically analyse effects of potential problems arising in each vessel of the operation. Parameters are selected, e.g., flow, temperature, pressure and time, then the effect of deviations from design conditions of each parameter are examined. A list of key words, e.g., 'more of', 'less of' 'part of' etc, are selected for use in describing each potential deviation. The system is evaluated as designed and with deviations noted. All causes of failure are identified. An assessment is made weighing the consequences, causes and protection requirements involved.
Heating value	amount of energy when a fuel is burned completely.

High pressure water blasting	the use of high pressure water, with or without the addition of other chemicals or abrasives to remove matter from various surfaces and as a cutting agent. Typically used for surface preparation prior to application of protective coatings, for drain cleaning and scale removal from process systems such as boiler tubes.
Hydrocarbons	an organic compound containing only hydrogen and carbon.
Hydrology	the study of the distribution, uses and conservation of water on the earth and in atmosphere.
Hydrogeology	the branch of geology that deals with the occurrence, distribution and effect of ground water.
IBC (Intermediate Bulk Container)	a rigid or flexible portable container of capacity not exceeding 3 m^3 for the transport of dangerous goods.
Inorganic compounds	compounds that contain elements other than carbon.
ISO-tank containers	a tank fitted with frames to standard international freight container dimensions.
Lower heating value	the energy content of a fuel less the energy in the water vapour formed by the combustion of hydrogen in the fuel (typically 10% of the energy content).
Mean	average value of a set of numbers.
Median	the middle value of a series of values; the value below which 50% of cases fall.
Metal hydroxide	a metallic compound formed from hydroxide groups binding to metal atoms.
Native vegetation	indigenous flora.
Organic compounds	compounds that contain carbon.
Packing Group	dangerous goods are assigned to Packing Groups according to the degree of risk the goods present during transport and ranked as follows: Packing Group I - great danger. Packing Group II - medium danger. Packing Group III - minor danger.
Particulate	of, relating to, or existing in the form of minute separate particles.
pH	a measure of acidity or alkalinity.
Phytotoxic	toxic to plants.
Polyelectrolyte	a synthetic organic polymer used as a flocculant aid in water and wastewater treatment to accelerate the settling rates of suspended particles and colloids.
Portland cement	a calcium silicate mixture containing predominantly tricalcium (C_3S) and dicalcium silicates (C_2S) with smaller amounts of tricalcium aluminate (C_3A) and a calcium aluminoferrite (C_4AF). Portland cement is produced by heating together limestone and clay (or some other source of silica) at about 1800^oC to form 'clinker', to which a small amount of gypsum is added and the mixture ground to a fine powder.

Pozzolan	materials composed of reactive silica and/or alumina such as fly ash and blast furnace slag.
Pozzolanic process	solidification reaction in which pozzolans combine with calcium hydroxide and water to form a largely impermeable mass of silicate hydrates or alumina hydrates (cementitious compounds).
Q_5, Q_{100}, etc	a predicted rainfall event based on calculations using historical data, e.g., Q_5 is an 1-in-5 year rainfall event.
Resource Recovery and Recycling Facility	an integrated facility capable of segregating, recovering and recycling resources from industrial wastes.
Risk	potential for loss or harm to occur in terms of severity and probability.
Risk score calculator	a qualitative method of risk assessment which allows the risks to people, the environment and assets from identified hazards to be calculated in terms of consequence and severity. The results form the basis of management strategies to minimise risks to a level "as low as reasonably practicable" (ALARP). Practicable can be defined as what is reasonably practicable for the nature of the project, the state of knowledge of the risk and technology, the availability of the technology and the cost involved.
Sludge	a solid/liquid mixture generally settled from a liquid.
Solidification	encapsulation of fixed waste in an impermeable chemical matrix such as cement to render it inert and non-hazardous.
Sour gas	a gas stream that contains hydrogen sulphide, methane and other light end hydrocarbons.
Sour water	water that contains hydrogen sulphide.
Stormwater	rainwater on the ground.
Suspended solids	small particles present in colloidal form in a liquid.
Supernatant	the clear liquid remaining after a precipitate has settled.
Total organic carbon	measure of the total organic content of a liquid or substance.
TCLP	Toxicity Characteristic Leaching Procedure is a standard testing procedure developed by the United States Environmental Protection Agency to simulate the long term conditions experienced within a landfill. A sample is agitated in an acidic solution for a number of hours (generally 16 – 18 hours), the solution filtered and the contaminants such as metals determined in the filtrate. The concentrations are used to determine environmental risk and the appropriate disposal strategy, e.g., disposal criteria have been developed for landfills based on concentrations and the total mass loading of contaminants able to be absorbed by the landfill.
User pays	The principle that the generator of the waste stream is responsible all costs associated with the treatment and disposal of that waste.
VOC	Volatile Organic Compounds are organic compounds which have a low boiling point and hence rapidly form a vapor above the liquid surface.

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Executive Summary

This Environmental Assessment (EA) supports a development application by Transpacific Industries Group (TPI) Ltd, an Australian listed company, for a *Resource Recovery and Recycling Facility* (the Facility). The project is located in Rutherford in the Maitland Local Government Area.

The proposal is a Major Infrastructure Project under Part 3A of the *Environmental Planning and Assessment (EP&A) Act 1979* as it constitutes a development for the purposes of resource recovery and recycling that transfers and stores more than 1,000 tonnes per year of solid and liquid waste classified in the Australian Dangerous Goods Code and treats, stores and disposes more than 10,000 tones of industrial liquid waste and more than 1,000 tonnes of aqueous and non-aqueous waste. As such, the Minister for Planning is the Consent Authority for this proposal.

The Facility will be purpose built to store, treat, recycle, recover and dispatch most types of industrial, commercial and domestic wastes generated within the NSW Region including oily water wastes, wash waters, agricultural and mining operations and other non-sewerable industrial wastes. The Facility will incorporate a transfer station for wastes which require treatment or recycling at other approved facilities. The Facility will also operate as the central depot for the large transport fleet operated by TPI within NSW for the collection and transportation of liquid wastes, and treated and recycled products.

TPI has been awarded a Federal Government Grant to develop, install and commission the hydrogenation process as part of the Comprehensive Product Stewardship (Oil) Scheme (2000) to encourage the recovery, reuse and recycling of waste lubricant oils. TPI will be the first recycler in Australia to use hydrogenation to completely recycle base lube oils to refinery grade lubricant specification. The awarding of this grant has been the basis for the construction and operation of the new resource recovery and recycling facility at Rutherford.

The proposed resource recovery and recycling treatments proposed at the Facility include:

- oily water treatment and waste oil transfer station to separate the water phase from oils and store lube oils in preparation for the hydrogenation process
- lube oil hydrogenation process to completely recycle oil to refinery grade lubricant specification
- treatment of non-sewerable aqueous wastes by chemical fixation, stabilisation and solidification (CFS) to treat industrial liquid wastes using blends of cement, fly ash and other additives to produce a soil-like product that is non-hazardous, non-toxic and suitable for disposal to approved landfills.

In addition to the above waste treatment processes, the Facility will also incorporate:

- a waste water treatment plant
- an onsite laboratory
- a Dangerous Goods store
- an industrial cleaning services depot

- an Environmental Recovery Services depot
- a truck wash
- a transport vehicle depot.

Consultation was undertaken with the community, public authorities, service utilities and Aboriginal Groups during the preparation of the EA. Director General's Requirements (DGRs) were obtained from Department of Planning with input from the Environment Protection Authority (EPA) initially on 30 January 2004. Revised DGRs were obtained on 19 July 2004 and 6 September 2005 initially due to changes in the scope of the project and subsequently due to changes in legislation. Comments on the proposal were also sought from other agencies that did not contribute to the DGRs.

The site is largely cleared, and has been intensively used for industrial purposes since the 1940's. The proposed development continues a long history of industrial and employment activities on the site.

Groundwater was encountered 12.75 m below ground level. The groundwater investigation indicated the presence of Total Petroleum Hydrocarbons (TPH), copper and nickel, tetrachloroethene and chloroform above investigation levels as a result of previous site activities. Groundwater contamination from proposed site activities is not anticipated as wastes will not be treated at the sub-level. Mitigation measures such as impervious bunding will be implemented at the site to prevent potential impacts on the groundwater system. Groundwater monitoring will be undertaken during the operation of the Facility.

Surface water quality sampling and testing undertaken at the site indicates that the existing quality of water is likely to be generally poor. The proposed Facility is not expected to impact upon surface water quality. Waste water will be treated via a waste water treatment plant prior to discharge to sewer. Clean stormwater will be collected and reused onsite, where possible. Waste processing activities will be undertaken in imperviously bunded areas that drain to blind sumps to prevent runoff and contamination of surface water.

A Phase II Environmental Assessment for the site detected total petroleum hydrocarbon (TPH) in the soils above the sensitive land use criteria as a result of previous activities on the site within the ash disposal area on the eastern portion of the site. Where required, disruption of impacted fill will be undertaken in a manner that will minimise impact on the surrounding area, groundwater and people. Impacted fill will be disposed of at an appropriately licensed facility. The risk of land contamination disturbance during the construction and operation of the Facility will be minimal provided appropriate mitigation measures are implemented.

Four small and highly modified remnants of Endangered Ecological Communities have been discovered onsite. The proposal requires the removal of three of these remnants. An eight part test in accordance with the provisions of the *Threatened Species Conservation Act* was conducted on the Endangered Ecological Communities and it was determined that the proposal is unlikely to have a significant impact. Similar species will be planted to minimise and offset the impacts upon biodiversity.

An air quality assessment has been conducted at the site to determine existing air quality and dispersion meteorology and an air quality impact assessment was

conducted for the proposed operations at the Facility. The assessment has determined that with adherence to the outlined mitigation measures, the Facility would not significantly degrade the existing air quality environment nor detract from the existing local ambient air quality of the nearest potentially affected receptors. No long term loss or degradation to existing local amenity is expected from the operation of the proposed site.

A noise assessment has been conducted at the site and at selected sensitive receptors surrounding the site to determine ambient noise levels. Noise modelling has determined that the proposal is likely to meet all relevant noise objectives.

The visual impact of the proposal will be minimal as it replaces an existing industrial use and utilises existing industrial buildings. The development will be visible from surrounding areas. However, the landscape character of the site will be improved by redeveloping existing aged buildings and landscaping the site.

The proposed development will result in a slight increase of heavy and light vehicle movements to and from the site. An assessment of the intersection of the New England Highway and Kyle Street has demonstrated that the proposal will only marginally impact on the local road network past the planning year 2015 and the current level of service will not be impacted.

The proposed development is likely to lead to socioeconomic benefits through the creation of an additional 100 jobs within the region and the annual injection of $9 million into the regional economy.

The proposed development is likely to lead to regionally positive benefits to the environment and waste management. The expansion in recovery and recycling of waste products will help to minimise the quantity of waste being directed to landfill and sewage.

TPI is committed to implementing an environmental management plan that will provide TPI with the opportunity to demonstrate best practice environmental management. The plan will include monitoring of air quality, surface water and groundwater.

Whilst specialist studies have indicated there may be some environmental impacts, these studies have also shown that with appropriate consideration of these issues and the implementation of mitigation measures, the impacts will be minimised and/or ameliorated.

Justification of the project is based on clearly positive social, economic and environmental benefits. The recycling of industrial waste products presents a regionally important opportunity to completely recycle used oils to refinery grade specification and recover and recycle wastes that would have otherwise been directed to landfill.

1. Introduction

1.1 Project Background

Transpacific Industries Group (TPI) currently has a number of waste treatment and transfer operations located throughout the Hunter Valley Region including the recently acquired Cleanaway Technical Services Site at Kooragang Island. TPI also operates the former Waste Services NSW Liquid Waste Treatment Facility at Homebush Bay. The proposed Facility at Rutherford would allow TPI to consolidate its operations and provide a range of services from one location. The proposal involves the relocation of the Branxton transport operations and Kurri Kurri oil and industrial waste transfer station to the Rutherford Site. An Environmental Recovery Services business would also be established at the site, placing the operations closer to industrial and mining clients.

TPI has been awarded a Federal Government grant to develop, install and commission the hydrogenation process as part of the Comprehensive Product Stewardship (Oil) Scheme (2000) to encourage the recovery, reuse and recycling of waste lubricant oils. TPI will be the first recycler in Australia to use hydrogenation to produce recycled base oils and the process, and in conjunction with the re-refinery at Wetherill Park, represents a substantial capital investment.

The hydrogenation of re-refined base lube oils will recycle oil to refinery grade lubricant specifications. As Australia's largest oil recycler, TPI is committed to the Federal Government's initiative for life cycle management of oil resources to maintain existing stocks of oil. This is in preference to current methods in which recycled oils are combusted for energy recovery, a process which reduces existing oil resources and contributes to greenhouse gas emissions.

The awarding of this grant has been an important reason for the construction and operation of a new resource recovery and recycling facility. Existing TPI facilities do not provide sufficient space or appropriate locations for TPI to operate the hydrogenation plant. TPI therefore investigated the Rutherford site in order to establish hydrogenation operations and other resource recovery and recycling operations.

1.2 Project Objectives

1.2.1 Objectives of the Proposed Development

- The primary objective of the Facility will be minimisation of contamination and reduction in the volume of wastes disposed into the environment (going to landfill). This will be achieved through appropriate recovery and recycling of waste resources through the provision of the following treatments:
  - recovery of usable or recyclable liquid wastes including industrial oils, solvents and cooking oils
  - hydrogenation of re-refined base oils to specifications suitable for reuse as lubricants

  - chemical neutralisation, fixation, stabilisation and solidification of industrial wastes to a level acceptable for disposal.

- integration and centralisation of a number of TPI's business units facilitating a complete waste management and resource recovery business within the Hunter Valley
- provision of a transfer station for recyclable industrial wastes such as solvents, waste oils and cooking oils for distribution to the appropriate treatment facilities
- provision of industrial cleaning and protective coating services
- provision of modern laboratory services for internal and external customers
- provision of waste collection and transport services throughout the NSW Region.

1.3 Project Overview

The Facility will be purpose-built to store, treat, recycle, recover and despatch most types of industrial wastes generated in NSW. Used oils will be recovered and recycled to lubricant specifications, aqueous-based industrial wastes will be treated to a level that poses negligible risk to the receiving environment, and waters from industrial wastes will be treated to a quality suitable for reuse on-site or discharge to sewer.

The proposal provides for the transport of raw materials, waste, waste by-products, treated wastes and saleable products by road. Racecourse Road and Kyle Street, which adjoins the New England Highway will be used as the heavy vehicle transport route. Wastes delivered to the site will be sampled by the onsite laboratory and directed to the appropriate treatment or transfer area subject to the source and nature of the waste.

Other benefits for the site include cost-effective justification for shared ancillary functions such as vehicle maintenance facilities, workshop and a laboratory. Internal company support services such as accounting services, administration, IT systems, purchasing, vehicle maintenance and transport logistics are generally common to each unit and will be able to be streamlined through consolidation onto a single site.

Infrastructure such as service utilities (power, water, sewerage and telephone services) is available at the Rutherford property. Existing structures include a number of large warehouses, a wastewater treatment plant, a lined lagoon and storage tanks.

1.4 Company Profile

1.4.1 Overview

TPI provides integrated cleaning and total waste management solutions to clients across Australia, New Zealand and parts of Asia Pacific, with a particular focus on the liquid and hazardous segments of the waste management market. TPI was floated on the Australian Stock Exchange in May 2005. TPI is the parent company that incorporates a range of wholly owned or controlled subsidiary companies and divisions involved in waste management and recycling.

TPI has the ability to tailor its services to meet the needs of each client group and provides a wide range of services aligned to the requirements of integrated total waste management and facility management services. TPI is strongly committed to the safe and responsible management of waste, regulatory compliance and the protection and enhancement of the environment.

TPI operates an integrated business across three primary divisions:

- waste management and recycling services
- industrial solutions
- commercial vehicles.

1.4.2 Company Operations

TPI's network of operations includes collection operations, transfer stations, waste-to-energy sites, recycling plants and facilities management.

1.4.2.1 Waste Management and Recycling Services Operations

Waste Management and Recycling Services Operations incorporate key operating companies such as Transpacific Industries and Nationwide Oil and offer the following services and solutions:

- *collection and treatment of liquid waste and controlled waste* – collection, transport, processing, recycling and disposal of liquid wastes and controlled wastes (both liquid and solid), operating from 95 sites including 25 major processing facilities located throughout Australia and New Zealand
- *recycling and conversion of waste mineral oil to energy* – collection and processing of over 55% of used mineral oil collected in Australia. A used mineral oil re-refinery is currently operated to produce alternative fuel products for reuse in areas such as boiler start-up fuel for power generation.

1.4.2.2 Industrial Services Operations

Industrial Services Operations incorporate key operating companies including Transpacific Industrial Solutions and Environmental Recovery Services and offer the following services and solutions:

- *industrial cleaning services* – high pressure water and abrasive blasting, vacuum loading, asbestos removal, sewer and drain cleaning, iso-tanker cleaning, protective coating, emergency spill and recovery services
- *total waste management* – total waste management solutions, combining a range of waste management and industrial services
- *parts cleaning solutions* – aqueous and solvent based parts cleaning services and equipment for the automotive, mining, printing and food sectors.

1.4.2.3 Commercial Vehicles Division

Commercial Vehicles Division incorporates key brands such as Western Star, MAN and Autocar and offers the following products and services:

- *importation and distribution of commercial vehicles* – import and distribution rights for Western Star and Autocar trucks and parts throughout Australia, New Zealand and select markets in Asia. Import and distribution rights for MAN trucks, bus chassis and parts in Australia and New Zealand. Import and distribution rights for MAN marine engines, industrial engines and parts in Australia (excluding Western Australia and the Northern Territory)
- *product range* – Western Star trucks are custom built and are targeted at linehaul, road train, local delivery, heavy haulage, logging and mining markets. The MAN range of trucks is suited to linehaul, local delivery, exploration drilling, logging, utility servicing and agriculture markets. The Autocar trucks are suited to waste management and construction industries
- *national distribution network* – Western Star and MAN commercial vehicles are distributed through an independent dealer network of 66 dealers and sub dealers located in Australia, New Zealand, Philippines, Papua New Guinea and China. The MAN marine engine product range are distributed through 10 Australia Dealers.

1.5 Property Description and Ownership

Proponent	Transpacific Industries Group Pty Ltd – ACN 101 155 220
Site	The site is located west of the township of Rutherford Lot 223 Kyle Street Rutherford off the New England Highway.
Size	10.2 hectares (25 acres)
Real Property Description	Lot 223 in Deposited Plan 1037300 Kyle Street, Rutherford Parish of Gosforth, County of Northumberland.
Local Government	City of Maitland
Landowner	Transpacific Industries Pty Ltd PO Box 1824 Milton BC QLD 4064
Construction Period	All aspects of the Facility described in this EA will be constructed following development approval. Construction is expected to take between 6 and 9 months.
Construction Times	Monday to Friday 6am to 6pm and Saturday 7am to 1pm for works with the potential to generate construction noise
Environmental Assessment:	Major Infrastructure Project, Part 3A of the *Environmental Planning and Assessment Act 1979*
Consent Authority	Department of Planning

Main Planning Instruments	Major Project SEPP 2005
	Maitland Local Environmental Plan 1998
Zoning	Industrial Area 4(a)

1.6 Structure of the EA

This Environmental Assessment has been grouped into the following sections:

Section 2	Provides a description of the proposed development and proposed waste treatment processes.
Section 3	Provides an assessment of the need and alternatives for the proposed development.
Section 4	Provides a description of the statutory planning context and approvals sought.
Section 5	Provides a description of regulatory and community consultation undertaken during the production of the EA.
Section 6	Provides an assessment of the human environment, impacts and mitigation measures to be implemented to ameliorate any adverse impacts.
Section 7	Provides an assessment of the natural environment, impacts and mitigation measures to be implemented to ameliorate any adverse impacts.
Section 8	Provides a description of the environmental management and monitoring measures to be undertaken.
Section 9	Provides justification for the proposed development.

1.7 Study Team

This EA has been prepared by a team of PB specialists and sub consultants in conjunction with TPI. The study team consisted of:

Transpacific Industries

Tibor de Jong	Group Environment Manager
Bob McKenzie	Process Engineer

FFS Refiners

Antony Steynbery	Process Engineer

Parsons Brinckerhoff

Wayne Jones	Project Manager
Bernice Redman	Project Coordinator
Gary Freeland, Bruce Colman	Planning Context
Shay Gill	Consultation Liaison
David McKay, Trent Lee, Stewart McMaster	Water Issues
Evette Griffin, Trent Lee	Soils and Land Contamination
Dr Martin Predavec, Nick Corkish	Flora and Fauna
Shane Harris	Air Quality and Noise
Stacey Brodbeck	Visual Assessment
Wendy Adam, Doris Lee	Traffic and Transportation
Bernice Redman	Waste Management
Ainslie Just	Preliminary Hazard Analysis

Specialist Consultants

Northern Transport Planning Engineering	Traffic Assessment
Insite Heritage	Indigenous and Non-Indigenous Heritage

2. Proposal Description

2.1 TPI Corporate Structure

TPI is one of Australia's main resource recovery and recycling businesses. Approval of the proposed Facility at Rutherford will help to establish TPI's NSW headquarters which will provide industrial waste management support to Sydney, Newcastle and Wollongong as well as the Central Coast and Central Highland regions.

The development of the Facility will see the integration of a number of TPI's existing operations from the Hunter Valley region, presenting a complete waste management and resource recovery business for NSW.

The Facility will be purpose-built and capable of storing, treating, recycling, recovering and despatching most industrial wastes. The Facility will be the central depot for the transport fleet operated by TPI for the collection and distribution of liquid wastes, treated and recycled products.

TPI propose to renovate, build and operate the Facility at Rutherford for the treatment of a wide range of industrial, commercial and domestic wastes including oily water wastes, wash waters, wastes from manufacturing, agricultural and mining operations, and other non-sewerable industrial wastes.

The site will operate as a transfer station for wastes which require treatment or recycling at other approved facilities. It is anticipated that wastes will be received from locations throughout NSW, processed predominantly onsite and the end products transported by TPI's fleet of vehicles throughout NSW and interstate.

2.2 Construction Phase

2.2.1 Development Components

The proposed development will consist of resource recovery and recycling treatments (including oily water treatment and waste oil transfer station; processing of base oils by hydrogenation to produce lube oils; and treatment of non sewerable aqueous wastes by neutralisation, chemical fixation, stabilisation and solidification) a waste water treatment plant; onsite laboratory; dangerous goods store (including flammable and combustible goods packaged area); drum wash/conditioner; industrial cleaning services depot; environmental recovery services depot; truck and tanker wash facility and transport vehicle depot.

Where possible components of the proposed development will be constructed and operated within existing site buildings and with existing infrastructure. Components of the Facility that will increase the footprint of the existing development include, hydrogenation process, oily water treatment, waste water treatment plant, truck parking, fuel bowsers, truck and tanker wash and tank farms for waste treatments. The proposed site layout is illustrated in **Figure 1**.

TPI proposes to renovate existing buildings and infrastructure and construct additional infrastructure. The Facility requires demolition of some existing site infrastructure.

Demolition works will be undertaken at the first stage of the development. Demolition timeframes have been integrated into construction timeframes. **Table 2.1** details demolition wastes and quantities.

Table 2.1 Demolition Waste Estimates

Material	Quantity	Disposal
Metal		
Cladding	10,000 square metres (approx 500 cubic metres non-compacted)	Steel - including cladding, reinforcing and other scrap metal will be sent to metal recyclers for recycling or disposal to landfill
Fencing	20 cubic metres	
Structural	50 cubic metres	
Reinforcing	10 cubic metres	
Pipes	25 cubic metres	
Tanks	900 sq m steel plate (approx 80 tonnes)	
Concrete and bricks		
Floors, plinths, etc	400 cubic metres	Crushed for reuse on-site where possible, otherwise will be sent to recyclers for recycling and eventual reuse or disposed of at an appropriately licensed landfill facility. Reinforced concrete will be re-laid over existing floors to achieve level surfaces and floor gradients, preserve material and construct seamless bunding.
Foundations	250 cubic metres	
Bunds	100 cubic metres	
Walls	100 cubic metres	
Timber		
Beams, framework	500 cubic metres	Ground and chipped for reuse onsite, sent to recyclers for recycling and eventual reuse or will be disposed of at appropriately licensed landfill facilities.
Sheeting	250 cubic metres	
Insulation		
Asbestos-based wool	10 cubic metres (estimate)	Removed, triple wrapped and transported by appropriately licensed specialists. Asbestos that is removed will be disposed of at appropriately licensed landfill facilities. Where possible, sound asbestos roofing will be sprayed with PVA coating and retained. Broken and damaged asbestos sheets will be removed and replaced.
Non-asbestos-based wool	10 cubic metres (estimate)	
Asbestos-based roofing	100 cubic metres (estimate)	
Electrical		
Power boards	10 cubic metres	Sent to metal recyclers for recycling and eventual reuse or will be disposed of at
Wiring	10 cubic metres	

Material	Quantity	Disposal
Fittings and appliances	20 cubic metres	appropriately licensed landfill facilities.
Earthworks		
Excavation (for pipelines, etc)	50 cubic metres	Reused on site for landscaping, or fill.
Vegetation		
Trees and scrub	500 cubic metres	Ground and shredded for reuse as mulch on-site.

Construction works will take between six and nine months to complete.

The sequence of construction will be as follows:

- removal and demolition of concrete, unwanted structures, roofing and cladding
- installation of trenches and conduits for utilities and pipes
- civil construction works including foundations, footings, floors, pits and bunds
- construction of tilt slab walls, if required
- installation of roofing
- installation of stormwater drains
- completion of roadways, kerbing and channelling
- installation of tanks, vessels and major plant (some tanks may be installed before the roof is installed)
- installation of cladding and walls
- installation of internal offices and amenities
- connection of pipe work for tanks and processes
- installation of electrical systems
- painting.

Commissioning of the waste treatment processes will be undertaken as follows:

- CFS - two months
- oily water and waste water treatment plant - two months
- oil transfer storage - one month
- hydrogenation plant - six months.

Table 2.2 details waste quantities anticipated to be generated in the demolition process.

Table 2.2 Construction Waste Estimates

Material	Quantity	Disposal
Metal		
Cladding	100 square metres (approx 25 cubic meters non-compacted)	Metal recyclers or disposal to landfill.
Fencing	5 cubic metres	
Structural	10 cubic metres	
Reinforcing	5 cubic metres	
Pipes	3 cubic metres	
Sheet metal	10 cubic metres	
Concrete and bricks		
Foundations	20 cubic metres	Crushed and sorted for reuse onsite and off site, disposal to landfill, bricks to be sorted and reused where possible.
Bunds	5 cubic metres	
Walls	5 cubic metres	
Timber		
Formwork and boxing	50 cubic metres	Reused onsite where possible, sent to recyclers or disposed to landfill.
Beams, Framework	20 cubic metres	
Sheeting, packing and crates, pallets and treated timber	20 cubic metres	
Plastic		
Wrapping and ties	10 cubic metres	Sent to recyclers or disposed to landfill.
Packing	10 cubic metres	
Fittings	1 cubic metres	
Electrical		
Wiring	1 cubic metres	Sent to recyclers or disposed to landfill
Appliances and fittings	0.5 cubic metres	
Fittings		
Gyprock sheets	10 cubic metres	Sent to recyclers or disposed to landfill
Insulation	5 cubic metres	

Material	Quantity	Disposal
Earthworks		
Pits	250 cubic metres	Reuse on site for landscaping, fill, etc or uses as off-site fill.
Landscaping	200 cubic metres	
Roadworks	200 cubic metres	
Process areas	250 cubic metres	
Bunds	1,000 cubic metres	
Excavation (for pipelines, etc)	250 cubic metres	
Vegetation		
Trees and scrub	500 cubic metres	Ground and shredded for reuse as mulch on-site.

Construction working hours will be between 6am to 6pm, Monday to Friday, and 7am to 5pm, Saturday and Sunday. No work will be undertaken on Public Holidays. Construction works with the potential to generate noise impacts would be undertaken during the day time period of 7am – 6pm weekdays and 8am – 1pm Saturdays and no work on Sundays or Public Holidays. Internal and non intrusive noise activities such as painting, electrical and installation of plant and equipment may progress after hours.

2.3 Operational Phase

2.3.1 Services Offered

TPI is proposing recycling and waste management services to support industries and governments throughout NSW. Services will include the following:

- recovery and recycling of lubricant oils from oily waters, waste oils and oil filters
- manufacturing of lubricant oils
- total waste management services to mining and manufacturing sites as well as commercial, industrial and government facilities
- industrial cleaning operations including high pressure water blasting, tank cleaning and equipment maintenance
- drum collection, storage and transfer
- contaminated site remediation and clean-up
- provision of specialist waste management and agronomic advice and including waste minimisation programs, treatment strategies and site rehabilitation
- support services to local government authorities such as drain cleaning, maintenance of potable water and sewage reticulation systems, pipe inspection (using closed circuit television cameras)
- application of protective coatings

- facilities management
- collection and treatment of non-sewerable industrial wastes
- emergency response advice and services
- collection of cooking oil for offsite treatment.

2.3.2 Waste Storage and Handling

Waste will be accepted and handled in accordance with the *NSW EPA Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-liquid Wastes*. All incoming waste materials will be subject to onsite assessment in order to confirm consistency with the pre-delivery sample data and allocate waste to the most appropriate waste treatment process. Some wastes, particularly industrial wastes being received for the CFS process will be subject to detailed pre-screening analysis. Refer to Process Flow Diagram 1 in **Appendix B**.

2.3.2.1 Pre-screening

Before entering into an agreement to accept waste for storage or treatment TPI will require written application from the waste generator or their agent and will take all reasonable care to verify the accuracy of the classification of the waste stated in the written application by the waste generator or their agent.

Preliminary Assessment

Prior to acceptance at the Facility, each waste will require preliminary assessment and approval from TPI. Each waste will be classified according to the chemical characteristics and the most appropriate process for treatment. A certificate of analysis from a recognised laboratory may be requested or a representative sample may be needed to enable classification of the waste, the treatment strategy and the cost of disposal. The Facility's technical staff will ensure compatibility with the envisioned treatment process.

It will be the obligation of the generator to provide information on the waste for disposal including Material Safety Data Sheets (MSDS), chemical data sheets, certified analysis and to assist in provision of waste samples when requested. The generator will be required to meet any costs incurred by TPI in order for the waste to be classified and the most appropriate method of treatment to be determined.

All applications for disposal including analytical results and data sheets will be assessed by TPI's on-site technical staff, recorded and assigned to a waste class (based on the chemical characteristics and treatment process).

Post Assessment Treatment

Following the assessment process, TPI will allocate the waste generator either an approval number (where the waste is consistent and/or frequent) or a unique job number which will also be recorded on TPI's database. The waste generator (or their agent) will be advised of the waste classification, the price of treatment/disposal and the conditions for acceptance at the Facility.

When formally agreeing to accept the waste a consignment authorisation number will be issued in writing to the waste generator or their agent for tracking purposes in

accordance with NSW Guidelines. The consignment authorisation number issued by TPI will be accompanied by a written statement to the waste generator or their agent that describes the waste to which it applies, the amount of waste, the period of time for which it applies and the date of dispatch of the first load of waste.

In some cases where the Facility cannot treat the waste, the Rutherford site may act as a transfer station prior to the waste being delivered to other licensed treatment facilities. It is also possible that TPI may act as the waste manager and provide a service mechanism by which the waste is transferred to another licensed treatment facility in accordance with legislative requirements.

Once approved by TPI, the generator or their agent will be required to contact the Facility to arrange delivery to ensure that personnel and capacity are available to handle the incoming waste.

Where necessary, customers will be made aware of specific chemical pre-treatment, handling or packaging requirements will be advised for particular wastes.

A register will be maintained by the Facility of all waste generators conducting business at the Facility. Such information will be available to regulators and the authorities in accordance with statutory requirements and will include the following information:

- generators name and address from which the waste will be received
- authorised contact person and telephone number
- locality code
- chemical analysis and MSDS information
- waste classification
- expected or observed contaminants
- anticipated volume of waste
- frequency of disposal
- transport and delivery requirements
- on-site handling requirements including safety precautions
- cost per unit for disposal
- handling or extra fees (examples are laboratory analysis, drum fees etc).

2.3.2.2 Waste Receival

Wastes will be subject to onsite evaluation upon arrival. Wastes will be sampled and checked by TPI's technical staff to confirm consistency with the pre-delivery sample data. Transport documentation will also be checked and a receipt issued on completion. Samples will be retained for a certain period for quality control. Transfer of the wastes to treatment cells or storage tanks will be completed at the direction of the Site Chemist.

Operators will be alerted of incoming material. Incoming vehicles containing waste will be attended at all times to ensure waste is delivered appropriately and to correct

locations to prevent possible contamination of other waste streams. Transport vehicles are not permitted to unload their waste unless attended by an operator.

Incoming material in drums to be stored will be tested by the onsite laboratory and classified into relevant dangerous goods classes. Incoming material will be segregated, consolidated and stored according to their dangerous goods classifications.

When receiving waste TPI will:

- only accept waste from a non-licensed waste activity if the conditions of acceptance of the waste have been complied with by the generator or transporter of the waste
- only accept the waste for which TPI has issued a valid consignment authorisation number
- ensure all incoming and outgoing loaded transport vehicles carrying raw materials, waste and treated material to the site will be weighed on the weighbridge and loads of drums being transported to the site will be counted, details of the contents and size of each drum will be recorded
- obtain and keep a copy of the waste data form from the waste transporter
- accurately complete the waste data form and forward relevant copies to the waste generator, the EPA and the agency of the State or Territory of origin
- forward to the waste generator or their agent within 14 days of receipt of each load, written confirmation of acceptance of that load of waste
- record the location within the premises where the waste is placed or the temporary storage location and the date and means of treatment
- record and retain all information related to each consignment of waste for which an application for a consignment authorisation is received
- notify the EPA in writing within 48 hours of becoming aware of any suspected breach of the *Protection of the Environment Operations Act* or *Regulation*.

Should any anomalies be detected between the pre-screening analysis and onsite analysis, the waste may be quarantined or rejected. TPI will liaise with the transporter and/or generator of the waste to determine the source of the anomaly in order to characterise the waste. TPI may provide a modified quotation to accept the waste if they have the capability and capacity, otherwise the waste will be turned away from site. If waste is found to have been wrongly classified by the consigner and TPI cannot accept such waste under this licence, the waste will be returned to the waste generator or their agent within 21 days of TPI becoming aware of the incorrect classification.

Bulk waste deliveries will be discharged via hoses into the treatment cells or pumped directly into the storage tanks. Tankers will wash out using recycled water from the waste water treatment plant which will also be transferred to the appropriate cell or tank.

Waste stored in containers or drums delivered to the Facility may also be checked prior to storage in a suitably bunded and covered area whilst awaiting treatment or despatch to another approved treatment facility (where TPI acts as the transfer station). All containers will be labelled to allow identification tracking and in accordance with the site management system. Containers of poor integrity will not be accepted at the Facility

unless contained within suitable receptacles such as chemical overpacks. The Facility will retain a supply of chemical overpacks of various sizes for emergencies or for drums in poor condition.

All wastes will be stored in bunded storage areas that comply with the requirements of the Australian Standards and the Building Code of Australia. Bunding and floors will be constructed of impermeable materials (reinforced concrete) to ensure containment and isolation from the environment.

Ventilation provisions within the workplace will be compliant with relevant health and safety requirements.

For a detailed discussion of waste handling and storage specific to each waste process refer to **Section 2.3.3.**

2.3.2.3 Transportation of Waste

The Facility will accept waste for the terms and conditions outlined herein from licensed waste transporters including TPI's transport fleet. All vehicles will be back loaded where possible in order to reduce energy requirements and maximise the use of vehicles. B-double vehicles will be used as part of the transport fleet.

Tankers will be cleaned out before transporting loads. Where Dangerous Goods are being transported, placards will be displayed on vehicles, drivers will be appropriately licensed and trained in emergency and spill procedures and in the transport of Dangerous Goods, appropriate documentation will be carried including an emergency procedure guide and emergency contact and vehicles will be appropriately registered. All Dangerous Goods loads will be covered, packaged goods such as drums and Intermediate Bulk Containers (IBC's) will be sealed and covered and all TPI vehicles carrying Dangerous Goods will be fitted with spill trays. Vehicles carrying Dangerous Goods will comply with the Australian Dangerous Goods code.

Where required, loaded flatbed vehicles and tippers entering and leaving the site will be required to cover their loads in order to prevent emission to the environment.

Interstate transport of wastes will comply the National Environmental Protection Measure (NEPM) for the Movement of Controlled Waste.

Overnight parking of vehicles will be on gravelled or hardstand areas. Where a vehicle is in transit and is storing waste materials or liquid raw materials, the vehicle will be parked within an impermeable, concrete bunded area to prevent loss of containment to the environment. The parking arrangement for laden vehicles will comply with separation and emergency access requirements.

2.3.3 Resource Recovery and Recycling Processes

The resource recovery and recycling facility will incorporate the following treatment processes:

- oily water treatment and waste oil recovery
- manufacture of base lube oils by hydrogenation to base lube oils specification
- treatment of non-sewerable aqueous wastes by neutralisation, chemical fixation, stabilisation and solidification (CFS).

All incoming waste materials will be subject to onsite assessment in order to confirm consistency with the pre-delivery sample data and allocate waste to the most appropriate waste treatment process. Some wastes, particularly industrial wastes being received for the CFS process will be subject to detailed pre-screening analysis. All pre-screening, transportation and receival of waste will be carried out in accordance with EPA requirements. Onsite evaluation and pre-screening analysis are discussed in detail in **Section 2.3.5.1** and **Section 2.3.5.2**.

2.3.3.1 Oily Water Treatment and Waste Oil Transfer Station

The oily water treatment is located with the waste water treatment plant and will consist of:

- two (2) 100,000 litre conical bottom incoming phase separation tanks with screens
- two (2) 100,000 litre storage tanks
- one (1) separator unit.

The waste oil transfer station will consist of:

- six (6) 200,000 litre capacity oil settling and storage tanks, black in colour to retain heat and encourage separation of oil from water.

Hours of Operation and Capacity

The oily water and waste oil treatment plant will operate 24 hours per day, 7 days a week.

The proposed maximum capacity of the plant will be 16 million litres per year. The expected collection volumes of oily waters and waste oil will be about 1,500,000 litres per month.

Table 2.3 Oily Water Treatment

	Nature of Waste	Per Day (Litres)	Per Week (Litres)	Per Month (Litres)	Per Year (Litres)	Destination
Incoming	Oily water	42,740	300,000	1,300,000	15,600,000	Oily water treatment
	Waste oil	4,274	30,000	130,000	1,560,000	Waste oil storage transfer tank
	Process	15,000	105,000	420,000	5,460,000	Oily water treatment

	Nature of Waste	Per Day (Litres)	Per Week (Litres)	Per Month (Litres)	Per Year (Litres)	Destination
	waters					
	Chemical additives	14	100	433	5,200	Chemical storage area WWTP
	Waste oil	2,351	16,500	71,500	858,000	Offsite for treatment
	Recovered water	42,740	300,000	1,300,000	15,600,000	WWTP
Outgoing	Sludge residues	2,351	16,500	71,500	858,000	CFS process
	Metal wastes	1,420	10,000	40,000	520,000	Disposal to landfill

Table 2.4 Waste Oil Transfer Station

	Nature of Waste	Per Day (Litres)	Per Week (Litres)	Per Month (Litres)	Per Year (Litres)	Destination
Incoming	Waste oil	30,000	150,000	600,000	7,200,000	Waste oil storage transfer tank
Outgoing	Waste oil	27,000	135,000	540,000	6,480,000	Offsite for treatment
	Oily water	3,000	15,000	60,000	720,00	Oily water Treatment

Input

Input into the oil water and waste oil treatment plant will include;

- *oily water and waste oils* – are to be collected from neighbouring regions and from interstate generators such as mines, service stations and automotive workshops
- *residual oil from used oil filters* – used oil filters from motor vehicles, agricultural equipment, mining equipment and machinery retain a significant volume of oil, even after draining (up to 30% by volume of the filter cartridge) and are not suitable for disposal to landfill. TPI proposes to introduce a road based collection service of oil filters throughout NSW. Oil filters will be collected from generators such as mines, service stations and automotive workshops. The collected filters will be crushed in a specially-designed and engineered unit within the Facility and the oil recovered for storage and recycling.

  The oil filter crush unit will be close to the oil storage tank farm. The oil from the crushing unit will be transferred to the oil storage tanks for recycling
- *process waters* – including plant and tanker wash down and stormwater from bunded areas
- *decant water* - from the oil storage tanks
- *phase separating chemicals* - for the separation of oil and water

- *lime* – for coagulation, flocculation and precipitation treatment.

All unloading of oily water and waste oil will be undertaken in a transfer area fitted with rollover bunds and a blind sump to collect any runoff.

Waste Processing Description

Oily Water Treatment

The oily water treatment will separate the water phase from oils in preparation for re-refining at Wetherill Park. Refer to Process Flow Diagram 2 in **Appendix B**.

Oily water emulsions will pass through a screen (to remove gross solids such as plastic, nuts and bolts etc) and will be transferred to vertical phase separation holding tanks with sufficient retention time to allow separation of the oil, aqueous and solid phases. The holding tanks will have conical bases to improve settling rates and the removal of solids from the tank. Chemicals may be added at appropriate quantities to assist phase separation of the water and oil phases. Once the emulsion is broken, the oil and water phases can be separated by conventional methods. Separated oil will be sent to the waste oil transfer station and oily water to the next phase of the oily water treatment.

The aqueous phase will be transferred to an oil separator device such as a Dissolved Air Flotation (DAF) or a Coalescing Plate Separator in which any residual oils or solids will be removed. The effluent from the separator unit will then be directed to the waste water treatment plant for final treatment. Any oil recovered by the separator unit will be transferred to the oil storage tanks and any solids removed for CFS treatment.

Waste Oil Transfer Station

TPI will operate a waste oil transfer station. Waste lube oils (or mineral oils) collected from industrial, and commercial operations, mine site, service stations, truck washes and automotive workshops will be delivered to the Facility for storage prior to transfer to offsite TPI licensed recycling plants.

TPI will encourage generators to segregate waste lube oils suitable for recycling and reduce contamination from other waste streams.

As an additional service to generators, TPI will also collect oil filters and recover the residual oil by crushing.

Oils from the oily water process and CFS processes will also be recovered for storage and offsite recycling.

Any free water will be drained from the storage tanks and transferred to the oily water process for treatment. Any settled sludge which accumulates in the waste oil storage tanks will be transferred to the CFS plant for treatment.

All storage and processing areas and equipment are to be installed within impermeable concrete bunds to prevent any spillage to the land. The installation of all equipment for the storage and handling of the oil material will comply with the requirements of *AS1940 – 2004: The storage and handling of flammable and combustible liquids* and other relevant standards and regulatory requirements.

Output

The oily water and waste oil treatment will produce the following outputs:

- *waste oil* - will be transported by road to TPI's licensed oil recycling plants. All transfer of waste oil will be undertaken in bunded areas
- *recovered water* - from the oily water process and waste oil storage tanks will be transferred to the waste water treatment plant for final treatment and discharge to sewer in accordance with discharge criteria or reuse on-site as wash water
- *sludge residues* – will be transferred to the CFS plant for further treatment
- *metal wastes* - produced from the crushing of oil filters from motor vehicles, agricultural equipment, mining equipment and machinery will be sent to scrap metal merchants for recycling
- *bund water* – will be transferred to the waste water treatment plant

It is not anticipated that the oily water and waste oil storage tanks will have significant emissions to air, but will comply with Environmental Protection Licence requirements. Oily waters and waste oils containing light end contaminants will not be accepted. Incoming oil will be checked by flash point analysis.

2.3.3.2 Lube Oil Hydrogenation Process

The lube oil hydrogenation plant will consist of two (2) units located external to buildings:

- the steam methane reformer unit
- the hydrogenation process

Together the steam methane reformer and the hydrogenation process will comprise of the following:

- two (2) 2.5m^3 reactors connected in parallel
- one (1) direct fired heater to heat reactor feed to above 300^oC.
- one (1) high pressure circuit liquid separator
- one (1) low pressure circuit liquid separator
- product shell and tube pinch heaters and coolers
- one (1) circulating vacuum stripper column with an overall height of 16 meters and a 2 meter diameter. The stripper will be heated by a 54m^2 shell and tube steam heater
- one (1) off-gas drum accumulator with an overall height of 6 meters a volume of 20 cubic metres.
- one (1) gas fired boiler to supply steam for the vacuum stripper heater and the steam driven vacuum ejectors
- one (1) evaporative cooling tower 16 meters in height. The tower will be capable of 2000kW energy dissipation using a 200 cubic metres per hour cooling water distribution pump

- one (1) flare – 16 metres in height
- eight (8) 100,000 litre process tanks for the storage and processing of re-refined oil. The process tanks will store raw product, intermediate product of medium flash point, final product of high flash point, light ends (low flash solvent) and sour water
- three (3) 450,000 litre tanks for the storage of the final hydrogenated base lube oil product
- fire protection equipment including fire mains system, sensors and monitors, foam proportioning system, steam lances and additional services for fire fighting
- utilities building that will house a boiler, compressor and other plant and ancillary equipment
- building located 15 metres from the plant that will house the control room, motor control centre, laboratory, lunch room , staff offices and amenities
- standard liquid nitrogen storage facility of 10 cubic metres vacuum insulated vessel with outlet flow evaporators designed for continuous maximum demand
- plate and frame filter press to be used in the bleaching process to separate the clay from the decolourised oil.

The steam methane reformer and the hydrogenation process are described in more detail below.

Hours of Operation and Capacity

It is proposed that the lube oil hydrogenation plant will operate seven days a week, 24 hours per day.

The proposed maximum capacity of the plant will be 36,000 tonnes per year of final product, or 3,000 tonnes per month. This capacity will require a feed in-take of 40,000 tonnes of re-refined oils per year or 3,300 tonnes per month.

Table 2.5 Production of Base Lube Oils by Hydrogenation Summary Quantities

	Nature of Waste	Unit of Measurement	Per Day	Per Week	Per Month	Per Year	Destination
Incoming	Re-refined oil	tonnes	110	750	3,000	36,000	Hydrogenation storage tanks
	Water for cooling	Litres	28,493	200,000	866,667	10,400,000	Hydrogenation process tanks
	Hydrogen	cu m/hr	250	42,000	168,000	2,184,000	Hydrogenation plant
	Nitrogen	kilogram	329	2,308	10,000	120,000	15m^3 nitrogen storage tank
	Electricity	kilowatt hours	9,000	61,600	250,000	3,000,000	Hydrogenation plant
Outgoing	Base lube oil	tonnes	93	651	2,600	31,250	Hydrogenation storage tanks
	Air emissions	tonnes	1	8	30	360	Atmosphere

Nature of Waste	Unit of Measurement	Per Day	Per Week	Per Month	Per Year	Destination
Steam	litres	3	21	84	1,000	Condensed
Sludge	tonnes	nil	nil	nil	nil	CFS process
Used catalysts reformer	tonnes	N/A	N/A	N/A	20	Manufacturers for disposal or CFS Process
Liquid light ends	Tonnes	7.2	50	202	2420	Designated process tank
Used catalyst hydrogenation		N/A	N/A	N/A	20	Manufacturers for disposal or CFS Process

Input

Inputs into the lube oil hydrogenation process include:

- *pre-treated re-refined oil* – feedstock for the hydrogenation process will be supplied by TPI's Wetherill Park Re-refinery located in Sydney's western suburbs
- *hydrogen* – will be made onsite through a steam methane reformer unit and supplied as required, therefore no onsite storage is required. Hydrogen required for the process will be fed from the steam methane reformer unit via reciprocating compressor
- *electricity supply*
  - 500 kVa maximum with an installed motor capacity of 300 kW
- *potable water* - required for replacement of:
  - cooling tower evaporative losses to atmosphere
  - cooling tower blow-down to avoid build-up of total dissolved solids (TDS) concentration
  - boiler feedwater after steam losses in the reformer reaction
  - boiler feedwater after losses through ejectors and during boiler blow-down
  - demineralised water dosing used to remove the soluble salts contained in the reactor outflow and drained from the high pressure separator.
- *natural gas*
  - 6 GJ/hr is required for the hydrogenation plant to fuel the product heater and steam boiler
  - 5 GJ/hr of natural gas will be required as input for the steam methane reformer process as well as fuel for the operation of the reformer burner and the boiler.
- *saturated steam* - 2,000 kg/hr of 10 barG from the steam boiler will be required for the steam-driven vacuum ejectors and the vacuum stripper product heater
- *nitrogen* - to provide an inert gas blanket in the process and product tanks as well as purge pipelines and vessels during shutdown and maintenance activities.

- *spent catalyst* - to replace spent catalyst lost in the steam methane reformer (estimated replaced volume of 0.5 cubic metres) and hydrogenation process (estimated total volume of 7.5 cubic metres) once it has become deactivated from the absorption of impurities. This is estimated to occur twice in the first year of commissioning and once annually thereafter
- *steam* - required for the reformer conversion reaction, produced by the boiler at 2,000 kPa at a rate of 300 kg/hr
- *instrument air supply* - for the operation of actuators and control valves will be supplied to both units at 800 kPa
- *activated clay* - to be used in the bleaching process will be delivered in 1 cubic metre bulk bags and stored undercover

Waste Processing Description

Hydrogen Generation by Steam Methane Reformer

A "Hydro-Chem" steam methane reformer will produce the hydrogen required for the hydrogenation process using steam and natural gas. Natural gas and steam are reacted in the presence of a catalyst to produce hydrogen at the demand rate required for the hydrogenation reaction. No storage of hydrogen will be required.

Steam will be generated by a gas-fired boiler. The natural gas will be provided from the gas pipeline network (AGL – Agility) at the required pressure.

The hydrogen generation process occurs in several stages summarised as follows:

- trace impurities in the gas are chemically converted and removed
- gas is mixed with superheated steam under pressure and fed into the fired reformer tubes filled with nickel reforming catalyst to form hydrogen and carbon dioxide
- a further refining step is performed in the shift converter which produces more hydrogen by converting carbon monoxide to carbon dioxide over a chromium oxide catalyst.

After passing through a liquid phase separator the process gas is fed to the pressure swing absorbers which remove the final traces of carbon monoxide and water to produce 99.9% pure hydrogen.

The design maximum production rate of the plant is 250Nm^3/hr.

From the pressure swing absorbers the hydrogen pressure will be boosted to 2,500kPa for the hydrogenation process using a reciprocating compressor. It is intended that the hydrogen compressor will take its suction from the reformer.

Hydrogenation Process

The hydrogenation process is a closed loop operation where pre-treated re-refined used lubrication oil is chemically reacted with hydrogen in the presence of a catalyst at elevated temperature and pressure to produce base lubricant oil with enhanced properties that comply with the regulatory specifications outlined in *Schedule 1, Product Stewardship (Oil) Regulations 2000* (Com).

The hydrogenation process involves:

- saturating active open-chain hydrocarbons containing one or more double bonds (known as olefinic bonds) with hydrogen
- removing metals and other impurities from the re-refined oil
- reducing the sulphur and nitrogen content
- improving the colour to a bright appearance.

The hydrogenation reaction releases heat, raising the temperature from 300°C to 350°C - 450°C at the reactor outlet.

From the reactor, the processed oil and gases are cooled through a series of heat exchangers and pressure separators. Hydrogen is recovered and recycled via a compressor and returned to the reactor.

In the hydrogenation process some long chain hydrocarbons are “cracked” into short chain, volatile hydrocarbons (known as light ends), incondensable off-gases (predominantly ethane, methane and propane) and water. The off-gases are recovered for use as a supplementary fuel source for the fired heater to reduce stack emissions and to improve process efficiency. The light ends are condensed and transferred to a dedicated process tank for reuse and sale. The separated water is sent to the sour water storage tank to be transferred to the waste water treatment plant for further treatment.

The flare is provided as a standby for the combustion of any excess off-gas. A pilot flame will be continuously maintained using a supply of natural and off-gases.

The final recovered oil product is cooled and transferred to the above ground process tanks for storage and quality checks before final despatch to customers.

If necessary, a bleaching process will be applied to the final product to correct the colour of the base lubricant oil. The bleaching process involves heating the processed oil, adding a small amount of clay and filtering the mixture through a plate and frame filter press.

The hydrogenation of pre-treated waste lube oils will completely recycle the oil to refinery grade base lubricant specifications as specified in the *Product Stewardship (Oil) Regulations 2000 – Schedule 1*.

Output

The lube oil hydrogenation process will produce the following outputs:

- *water* – produced by continuous loss of water from the evaporative cooling tower will be discharged to the atmosphere (dependent on the temperature range over the incoming and outgoing streams). This is estimated as 3 cubic metres per hour
- *base lube oil* - to refinery grade specifications or to customer requirements. The hydrogenation process recovers approximately 90% of the re-refined oil
- *light ends* - produced in the process will be recovered, transferred and stored in dedicated tanks

- *off-gas* - produced by the process will be used as fuel for the direct-fired product heater to maximise process efficiency. Any excess off-gases will be directed to the flare and combusted
- *sulphur – will be* removed from the waste in two streams.
  - sour water which is made up of process-generated water, dosed demineralised water to extract soluble salts, and condensed water from the steam-driven vacuum ejectors will be stored in a dedicated tank and transferred to the waste water treatment process
  - waste process gas stream from the hydrogenation process which will be burnt in the heater and/or the flare. The products of combustion will be water, carbon dioxide and trace levels of oxides of sulphur and nitrogen.
- *combustion gases* – such as carbon oxides and water produced from natural gas used in the steam methane reformer and carbon monoxide, water and nitrogen from 95Nm^3/h of natural gas used in the hydrogenation plant steam boiler
- *effluent water* - generated as a result of regular boiler blowdown to maintain optimal concentrations of dissolved solids in the boiler feedwater
- *spent catalyst* - used in the steam methane reformer and hydrogenation plant made up of metals including aluminium, nickel and molybdenum. Due to the low demand on the catalysts, spent catalyst from petroleum refineries will be used where possible. This provides an extended life for this waste product. Spent catalyst will be returned to manufacturers for disposal. Therefore, no additional waste catalyst is generated
- *filter cake* – if required will consist of approximately 60 - 70% activated earth and oil which will be directed to the CFS process for treatment prior to disposal at an appropriately-licensed facility.

2.3.3.3 Treatment of Non-Sewerable Aqueous Wastes by Chemical Fixation, Stabilisation and Solidification (CFS)

The CFS process treats industrial liquid wastes using blends of cement, fly ash and other additives to produce a soil-like product that is non-hazardous, non-toxic and suitable for disposal to approved landfills. The process can also be used for contaminated soils. CFS converts inorganic and organic contaminants to the least soluble, least mobile or least toxic form. Generally the CFS plant will be used to treat heavy metal wastes, inorganic sludges, wash waters and other industrial wastes. The plant will consist of:

- one (1) conical base silo of approximately 100 – 200 cubic metre capacity, for the storage of fly ash located outside of the existing metal shed, adjacent to the CFS operations. Fly ash will be pumped into the silo under a pneumatic compressed air system. The silo will have 5 metres clearance, a total height of approximately 20 metres and a diameter of approximately 8 metres. The silo will be painted a green colour, to blend in with the surrounding landscape
- one (1) conical base silo of approximately 50 tonne capacity for the storage of cement located outside of the existing metal shed, adjacent to the CFS operations. Cement will be pumped into the silo under pneumatic compressed air system. The

silo will have 5 metres clearance, will have a total height of approximately 17 metres and a diameter of approximately 8 metres. The silo will be painted a green colour, to blend in with the surrounding landscape

- one (1) compressor – for air supply for silos located at ground level in an insulated shed or inside the exiting shed to minimise noise emissions
- eight (8) to twelve (12) reinforced, polyethylene, Class A storage tanks with a combined maximum capacity of 250,000 litres for the storage of incoming industrial liquid wastes (<5% sludge content)
- four (4) to eight (8) above ground, reinforced polyethylene, Class A treatment tanks with stirrers with a combined maximum capacity of 200,000 litres
- four (4) concrete rectangular mixing cells of 50,000 – 60,000 litre capacity with a combined maximum capacity of 200,000 – 240,000 litre capacity for the treatment of sludges. Pit dimensions will be approximately 4 metres in length, 4 metres in width and 3.5 metres in depth. The mixing cells will be constructed of lined, high–strength, reinforced concrete and located within the treatment building. The cells will have inspection points and leachate collection systems sensing equipment to detect any loss of containment. Any breaches will be captured and contained by a secondary catchment protection system. The cells will be used for the treatment of sludges and solid wastes. A backhoe or excavator will be used to mix the materials and to remove the final product from the cells for curing. A retrograde, sloped floor (0.5 – 1% gradient) with a roll back bund will be constructed in front of the pits to allow tankers and tippers to empty their loads. The floor gradient will also ensure that any liquid spillage and floor washings are directed to drains and blind sumps for transfer into the cells. The rollback bund will prevent tankers and machinery from rolling into the cells
- one (1) above ground reinforced, polyethylene, Class A lime slurry storage tank with stirrer to a maximum capacity of 25,000 litres. Lime will be purchased as a slurry, as required
- phase separating chemicals storage – will be stored in drums and IBCs used to achieve phase separation in the CFS treatment. These materials will be stored primarily within the Dangerous Goods Store and will be transferred and stored temporarily in a designated bunded area within the CFS Plant to be used in the process, as required
- curing shed which will be housed in the adjacent building to store the final, fixated material during the curing process. The curing shed will have a maximum capacity of 3,000 cubic metres of fixated material, representing three (3) weeks storage capacity. The curing area will be sealed and contained with an impervious concrete floor and bunded to prevent transfer or exposure of fixated material to the environment.

Hours of Operation and Capacity

It is proposed that the CFS plant will operate seven days per week from 6am to 9pm.

The proposed maximum throughput of the CFS plant will be 52,000 tonnes per year or approximately 1,000 tonnes per week.

Table 2.6 CFS Process Summary Quantities

	Nature of Waste	Per Day (tonnes)	Per Week (tonnes)	Per Month (tonnes)	Per Year (tonnes)	Destination
Incoming	Non sewerable aqueous wastes and sludges from clients and onsite activities	71	500	2,167	26,000	In ground pits or storage tanks
	Phase separating chemicals	36	250	1,083	13,000	Chemical storage area CFS plant
	Cement and lime (chemical fixation and stabilisation)	9	50	217	2,600	Silo and lime storage tank
	Electricity	80 kilowatt hrs	560 kilowatt hrs	2,240 kilowatt hrs	26,880 kilowatt hrs	Pumps, instruments, controls etc
Outgoing	Supernatant liquid	57	400	1,733	20,800	WWTP
	Fixated material	91	500	2,167	26,000	Disposal to landfill
	Emissions	nil	nil	nil	nil	Atmosphere via a bag filter

Inputs

Inputs into the CFS Process include:

- *non-sewerable, aqueous wastes and sludges* - transported by road tanker from external industrial and commercial businesses or stored and transported in containers (drums, IBCs, etc). Wastes will include predominantly inorganic and organic wastes such as oily sludges, process residues, interceptor sludges, paint sludges, resins, degreasing agents and contaminated soils. Solid and sludge wastes will be transferred directly to the treatment cells. Liquid wastes may be discharged directly into the cells for immediate treatment or transferred to storage tanks
- *non-sewerable aqueous wastes and sludges* - generated from on-site treatment processes and activities such as the oily water and waste water treatment plants, the truck wash bay, and the waste oil transfer station. The on-site laboratory will also produce minor quantities of waste for treatment in the CFS plant
- *fly ash* - sourced from nearby coal-fired power stations and delivered by road transport to be stored in a dedicated silo prior to use in the CFS treatment process
- *cement* - sourced from local suppliers and delivered by road transport to be stored in a dedicated silo prior to use in the CFS treatment process

- *phase separating chemicals* - such as lime, sodium hydroxide, synthetic polyelectrolytes and proprietary acids and alkalis. With the exception of lime which is purchased, delivered and stored in bulk as a slurry, the remaining chemicals will be purchased in small, packaged quantities, as required, and stored in the Dangerous Goods Store. When required, the chemicals will be transferred to the CFS Plant for use.

All transfer of materials in the CFS process will occur within impervious, bunded areas. Vehicular access will be via rollover bunds. Sealed drains, channels and blind sumps will be installed to collect floor washings and spills. Regular housekeeping and spill management procedures will be implemented to ensure the storage and processing areas are kept clean and free of contamination. Residues will be removed and transferred to the CFS process using dry cleaning methods, absorbents, pumps and vacuum tankers, as appropriate.

Waste Processing Description

The CFS process is used for non-sewerable liquid wastes and sludges to reduce the hazard potential of wastes by converting potentially hazardous contaminants to the least soluble, least mobile, or least toxic form and immobilising the by-products using proven chemical processes to produce a stable, inert, soil-like material. Process Flow Diagram 3 in **Appendix B**. The fixation step chemically reduces contaminants to the least hazardous form and the solidification step physically and chemically binds the contaminants into a solid matrix resistant to leaching or breakdown in a landfill environment.

The CFS process is undertaken in five stages.

Stage 1: Pre-screening

Prior to acceptance at the Facility, waste will require preliminary assessment and approval from TPI. Waste will be classified according to the chemical characteristics and the most appropriate process for treatment. A certificate of analysis from a recognised laboratory may be requested or a representative sample may need to be submitted to the Facility for assessment to enable classification of the waste, the treatment strategy and the cost of disposal. The Facility's technical staff will ensure compatibility with the envisioned treatment process.

Following the assessment process, TPI will allocate the waste generator either an approval number (where the waste is consistent and/or frequent) or a unique job number which will be recorded on TPI's database.

Once approved by TPI, the generator or their agent will be required to contact the Facility to arrange delivery to ensure that personnel and capacity are available to handle the incoming waste.

Pre-screening is discussed in detail in **Section 2.3.5.1**.

Stage 2: Receival

On arrival, wastes will be sampled and checked by TPI's technical staff to confirm consistency with the pre-delivery sample data. Transfer of the wastes to treatment cells or storage tanks will be completed at the direction of the Site Chemist.

Receival is discussed in detail in **Section 2.3.5.2**.

Stage 3: Mixing and Settling

In the mixing and settling step, proprietary chemicals will be added to the waste to destabilise emulsions and facilitate separation of phases.

Mixing will be by impeller mixers in the storage tanks or by backhoe or excavator in the cells. Air sparges using compressed air may also be used to provide intimate mixing.

Following the mixing process, the waste is allowed to stand and separate into discrete phases (water, oil and sludge residues). If present, the oil phase will be removed from the surface and transferred to the waste oil storage tanks for recycling. The water phase will be transferred to the waste water treatment plant for further treatment whilst the sludge phase will undergo fixation and stabilisation.

Stage 4: Chemical Fixation and Stabilisation

In the chemical fixation and stabilisation step, wastes are mixed with additives which chemically reduce contaminants to the least hazardous form and improve the handling and physical characteristics of the waste. Fixation involves the addition of proprietary chemical mixtures to precipitate soluble metals as insoluble compounds (such as metal hydroxides). Chemical fixation refers to those techniques that reduce the hazard potential of a waste by converting the contaminants into their least soluble, least mobile or least toxic form.

The resultant 'fixated' sludge from the fixation and stabilisation treatment can be dewatered using a belt or plate filter press to separate the precipitate as a cake which can then undergo solidification and immobilisation.

The filtrate, containing low to trace levels of metals and contaminants, will be transferred to the waste water treatment plant for further treatment.

Stage 5: Solidification and Immobilisation

The solidification and immobilisation step physically and mechanically binds the precipitated sludge into a soil-like matrix resistant to leaching or breakdown. Proprietary additives encapsulate the fixated compounds in a complex alumino-silicate matrix (pozzolanic process) so that the leaching potential of metals becomes negligible under environmental conditions and the physical nature of the material (strength, compressibility and permeability) is significantly altered.

The fixated product has improved structural integrity, engineering properties and physical characteristics that are suitable for transportation, storage and disposal.

Solidification binds the fixated waste using chemical additives such as fly ash or cement. Mixing is generally achieved using a backhoe with dry chemical additives fed by hopper through sealed air slides to the waste sludge residues and the dewatered filter cake from the filter press. In addition to providing absorption capabilities, the fly ash assists in providing compressive and mechanical binding strength to the solidified matrix so that it is suitable for landfill disposal.

The chemically-bound solids are then allowed to hydrate/cure for a period of at least 7 - 10 days within the Curing Shed to ensure that the pozzolanic process proceeds to completion. Water is used up in the hydration reaction of these chemical systems. The

entire pozzolanic matrix, when physically set and cured, decreases metal and other compound mobility by reducing the incursion of leaching liquids into and out of the stabilised matrices. At a molecular level, as the solidification reaction proceeds, fibrils are formed upon hydration of the silicate and aluminate compounds (pozzolans). These interlocking fibrils bind the matrix and the various hydration products and wastes into the hardening mass.

Addition of the fixation additives is assisted with enclosed air slides and particulate filters to ensure the air entrainment of the solids is minimised. Dust and vapours from the cells will be captured by an exhaust system and directed back to the storage silos for recovery and reuse.

All floor areas within the building will be constructed of impermeable concrete and designed so that a path sweeper can be easily manoeuvred to maintain the cleanliness of the work area. Blind sumps will be used to capture spills and floor wash waters for transfer back to the treatment process. The entire treatment area will be bunded to ensure no contamination of the environment occurs.

The recording of all materials treated will be completed on a batch-wise activity, based on the chemical neutralisation and subsequent 'fixated' material produced. The material description and quantity of additives included will also be recorded to allow the tracking of all wastes received for this treatment.

Control of chemical fixation and solidification activities will be undertaken by technical staff and trained operators.

Batch reaction details will be recorded on the Facility's database. Process control and assessment advice will be provided by the Plant Chemist.

Output

Outputs from the CFS process include:

- *fixated material* – produced on completion of the curing process. The final product can resemble a clay-like, friable soil

  Prior to disposal at landfill, fixated material will be tested for leachate performance by carrying out a toxicity characteristic leachate procedure (TCLP) and specific contaminant concentration (SCC) and will be assessed by a NATA accredited laboratory in accordance with the *NSW EPA Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-liquid Wastes* and to any relevant local council requirements. If fixated material passes the TCLP and SCC analysis it will be disposed of at an appropriately licensed landfill. If fixated material fails the required tests, it will undergo further CFS treatment.

  It is anticipated that 26,000 tonnes of fixated material will be produced per year to be disposed of at an appropriately licensed landfill facility. All loading of fixated material will be undertaken in a covered transfer area fitted with rollover bunds. Loads of fixated materials will be covered for transportation

- *supernatant liquid* – CFS produces a relatively clean liquid containing only trace levels of metals. The supernatant liquid will be transferred to the waste water treatment plant for further processing and final filtration. It is anticipated that

approximately 12,000 tonnes of treated effluent from the CFS process will be produced per year or 250 tonnes per week

- *emissions to air* - will be controlled by a bad filter to remove particulate matter to protect personnel and public health. Any emissions will be in accordance with Environmental Protection Licence (EPL) limits

  Dust from the addition of cement and fly ash to the mixing cells will be extracted and returned to the fly ash silo via a bag filter.

2.3.4 Waste Water Treatment Plant

The waste water treatment plant will treat industrial waste waters generated from the various waste treatment facilities onsite, stormwater drains, collection pits, etc to sewer discharge criteria. The waste water treatment plant will consist of:

- two (2) 100,000 litre capacity incoming phase separation tanks
- two (2) 100,000 litre capacity coagulation, flocculation and precipitation tanks
- two (2) 100,000 litre capacity conical bottom settling tanks
- one (1) filter press
- two (2) 100,000 litre capacity effluent storage tanks
- *chemical storage* – will use drums and IBCs to achieve phase separation and coagulation, flocculation and precipitation in the waste water treatment. These materials will be stored primarily within the Dangerous Goods Store and will be transferred and stored temporarily in a designated bunded area within the waste water treatment plant.

Hours of Operation and Capacity

It is proposed that the plant will operate as required seven days per week, 24 hours a day.

The proposed maximum throughput of the plant will be 36.4 million litres per year or 700,000 litres per week.

Table 2.7 Waste Water Treatment Plant Summary Quantities

	Nature of Waste	Per Day (litres)	Per Week (litres)	Per Month (litres)	Per Year (litres)	Destination
Incoming	Oily water, trade waste water, CFS process water, condensate (hydrogenation)	99,726	700,000	3,033,333	36,400,000	Incoming storage tank
	Phase separating chemicals	28	200	867	10,400	Chemical storage area

	Nature of Waste	Per Day (litres)	Per Week (litres)	Per Month (litres)	Per Year (litres)	Destination
	Coagulation, flocculation and precipitation chemicals	28	200	867	10,400	Chemical storage area
Outgoing	Oil from phase separation	4,986	35,000	151,667	1,820,000	Waste oil storage
	Sludge from phase separation	4,986	35,000	151,667	1,820,000	CFS process
	Cured filter cake	1,425	10,000	43,333	520,000	CFS process or disposal to landfill
	Effluent - Discharge	42,740	300,000	1,300,000	15,600,000	Sewer
	Effluent - Plant Water	42,740	300,000	1,300,000	15,600,000	Reuse in plant operations
	Emissions	nil	nil	nil	nil	atmosphere

Input

Input into the waste water treatment plant includes:

- *oily water* - from the oily water treatment process
- *trade waste water* – from onsite activities including wash water, oily water and dirty water from wash down bays, tanker washout and mechanical workshop collected from blind sumps in bunded areas
- *CFS process water* - from the CFS process
- *condensate and sour water* – from the hydrogenation process
- *chemicals* – possible chemicals that may be used include lime and phase separating chemicals such as hydrochloric acid, sulphuric acid, galvanizing acid and ferric chloride.

Waste Processing Description

The waste water treatment process will consist of five stages. Refer to Process Flow Diagram 5 in **Appendix B**.

Stage 1 - Phase separation

Phase separation will be used to separate oils from water. Phase separating chemicals will be added and mixed into the waste water to chemically separate oil from water compounds. Separated oil will be sent to the waste oil and oily water plant for treatment. The water phase will be fed into the next phase of the waste water treatment plant.

Stage 2 - Coagulation, Flocculation and Precipitation

Lime is added to the waste water to neutralise and stabilise pH to 9.5 – 10.5 to encourage metals and other sediments to precipitate and settle out. This process

creates a sludge consisting of insoluble metals and sediments. Polymers may be added to enhance the settling process and improve dewatering.

Stage 3 - Settling

Following coagulation, flocculation and precipitation, the sludge and water will be fed into the settling tanks and allowed to settle overnight into a thickened sludge layer (containing the insoluble heavy metals) and a clean supernatant.

Stage 4 – Filter Press

Following settling, the supernatant and sludge are dewatered using a belt or plate filter press to produce a filter cake that will be dried further in the curing area of the CFS plant. Following tests, the filter cake may be treated further in the CFS process or disposed directly to an appropriately licensed landfill.

The filtrate from the dewatering step will be transferred to effluent storage tanks prior to discharge to sewer or reuse as on-site wash water.

Stage 5 – Discharge and Reuse

Filtered water will be fed into effluent storage tanks for quality control checks for potential reuse on site as plant wash water or discharged to sewer as trade waste. The waste water treatment plant will operate on a batch discharge system. If required, final pH correction will be undertaken.

Quality control checks on the final effluent will include pH, suspended solids, metals and conductivity.

Output

Outputs from the waste water treatment plant include:

- *oil* - from phase separation will be fed into the oil transfer station for recycling.
- *sludge and solids* – generated by the various phases of the waste water treatment process will be cured and analysed by the onsite laboratory to determine if landfill criteria as specified in the *EPA's Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-liquid Wastes* are satisfied. If the sludge and solids meet disposal requirements it will be transported by TPI's licensed waste transport contractors and disposed of at an appropriately licensed waste facility. If sludge and solids do not meet landfill criteria they will undergo CFS treatment.
- *final effluent* - will be disposed of to sewer in accordance with Hunter Water's sewer discharge criteria or reused onsite as wash down water. If laboratory analysis reveals that water does not meet sewer discharge specifications, the effluent will be retreated. It is anticipated that a maximum of 30 – 35 megalitres will be discharged to sewer per year.
- *emissions to air* – in general, tanks will be enclosed. Negligible emissions are anticipated from the water treatment process.

2.3.5 Onsite Laboratory

The onsite laboratory will provide an integral role in the Facility's quality assurance and control programs for each of the processes. The onsite laboratory will also play an integral role in ensuring that pre-screening, transportation and receival of waste is conducted in accordance with DEC requirements. The onsite laboratory will chemically analyse and pre-screen waste samples, incoming wastes, monitor processes and treatment steps, final waste products and final product control (hydrogenation) as well as environmental monitoring.

2.3.5.1 Pre-screening

A waste pre-screening discussion is included in **Section 2.3.2.1**. The following discussion is limited to the onsite laboratory's role in the pre-screening process.

Prior to acceptance at the Facility, each waste will require preliminary assessment and approval from TPI's onsite laboratory. Each waste will be classified according to the chemical characteristics and the most appropriate process for treatment. A certificate of analysis from a recognised laboratory may be requested or a representative sample may need to be submitted to the Facility for assessment to enable waste classification, the treatment strategy and disposal cost. The Facility's technical staff will ensure compatibility with the envisioned treatment process.

All applications for disposal, including analytical results and data sheets, will be assessed by TPI's on-site technical staff, recorded and assigned to a waste class (based on the chemical characteristics and treatment process). The classification system will be based upon the characterisation guidelines developed at other treatment facilities operated by TPI.

The hazard potential of all wastes will be assessed in accordance with US EPA standard methods for the evaluation of industrial wastes. Four characteristics are used to evaluate the hazard potential of industrial wastes and their suitability for treatment and disposal: corrosivity, ignitability, reactivity and toxicity. The evaluation will also include risk management to ensure protection of personnel, public health and safety, assets and the environment.

2.3.5.2 Waste Receival

On arrival at the Facility, the wastes will be subject to onsite evaluation by the onsite laboratory. Wastes will be sampled and checked by TPI's technical staff to confirm consistency with the pre-delivery sample data. Transport documentation will also be checked and a receipt issued on completion. Samples will be retained for a defined period for quality control purposes. Transfer of the wastes to treatment cells or storage tanks will be completed at the direction of the Site Chemist.

The onsite laboratory will play an integral role in the management of the dangerous goods store. All incoming drums will be tested by the onsite laboratory and classified into relevant dangerous good classes. Incoming material will be segregated, consolidated and stored according to their dangerous goods classifications.

Should any anomalies be detected between the pre-screening analysis and onsite analysis, the waste may be quarantined or rejected. TPI will liaise with the transporter

and/or generator of the waste to determine the source of the anomaly in order to characterise the waste.

2.3.5.3 Process Monitoring

The laboratory will also undertake analytical sampling for the purposes of quality control process check. The laboratory will sample wastes being treated in the CFS plant, waste water treatment plant and oily water and waste oil particularly for moisture and mineral content.

The laboratory will perform quality control sampling of final products to ensure compliance with relevant guidelines, standards and specifications. Quality control sampling of final products will include trade waste for compliance with sewer discharge guidelines, fixated material for compliance with landfill guidelines and oils for compliance with base lube specifications.

The laboratory will also perform ancillary activities such as environmental monitoring of the site to ensure compliance with any relevant permits and licences. Monitoring may include trade waste monitoring, stormwater monitoring and monitoring of groundwater bores. These will be internal services to the Facility only and will not be offered as an external service.

2.3.6 Dangerous Goods Store

A Dangerous Goods Store (refer to **Figure 1**) is to be established to store raw materials and wastes. A maximum of 600,000 litres of Dangerous Goods would be stored within the Dangerous Goods Store. All waste materials will be assessed, identified and correctly labelled prior to acceptance for delivery to the Facility. It is anticipated that incoming waste will range from household domestic wastes to laboratory and industrial waste.

Segregation of Dangerous Goods will be in accordance with Australian Standards and legislative requirements. These may include:

- Occupational Health and Safety (Dangerous Goods) Regulation
- AS1940 – 2004: The storage and handling of flammable and combustible liquids
- AS3790 – 1994: The storage and handling of corrosive substances
- AS3833 – 1998: The storage and handling of mixed classes of dangerous goods
- AS4326 – 1995: The storage and handling of oxidizing agents
- referenced standards within those documents.

All unloading and loading of Dangerous Goods for transportation will be undertaken in a covered transfer area fitted with rollover bunds and a blind sump to collect runoff.

Inspection, sampling and confirmation testing will be conducted by the Site Chemist on each batch on arrival at the Facility before allocation to the relevant storage area. Following sampling, incoming Dangerous Goods will be labelled, segregated, consolidated and stored according to their Dangerous Goods classification. Dedicated areas will be constructed and clearly identified for transit storage of waste Dangerous Goods.

Dangerous Goods used by the Facility such as laboratory solvents, fuels, welding gases, etc, will be segregated in order to prevent inadvertent treatment or disposal of dangerous goods intended for use by the Facility.

A quarantine storage area will be provided for wastes requiring further confirmation testing, for unauthorised wastes or emergencies.

The results of testing will determine the most appropriate recycling or treatment process of the waste. Where possible and appropriate, Dangerous Goods will be recovered, recycled and treated either onsite or will be transported by road to other appropriately licensed facilities for treatment.

Drums will be stored in a pallet racking system, up to three pallets high in fully bunded areas only. Each pallet is capable of holding four (4) 200 litre drums or one (1) IBC. The pallets will be mobilised by forklift.

Records of all packaged waste movements will be maintained on site.

2.3.6.1 Flammable and Combustible Goods Package Area

A flammable and combustible goods package area will be provided within the Dangerous Goods Store.

Where possible, drums and packaging from the Dangerous Goods Store and flammable and combustible goods package area will be sent to drum reconditioners for cleaning, reuse and recycling. The remainder will be cleaned, crushed and sent to metal recyclers or landfill. Small containers will be sent to landfills, metals and plastics will be sent to recyclers where possible. Pallets will be reused where possible or disposed of at an appropriately licensed waste facility.

Table 2.8 details the output/wastes that the Dangerous Goods Store is anticipated to produce. Please note: quantities have not been included due to variability in anticipated volumes. All wastes will be recycled and reused where possible rather than disposed.

Table 2.8 Dangerous Goods Store Outputs

Output	Destination
Contents of drums and packaging	Treated onsite or sent to offsite TPI facilities for treatment or disposed of an appropriately licensed landfill facility.
Drums and packaging	Cleaned, reused and recycled where possible, metal and plastic recyclers or disposed of at an appropriately licensed landfill facility.
Pallets	Reused where possible or disposed of at an appropriately licensed landfill facility.

2.3.7 Industrial Cleaning Services Depot

An industrial cleaning services depot (refer to **Figure 1**) will be incorporated into the TPI Facility which will provide multi-purpose industrial and environmental cleaning services to the manufacturing, heavy engineering and mining markets and to local government bodies.

The majority of industrial cleaning services activities will be conducted offsite. The Rutherford Facility will provide a depot for storage, vehicles and equipment associated with the provision of industrial cleaning services.

Industrial cleaning services may include:

- abrasive blasting
- asbestos containment, decontamination and removal
- environmental services including spill recovery, decontamination and waste removal and recovery
- high pressure water blasting
- industrial services including tank cleaning and maintenance, demolition, removal and disposal of wastes
- municipal services including concrete repairs, sewer and drain cleaning, closed circuit TV (CCTV), sewer inspections, water treatment plants, digesters and road sweeping
- application of protective coatings
- vacuum loading and recovery.

Any work conducted onsite at the Facility will be undertaken in an imperviously bunded area with blind sumps to collect runoff. Activities that may be conducted onsite include maintenance and storage of equipment and limited water blasting activities for small piece of equipment. All refuelling will be undertaken within the designated fuel deport (refer to **Section 2.3.10.1**) and all chemicals will be stored in the Dangerous Goods store (refer to **Section 2.3.6**).

Industrial cleaning services would generally operate five days per week, Monday to Friday from 6am to 6pm, however this may depend on customer requirements.

2.3.8 Environmental Recovery Services Depot

TPI will provide an environmental recovery transfer station and related transport services depot at the Rutherford Facility (refer to **Figure 1**). Environmental Recovery Services will provide specialised, environmentally responsible solvent collection, consolidation and transport to appropriately licensed recycling facilities for the automotive, industrial and paint market customers.

The Environmental Recovery Services depot would operate five days per week, Monday to Friday from 6am to 6pm.

Products and services that will be offered by Environmental Recovery Services include:

- service and maintenance of parts cleaning machines including non-flammable, solvent based washers
- collection, consolidation and transportation of packaged industrial wastes
- range of workshop cleaning products, spill kits and absorbent products.

The Depot will predominantly be a transfer station. Service and maintenance of parts cleaning machines will be conducted predominantly at the Facility. Activities that will be conducted on site include storage and maintenance of parts washers, spill kits, absorbents. All wastes collected as part of the ERS business will be segregated and stored in the designated Dangerous Goods area (refer to **Section 2.3.6**). No Dangerous Goods will be stored in the ERS Depot.

Any waste generated will be recycled where possible, treated in the CFS process or disposed of at an appropriately licensed landfill facility.

Any emissions to air will be controlled through an activated carbon filter.

2.3.9 Truck Wash

A truck wash facility (refer to **Figure 1**) will be constructed and operated for the maintenance of TPI's transport fleet. The truck wash facility will provide washing facilities for all commercial vehicles up to semi trailer length.

The truck wash would use treated water from the waste water treatment plant supplemented by clean potable water. The truck wash facility will consist of two (2) imperviously bunded pits with rollover bunds. Wash waters will be directed via separator pits and oil interceptors to the waste water treatment plant. Biodegradable truck wash detergent will be used. Oil from the interceptor will be recovered for recycling and any soil waste, such as dirt, grease and grit generated by the truck wash facility will be sent to the CFS treatment plant. **Table 2.9** details the output/wastes that the truck wash is anticipated to produce. Please note: quantities have not been included due to variability in anticipated volumes. All wastes will be recycled and reused where possible rather than disposed.

Table 2.9 Truck Wash Outputs

Output	Destination
Oil	Oily water treatment and waste oil transfer station
Sediment	CFS process for treatment
Waste water	Waste water treatment plant via separator pits and oil interceptors

2.3.10 Transport Vehicle Depot

The Facility will also operate as a parking and transport depot (refer to **Figure 1**) for TPI's transport fleet associated with the collection and road transfer of waste and liquid materials. The transport activities are essential services to the functions and activities of the Facility.

Transpacific operates a transport fleet of approximately 650 vehicles throughout Australia, approximately 40 of these vehicles will utilise the Rutherford Facility as a truck depot. The transport fleet will consist of tankers, truck and dog, semi trailers, B-doubles and flat beds. The transportation fleet associated with the Rutherford Facility will collect and transport waste and final products to NSW and interstate.

All trafficable areas on the Facility will be either imperviously paved or hardstand to prevent surface water discharges. The site will be curbed and a containment system installed so that in the event of an emergency, the stormwater system can be isolated.

Overnight parking will be on gravelled or hardstand areas. Where a vehicle is in transit and is storing waste materials or liquid raw materials, the vehicle will be parked within an impermeable, concrete bunded area. The parking arrangement for laden vehicles will comply with separation and emergency access requirements.

Access to the site will be required seven days a week, 24 hours a day to ensure access by heavy transport vehicles.

2.3.10.1 Fuel Depot

A fuel depot forms part of the transport vehicle depot. The fuel depot will consist of an above ground 50,000 litre tank and one fuel bowser. The tank will hold diesel for TPI's transport vehicles and other machinery operated on site such as forklifts, front end loaders, backhoe excavators and the windrow turner. The fuel depot will be imperviously bunded with a blind sump to collect runoff.

The fuel depot will comply with the requirements of AS1940 (2004) and other relevant standards.

2.3.11 Stormwater Lagoon

The stormwater lagoon will be used for the retention of rainfall from site roadways and hardstand areas. Any stormwater directed into the stormwater lagoon will be via a separator system to remove hydrocarbons, floating matter, gross pollutants etc.

The lagoon stormwater will be recycled for use in wash water and onsite irrigation following testing and approval by the on-site laboratory. The capacity of the stormwater lagoon will be maintained to allow sufficient freeboard in the event of 1:25 year, 24 hour rainfall event.

The lagoon will be used as a first flush system to intercept or contain a major spill/fire at the facility from entering the stormwater system. Water retained in the lagoon will also be available for fire fighting provisions.

2.4 New Treatment Technologies

TPI will continue to investigate and research innovative and new treatment technologies applicable to waste management, focusing on resource recovery and recycling processes.

New or innovative recycling processes will be tested and researched at the Facility, generally as pilot studies, as part of the Company's continuous improvement programme. Research and development projects will be conducted with approval from the relevant agencies.

Any future expansion or addition to the Facility would be subject to the relevant planning approvals process.

2.5 Service Utility Requirements

2.5.1 Electricity

The Facility would require quantities of electricity, primarily in power supply for the operation of the hydrogenation process. Total demand is estimated to be 660 KW per hour with a peak demand of 925 KW per hour.

A backup diesel generator would be used to power lighting and major equipment in the case of a power failure.

During construction of the Facility, a voltage supply of 400 amps would be required from existing electricity connection to the site.

Preliminary consultation with EnergyAustralia has indicated that electricity available at the site is sufficient to meet requirements. Should additional supply be required, TPI will liaise with EnergyAustralia regarding upgrade works.

Table 2.10 Estimated Electricity Requirements

	Normal			Peak		
Electricity Requirements	**Kilowatts**	**Volts**	**Amps**	**Kilowatts**	**Volts**	**Amps**
Oily water treatment and waste oil transfer	100	415	174	175	415	304
Hydrogenation process	300	415	522	400	415	695
CFS process	40	415	70	50	415	87
Waste water treatment plant	150	415	261	200	415	348
Other site activities	30	415/240	52	50	415	87

2.5.2 Natural Gas

Natural gas is required to produce hydrogen in the hydrogenation process. Production is planned for 24 hours per day and upon commissioning and peak production would require 11,000 mega joules per hour.

Natural gas will be supplied by AGL through existing infrastructure.

Table 2.11 Estimated Natural Gas Requirements

Natural Gas Requirements	Annual Gas Requirement	Peak Hour Gas Requirement
Hydrogenation Process	100 tera joules per year	11,000 mega joules per hour

2.5.3 Telecommunications

The proposal would require standard telecommunication services including telephone, facsimile and internet access. These services are currently available and connected onsite.

2.5.4 Water

The Facility would require approximately 305 kilolitres of clean, potable water per day for waste processes and wash down. In addition to process water, there would also be water requirements for the ancillary purposes such as staff amenities, landscaping and fire fighting.

Water would be obtained from the Hunter Water Corporation water supply network. Requirements for clean potable water would be supplemented by collected clean stormwater and treated effluent from the waste water treatment plant.

Preliminary consultation with Hunter Water has indicated that water requirements at the site can be met.

Water usage requirements are outlined in **Table 2.12**.

Table 2.12 Water Usage Requirements

Activity	Daily (kL/d)	Annual (kL/yr)
CFS	50	16,000
Hydrogenation Plant	110	40,100
Waste Oil Storage	10	3,250
Oily Water Treatment Plant	10	3,250
Waste Water Treatment Plant	10	3,250
ERS and Industrial Cleaning Services Depot	5	2,000
Drum Store	NIL	NIL
Truck Wash	20	6,250
Cooling Tower	90	33,700
Total	**305**	**107,800**

2.5.5 Sewerage

The proposal would require connection to the existing Hunter Water Corporation Farley Waste Water Treatment Plant.

The facilities that would be connected to the sewer are the onsite waste water treatment plant, staff amenities including wash basins and toilets for 73 staff. Trade waste would only be discharged to sewer, after treatment through the waste water treatment plant and testing to ensure compliance with discharge license requirements.

Trade waste discharge to sewer requirements are outlined in **Table 2.13**.

Table 2.13 Trade Waste Discharge to Sewer Requirements

Activity	Daily kL/d)	Annual (kL/yr)
CFS	NIL	NIL
Hydrogenation Plan	NIL	NIL
Waste Oil Storage	NIL	NIL
Oily Water Treatment Plant	NIL	NIL
Waste Water Treatment Plant	700	255,500
ERS and Industrial Cleaning Services Depot	NIL	NIL
Drum Store	NIL	NIL
Truck Wash	20	6,250
Total	**720**	**261,750**

2.6 Decommissioning

There is currently no plan or estimated timeframe to decommission the Facility. In the event that the site is decommissioned or sold, an environmental site assessment, surrender audit and environmental management plan would be developed.

3. Need and Alternatives for the Proposal

3.1 Need

Waste avoidance and minimisation is increasingly being identified as an issue that must be managed in order to promote ecological sustainable development. Both Commonwealth and NSW State Government's are recognising the importance of the issue and have introduced legislation and other initiatives in an effort to promote waste management improvements.

Oil is a finite resource. In 2001 the Commonwealth Government established the Product Stewardship for Oil Program in an effort to increase recycling and reuse rates for oil. The program is supported by the *Product Stewardship (oil) Act 2000*. The program provides incentives to increase used oil recycling and aims to encourage the environmentally sustainable management and re-refining of used oil and its reuse. According to the Department of Environment and Heritage (2004), more than 500 million litres of lubricating oils are sold in Australia each year. Of this amount at least 250 million litres of used oil is generated by industry and the community and is available for recycling. Although Australians recycled approximately 194 million litres of used oil in 2003, between 60 and 100 million litres remains unaccounted for.

TPI has been awarded a Federal Government grant to develop, install and commission the hydrogenation process as part of the Product Stewardship for Oil program. TPI will be the first recycler in Australia to use hydrogenation to produce recycled base oils and the process, in conjunction with the re-refinery at Wetherill Park, represents a substantial capital investment. The hydrogenation of re-refined base lube oils will completely recycle the oil to refinery grade lubricant specifications.

TPI's market research has determined that the largest used oil market in Australia is Sydney and therefore wishes to establish a hydrogenation unit to service the Sydney and surrounding markets. TPI has recently purchased a hydrogenation unit. Review of existing TPI operations in Sydney and NSW has revealed insufficient space and capacity required to install and operate the hydrogenation unit. The site at Rutherford is therefore required as it provides an appropriate location and sufficient space for the operation of the hydrogenation unit.

Prior to 1995, waste legislation was primarily concerned with disposal. In 2000 the *Waste Minimisation and Management Act 1995* was reviewed, as a result of the update to the NSW *Waste Avoidance and Resource Recovery Act 2001*, and the Waste Avoidance and Resource Recovery Strategy 2003 was introduced. The act and strategy are aimed at reducing waste and increasing the recovery of resources from waste and identified priorities to avoid waste, recover and reuse more secondary resource and reduce the toxicity in products and materials and littering and illegal dumping.

The proposed waste resource recovery and recycling Facility is consistent with the objectives of the Waste Avoidance and Resource Recovery Act and associated strategy. Approval of the Facility would therefore provide increased opportunity to waste generators within the NSW region to reduce waste, recover and reuse secondary

resources and reduce the toxicity of waste materials through the oil hydrogenation process and CFS operations.

The oil hydrogenation process actively recovers and reuses secondary resources. The CFS plant reduces waste by removing the water phase from waste and reduces toxicity, making waste suitable for landfill.

3.2 Site Selection

Site selection for the proposed waste resource recovery and recycling facility was based on consideration of the following factors:

- proximity to clients
- proximity to raw waste material sources
- availability and cost of gas, electricity, telecommunications, water and sewer infrastructure
- access to available and skills workforce
- access to ancillary services
- links to major transport facilities including freeways
- economic viability
- land area, ownership, required earthworks and existing site infrastructure
- potential for environmental impacts.

The Rutherford Industrial Estate was selected as the preferred location for the proposal based on these criteria. The site is close to domestic, government, industrial and mining clients and is in a central location relative to the supply of raw materials required for NSW waste treatment processes. The site is close to the New England highway and F3 Freeway providing ready access to clients in the NSW region.

The recent decline in the manufacturing industry in the Hunter Valley, including the closure of National Textiles has resulted in spare capacity in the workforce. The proximity of existing TPI operations that would be relocated to the Rutherford Facility allows the existing the TPI workforce to continue employment with TPI and commute to the relocated site.

The area also has access to ancillary services, which generally support the mining and manufacturing industries in the Hunter Valley and has available gas, electricity, telecommunications, sewer and water infrastructure. The site is generally cleared, visually screened and located in the Rutherford Industrial Estate which is zoned for general industrial use.

3.3 Alternatives Considered

3.3.1 Sites

Site selection was initially undertaken on a NSW State wide basis, with consideration of establishing an integrated waste Facility in NSW to service NSW region clients. Considerations included central location to clients, central location to established and existing TPI facilities and access to major transport routes.

The Hunter Valley region was selected as the preferred site for the integrated waste Facility. TPI has established waste facilities at Albury, Wetherill Park, and Tamworth. The Hunter Valley is central to these locations, supplies a large potential client market and is located in close proximity to major transport routes.

Having selected the Hunter Valley, and particularly Rutherford as the location of the waste facility, the site selection focused on sites that provided quick access to major arterial transport routes, was of sufficient size to accommodate all required operations, provided access to required ancillary services and infrastructure.

TPI considered several sites, a brief discussion of these sites is provided below.

3.3.1.1 Site 1 Lot 402 DP 881621

Site 1 is located east of the selected site on an adjoining site to the east at 176 Racecourse Road. Whilst the location of this site was ideal several shortcomings of the site were identified:

- the site is approximately 1.5 hectares in area and therefore of insufficient size to accommodate all desired aspects of the proposed Facility
- the site did not have direct sewer connection. TPI held preliminary discussions with the owner of a neighbouring property in order to jointly establish a sewer connection, however the cost of establishing a sewer connection was uneconomical
- the value of the property per square metre was uneconomic.

3.3.1.2 Site 2 Lot 193 DP809485

Site 2 is located south of the selected site on Gardiner Street. Gardiner Street runs off Kyle Street. The location of the site, although further removed from the New England Highway was also an ideal location, however the following shortcomings of the site were identified:

- the site is approximately 2.5 hectares in area and therefore of insufficient size to accommodate all desired aspects of the proposed Facility
- the site did not have direct sewer connection
- the site is in closer proximity to the nearest residential neighbour
- the site has a 20 metres wide easement allocated through the centre property for high tension powerlines, thus placing potential restrictions on future development of the site

- the site is subject to flooding across the middle of the lot.

3.3.1.3 Site 3 Lot 223 DP 1037300

Site 3 is the selected site, located off Kyle Street. This site was selected as being the most appropriate site for the location of the Facility for the following reasons:

- ideal location, located in close proximity to the New England Highway
- direct sewer connection of 5 mega litre per day capacity to Farley Waste Water Treatment Plant
- the site is 10.28 hectares in size, therefore of a sufficient size to accommodate all desired aspects of the proposed Facility and allows consolidation of several TPI operations into one operation
- the site is effectively screened from the view of surrounding roadways and residential neighbours via other businesses and vegetation
- the site has direct access to power and gas which will be used in Facility processes
- the previous use of the site provides infrastructure that is consistent with the proposed future use of the site.

3.3.2 Treatment Processes

In addition to considering alternative sites for the location of the waste resource recovery and recycling facility, TPI also a considered and analysed several alternative waste treatments for processing at the site. TPI's vision is to provide 'comprehensive resource recovery, waste management and transport solutions' and accordingly the company is committed to recovering, recycling and reusing waste where possible in order to reduce disposal to landfill. Alternatives were analysed in accordance with the company vision.

3.3.2.1 Oil Recycling to Base Lube Oil Specification

In NSW, used oil waste by-products are generally used for energy (fuel oil) purposes. The alternative is recycling of oil back to base lube specification through hydrogenation. This alternative prevents further reuse and recycling of a non renewable resource. TPI has considered a number of alternative treatments for waste oil specification as the preferred treatment of oil of using for energy requirements for the following reasons:

- hydrogenation allows for the complete recycling of oil waste products back to base lube specification for unrestricted reuse
- the hydrogenation plant has Commonwealth Government support. TPI has received a grant of the Commonwealth Government to assist in the funding of the development of a comprehensive product stewardship arrangement for used oil to ensure the environmental sustainable management of re-refining of waste oil and its reuse
- the recycled base lube oil will conform with the Department of Environment and Heritage's acceptance criteria and conforms to industry standards for re-use as a quality lubricant
- facilitates ongoing use of a finite non renewable resource and closed loop recycling

- limits greenhouse gas emissions to the atmosphere that would be created in the oil burning process
- limits energy requirements for the production of new oil.

3.3.2.2 CFS

Non-sewerable industrial waste is generally disposed of at landfill as regulated or industrial waste, discharged to sewer, illegally buried, discharged to rivers or dumped. Industrial waste of this nature may be susceptible to leaching, presenting potential risks to the environment and to human health if not managed appropriately. TPI assessed CFS treatment as the preferred treatment of non-sewerable, industrial wastes for the following reasons:

- CFS reduces potential hazard and toxicity exposure to the environment and human health by converting hazardous materials into their least insoluble and leachable form
- there is currently limited CFS treatment available within the Hunter Valley region, the construction and operation of this Facility would increase capability for such as treatment and reduce transport costs for wastes that may have been transported to Sydney or other areas
- by providing a viable and acceptable treatment within the Hunter Valley Region, the potential for illegal disposal of such substances may be reduced
- electrowinning cannot handle combined waste streams, therefore making it an unsuitable treatment for many of the incoming waste streams. The energy requirements of electrowinning of metals outweigh the benefits of their recovery making the process uneconomical.

3.3.2.3 Waste Water Treatment Plant

TPI proposes to install and operate a waste water treatment plant onsite not only to meet sewer discharge permit requirements but also to facilitate reuse and recycling of water onsite. Many of the waste treatments and activities onsite require the input of significant quantities of water and will also produce significant quantities of waste water. The reuse and recycling of water in the various waste treatment processes and activities onsite will reduce the demand for clean potable water onsite.

3.3.2.4 Collection Services and Transfer Station

TPI is proposing to establish a collection service for the NSW region and transfer station at Rutherford for collection and transfer of wastes to other licensed facilities throughout NSW and Australia for wastes that cannot be treated onsite. Possible alternatives to this approach include:

- establishment of a wider range of treatment processes onsite to deal with incoming waste and to prevent the need to transfer wastes to other licensed facilities for treatment; and
- no collection service and therefore no transfer station.

TPI have chosen to establish a collection service and transfer station for the following reasons:

- the no collection service and transfer station option could potentially see waste streams being disposed of at landfill rather than being recovered, recycled and/or reused
- TPI has established waste treatment facilities at strategic operations throughout Australia, easily accessible by TPI's transport fleet. The transportation of waste to these various facilities is more economic than duplication treatment processes at the Rutherford Facility
- the collection service and transfer facility allows for the recovery, reuse and recycling of wastes such as chlorinated and non-chlorinated solvents, non sewerable industrial wastes and other chemicals and dangerous goods.

3.3.2.5 Treatment and Waste Streams not to be Established/Treated Onsite

The incineration of waste shall not be conducted by TPI at the site. Compost and soil conditioner manufacturing will not be undertaken at the site as part of this proposal. TPI has also determined that the following waste streams will not be treated at the site:

- radioactive waste
- medical/clinical waste
- PCBs
- highly odorous products such as abattoirs waste.

4. Statutory Planning Context

4.1 Approvals Process

The proposed renovation of existing buildings to construct and operate a Resource Recovery and Recycling Facility at Rutherford requires planning approval under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act). In accordance with s75B(1a) of the Act, the proposed development would be considered a 'Major Infrastructure Project'. The proposed development constitutes a 'Major Infrastructure Project' under *State Environmental Planning Policy (Major Projects) 2005.* Under this SEPP, the development that transfers and stores more than 1,000 tonnes of waste per year classified in the *Australian Dangerous Goods Code*, treats and stores more than 10,000 tonnes per year of industrial liquid waste and more than 1,000 tonnes per year of aqueous and non–aqueous waste. The Minister for Planning is the Consent Authority for this proposal.

Pursuant to Section 75R(1) of the Act, as the project falls under Part 3A, provisions relating to other Parts of the Act, such as integrated development (Part 5A) and designated development (Part 4 77A) do not apply. Therefore, an Environmental Impact Statement (EIS) is not required. Alternatively under 75F, 'environmental assessment requirements for approval' are issued by the Director General.

Clause 8J of this Regulation states that the Director General may adopt (with or without modification) as environmental assessment requirements for a major project, requirements that were issued by the Director General under Part 4 of the Act. The Director Generals Requirements for this proposed development are attached in **Appendix C**.

Under Part 3A (s75R(3)) of the Act, Local Environmental Plans, Regional Environmental Plans and Development Control Plans do not apply. These are nevertheless addressed briefly in the following sections as they help to provide the local planning context for consideration of the proposal. Clause 75J(3) of the EP&A Act does require the proposal to be permissible under an environmental planning instrument.

4.2 State Environmental Planning Policies

The following State Environmental Planning Policies (SEPP) are relevant to the proposed development. Section 75 of the Act states that SEPPs apply to major projects.

4.2.1 Major Projects State Environmental Planning Policy 2005

This SEPP defines major projects to be approved by the Minister under Part 3A of the EP&A Act. The policy repeals SEPP 34 and 38, as well as provisions in numerous other planning instruments, declarations and directions. Major projects, are defined as developments listed in Schedules 1, 2 or 3 of the SEPP.

Schedule 1 identifies resource recovery or waste facilities meeting the following criteria as state significant development:

- development for this purpose that handles more than 75,000 tonnes per year of waste or has a capital investment of more than $30 million
- development for the purpose of hazardous waste facilities that transfers, stores or disposes of solid or liquid waste classified in the *Australian Dangerous Goods Code* or medical, cytotoxic or quarantine waste that handles more than 1,000 tonnes per year of waste
- development for the purpose of any liquid waste depot that treats, stores or disposes of industrial liquid waste and handles more than 10,000 tonnes per year of liquid food or grease trap waste or handles more than 1,000 tonnes per year of aqueous or non-aqueous waste.

The proposed development exceeds all or most of these criteria and is therefore a major project. The Minister is therefore the consent authority.

4.2.2 State Environmental Planning Policy No 11 - Traffic Generating Development

SEPP 11 rationalises consultation required in relation to traffic-generating developments. The policy establishes the Roads and Traffic Authority as the sole traffic management authority to be consulted.

The proposed development falls into the category of Schedule 1(f) to SEPP 11 as the floor space of the building development will be greater than 20,000m^2; and will be required to be forwarded to the RTA for comment.

4.2.3 State Environmental Planning Policy No 33 - Hazardous and Offensive Development

SEPP 33 provides definitions for 'hazardous industry', 'hazardous storage establishment', 'offensive industry' and 'offensive storage establishment'. The policy requires specified matters to be considered for proposals that are 'potentially hazardous' or 'potentially offensive' as defined in the policy. Applications to carry out potentially hazardous development must be supported by a Preliminary Hazard Analysis (PHA).

In the policy the following definitions apply:

> *"potentially hazardous industry" means a development for the purposes of any industry which, if the development were to operate without employing any measures (including, for example, isolation from existing or likely future development on other land) to reduce or minimise its impact in the locality or on the existing or likely future development on other land, would pose a significant risk in relation to the locality:*
>
> *a) to human health, life or property, or*
>
> *b) to the biophysical environment, and includes a hazardous industry and a hazardous storage establishment.*

"potentially offensive industry" means a development for the purposes of an industry which, if the development were to operate without employing any measures (including, for example, isolation from existing or likely future development on other land) to reduce or minimise its impact in the locality or on the existing or likely future development on other land, would emit a polluting discharge (including for example, noise) in a manner which would have a significant adverse impact in the locality or on the existing or likely future development on other land, and includes an offensive industry and an offensive storage establishment.

Clause 13 identifies those matters which, must taken into account, being:

- current circulars or guidelines issued by DIPNR relating to hazardous or offensive development
- whether any public authority should be consulted regarding environmental and land use safety requirements
- for potentially hazardous industries, the PHA that has been prepared
- any feasible alternatives for carrying out the development including the reasons for choosing the subject site.

A full Preliminary Hazard Assessment has been prepared for the proposal and is provided in **Appendix O**.

4.2.4 State Environmental Planning Policy No 44 - Koala Habitat Protection

This SEPP encourages the conservation and management of natural vegetation areas that provide habitat for koalas to ensure permanent free-living populations will be maintained over their present range. The policy applies to 107 local government areas, including Maitland City.

There is no Koala habitat associated with the development site. Further consideration of SEPP 44 is not warranted.

4.2.5 State Environmental Planning Policy No 55 - Remediation of Land

SEPP 55 introduces State-wide planning controls for the remediation of contaminated land. The policy states that land must not be developed if it is unsuitable for a proposed use because it is contaminated. If the land is unsuitable, remediation must take place before the land is developed. The policy makes remediation permissible across the State, defines when consent is required, requires all remediation to comply with standards, ensures land is investigated if contamination is suspected, and requires councils to be notified of all remediation proposals. To assist councils and developers, the Department, in conjunction with the EPA, has prepared Managing Land Contamination: Planning Guidelines.

There is evidence to suggest that there has been land contamination associated with past land uses. This is fully detailed in **Section 7.2** and **Section 7.3.1.1**.

4.3 Regional Environmental Plans

4.3.1 Hunter Regional Environmental Plan 1989

The Hunter Regional Environmental Plan (Hunter REP) 1989 applies to the Maitland City. The aims are contained in Clause 2, viz:

a) *to promote the balanced development of the region, the improvement of its urban and rural environments and the orderly and economic development and optimum use of its land and other resources, consistent with conservation of natural and man made features and so as to meet the needs and aspirations of the community,*

b) *to co-ordinate activities related to development in the region so there is optimum social and economic benefit to the community, and*

c) *to continue a regional planning process that will serve as a framework for identifying priorities for further investigations to be carried out by the Department and other agencies.*

Clauses of most relevance to the proposed development are contained within Part 7 of the REP – *Environment Protection.* The objectives of the REP in this regard are to minimise air, noise and water pollution and to provide for the safe and effective disposal of wastes. The following clauses relate to development control within these stated objectives are as follows.

Clause 47: A consent authority should not grant development for a designated development unless it is satisfied that:

a) *topographic and meteorological conditions are such that air pollutants would have no significant adverse effect*

b) *an appropriate buffer zone can be provided to ensure that noise, dust and vibration are maintained at acceptable levels*

c) *the best practicable technology for air, water and noise pollution control will be incorporated in the design and operation of the equipment and facilities to be used for the purposes of the industry*

d) *there will be no significant deterioration of air or water quality as a result of emissions from that equipment or those facilities*

e) *the site will not become contaminated within the meaning of Part 5 of the Environmentally Hazardous Chemicals Act 1985.*

4.4 Local Environmental Plans

4.4.1 Maitland Local Environmental Plan 1993

The Maitland Local Environmental Plan (LEP) 1993 applies to land throughout Maitland City. The objectives of the LEP are contained with Clause 2 and they are:

a) *to ensure the natural environment remains safe from detrimental impacts of development*

b) *to minimise adverse environmental, social and economic impacts resulting from urban development and to encourage building designs which are aesthetic and energy efficient*

c) *to provide appropriate land in area, location and quality for living, working and recreational activities and agricultural production*

d) *to provide a diversity of housing available throughout the City*

e) *to ensure the retail hierarchy of regional, district and neighbourhood shopping centres is maintained*

f) *to encourage functional and economically viable industrial development, which does not adversely affect the environment or the amenity of nearby residents*

g) *to provide a range of community facilities to serve the population*

h) *to conserve and enhance buildings, structures and sites of recognised significance which are part of the heritage of the City for future generations*

i) *to ensure an efficient and safe road network is maintained with minimum intrusion on business centres, open space and residential areas*

j) *to provide open space and a range of recreational facilities to meet the needs of the population*

k) *to protect attractive landscapes and preserve places of natural beauty, including wetlands, waterways and the floodplain*

l) *to ensure residents are not put at risk in the event of flooding.*

The land on which the proposed development is to be situated is zoned 4(a) *Industrial General*. The 4(a) zone caters for a range of industrial development. Traffic generating development is restricted along main roads. Premises of a commercial and retailing nature are limited in the industrial zone, however bulky goods retailing is allowed. Industrial development is allowed only if it does not adversely affect adjacent residential areas. The objectives of the zone are contained in Clause 23, namely:

a) *to set aside certain land for the purpose of general industry within convenient distance of the urban centres of the City*

b) *to allow commercial and retail development for:*
   (i) use ancillary to the main use of land within the zone
   (ii) the display and sale of bulky goods
   (iii) the day-to-day needs of occupants and employees of the surrounding industrial area.

c) *to ensure that industrial development creates areas which are pleasant to work in and safe and efficient in terms of transportation, land utilisation and service distribution.*

The site is not listed in Schedules 1 or 2 of the Maitland LEP, which identifies Heritage Conservation Areas and Heritage Items.

Therefore, the proposed Facility would be permissible only with development consent. In accordance with s75J(3) of EP&A Act, the Minister for Planning can approve the project as it is not prohibited under the Maitland LEP.

4.5 Development Control Plans

The following Development Control Plans (DCP) are applicable to the proposal. Section 75 of the EP&A Act states that DCP's do not apply to major projects, however, TPI will comply with the provisions of relevant DCP's where practicable.

4.5.1 Industrial Development Code – DCP 1

The objectives of the DCP are contained in Clause 1.2 of the DCP and they are:

a) *to encourage growth in the industrial sector, provided that new industrial development does not present unacceptable risks to residential areas or other land by way of pollution, hazards or otherwise*

b) *to encourage applicants to act in their own interests by submitting fully substantiated and documented proposals, including hazards analysis where appropriate*

c) *to encourage a process which minimises problems with development proposals, through appropriate consultation prior to applications being submitted*

d) *to provide general guidelines for applications for designated development, as to matters to be addressed in Environment Impact Statements*

e) *to assist applicants by minimising duplication of documentation required under other laws (pollution control, occupational health and safety etc)*

f) *to encourage visual and operational compatibility between industrial development and residential areas*

g) *to encourage improvements to the character and appearance of industrial estates.*

Part II of the DCP deals with Application Requirements and includes provisions relating to designated development and EIS preparation (Clause 2.2). Those matters are addressed in this Environment Assessment.

The performance criteria in Part III of the DCP relevant to the proposed development are:

- *design and approval of buildings* - buildings are to be attractive in the context of the surrounds through selective use of compatible materials and colour. Particular attention is to be paid to minimisation of impacts on commercial and residential areas. Energy efficient development is encouraged
- *landscaping* - visual quality and amenity is to be achieved through effective low maintenance landscaping. The front 5 metre setback is to be landscaped. A detailed landscaping plan is to be submitted with the application
- *parking and access* - on site vehicular access is to be provided close to building entrances. Parking is to be provided at one space per 75m^2 of gross floor area (GFA) and be situated behind landscaping area. Accesses shall have a minimum width of 6 metres and are not to be located near intersections. Loading or unloading facilities are to be provided on site and not conflict with parking areas

- *setbacks* - setbacks are to be provided that establish separation between buildings, provide opportunities for parking and access for emergency vehicles and restrict the spread of fire. Front boundary landscaping of 5 metres is required. Side and rear setbacks are to be in accordance with the Building Code of Australia (BCA)
- *storage areas* - external storage areas are to be located near the rear of the site and screened from public view
- *advertising signs* - advertising material is to be of a size, colour and design that is compatible with the building design and streetscape.

The proposal uses existing buildings. All new buildings and the layout of the site comply with these requirements.

4.5.2 Car Parking Requirements – DCP 40

The objectives of DCP 40 are contained in Clause 1.4. They are:

a) to ensure adequate provision of off-street parking to maintain the existing levels of service and safety on the road network

b) to detail requirements for the provision of parking and loading/unloading facilities in association with development in the City of Maitland

c) to provide a consistent and equitable basis for the assessment of parking provisions

d) to facilitate design of parking areas, loading bays and access driveways which function efficiently

e) to ensure that parking areas are visually attractive and constructed, designed and situated so as to encourage their safe use

f) to acknowledge the traditional lack of parking spaces within areas of historical or architectural significance (Central Maitland, Morpeth) and balance this with the need to facilitate development in order to maintain vitality and vibrancy in such centres.

The following is a summary of the relevant sections of the DCP applicable to the proposed development:

- calculation of parking requirements (Clause 2.2). The car parking requirement for the proposed development is at the rate of one space for 75m^2 of GFA or one space to two employees, whichever is greatest
- where existing development is being extended, additional parking will be required on the basis of the additional floor space in accordance with the standards in Appendix A to the DCP (Clause 2.2.6)
- clause 2.2.8 states that Council may consider reducing car parking requirements where it can be demonstrated that the peak parking demand for the development occurs outside the hours of 9:00am to 6:00pm, where public car parking is in close proximity
- any development should be designed to provide adequate on site manoeuvring and circulating areas to allow vehicles to enter and leave in a forward direction

- access is to be situated to cause the least interference to traffic and pedestrians. Section 4.1 lists a range of locations were access will generally not be permitted
- entry and exit requirements are to be as per the RTA guidelines, which appear in Appendix B to the DCP. The proposal falls into Type 2, as defined in Table 2 of Appendix B
- parking space and aisle dimensions are listed in Section 4. Spaces are generally to be 2.6 x 5.5.metres. Obstructed spaces are to be wider. The aisle width is to be 6 – 7 metres
- car parking areas are to be landscaped to achieve a satisfactory appearance and to provide shade and buffers. Generally there is to be perimeter planting and no more than 10 bays without a planted break
- clause 4.9 contains a principles that when implemented will assist in the reduction of crime opportunities
- loading bays are to be provided for businesses where regular deliveries are made
- special car parking spaces for persons with disabilities are to be provided.

Car parking requirements have been addressed in **Section 6.7**.

4.6 Licensing and Approvals

A number of other licences and approvals would be required for the proposal under other relevant environmental legislation. Under Part 3A 75U of the EP&A Act, the approval provisions of the following relevant Acts do not apply:

- *Heritage Act 1977* – approval under Part 4, excavation permit under section 139
- *National Parks and Wildlife Act 1974* – permit under section 87 or a consent under section 90
- *Native Vegetation Act 2003* – authorisation under section 12
- *Rivers and Foreshores Improvement Act 1948* – permit under Part 3A
- *Rural Fires Act 1997* – authority under s100B
- *Water Management Act 2000* – water use approval under section 89, 90 or 91.

Under Part 3A cl.75Vof the EP&A Act, the following approvals cannot be refused if it is necessary for carrying out an approved project. These approvals are also required to be substantially consistent with the approval under this Part.

- *Mine Subsidence Compensation Act 1961* – approval under section 15
- *Protection of the Environmental Operations Act 1997* - environment protection licence
- *Roads Act 1993* - consent under section 138.

A summary of the potential licensing and approval requirements is provided in **Table 4.1**. The need for licensing and approval may change as a result of amendments to the proposal during the detailed design stage. The following assessment is, therefore, provided for consideration as part of the Environmental Assessment.

Table 4.1 Summary of Potential Licensing and Approval Requirements

Legislation (Responsible Agency)	Relevant Provisions	Requirements to Gain Approval
Protection of the Environment Operations Act 1997 Department of Environment and Conservation	The Act enforces licences and approvals relating to air, water and noise pollution and waste management with a single integrated licence.	As the proposal is a scheduled activity being a waste processing facility that stores, transfers or recovers by processing more than 30,000 tonnes of waste per year, a licence under this Act is required.
Threatened Species Conservation Act 1995 and *Threatened Species Amendment Bill 2004* Department of Environment and Conservation	The Act aims to protect threatened flora and fauna and their habitats. Assessment of impact on threatened species, populations and communities is required in accordance with Section 94 of the Act.	A flora and fauna study has been completed for the site (**Appendix G**) demonstrating the project would not have a significant impact on threatened species, populations or communities pursuant to the *Threatened Species Conservation Act 1995*.
Native Vegetation Conservation Act 1997 and Native Vegetation Act 2003 Department of Infrastructure, Planning and Natural Resources	The Act protects State-protected land and native vegetation that is identified by the Minister for Planning.	Under s75U(1) EP&A Act, Part 3A projects are exempt from s12 approvals of this Act.
Rivers and Foreshores Improvement Act 1948 Department of Infrastructure, Planning and Natural Resources	Under Part 3A of the *Rivers and Foreshores Improvement Act 1948*, approval is required for excavations within 40 metres of a waterway.	Under s75U(1) EP&A Act, Part 3A projects are exempt from Part 3A approvals of this Act.
Water Act 1912 and *Water Management Act 2000* Department of Infrastructure, Planning and Natural Resources	Under the Act, a licence would be required if water was to be extracted from a creek or if any waterways were to be realigned during construction.	Under s75U(1) EP&A Act, Part 3A projects are exempt from s89, s90 or s91 approvals of this Act.
National Parks and Wildlife Act 1974 Department of Environment and Conservation	The Act aims to prevent the unnecessary or unwarranted destruction of relics and the active protection and conservation of relics of high cultural significance. This Act covers relics of both 'indigenous and non-European' habitation in NSW.	Under s75U(1) EP&A Act, Part 3A projects are exempt from requiring s87 or s90 approvals of this Act.
Heritage Act 1977 NSW Heritage Office	The Act protects heritage items, sites, and relics in NSW older than 50 years regardless of cultural heritage significance.	Under s75U(1) EP&A Act, Part 3A projects are exempt from Part 4 or s139 approvals of this Act.

Legislation (Responsible Agency)	Relevant Provisions	Requirements to Gain Approval
Dangerous Goods Act 1975 NSW WorkCover Authority	This Act regulates Dangerous Goods in NSW by requiring the various activities, such as the keeping, conveyance, use and manufacture of certain dangerous goods to be licensed by WorkCover	A licence would be required for the storage of greater than 250 litres of a dangerous good (fuel or oil).
Roads Act 1993 NSW Roads and Traffic Authority	Consent required from the Roads and Traffic Authority for work in, on, under or over a public road.	Closure of roads for transport of the facility components would require Roads and Traffic Authority consent under the Act.
Environment Protection and Biodiversity Conservation Act 1999 Commonwealth Department of Environment and Heritage	Proposals which have the potential to significantly impact on matters of national environmental significance, or the environment of Commonwealth land, must be referred to the Commonwealth Minister for the Environment. Matters of national environmental significance include: World Heritage properties National Heritage places Ramsar wetlands of international significance listed threatened species and ecological communities listed migratory species Commonwealth marine areas nuclear actions (including uranium mining).	The proposal would not impact on any nationally listed threatened or endangered species or communities or internationally listed migratory species. Referral to, or approval from the Commonwealth Minister for the Environment is not required under the *Environment Protection and Biodiversity Conservation Act 1999*.

4.7 Summary of Key Approvals

The following additional approvals and licenses would be required for the proposal:

- *Protection of the Environment Operations Act 1997*
- *Dangerous Goods Act 1974.*

5. Community and Stakeholder Consultation Process

Key stakeholders were consulted during the preparation of this Environmental Assessment to identify and address the key issues of concern. Community, local groups and government agencies were contacted during the preparation of this Environmental Assessment. The approaches taken and the responses received are described below.

5.1 Agency Consultation

5.1.1 Department of Planning

The Director Generals Requirements (DGRs) for the proposed resource recovery and recycling facility, Rutherford were issued on 5 October 2005.

A summary of the Director-General's requirements under Part 3A of the *Environmental Planning and Assessment Act* 1979, including where they are addressed in this report is provided in **Table 5.1**.

Table 5.1 Summary of Director-General's Requirements Under Part 3A

Director-General's Requirements	Where Addressed
The EA must include:	
an executive summary	**EA Executive Summary**
a description of the proposal, including construction and operation	**EA Section 2**
details of the location of the project and environmental planning provisions applicable to the site and the project	**EA Section 1.5** and **Section 4**
consideration of alternatives to the project	**EA Section 3.3**
an assessment of the key impacts of the project, with particular focus on the key assessment requirements specified below	**EA Section 6** and **Section 7**
proposed mitigation/management measures of residual environmental impacts	**EA Section 6** and **Section 7**
justification for undertaking the project with consideration of the benefits/impacts of the proposal, and proposed management/mitigation monitoring	**EA Section 3** and **Section 9**
a draft statement of commitments for environmental mitigation, management and monitoring of the project	**Statement of Commitments**
certification by the author that the information contained in the Assessment is neither false nor misleading	**EA**
Assessment of key issues as identified in the Director-General's Requirements issues under Part 4 of the Act on 19 July 2004	
Waste management – identify the quantity and nature of waste that would be recycled/disposed of at the facility; describe how this waste would be stored and handled on site, and transported to and from the site; identify the potential impacts associated with processing this waste; and describe what measures would be implemented to mitigate or manage these potential impacts	**EA Section 2.3.2** and **Section 6.10**

Director-General's Requirements	Where Addressed
Air quality – particularly dust impacts and the potential emissions from the waste treatment process at the site, especially odour emissions from the aqueous phase treatments as well as emissions from the hydrogenation plant. The air quality assessment must assess relevant parameters from a project specific perspective and with regards to the cumulative air quality impacts from development within the area. The air quality assessment must be carried out in accordance with the EPA's *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW (2000)*	**EA Section 6.4** and **Appendix J**
Hazards and Risk – the EIS must include a screening of all potential hazards on site to determine the potential for off site impacts and any requirement for a Preliminary Hazard Analysis (PHA), under the provisions of *State Environmental Planning Policy No. 33 – Hazardous and Offensive Development* (SEPP 33) and in accordance with the Department's *Hazardous Industry Planning Advisory paper No. 3* (HIPAP 3), *Hazardous Industry Planning Advisory paper No. 6* (HIPAP 6) and Multi Level Risk Assessment	**EA Section 6.12** and **Appendix O**
Noise and vibrations – particularly with regards to the potential for impacts on any nearby private residences and sensitive land uses. The noise assessment shall be undertaken in accordance with the EPA's *Environmental Noise Control Manual, Environmental Criteria for Road Traffic Noise* and *Industrial Noise Policy (2000)* , and include cumulative impacts assessment of noise from the proposed development with nearby existing developments	**EA Section 6.5** and **Appendix K**
Surface and ground waters – the nature of the surface, subsurface and groundwater that may be affected by the development must be discussed and how any impacts will be mitigated and managed. In particular the potential impacts on any other receiving waters must be discussed including erosion and sediment control measures	**EA Section 7.2**, **Section 7.3, Appendix D**, and **Appendix E**
Traffic and transport – particularly with regards to the nature of the traffic and the proposed traffic routes, volume and frequency if anticipated movements; site access, internal roadways and parking and the impact of the proposed development on traffic volumes on local roads, regional roads and intersections	**EA Section 6.7** and **Appendix M**
The potential for existing contamination to soil/groundwater – in particular, the EIS must detail any proposed excavation and filling, including volumes, nature of material, storage and disposal, and the nature of potential contaminants during construction and operations, and how these issues would be monitored and managed to ensure the site is appropriate for its intended use	**EA Section 7.4**, **Section 2.2** and **Section 6.11**
Land form – physical features at the site must be described including ground levels, soil types and constraints, vegetation cover and flood levels including the probable maximum flood level (if available) and the impacts associated with the modification to the land form by the development	**EA Section 7.4** and **Section 7.5.5**
Visual impacts – particularly with regards to the potential for any impacts on nearby residential areas, adjacent development and any publicly accessible places, including public roads	**EA Section 6.6** and **Appendix L**
Flora and fauna – especially with regards to the potential impacts on critical habitats; threatened species, populations or ecological communities or their habitats	**EA Section 7.6** and **Appendix G**
Other Important Issues	
Statutory Planning instruments – in addition to those mentioned above, the EIS must assess the proposed development against the relevant provisions of the following environmental planning	**EA Section 4**

Director-General's Requirements	Where Addressed
instruments: *State Environmental Planning Policy No. 44 – Koala Habitat Protection; State Environmental Planning Policy No. 55 – Remediation of Land,* the *Hunter Regional Environmental Plan 1989* and the *Maitland Local Environmental Plan 1993*	
Environmental Monitoring and Management – The EIS must indicate how the environmental performance of the proposal would be monitored and managed during construction and operation	**EA Section 8**
A single, clear and comprehensive list or table, of all commitments made in relation to environmental impact mitigation, management and monitoring. A clear statement must be made indicating what measures will be implemented/applied; the scope of these measures; and the timing of implementation/application of these measures.	**Statement of Commitments**
Consultation with parties as identified in the Director-General's requirements issued under Part 4 of the Act on 19 July 2004	**EA Section 5**
Consultation with Maitland City Council, and any other relevant local, State and Commonwealth government authorities, service providers and community groups, and take into account any comments these agencies may have in the preparation of the EIS. Further you must describe any consultation with the potentially affected community, and discuss the outcomes of any such consultation.	**EA Section 5**

A draft Environmental Assessment was submitted to the Department of Planning for review prior to public exhibition. In response to the review of the draft Environmental Assessment, the issues raised by the Department of Planning and where they are addressed in this Environmental Assessment is provided in **Table 5.2**.

Table 5.2 Issues Raised by Department of Planning in Response to Draft Environemntal Assessment

Issues Raised	Where Addressed
General Requirements	
The Draft Environmental Assessment does not provide an adequate draft Statement of Commitments, as it does not sufficiently describe the relevant environmental control criteria, monitoring or management regimes for the project. In particular:	
▪ performance criteria for the development (such as environmental performance criteria, maximum capacity limits, design measures for air quality control (e.g. stack heights) etc);	**Statement of Commitments**
▪ relies on measures detailed within earlier sections of the draft Environmental Assessment. As the Statement of Commitments (SOC) is intended to act as a stand alone document, all proposed mitigation measures must be transferred into the SOC;	**Statement of Commitments**
▪ details of the composting staging program has been deferred and relies on any detail to be provided in a 'conditions of consent'. Given this is a recommended mitigation measure proposed by the Proponent, some level of detail on this program must be provided in the SOC.	The compost and soil conditioner manufacturing operations have been withdrawn from this proposal.
▪ timing of monitoring of mitigation measures, monitoring and management regimes should also be provided.	**Statement of Commitments**

Issues Raised	Where Addressed
Hazards and Risk	
The PHA must be updated to address the following:	
▪ the results of the hazard identification should be listed for each major process or storage unit or area, with a brief description of possible incident initiating events, possible consequences and proposed or existing safeguards. Reference should be made to the Department's guideline Hazardous Industry Planning Advisory Paper No.6 – Guidelines for Hazard Analysis. In particular, Appendix 4;	**Table 2.2 Appendix O**
▪ possible initiating events for the hydrogen plant and the hydrogenation plant should be carefully considered and included in the hazard identification;	**Table 2.2 Appendix O**
▪ Paragraph 1 of Clause 3.1.3 refers to solvents received for recycling as Class 3 with possible 10% being PG 1. Paragraph 2 refers to the recycled solvents as Class C1. Please clarify;	**Section 3.1.3 Appendix O**
▪ Clause 3.1.4 (Natural Gas) should discuss the consequences such as jet flame radiation distances in the event of a pipe failure and the emergency shutdown systems available. Above ground/below ground pipe routes and metering station should be shown on the site drawing at Appendix A;	**Section 3.1.4 Appendix O** The location of pipe routes and metering station have not yet been determined. These will be determined during the detailed design phase. Design will be in accordance with relevant Australian Standards, DA conditions, licence conditions and other relevant design requirements.
▪ Appendix A does not have a legend, scale or distances;	**Figure 6-1 Appendix O**, **EA Figure 7**
▪ Clause 3.1.5 (hydrogen) refers to 'no significant intermediate storage'. A clear statement should be made if has is piped direct to the hydrogenation plant or if any intermediate storage is to be used. A process description with process flow diagram/s of the reformer and the hydrogenation plant should be included with pressures and temperatures;	**Section 3.1.15 Appendix O**
▪ the storage locations for the various dangerous goods should be shown in the site plan with depot numbers;	The storage locations for Dangerous Goods have not yet been determined. These will be determined during the detailed design phase. Design will be in accordance with relevant Australian Standards, DA conditions, licence conditions and other relevant design requirements.
▪ Table 3.1 should include the PG where applicable. For each class and PG, at least one (with the highest potential for impact) representative material should be identified and the MSDS sheet included;	**Table 3.1 Appendix O**
▪ in applying the IAEA method, a population density of 5 per hectare has been assumed. Justification must be included;	**Section 4.1 Appendix O**
▪ Clause 3.1.2 of the Department's Multi-Level Risk Assessment (MLRA) states that the IAEA method does	**Section 4.1.3**, **Section 5.3**

Issues Raised	Where Addressed
not apply to Class 5 DG's and recommends that there should be a quantification of consequences of all credible accidents. MLRA also states 'if there are significant off-site consequences, a higher level of analysis will be required'.	and **Section 5.4 Appendix O**
▪ the analysis for the Class 6.1 DG's clause 3.3.4 has used np=0.5. Should it not be 0 for Category III and population factor of 100%? Justification is required if using 0.5;	A review of the application of the IAEA method used to screen this project has shown that the (conservative) use of a 100% populated area for all classes of material was inappropriate, since for Class 3 the effect area does not extend outside the boundary at all, and for all other classes only 20% of the effect area is outside the boundary. For Class 6.1, the use of n_p= 0.5 was in fact incorrect based on 100% populated area, but use of a 20% populated area for Category III means that the factor chosen was in fact correct for this case. All other consequence and frequency calculations are being revised. **Section 4 Appendix O**
▪ Clause 3.4 and beyond will need to be revised after the exclusion of Class 5.	**Section 4 Appendix O**
The Draft Environmental Assessment must be updated to address the following:	
▪ Clause 2.3.3.2 lists the plant items for the reformer and the hydrogenation plant. The operating conditions of these items should be considered in the PHA when developing the hazard identification. For example, the off gas drum and the flare;	The operating conditions of items of the reformer and hydrogenation plan have been considered in further detail in **Table 2.2 Appendix O**. The screening process has been undertaken using the total quantities of hazardous materials present and a detailed review of failure modes is not considered necessary where the screening threshold has not been exceeded. The conditions in the reformer were considered in the PHA by treating the inventory of C1 material present in the plant at high temperatures as Class 3.
▪ Page 43 refers to a hydrogen compressor. The compressor location, the hazardous classification for the electrics and the high pressure safety systems should be discussed in the PHA and credible scenarios included in the hazard identification;	The PHA found that the quantities of hydrogen on the plant will be less than the minimum quantity considered a hazard by the IAEA method, and would most unlikely to give rise to any significant risk to people outside the boundary. The hazardous area classification in the vicinity of the hydrogen compressor (and also the natural gas compressor for the reformer) will be assessed according to the

Issues Raised	Where Addressed
	relevant standard once detailed layouts and construction details had been decided. All electrical systems will be selected in accordance with the standards for the relevant hazardous area classification, once it has been determined.
	Table 2.2 Appendix O
▪ clarify if the compressor suction is direct from the reformer. If so, what are the safety systems in place to prevent air being drawn in on loss of positive pressure? Discuss in the PHA and include in the hazard identification table if appropriate.	It is intended that the hydrogen compressor will take its suction from the reformer. The system will be appropriately designed to prevent air from being drawn in. Detailed design has not been completed, so specific safety systems can not be provided at this stage. All mechanical systems, trips, interlocks, vent systems etc necessary to ensure that the plant operates safely will be included and checked through the subsequent safety studies, including HAZOP.
▪ clarify if the spent earth (filter cake) from the filter press a class 4 DG. Discuss in PHA;	The spent earth from the filter press will not be class 4.
▪ Clause 2.6 refers to the DG store. A table showing each class and PG with maximum unit size and total quantity for each class and PG should be included in the PHA (see item 8). At least one representative DG from each class and PG (typically with the highest potential for impact) should be identified and the MSDS included. Incompatibilities should be discussed and how appropriate separation requirements are met should be demonstrated.	Table 3.1 and Section 6, Appendix O
▪ confirm that Point 3 of clause 3.3.2.2 (CFS) implies that liquid regulated materials are currently going to landfill is correct.	No liquid wastes from the CFS process will be disposed of at Landfill. All liquid waste will be treated, recycled or disposed of at appropriately licensed facilities.
Air Quality	
The Draft Environmental Assessment does not adequately address this requirement because:	
▪ The draft Environmental Assessment must be updated to provide:	
- a detailed list of all process inputs and outputs;	**Section 5 Appendix J** and **EA Section 2**
- a mass balance diagram for each process indicating the fate of all contaminants in the process and consequent identification of the pollutants of concern for the proposal;	Text description provided in **Section 5** of **EA Appendix J** Process Flow Diagrams and Mass Balance Diagrams **Appendix C** of **Appendix J**
- a description of all aspects of the air emission control system, with particular regard to any fugitive emission capture systems (e.g. hooding,	Provided where relevant **Section 5.2.1 J** and **Appendix D** of **EA**

Issues Raised	Where Addressed
ducting), treatment systems (e.g. scrubbers, bag filters) and discharge systems (e.g stacks); and	**Appendix J**
- a table summarising the operational parameters of all emission sources, including operational variability, i.e. location, release type (stack, volume, area) and release parameters (e.g. stack height, stack diameter, exhaust velocity, temperature, emission concentration and rate).	Table not provided. Information contained within text of **Section 5** of **EA Appendix J** Additional data included in AUSPLUME Configuration files
▪ The use of the flare (to treat 65% of waste gases) as an emission control system is not supported by the DEC. Flares are typically used as emergency systems. Alternative controls such as an after burner, should be considered and incorporated into the proposed development.	Not applicable
▪ A large number of potentially significant sources of air emissions have been excluded from the assessment presented in the draft Environmental Assessment.	
- the Environmental Assessment excludes sources from the assessment without sufficient justification	Further assessment provided for a number of sources (as discussed within DEC meeting of Friday 6 January 2006)
- all potential pollutants of concern have not been identified and are excluded from the inventory, such as hazardous substances, hydrogen chloride, chlorine, chlorinated compounds, polycyclic aromatic hydrocarbons and dioxins and furans	Not applicable. Pre-processed feedstock utilised.
- the emission rates for some sources do not adequately reflect the proposed operations	Not applicable. Greenwaste sources removed. Further assessment of key tank emissions undertaken
▪ The draft Environmental Assessment must be updated to revise the air quality impact assessment to include a comprehensive emissions inventory. The Proponent must refer to the Approved methods for the Modelling and Assessment of Air Pollutants in NSW which provides a description of to develop a sound emissions inventory. The revision must take into account the following issues:	
- sources of air emissions – a number of sources have been excluded without sufficient justification. A more robust justification must be provided	**Section 5** and **Appendix B** of **EA Appendix J**
- emission rates of sources including in original air quality impact assessment (hydrogenation plant boiler) – it is noted that the revised EA introduces the potential use of recycled oil or natural gas as a source of energy for the boilers. The assessment is based on burning natural gas only. The emissions inventory (and assessment) must be revised to include boilers firing recycled oil	Not applicable. Natural gas to be burnt only.
- emission rates of additional sources included in revised impact assessment. The odour emission rates assumed for the compost lagoon and mixing cell is based on rates measures at the green waste operations at Eastern Creek. The	The compost and soil conditioner manufacturing operations have been withdrawn from this proposal.

Issues Raised			Where Addressed
	use of these odour emissions is not considered representative due to injection of more odorous wastes into the windrows and mixing cells (such as grease trap waste and septic waste). Consequently, the use of these odour rates underestimates the odour impacts, and the air assessment must be updated to include a more representative odour emission rate for these sources.		
Process	**Air Emission Source**	**Included**	
Oily Water Treatment and Waste Oil Recovery	oily water and waste oil storage and settling tanks	X	Qualitatively assessed, not considered a major source. **Section 5.1.1** and **Section 7.1** of **EA Appendix J**. Case study prepared and mitigation measures / safeguards recommended.
Lube Oil Hydrogenation Process *	direct fired heater to heat reactor feed (product heater)*	✓	
	off-gas drum accumulator	X	Not assessed, not considered a major source. General air quality management recommendations made.
	gas fired steam boiler for vacuum stripper heater and steam driven vacuum ejectors	✓	
	flare	✓	
	8 incoming and process tanks for storage and processing of re-refined oil	X	**Section 5.3.2** and **Section 7.3** of **EA Appendix J**. Mitigation measures/safeguards recommended.
	boiler in utilities building*	✓	**Section 5.4.3 Appendix J**
	Reactor*	✓	
	storage of light ends	✓	No assessed, not considered a major source. General air quality management recommendations made.
Hydrogen Generation by Steam Methane Reformer	gas fired steam boiler	✓	**Section 5.4.3 Appendix J**
	reformer	X	No assessed, not considered a major source. General air quality management recommendations made.
Chemical Fixation Stabilisation and Solidification (CFS)	exhaust vent	✓	
	fugitive	✓	**Section 5.2.2 Appendix J**
Compost and Soil Conditioner Manufacture	windrows regular com posting	N/A	The compost and soil conditioner manufacturing operations have been withdrawn from this proposal.
	windrows organic compositing	N/A	

Issues Raised			Where Addressed
	collection drain	N/A	
	compost lagoon	N/A	
	2 holding tanks	N/A	
	mixing cells	N/A	
	sawdust and greenwaste stockpiles	N/A	
Waste Water Treatment Plant	tanks	X	Qualitatively assessed, not considered a major source. **Section 5.1.1** and **Section 7.1** of **EA Appendix J**. Case study prepared and mitigation measures/safeguards recommended.
Industrial Cleaning Services	Depot discharge point via scrubber	X	Not assessed, not considered a major source. No scrubber proposed. General air quality management recommendations provided.
Environmental Recovery Ser vices	Depot discharge point via scrubber	X	Not assessed, not considered a major source. No scrubber proposed. General air quality management recommendations provided.
Unsealed surfaces	Vehicle movements on unsealed internal roads and surfaces	✓	**Section 5.5.2 Appendix J**

* Material and air flows for this process (and other processes, see point 1) are not apparent and must be clarified.

- The draft Environmental Assessment must be updated to revise the air quality impact assessment to address the following:

  - CFS exhaust vent - The proponent has assumed a solid particles emission concentration of 100mg/Nm^3, which is equivalent to the requirements of the Clean Air (Plant and Equipment) Regulation 1997 (CAPER). However the amended POEO (Clean Air) Regulation 2002 commenced on 1 September 2005, replacing the Clean Air (Plant and Equipment) Regulation 1997. Current standards for emissions concentration for scheduled premises: general activities and plant are specified in Schedule 4 of the Regulation. The Rutherford Recovery and Recycling Facility belongs to group 6 and accordingly the solid particle emissions must meet 50 mg/Nm^3. An emission concentration of 100 mg/Nm^3 therefore exceeds the current legislative requirements.

    As a minimum, the CFS exhaust vent solid particles emission concentration must be revised to meet the requirements of the POEO (Clean Air) Regulation 2002 and reflect the expected actual level of solid particles to be emitted from the CFS exhaust vent.

    Section 5.2 Appendix J

  - Regular Composting - The proposed inputs into

    The compost and soil conditioner

Issues Raised	Where Addressed
the regular compost manufacture include wastes from grease traps and septic tanks. Odour emission rates used in the assessment are based on measurements from various green waste operations. It is unclear whether or not the odour measurements were conducted on windrows composed of green waste impregnated with wastes from grease traps and septic tanks. The DEC is concerned the proponent has underestimated the regular composting odour emission rates.	manufacturing operations have been withdrawn from this proposal.
The proponent must confirm the composition of the windrows the odour samples were taken from and provide copies of the odour sampling reports.	
- Organic Composting – Odour emission rates are based on previous measurements of organic composting conducted by Parsons Brinckerhoff. It appears that ambient odour measurements have been back calculated to determine a source emission rate. The reliability of these odour emission rates is highly questionable and the odour samples have not been collected using an isolation flux hood, the DEC's approved method for the collection of odour samples.	The compost and soil conditioner manufacturing operations have been withdrawn from this proposal.
The proponent is requested to source odour emission rates that are sampled in accordance with the requirements of the Approved Methods for the Sampling and Analysis of Air Pollutants in NSW.	
- Hydrogenation Emissions – Sulfur dioxide emission rate is calculated based on information provided by Transpacific Industries. In particular, a Sulphur dioxide "emission value" of 12.6m^3/hour is converted to an emission rate by assuming 1m^3 of SO_2 is equivalent to 0.37kg . It appears the flow rate has been converted to an emission rate by assuming the gas stream is composed entirely of Sulphur dioxide. The emission rate calculation is unclear and must be clarified.	**Section 5.4.1 Appendix J**
The proponent is requested to clarify the Sulphur dioxide emission rate with Transpacific Industries.	
- Hydrogenation Plant Boiler – The oxides of nitrogen emission rate for the hydrogenation plant boiler is based on emission factors from the National Pollutant Inventory Combustion in Boilers Emission Estimation Technique Manual. The maximum emission factor for low NO_X boilers in the NPI manual is 800 kg per 10^6 m^3 of gas consumed. Using the maximum energy usage of 134 GJ/day, the maximum NO_X emission rate is less than 0.1g/s.	**Section 5.4.3 Appendix J**
The draft EA incorrectly refers to the limits in the (superseded) Clean Air (Plant and Equipment) Regulation, 1997 (CAPER), stating that the CAPER requirement for NO_X emissions from gas fired boilers is 0.35g/s (whearas it is 0.35g/m^3). The proponent states that the NPI derived 0.1g/s emission rate is less than the so called CAPER requirements, but to be conservative it has chosen to apply NOX emissions from the gas fired boiler of 0.35g/s in its assessment.	

Issues Raised	Where Addressed
There are several problems leading to an unacceptably high emission rate: 1. The hydrogenation plant boiler oxides of nitrogen emission rate is inadequate as it is based on emission factors which do not represent contemporary technology and are an average of existing boilers in operation; 2. There is confusion regarding the units in CAPER; 3. There is confusion regarding the superseded 1997 regulation. *The proponent must use manufacturers performance specifications to determine the oxides of nitrogen emission rate for the boiler. These specifications must also meet the legislative requirements of the Clean Air (Plant and Equipment) Regulation, 2002.*	
▪ the modelling presented for air quality assessment for the proposed facility does not comply with DEC guideline Approved Methods for the Modelling and Assessment of Air Pollutants in NSW and/or clarification on the modelling inputs is required. This may have resulted in the air quality impacts being underestimated. The draft Environmental Assessment must be updated to:	
- to revise the odour impact assessment with near field peak to mean ratios so that it complies with the requirements of the Approved Methods for the Modelling and Assessment of Air Pollutants in NSW.	Near field odour predictions undertaken for all odour scenarios
- confirm the number of windrows at the compost facility and provide a justification for modelling the windrows as area sources instead of volume sources (given surface area of the windrows would be around 30% greater than what has been modelled).	The compost and soil conditioner manufacturing operations have been withdrawn from this proposal.
- consider the DEC's Environmental Guidelines: Compositing and Related Organics Processing Facilities (DEC 2004) which recommend the use of enclosed storage and processing/mixing facilities to minimise the potential for the emission of offensive odour.	The compost and soil conditioner manufacturing operations have been withdrawn from this proposal.
- revise the impact assessment to include surrounding places of employment as sensitive receptors.	No existing sensitive industries or retail/commercial facilities located within the vicinity of the proposed site. Boundary impacts used as a surrogate for adjacent facilities.
- revise the impact assessment with site-specific meteorological data (e.g. data sets used for the National Ceramics impact assessment).	Predictions undertaken for Rutherford (2001) and Lochinvar (1980)
- provide all input, output and metrological files in the dispersion modelling in Microsoft Windows compatible format.	Provided, refer to CD
- Provide clear contour plots for each modelling scenario (currently illegible).	Not prepared for air quality descriptors assessed. Minor

Issues Raised	Where Addressed
	incremental impacts generally predicted for all pollutants modelled with assessment prepared for 16 separate residential receptors.
▪ the air impact assessment does not include an assessment of cumulative odour impacts on the local community, nor does it demonstrate that the project can comply with the relevant odour criteria. The draft Environmental Assessment must be updated to provide an assessment of the potential for cumulative odour impacts [contact DEC Hunter office for more detailed information].	The compost and soil conditioner manufacturing operations have been withdrawn from this proposal. Further cumulative odour assessment not required (as discussed within DEC meeting of Friday 6 January 2006)
▪ the revised impact assessment refers to selected volatile organic compounds of benzene and ethyl benzene, and the DEC's impact assessment criteria for these compounds. However, there is no further discussion on the emission of these compounds from the proposal or the potential environmental impact. Further, there is no justification for selecting only benzene and ethyylbenzene. The Environmental Assessment must be updated to include impact assessment criteria for the speciated volatile organic compounds contained in the DEC's Approved Methods for the Modelling and Assessment of Air Pollutants in NSW, and provide a rigorous justification for the speciated volatile organic compounds included in the assessment.	**Section 4** of **EA Appendix J**. As discussed within DEC phone conference of Friday 23 December 2005 and meeting of Friday 6 January 2006.
Heritage	
The draft Environmental Assessment does not adequately address this requirement because this section of the report has been excluded. The draft Environmental Assessment must be updated to incorporate this information.	**Section 6.3**
Noise	
The Environmental Assessment must include an assessment of noise impacts associated with the project.	
▪ The draft Environmental Assessment does not adequately address this requirement because the draft Environmental Assessment does not provide an assessment of the potential road traffic noise impacts of the proposed development in accordance with the DEC's Environmental Criteria for Traffic Noise (ECRTN). The draft Environmental Assessment must be updated to establish current traffic noise levels and assess the potential increase in traffic noise levels as a result of total vehicle movements generated by the proposed development in accordance with DEC's Environmental Criteria for Traffic Noise.	N/A **Section 5.4 Appendix K** Detailed assessment not deemed necessary given existing road traffic flows and minor contribution to road movements from the proposed site operations. Mitigation measures and safeguards recommended. Control of existing road traffic noise levels considered beyond the requirement for an individual industrial development.
▪ It is also requested that Tables 5.4 and 5.5 of the Noise Impact Assessment are amended to show units of measure.	**Table 5.4** and **Table 5.5 Appendix K**
Groundwater	
▪ The draft Environmental Assessment does not adequately address this requirement because the	**Section 7.2**

Issues Raised	Where Addressed
impact assessment does not contain sufficient information to determine the significance of the contamination and whether off-site migration of contaminants is occurring and/or likely. The draft Environmental Assessment must be updated to more accurately describe the nature and extent of the groundwater contamination on the site. This is requires the establishment of the additional bores, as indicated in the draft EA.	

5.1.2 Other Agencies

Several meetings were held at the inception stage of the proposal with Council, Department of Planning and the Department of Environment and Conservation.

Formal consultation with the following government agencies was also undertaken by letter and/or phone:

- Department of Environment and Conservation (DEC)
- Roads and Traffic Authority (RTA)
- Maitland City Council (MCC)
- WorkCover

The following service utilities were also contacted by letter and/or phone:

- EnergyAustralia
- AGL
- Telstra
- Hunter Water Corporation

The Mine Subsidence Board was not consulted as the subject site falls outside of a designated mine subsidence district.

A summary of the key issues raised by these stakeholders is provided in **Table 5.3**. A full copy of written correspondence received is provided in **Appendix C**.

Table 5.3 Summary of Agency/Service Utility Issues Raised

Govt Agency/ Service Utility	Issues Raised	Where Addressed
Department of Environment and Conservation	Emissions to air, including noise, dust and odour must be considered	**Section 6.4**
	Water pollution, including stormwater management and groundwater pollution must be considered	**Section 7.2** and **Section 7.3**
	Waste management and disposal must be considered	**Section 6.10**
	An environmental protection license (EPL) is required to carry out scheduled development work and activities. This must be applied for separately to the EA	**Section 4.6**

Govt Agency/ Service Utility	Issues Raised	Where Addressed
	A flora and fauna survey is required assessing the impact of the proposed Facility on flora and fauna	**Section 7.6** and **Appendix G**
	A preliminary Aboriginal cultural heritage assessment is required	**Section 6.3** and **Appendix I**
	An Australian Heritage Information Management System (AHIMS) search is required	**Appendix H**
	Heritage surveys are to be undertaken by suitably qualified persons	**Appendix I**
Roads and Traffic Authority	Traffic analysis to be prepared in accordance with the RTA's *Guide to Traffic Generating Developments* for all relevant intersections/accesses to assess the impact of the development on the surrounding road network	**Section 6.7** and **Appendix M**
	Vehicle parking provisions to be addressed	**Section 6.7** and **Appendix M**
	Public transport, pedestrian and cyclist provisions to be addressed	**Section 6.7** and **Appendix M**
	Information about vehicle movements to and from the site and types of vehicles to be used to be provided	**Section 6.7** and **Appendix M**
	Construction/operational traffic management plan to be prepared	**Section 6.7** and **Appendix M**
	Road and transport infrastructure improvements to be addressed	**Section 6.7** and **Appendix M**
	Cumulative road traffic impact assessment to be undertaken	**Section 6.7** and **Appendix M**
Maitland City Council	Air impacts particularly odour and dust concerns to be addressed	**Section 6.4** and **Appendix J**
	Noise impacts to be addressed	**Appendix K**
	Waste water collection, treatment and disposal to be addressed	**Section 2.3.4**
	Storm water collection, treatment and disposal to be addressed	**Section 7.3**
	Site contamination from previous usage including presence, groundwater concerns, remediation and cumulative impacts of the proposed activity to be addressed	**Section 7.4**, **Appendix D** and **Appendix F**
	Waste generation including generation of waste from the recycling of material and proposed disposal of this waste to be addressed	**Section 2**
	Traffic assessment including increase of traffic, access to site and noise impacts to be undertaken	**Section 6.7**, **Appendix M**
	Fire hazard from combustion of compost and possible impacts to the surrounding environment to be undertaken	The compost and soil conditioner manufacturing operations have been withdrawn from this proposal.
EnergyAustralia	If additional high voltage electricity supply is required at site, TPI will be required to apply to EnergyAustralia to increase the amps available	**Section 2.5**

Govt Agency/ Service Utility	Issues Raised	Where Addressed
Hunter Water Corporation	A Section 50 and Trade Waste application are required	TPI are currently in the process applying for a trade waste application

5.2 Community Consultation

5.2.1 Methods

The consultation approach included targeted and broader community consultation. The following techniques were employed to engage community feedback on the proposal:

- letterbox drop of newsletter to surrounding industrial and residential neighbours
- newspaper advertisement
- letters to key community groups
- community information evening

The scope and detail of the consultation components are described in detail below.

5.2.1.1 Letterbox Drop of Newsletter

A project newsletter (October, 2005) was produced to overview the proposal, proposal description, environmental assessment and consultation activities.

The newsletter was delivered to approximately 450 nearby residential and business properties. The delivery included the entire Rutherford Industrial Estate and residential properties located south of the New England Highway on the western side of Rutherford. Refer to **Figure 2** for area covered by the Newsletter Letterbox drop.

A copy of the newsletter is provided in **Appendix C**.

5.2.1.2 Newspaper Advertisement

A Public Notice of the community information evening was published in the Maitland Mercury on Wednesday 26 October 2005.

5.2.1.3 Letters to Key Community Groups

Letters raising awareness of the project and requesting feedback were sent to key community groups in October 2005 with a copy of the Newsletter. Letters and newsletters were sent to the following community groups:

- Maitland Chamber of Commerce and Industry
- Maitland Environmental Youth Council

- Maitland Regional Landcare
- Mindaribba Local Aboriginal Land Council
- Royal Newcastle Aero Club

5.2.1.4 Community Information Evening

A community information evening was held on Thursday 3 November 2005. 11 members of the community attended including local residents, owners of businesses within the Rutherford Industrial Estate and local councillors.

The purpose of the evening was to provide the community with information on the project, answer questions in relation to the project and obtain community feedback on the project to identify and address concerns. A presentation was made to the community on the project including providing an overview of the project, key environmental aspects and project benefits.

A copy of the presentation is included in **Appendix C**.

A summary of the key issues raised by the community at this meeting is provided in **Table 5.4**. Notes from this meting are provided in **Appendix C**.

Table 5.4 Summary of Key Community Issues Raised

Issue Raised	Where Addressed/Comment
Concern about additional truck movements on the local road network impacting safety, noise and road maintenance costs	**Section 6.7** and **Appendix M**
Concern over odour impact from composting facility	The compost and soil conditioner manufacturing operations have been withdrawn from this proposal.
Concern about the health impacts of air emissions from the hydrogenation plant emissions stack for nearby workers and residents	**Section 6.4** and **Appendix J**
Concern that the Facility will regularly exceed EPA air criteria as have other existing industrial developments (particularly oil processing plants) within the Rutherford Industrial Estate	**Section 6.4** and **Appendix J**
Surrounding land uses are becoming more residential and therefore sensitive, therefore location is not suitable for Facility and the zoning is inappropriate	**Section 3.2** and **Section 4.4**
Concern over experience and previous performance of the technology	**Section 1.4**
What are the future growth plans of the facility?	**Section 2.4**

6. Human Environment and Impacts

6.1 Regional Setting

The site of the proposed Facility is located approximately 7km north-west of the city of Maitland in the Hunter Valley of NSW (**Figure 3**). The site is located within the Rutherford Industrial Estate, off the New England Highway, a major transportation route in NSW. Access to the site is via security gates on the western side of the property.

The Rutherford Industrial Estate has been dominated by industrial activity since 1941 when the Commonwealth of Australia used the site for the production of munitions during World War II. Neighbouring properties include industrial businesses such as liquid waste treatment and storage, heavy vehicle transport depots, biodiesel manufacturing, warehousing, cardboard recycling, stockyards and oil recycling.

The Hunter Valley has traditionally been dominated by agricultural activity. According to the Hunter Valley Research Foundation (2003) the main crops grown in 2000 were wheat, sorghum, sunflower and grain, and grapes were the hunter's main fruit crop. Wool production, cattle and poultry were the major livestock products for the region in 2003. The Hunter Valley is one of Australia's most significant wine making districts, with numerous vineyards located throughout the area.

The Hunter Valley also has a strong history of coal mining with the first coal being exported from the Hunter in 1799 (Hunter Valley Research Foundation, 2003). The Hunter Coalfield is the largest producing area in NSW, containing approximately 60 seams in 3 measures.

The proposed location for the Facility is consistent with surrounding land uses and is also close to some of the Facility's major clients.

6.2 Land Use

6.2.1 Previous Land Use

Prior to 1941, the site and surrounding area were originally used for rural and agricultural purposes.

In 1941, the site was converted to industrial land use when the Commonwealth of Australia used the site for the production of munitions during World War II. The site was subsequently used for textile manufacturing by Bradmill Industries from 1945 to 1983. In 1983, Bradmill was acquired by National Textiles and this site continued to be used for textile manufacturing until 2000.

In 2000, the Rutherford National Textiles went into voluntary administration, largely due to the deregulation of the textiles industry. Lot 223 of DP 1037300 (the proposed site for the Facility) of the previous National Textiles operation was used to store packaged raw materials including liquid and solid Class 8 and 5 Dangerous Goods materials; housed the batch and continuous dye operations and housed cotton spinning and material sheet rolls. The site also housed the new boiler house, the water treatment and effluent

storage tanks, the effluent dam and ash disposal pit. The closure of the site saw the removal of all associated plant and raw materials with the exception of existing sheds, large tanks, piping infrastructure and effluent dam.

TPI purchased lot 223 of DP 1037300, a portion of the former National Textiles site in late 2003.

6.2.2 Current Land Use

Existing buildings and infrastructure associated with the National Textiles operations that still remain on the site include:

- one (1) steel tank - approximately 25 metres in diameter and 6.5 metres in height (capacity – 2.5Ml)
- one (1) concrete tank - approximately 14 metres in diameter and 8.5 metres in height (capacity – 1.5Ml)
- one (1) retention pond – approximately 90 metres in length and 50 metres in width – plastic lined (capacity – 10 Ml)
- three (3) large existing metal sheds
  - western shed - approximately 85 metres in length, 25 metres in width and 18 metres in height constructed from metal frame and cladding and concrete slab
  - middle shed – approximately 164 metres in length, 25 metres in width and 14 metres in height constructed from metal frame and cladding and concrete slab
  - eastern shed – approximately 150 metres in length, 25 metres in width and 10 metres in height constructed from timber frame and floor and metal cladding
- one (1) small shed – approximately 11 metres in length and 7 metres in width
- one (1) dwelling – approximately 16 metres in length and 10 metres in width
- various waste water treatment infrastructure.

The remainder of the site is undeveloped and has been largely cleared with the exception of four remnant stands of vegetation. For more detail refer **Section 7.6**.

On 8 March 2004, TPI was granted development consent (DA 03-4290) by Maitland City Council for the demolition of an existing shed, construction of an office building and weighbridge and use of a portion of the existing western shed as a storage area for semi trailers and trucks and associated workshop facilities. At the time of preparing this EA, TPI had demolished the existing western shed, constructed the weighbridge and office building and conducted required works to the portion of the existing shed that is to be used for the truck depot. Associated works such as roads, paved areas, landscaping and car parking have also been completed.

Photograph 1 Existing Retention Pond

Photograph 2 Existing Shed With Newly Constructed Truck Depot

Photograph 3 Existing Metal Sheds

Photograph 4 Newly Constructed Administration Building

TPI owned Valley Disposal Services (previously located at Branxton) has relocated to the Rutherford site following completion of construction works.

An aerial view showing the site prior to development works associated with DA 03-4290 is illustrated in **Figure 4**. For the current site layout is included in **Figure 5.**

The site is not currently used for any waste activities. Fill excavated from earthworks undertaken for works associated with DA 03-4290 is being stockpiled to the east of the existing sheds, where tank farms are proposed.

6.2.3 Surrounding Land Use

The site is surrounded by industrial land uses.

North There are several industrial neighbours adjoining the northern boundary of the site. These include:

- Edwards Concrete Tanks (Part Lot 211 and 224, 37 – 39 Kyle Street)
- Maitland Auction Centre (Part Lot 211 and 224, 37 – 39 Kyle Street)
- Australian Wool Network (Lot 221, 35 Kyle Street and Lot 222, 33 Kyle Street)
- Rutherford Electrical Engineering Services (Lot 204 31 Kyle Street)
- HIE Signs and Engraving (Lot 203, 29 Kyle Street)

East There is a railway siding on the eastern most border of the site. There are several industrial neighbours adjoining the eastern boundary of the site. These include:

- vacant land - Lot 313 Racecourse Road
- vacant land - Lot 402, 176 Racecourse Road
- Mozzy Waste Pty Ltd - Lot 101, 107 Kyle Street

South There are several industrial neighbours adjoining the southern boundary of the site. These include:

- Richardson Brothers Stock Transport (No lot number Kyle Street)
- vacant developed land, currently for lease (Lot 3, 11 Kyle Street)
- vacant land (Lot 4, 60 Kyle Street)
- Maitland Towing (Lot 52, 93 Kyle Street)
- Budget Kitchens (Lot 51, 95 Kyle Street)
- Mozzy Waste Pty Ltd (Lot 6, 99 Kyle Street)

West There are several industrial neighbours adjoining the western boundary of the site. These include:

- disused land with existing metals sheds to the north of the access road to the Facility (Lot 224, Kyle Street Rutherford)

- Richards Brothers Stock Transport (Lot 105, 53 Kyle Street)

Vacant vegetated land is located on the western side of Kyle Street.

6.3 Heritage

Insite Heritage Pty Ltd undertook an Aboriginal and European heritage assessment for the proposed Facility. A copy of the heritage assessment is contained in **Appendix I**.

6.3.1 Existing Environment

6.3.1.1 Indigenous Heritage

Aboriginal occupation within the Central Lowlands of the Lower Hunter Valley took place over 20,000 years ago. Koettig (1987) recorded a date of 20,200 BP from a hearth at Glennies Creek to the north of Branxton. An Aboriginal site on the Liverpool Plains has been dated to at least 19,000 BP (Gorecki *et al,* 1984). Despite these and other dates extending back to the Pleistocene, the majority of dated sites within the Hunter Valley are less than 4,000 years old (Brayshaw, 1994).

Tindale (1974) places the study area within the territory of the Wonnarua clans. The Awabakal are described as occupying land between Wyong, Maitland and Newcastle. The Worimi people occupied land north from Maitland and Newcastle and the Wonnarua territory extended west from Maitland to the Dividing Range.

The local Aboriginal population were able to exploit a wide range of subsistence resources. The numerous wetlands of the region provided abundant floral species and early settlers to the region noted Aboriginals catching eels and fish (Brayshaw, 1986b). Available faunal species included kangaroo, wallaby, echidna, possums, waterfowl, emu and reptiles.

Material culture of the local Aboriginal people included items made of wood, bark, plant fibres, stone, shell and bone including such items as spears, clubs, shields, dishes, canoes, nets, cloaks, cord and cutting implements.

The Aboriginal population of the region suffered greatly following the arrival of European settlers. Populations were greatly reduced due to the introduction of previously unknown diseases and traditional social structures disintegrated. A significant Aboriginal population remains in the area today and they take an active interest in their cultural heritage.

A number of archaeological surveys and excavations have been conducted within the Rutherford area and the wider Lower Hunter region in a development context.

Of particular relevance to the study area is Dagg's (1996) survey and (1997) subsequent test excavation of a parcel of land adjacent to the study area. The area was subject to the development of a light industrial sub-division at West Rutherford. The site is located on tributaries to Stony Creek, 1 kilometre east of the study area. Seven Aboriginal sites were located during his survey along with three areas of Potential Archaeological Deposit (PAD). Dagg concluded that the area consisted of low density concentrations of artefacts with a higher frequency associated with the confluence of watercourses. His report recommended a program of sub-surface testing be carried

out. Umwelt Australia (1997) subsequently completed a series of test excavations in the area. The subsurface testing found that the highest artifact frequency in any pit was 11 and that three raw materials were present, mudstone, quartz and silcrete. The density of artifacts was found to decrease with distance from the watercourse. The sites were assessed as low significance and a Section 90 Heritage Impact Permit sought.

In 2004 Kuskie completed an Aboriginal Heritage Assessment for a proposed residential development adjacent to the Rutherford golf course. This area is approximately 5 km east, south-east of the current study area and includes an area previously investigated by Dagg in 1996. A total of 27 Aboriginal sites were located during this survey and 116 lithic items were recorded. Twenty-four of the twenty-seven sites were assessed as being of low significance within a local context and three sites were assessed as being of moderate significance with a high potential for sub-surface artefacts to be present on these sites. The landform units contained within this survey included simple slope, ridge crest, spur crest and drainage depressions. Stony Creek flows through this area.

In 2005 Insite Heritage conducted surveys over two proposed small scale residential developments on previously developed sites. These sites are the former Rutherford Drive-in and a privately held parcel of land fronting the drive–in. The landscape had been significantly modified on both these sites and no sites or evidence of potential archaeological deposit was found.

Besant (2000) conducted a survey at Lot 51 Aberglassyn Road, Aberglassyn, an area about 2km to the east of the current study area. No evidence of Aboriginal occupation was located. Despite there being a high probability of Aboriginal occupation in the area. It was argued that negligible surface visibility restricted the chance of locating any such evidence and further investigation was recommended.

AHIMS Search Results

A site register search was conducted over an area of 30 square kilometres surrounding the study area. A total of 74 sites were recorded. The sites recorded are generally open camp sites, artefact scatters and isolated artefacts. These sites were generally located on undulating ground near watercourses and wetlands. 27 of the sites were recorded by P. Kuskie in the vicinity of Stony Creek.

Site Visit

The area is situated in a resource rich environment and the topography of the site would have been conducive to open camp sites. Dagg's 1997 sub-surface testing has shown the presence of knapping floors near the study area and also a significant dispersal of artefacts in areas of disturbance. On this basis and the evidence in the physical condition of the site and the geotechnical report for those areas not built over, it is predicted that few if any artefacts would remain on the site and those that do would no longer be in context.

A site visit was undertaken with representatives of Mindaribba Local Aboriginal Land Council and the Lower Hunter Wonnarua Council on the 28th of October, 2005, selected on the basis of the DEC consultation guidelines.

The site was walked over although there was negligible opportunity for natural ground exposure due to fill.

The cultural significance of the site was discussed with the representatives in the field.

6.3.1.2 Non Indigenous Heritage

The study site is part of a large parcel of land which was acquired by the Commonwealth of Australia for the construction of a munitions factory during World War II. Negotiations for the acquisition began in 1941 but the legalities were not finalised until January 1944. The majority of the land had previously been used for grazing purposes, with the exception of an area of 268 acres on the eastern boundary which had been a racecourse for the past 55 years.

Following the fall of France in June 1940 the Australian government moved to increase the preparedness of the home defence force in the event of attack, and also adopted a policy of providing maximum material support to AIF divisions rather than relying on Britain. These developments led to a significant increase in the demand for equipment, and the consequent construction of additional factories specialising in munitions production.

The Rutherford site was selected due to the availability of labour within the region and the proximity to transport routes to move materials and products. The government found that the humidity and dust in the Rutherford area rendered it unsuitable for the manufacture of explosives. Consequently, it was decided to build the explosives factory in Tasmania and to construct a shell factory at Rutherford.

In its completed form, the munitions factory comprised a complex of buildings in which the various stages of shell production were carried out. A layout of the site in 1943 shows the various buildings at the time, including a Hull Shop, No.1 Case Shop, 3.7 Case Shop, 25 Pounder Case Shop, Hull Shop, Component Shop, Shell Forge Shop and Shell Machine Shop. Ancillary buildings included a General Store, Bulk Store, Box Store, Maintenance Engineering, Stores and Transport Office, Garages, Boiler House and Casualty Centre.

In August 1944, the Prime Minister announced that part of the Rutherford factory was to be leased for the establishment of a textiles factory. It was anticipated that munitions manufacture would continue in the remaining buildings.

Construction and operation of the textile factory, known as Burlington Mills (Aust), was a joint venture involving Burlington Mills (USA.) and Bradford Cotton Mills (Aust.) Pty. Ltd., later known as Bradmill. Local workers were involved in erection and mechanical aspects associated with the establishment of the textile factory, but in the early stages technicians from Burlington U.S.A. provided specific textile skills. “On floor” workers were initially drawn from the local area, the mining industry and returned servicemen, but within a few years they were joined by large numbers of migrants from the United Kingdom, Europe and Eastern Europe.

Installation of machinery began in early 1945 and production of synthetic textile woven products was under way before the end of World War II in August 1945.

In 1963 the Rutherford factory, occupying an area of 120 acres, contained the largest single concentration of textile equipment in Australia and provided employment for about 1300 people. A wide range of textiles was produced, from high fashion sheer fabrics to heavy gauge belting ducks. The success of the factory encouraged Maitland City Council to promote the Rutherford area as a centre for secondary industry by developing over two hundred acres of land for industrial sites. Three clothing factories

were established in Central Maitland, two of them built by the Council and leased to tenants.

Changes in tariff policies in 1974-75 had a dramatic effect on the textile industry and virtually halved the output of the Rutherford plant. By the middle of 1982, the factory was struggling to cope as orders declined and this led management to introduce a shorter working week, and to ask 200 employees to take a weeks holiday. Despite these moves, retrenchment notices were issued to 72 workers in December. Over the following months the situation continued to deteriorate and by mid-1983 closure of the factory was imminent.

With the factory on the point of closure, salvation came in October 1993 in the form of a newly formed company, National Textiles, which took over three Bradmill owned concerns – the yarn spinning business at Kotara, the apparel fabric business at Devonport, Tasmania and the Rutherford factory which was manufacturing fabric and towels.

Despite investment in new technology, the Rutherford factory was unable to continue as a viable concern. In 2000, following the loss of a major customer and the Government's removal of its export subsidy scheme, National Textiles Factory at Rutherford was closed by receivers.

The building which stands on the study site originally served two functions - the shell forge shop and the shell machine shop. Following the establishment of the textile factory it became the fabric dye house.

Documentary evidence indicates that subdivisions of the National Textiles estate at Rutherford were carried out as early as 1968 and continued at regular intervals until 2002, leading to the creation of a light industrial estate featuring numerous separately owned allotments of various sizes. The study site, Lot 223, DP 1037300, was created as the result of a subdivision of a larger allotment in February 2002.

The former National Textiles site is of historic interest on a number of levels. It was a place of great importance to the nation during World War II, as a place where munitions were manufactured for military use overseas and at home. At the end of the war, it became a textile factory where some of the first synthetic fabrics were woven in Australia. The building located on the study site initially housed equipment for forging and machining operations associated with the production of ammunition shells. With the conversion of the site to a textile factory, the building became a fabric dye house and continued in that role until textile production ceased in 2002. The site is also of significance to the Rutherford area because of its role in the local economy, creating employment for thousands of people between 1947 and 2002 and providing the impetus for the expansion of industrial activity in the area. Following the cessation of textile manufacture at Rutherford and the subdivision of the property, buildings which were "designed on the most economical basis" under wartime conditions are once again being put to a new use, ensuring the preservation of some of the area's most historically significant structures.

6.3.2 Impacts of the Proposal

6.3.2.1 Discussion

The Aboriginal community representatives found that the site is of low cultural significance. The study area has been highly modified during the development of the munitions factory and its continued use as the Bradmill site.

The heritage value of the site as representative of the munitions factories built during World War II has been greatly diminished by the 2001 subdivision. The site has not been listed on the Maitland LEP and was not subject to heritage assessment prior to subdivision. To effectively manage the heritage value of the site a full assessment of the entire munitions factory site would be required.

6.3.2.2 Development Impact Assessment

The proposed development entails the reuse of the main existing buildings and the construction of several new buildings.

The positive aspects of the development are:

- the renovation and reuse of the existing dye house building
- the construction of the new buildings will be in keeping with the industrial character of the surrounding segments of the former munitions site .

The negative aspects of the development are:

- the possible demolition of the tea rooms at the rear of the property.

In general the development is in keeping with the surrounding use of the industrial area.

6.3.2.3 Archaeological Potential

A review of the history of the site has shown the following buildings that date to the munitions period have been demolished:

- *lavatory and store* - this was located within the Bradmill ash dump area and will have been destroyed
- *laundry* - the archaeological potential of these potentially disturbed footings is considered to be very low. The laundry in isolation is unlikely to contribute any information to our knowledge of the workings of the munitions factory. The potential remains comprise a concrete pad

6.3.3 Impact Amelioration

The following mitigation measures will be implemented with respect to heritage during the construction and operation phases of the proposed Facility.

- a building integrity inspection of the tea rooms will be undertaken to assess the structural integrity. If feasible, the tea room will be retained and put to adaptive reuse

- if it is not possible to retain the tea room a full heritage assessment of the building will be undertaken by a suitably qualified professional. A Section 140 application will be submitted to the Director-General to gain a permit prior to demolition
- any additional heritage relics or sites discovered during construction shall be reported to the NSW Heritage Office. Work in the subject area to cease. If disturbance to any suspected relics or site is proposed, an excavation permit shall be sought from the Heritage Office
- any evidence of Aboriginal relics discovered during construction shall be reported to the Department of Environment and Conservation. Work in the subject area to cease. If disturbance to any suspected relics or site is proposed, an excavation permit shall be sought from DEC.

6.4 Air Quality

Parsons Brinckerhoff undertook the air quality assessment for the proposed Facility. A copy of the air quality assessment is contained in **Appendix J**.

6.4.1 Existing Environment

6.4.1.1 Overview

The existing air quality for the Rutherford Region can be characterised as typical of a suburban environment.

The locality includes a combination of rural, residential, commercial and light industrial land uses. No major pollutant generating activities are located within the immediate study area. Local minor sources of air emissions include a combination of general residential activities, light industry, as well as local and arterial roads.

Emissions of motor vehicles would be considered a primary contributor to air pollution for the local setting.

No background air quality monitoring has been undertaken for this technical paper. Monitoring information relating to existing ambient air quality levels is also not available for either the local or regional area.

However, acceptable ranges of particulates, dust, hydrocarbons, oxides of nitrogen and sulphur would be expected throughout the study area for the majority of the time due to the relatively undeveloped nature of the study area and surrounds.

6.4.1.2 Adopted Background Levels

Sufficiently detailed background air quality data is not currently available for the local or regional area.

During the site inspections undertaken on the 27 June 2005. Walk over investigations were carried out on a calm day following a cool, clear night. Stable atmospheric conditions were noted. No odours or visible plumes were detected throughout the local area.

No historical information was available or site-specific monitoring undertaken. The data supplied by the DEC Air Monitoring Network has been adopted.

Data measured for the Pacific Highway at Beresfield, near Newcastle (2003) was adopted. The monitoring station is located on the main street (Lawson Street) in a rural residential area. The measured air quality would be influenced by higher traffic flow profiles and increased industrial emissions than expected at Rutherford.

Although the monitoring site is not site specific, it is considered a conservative estimation of typical (or indicative) ambient air environs for the study area. Air quality at Rutherford would be expected to be better than the reported Beresfield data. The data was the best available for use in this technical paper and is considered to be a conservative estimate of baseline conditions.

Monthly averaged data for monitored levels of particulate matter, nitrogen dioxide and sulphur dioxide is provided in **Table 6.1**.

Table 6.1 Adopted Background Levels (Beresfield, 2003)

Month	Pollutant								
	PM_{10} [TEOM] ($\mu g/m^3$) 24-hour average			NO_2 ($\mu g/m^3$) 1-hour average			SO_2 ($\mu g/m^3$) 1-hour average		
	Avg.	Max.	days > goal	Avg.	Max.	days > goal	Avg.	Max.	days > goal
January	nd	nd	nd	14.4	55.4	0	2.9	57	0
February	20	39	0	10.3	79.9	0	2.9	119.7	0
March	19	59	1	16.4	51.5	0	2.9	48.5	0
April	16	34	0	20.5	67.7	0	5.7	42.5	0
May	16	30	0	20.5	67.7	0	5.7	199.5	0
June	18	31	0	20.5	67.7	0	5.7	65.6	0
July	17	27	0	22.6	65.6	0	5.7	82.7	0
August	20	35	0	22.6	59.5	0	5.7	65.6	0
September	25	51	1	18.5	82	0	5.7	68.4	0
October	17	88	1	16.4	69.7	0	5.7	59.5	0
November	17	49	0	16.4	67.7	0	5.7	91.2	0
December	20	34	0	10.3	57.4	0	5.7	57	0
NSW GOAL		30			62			60	
Annual Avg.		**18.6**			**18.5**			**5.7**	
NSW GOAL		50			246			570	
Peak		**88**			**82**			**199.5**	

Notes to Table
Source: NSW DEC Air Quality Monitoring Points
PM_{10} = Particulate matter ≤ 10μm in aerodynamic diameter
NO_2 = nitrogen dioxide
SO_2 =sulfur dioxide
$\mu g/m^3$ = micro grams per cubic metre
TEOM – I hour average
nd – no data

The measured PM_{10} Tapered Element Oscillating Microbalance (TEOM) measurements provide continuous recordings of PM_{10} with 24-averaged measurements reported. The annual average of 18 $\mu g/m^3$ was noted at below the NSW DEC 30 $\mu g/m^3$ long-term reporting goal. A maximum 24 hour average of 88 $\mu g/m^3$ exceeded the 24-hour goal of 50 $\mu g/m^3$. The TEOM measurements indicate that three days on 2003 exceeded the 24-hour PM_{10} goal. Localised sources or regional bushfire conditions are expected to be the cause of this.

A maximum NO_2 level of 85 $\mu g/m^3$ was measured during 2003 for the Beresfield monitoring station. The NEPM 1 hour maximum goal of 246 $\mu g/m^3$ was achieved. The annual average of 18.5 $\mu g/m^3$ readily achieved the goal of 62 $\mu g/m^3$.

A maximum SO_2 level of 199.5 $\mu g/m^3$ was measured during 2003 for the Beresfield monitoring station. A NEPM 1 hour maximum goal of 570 $\mu g/m^3$ was achieved. The annual average of 5.7 $\mu g/m^3$ readily achieved the goal of 60 $\mu g/m^3$.

Roadside air quality monitoring was collected in 1993 as part of the proposed upgrade of the Pacific Highway (Coolongolook and Possum Brush). The data was collected by Peter Stephenson and Associates, summarised by Holmes Air Sciences and provided in the *Upgrading of the Pacific Highway Environmental Impact Statement (Buladelah), Technical Paper No. 15 – Air Quality Impact Assessment*. While not site specific and is now slightly dated, it provides indicative background levels adjacent to an arterial road with heavy traffic. Measurements were presented at five road side sites along the Pacific Highway and at five back road locations. Grab samples were taken during peak traffic flows and worst-case dispersion conditions. The results cannot be compared with continuous monitoring data as they do not reflect diurnal changes in traffic flows or varying meteorological conditions. The 1-hour CO levels along the Pacific Highway were measured in the range of 0.4 to 18.4 mg/m^3. Back road sites were generally lower and all readings were less than half the air quality level of 30 mg/m^3. Congestion and higher fleet CO emissions influence measured levels.

No indicative annual average background TSP data for the Rutherford area is available. Where TSP background data is not available, it is considered good practice to assume a TSP concentration at least double the annual PM10 concentration. An annual TSP background concentration of 40 $\mu g/m^3$ was therefore adopted and added to the calculated incremental impacts where applicable.

Similarly, records relating to dust deposition monitoring in vicinity of the proposed works were not available. However, from experience of dust deposition levels in similar receiving environments it is anticipated that existing ambient levels would be less than two grams per square metre per month.

The approach adopted is considered the best available for the purposes of undertaking the contemporaneous assessment.

6.4.1.3 Industrial Sources

Regional

A search of the National Pollution Inventory database (NPI) 2003 – 2004 indicated six industrial sources reporting emissions to the Maintland airshed. Reporting was carried out for a total of 47 substances from 37 industrial sources.

Industrial sources included a vegetable oil manufacturing and bottling plant; bulk petroleum storage site; clay bricks and pavers manufacturer; open cut coal mine; extended aeration / activated sludge process; and biological nutrient removal sewage treatment.

Diffuse data was selected for 32 diffuse sources, such as traffic and agricultural sources, and reported for air emissions.

Indicative key sources for the Maitland air shed included ceramic product manufacturing, motor vehicles and coal mining.

Ambient air quality levels for the regional air sheds are not expected to be adversely influenced by existing industrial sources.

Local

A number of industrial sources are located in the study area that have the potential to influence local air sheds. In particular, a limited number of existing odour sources are located in the Rutherford area.

Correspondence held with the DEC North East Branch (document 273266A1; NEF 18163 dated 23 November 2005) indicated odour sources are present within the locality of the proposed resource recovery and recycling facility site. A summary of premises known to be odour sources which are regulated by the DEC and details regarding odour impact assessment works was provided. Relevant information is provided in **Table 6.2**.

Table 6.2 Summary of Odour Sources in Rutherford Area

Licensee	Activity	Address	Odour Assessment Information Held	DEC Comment
Truegain Pty Ltd	Waste oil refinery	Kyle Street, Rutherford	1. Australian Waste Oil Recyclers - Air Quality Assessment Report - Odour and VOC Modelling - July 2004 2. Advitech - Air Quality Assessment - Source Identification for Australian Waste Oil Recyclers 62 Kyle Street, Rutherford	Documentation held at Newcastle DEC office - application required under Freedom of Information Act to access.
Atlantic Pacific Foods Pty Ltd	Oil Seed processing/margarine manufacture	Gardiner Street, Rutherford	No recent info listed	Known to be a potentially significant odour source

Licensee	Activity	Address	Odour Assessment Information Held	DEC Comment
Wax Converters Textiles Pty Ltd	Textile manufacture	Racecourse Road, Rutherford	Wax Converters Textiles Pty, Rutherford – Odour Impact Assessment Report Wax Converters Textiles Pty Ltd - NSW EPA Pollution Reduction Program - Stage One - Preliminary Air Quality Assessment - December 2003 Wax Converters Textiles P/L - Air Quality Assessment - Reduction Program Stage 2 - July 2004.	Documentation held at Newcastle DEC office - application required under Freedom of Information Act to access. Current and on-going odour issues.
Pioneer Road Services Pty Ltd	Bitumen Hot-mix plant	Gardiners Road, Rutherford	No recent documentation	-
Maitland Saleyards	Livestock Intensive Industry	Kyle Street, Rutherford	No recent documentation	-
Environmental Waste Managers (NSW) Pty Ltd	Waste Activity (HIGAB storage/processing)	Kyle Street, Rutherford	No recent documentation	EIS may be held on file
National Ceramic Industries Australia Pty Ltd	Ceramic tile manufacture	Racecourse Road, Rutherford	HLA-Envirosciences P/L - fax - National Ceramic Industries Australia - Emissions Inventory. Stack emission sources that will be commissioned for Stage 1 operations at the Rutherford facility highlighted in attached figure. National Ceramic Industries - Rutherford Plan - Dispersion Modelling and Validation Report - dated 15 September 2005 National Ceramic Industries - Australia P/L – Ceramic Tile Manufacturing Facility at Rutherford - EIS	Documentation held at Newcastle DEC office - application required under Freedom of Information Act to access.

Notes to Table

source DEC document 273266A1; NEF 18163 (dated 23 November 2005)

Of the seven industrial sites listed, four sites do not have recent documentation.

With regard to the Wax Converters Textiles site, the primary author of this technical paper undertook the first two odour assessments for the site. A number of recommendations were implemented on the site as part of a pollution reduction programme.

PB completed the EIS for the National Ceramic Industries Australia site. Review of the Holmes Air Sciences *Air Quality Assessment: Proposed Ceramic Tile Manufacturing Facility at Rutherford* (2002) completed for the EIS indicated the assessment of odour issues (both from the site and cumulative) was not required.

Operations of the proposed Rutherford Waste Resource Recovery and Recycling Facility are noted expected to emit odours beyond the site boundaries. The requirement for quantifying the existing level of odour impact from the industrial sites listed, and undertaking a cumulative odour impact assessment is not required (pers com DEC officers Friday 6 January 2006).

6.4.1.4 Existing Meteorology

Air quality impacts are influenced by both regional meteorological conditions, primarily in the form of gradient wind flow regimes, and by local conditions, generally driven by topographical features in the form of drainage flows. Topography, wind speed and wind direction all affect the potential dispersion and transport of plumes. An effort to define both the regional and local dispersion meteorology at the project site has been made.

Regional surface wind profiles have been obtained from the observations compiled for Williamtown (Bureau of Meteorology, station #61078). Williamtown is approximately 30 kilometres east of Rutherford. Seasonal and annual wind rose plots have been provided in **Appendix J**.

Review of the wind rose data indicates that wind directions are generally variable throughout each season. Williamtown experiences winds predominately from the southern, north-east and west north-western quadrants on an annual basis. In summer, the winds are predominately from the south-east and north-east. Southerlies predominate in autumn. West north-westerlies are frequent in the winter and spring experiences winds predominately from the north-east.

A site-specific meteorological data file was also configured for Rutherford for the year 2001. The 2001 data was generated through the use of the CSIRO developed TAPM program. Grid spacing nested down to 1,000 metres was applied. This is required to provide a detailed and robust assessment. Annual and seasonal wind rose plots for this file have been included in **Appendix J**. An annual average wind speed of 4.3 m/s was calculated with the primary wind directions from the west and west north-west.

Data measured during 1980 for Lochinvar, and provided by Holmes Air Sciences, indicated winds predominately from the west–north west and north west directions on an annual basis. In the summer, south-south east through east-south east winds flows were dominant. During autumn, an even distribution of winds throughout the north west and south west quadrants were present. North westerly and south easterly winds dominated in spring. North westerly flows were dominate during winter. Wind rose plots for Lochnivar 1980 are provided in **Appendix J**.

The primary seasonal wind flow patterns have similar frequencies to the annual wind rose plot. The site-specific wind rose diagrams are consistent with wind flow regimes for the northern region and generally confirm the reviewed Bureau of Meteorology (BOM) wind rose plots for Williamtown.

A summary of the data used to compile the wind roses and the occurrence of stability classes has been provided in **Appendix J**.

Worse case dispersion conditions from the site (that is, least dispersion) would normally be associated with F-class stability conditions – still / light winds and clear skies during

the night time or early morning period (stable conditions). Analysis of the referenced site-specific meteorological data indicates that F-class dispersion conditions were present for approximately 10 percent of the time for the year 2001. E class conditions were present for approximately 22 percent of the time. The high frequency of E and F class stabilities indicates that dispersion conditions would be such that any particulate plumes would disperse slowly for a significant proportion of the time.

6.4.1.5 Topography

When assessing the impact potential from a ground level source of air pollutants, it is also important to consider local drainage flows. The movement of cold air down a slope (generally under stable atmospheric conditions) is referred to as katabatic drift and can result in plume entrapment, poor dispersion of air borne pollutants, and the potential to cause greater off-site impacts. Katabatic drift would follow the topography of the site.

The study area generally consists of cleared agricultural land with scattered patches of remnant vegetation and low gently rolling hills (10 - 50 metres in relief).

Although general patterns can be determined with confidence, it is difficult to accurately predict the influence of local drainage flows without detailed site-specific meteorological information. Topographic information available for the site of the proposal indicates that a localised catchment is formed within the site towards Stony Creek and the smaller tributary gullies. Based on this information, it would be reasonable to assume that there is the potential for plume entrapment and minimal horizontal or vertical diffusion in this area.

No further assessment of topographical influences in the fate and transport of air emissions has been made as part of this Technical Paper. Given emissions from the site would comprise low level emission sources, topography is not expected to significantly affect site related air emissions, and impact potential.

6.4.1.6 Adopted Standards and Guidelines

Air quality goals relevant to the site are presented in this section of the technical paper. Relevant National and New South Wales ambient air quality goals have been adopted. Air quality reporting standards and regional goals are established to protect the health of local communities and minimise potential annoyance.

The identified national goals are based on the recommendations of the National Health and Medical Research Council (NHMRC, 1995) and the National Environmental Protection (Ambient Air Quality) Measure (NEPM, 1998) prepared by the National Environment Protection Authority Council (NEPC). The NEPM goals are long-term reporting descriptors. New South Wales (NSW) ambient air quality goals are provided in the NSW DEC document *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW* (2005).

The adopted standards/goals for this proposal are presented in **Table 6.3**. Pollutants indicated are each expected to be emitted from the site.

No air quality goals are prescribed for reactive hydrocarbons as air quality guidelines are not specific for reactive species. Reactive species are the key elements in the formation of photochemical smog.

These adopted goals apply to sensitive receptors at site boundaries and beyond. Assessment of impacts also requires an understanding that the air quality at any given receptor may be a composite of emissions from a number of sources which all contribute various proportions to the overall pollutant burden (dependent on the location of the receptor with respect to sources and dispersion conditions).

Further, compliance with the NEPM regional goal requires management and control of all sources and is therefore considered beyond the scope of an individual project. However, large air quality sources (such as the proposed Waste Resource Recovery and Recycling Facility) should be assessed with respect to their influence on regional air quality. This has been qualitatively undertaken within this technical paper with the assessment of annual impacts.

A NEPM "advisory" standard has been established for 24-hour and annual $PM_{2.5}$ concentration levels. However, given the existing "advisory" status of the $PM_{2.5}$ criterion, detailed assessment of impact potential has not been presented in this technical paper.

The 2004 NEPC air toxics NEPM provides a framework for monitoring, assessing and reporting ambient levels of a number of DEC managed air toxics (Formaldehyde, Toluene and Xylenes). Similar with the approach applied to the $PM_{2.5}$ standard, the air toxic goals are "investigation levels" only and do necessarily require detailed assessment.

Table 6.3 Adopted Ambient Air Quality Criteria

Pollutants	Averaging period	Goal	Source
Nitrogen dioxide	1 hour maximum	245 $\mu g/m^3$	NEPC, NEPM
	1 hour maximum	200 $\mu g/m^3$	NSW DEC long term reporting goal
	annual mean	62 $\mu g/m^3$	NEPC
Carbon Monoxide	15 minutes	100 mg/m^3	WHO
	1 hour	30 mg/m^3	WHO
	8 hours	10 mg/m^3	NEPC
Sulphur dioxide	10 minute maximum	712 $\mu g/m^3$	NHMRC
	1 hour maximum	570 $\mu g/m^3$	NEPC, NEPM
	1 day	228 $\mu g/m^3$	NEPC, NEPM
	annual mean	60 $\mu g/m^3$	NEPC, NEPM
TSP	annual TSP Concentration	90 $\mu g/m^3$	NHMRC
	annual TSP Deposition[1]	2 g/m^2/month	NERDDC
	annual TSP Deposition[2]	4 g/m^2/month	NERDDC
PM_{10}	annual PM_{10} Concentration	30 $\mu g/m^3$	NSW EPA
	24-hour PM_{10} Concentration	50 $\mu g/m^3$	NEPC, NEPM

Pollutants	Averaging period	Goal	Source
Ammonia	1 hour maximum	0.33 mg/m^3	NSW DEC
Hydrogen Chloride	1 hour maximum	0.14 mg/m^3	NSW DEC
Cyanide (as CN)	1 hour maximum	0.09 mg/m^3	NSW DEC
INDIVIDUAL TOXIC AIR POLLUTANTS (selected)			
Lead	annual	0.5 μg/m^3	NSW DEC
Iron oxide fume	1 hour maximum	0.09 mg/m^3	NSW DEC
Copper fume	1 hour maximum	0.0037 mg/m^3	NSW DEC
Zinc oxide fume	1 hour maximum	0.09 mg/m^3	NSW DEC
Magnesium oxide fumes	1 hour maximum	0.18 mg/m^3	NSW DEC
VOLATILE ORGANIC COMPONDS (selected)			
Benzene	1 hour maximum	0.029 mg/m^3	NSW DEC
Ethylbenzene	1 hour maximum	8.0 mg/m^3	NSW DEC

Notes to Table

1 - maximum allowable increase

2 - maximum total deposited level

PM_{10} = Particulate matter ≤ 10μm in aerodynamic diameter

TSP = Total suspended particulates ≤ 30μm in aerodynamic diameter

NEPM = National Environment Protection (Ambient Air Quality) Measure

NHMRC = National Health and Medical Research Council

The above values are ambient air quality goals. Wherever possible, cumulative assessment of particulate matter impacts is required.

In assessing short-term impact potential, it should be noted that the 24-hour PM_{10} target specified in the NEPM should not be exceeded on more than five days in a single year.

The Air NEPM state that: the 1 hour NO_2 criterion of 245 μg/m^3 can be exceeded no more than one day in a single year, the SO_X 1 hour criterion of 570 μg/m^3 can be exceeded no more than one day in a single year; the SO_X 1 day criterion of 225 μg/m^3 can be exceeded no more than one day in a single year; and the 24 hour PM_{10} pollutant standard of 50 micrograms per cubic metre cannot be exceeded more than five days in a single year.

The goals established for the selected toxic air pollutants have been based on MSDS information outlined within the MSDS for the hydrogenation feed stock product.

The goals established for volatile organic compounds have been recommended as indicator air quality goals only. The selected volatile compounds allow for qualitative assessment of impact potential and assist in establishing boundary air quality goals for future boundary compliance monitoring works.

6.4.2 Impacts of the Proposal

6.4.2.1 Air Impact Modelling

The AUSPLUME modelling program (Version 6) implemented in this assessment utilises consecutive meteorological data records to define the conditions for plume rise, transport, diffusion and deposition. The model was used to estimate the concentration or deposition value for each source and receptor combination for each hour of input

meteorology and calculated user selected short-term average predictions. Within the AUSPLUME dispersion model, technical options are available to simulate plume behaviour affected by the presence of buildings and terrain. Atmospheric dispersion curves and surface roughness heights were also selected which specifically represented the industrial conditions present.

The basis of the model used is the straight line, steady state Gaussian plume equation (as consistent with current theory). The model is based on the U.S. developed ISC modelling code and has been the industry standard for predicting plume dispersions since 1986.

To provide a thorough assessment and to account for the additional buoyant plume rise and momentum flux, flare emission impacts were also assessed with the use of the US EPA Screen3 program.

Modelled Scenarios

A worse-case modelling approach was established in the configuration of the site-specific air quality impact model. The model was configured for air emissions over a constant 24 hour period. Fugitive emissions and impacts from spills have not been considered as these are not typical of site operations. Results are presented in **Table 6.4** through **Table 6.11**.

Potential short term NO_X impacts from the operation of the flare have been qualitatively assessed with the use of the US EPA Screen3 program,

The following parameters were assumed:

NO_X Emission Rate - 0.7 g/s

Flare Stack Height - 16 metres

Assumed Heat Release - 0.5374e+7 CAL/s

Receptor Height - 1.2 metres

Land Use Option - Rural

Simple terrain was applied and potential impacts for all stability classes and wind speed categories assessed. Building downwash was considered.

An effective release height of 23.5 m was calculated for the flare. A buoyancy flux of 89 m^4/s^3 and momentum flux of 54 m^4/s^2 were calculated within the Screen3 model.

Maximum 1 hour concentration impacts of less than 5 $\mu g/m^3$ were predicted at a distance of approximately 800 metres from the flare. An inversion break-up fumigation calculation also provided maximum NO_X impacts of less than 5 $\mu g/m^3$.

The AUSPLUME model provided more conservative incremental impacts. No further consideration is deemed necessary.

Table 6.4 Predicted Operational Air Impacts (CFS processing), Rutherord 2001 data

Parameter Modelled	Catchment 1 - NW	2 – NW	3 - S	4 - SE	5 - NE	6 - NE	near field
	Receiver A, B	C, D	E, F	G, H, I, J	K, L, M	N, O, P	boundary
CFS PROCESSING, CFS CURING, INTERNAL ROADWAYS							
annual TSP incremental concentration	0.412 µg/m^3	0.733 µg/m^3	0.294 µg/m^3	0.638 µg/m^3	0.609 µg/m^3	0.504 µg/m^3	39.6 µg/m^3
adopted annual background TSP concentration of 40 µg/m^3							
worse case residential annual TSP concentration impact of <41 µg/m^3. 90 µg/m^3 cumulative criterion satisfied							
annual (monthly average) TSP incremental deposition	<0.05 g/m^2/mth	<0.05 g/m^2/mth	<0.05 g/m^2/mth	<0.05 g/m^2/mth	<0.05 g/m^2/mth	<0.05 g/m^2/mth	3.2 g/m^2/mth
adopted annual (monthly average) background TSP deposition n of 2 g/m^2/month							
worse case residential annual TSP concentration impact of <2.5 g/m^2/month. 4 g/m^2/month cumulative criterion satisfied							
annual PM_{10} incremental concentration	0.296 µg/m^3	0.459 µg/m^3	0.184 µg/m^3	0.403 µg/m^3	0.380 µg/m^3	0.316 µg/m^3	20.4 µg/m^3
adopted annual background PM_{10} concentration of 18.6 µg/m^3							
worse case residential annual PM_{10} concentration impact of <19 µg/m3. 30 µg/m^3 cumulative criterion satisfied							
peak 24 hour PM_{10} incremental concentration	4.39 µg/m^3	6.64 µg/m^3	4.01 µg/m^3	4.43 µg/m^3	6.97 µg/m^3	5.83 µg/m^3	128 µg/m^3
comparing incremental PM_{10} concentration impacts to the adopted 2003 data indicates that for 2003, the 50 µg/m^3 cumulative criterion would have been exceeded on four occasions only. NEPM requirements are expected to be achieved throughout.							
peak 1 hour Ammonia concentration	0.012 mg/m^3	0.015 mg/m^3	0.011 mg/m^3	0.014 mg/m^3	0.013 mg/m^3	0.018 mg/m^3	0.484 mg/m^3
99.9th % 1 hour Ammonia concentration	-	-	-	-	-	-	0.21 mg/m^3
0.33 mg/m^3 criterion satisfied for all receptors. 99.9th percentile impacts satisfied at the boundary.							
peak 1 hour Hydrogen Chloride concentration	0.005 mg/m^3	0.007 mg/m^3	0.005 mg/m^3	0.006 mg/m^3	0.006 mg/m^3	0.008 mg/m^3	0.210 mg/m^3
99.9th % 1 hour Ammonia concentration	-	-	-	-	-	-	0.10 mg/m^3
0.14 mg/m^3 criterion satisfied for all receptors. 99.9th percentile impacts satisfied at the boundary.							
peak 1 hour Cyanide concentration	0.003 mg/m^3	0.004 mg/m^3	0.003 mg/m^3	0.004 mg/m^3	0.004 mg/m^3	0.005 mg/m^3	0.142 mg/m^3
99.9th % 1 hour Ammonia concentration	-	-	-	-	-	-	0.06 mg/m^3
0.09 mg/m^3 criterion satisfied for all receptors. 99.9th percentile impacts satisfied at the boundary.							

Table 6.5 Predicted Operational Air Impacts (CFS processing), Lochinvar 1980 data

Parameter Modelled	Catchment / Receiver						
	1 - NW	2 – NW	3 - S	4 - SE	5 - NE	6 - NE	near field
	A, B	C, D	E, F	G, H, I, J	K, L, M	N, O, P	boundary
CFS PROCESSING, CFS CURING, INTERNAL ROADWAYS							
annual TSP incremental concentration	1.340 µg/m^3	0.977 µg/m^3	0.532 µg/m^3	3.240 µg/m^3	0.785 µg/m^3	1.230 µg/m^3	54.0 µg/m^3
adopted annual background TSP concentration of 40 µg/m^3							
worse case residential annual TSP concentration impact of <45 µg/m^3. 90 µg/m^3 cumulative criterion satisfied							
annual (monthly average) TSP incremental deposition	<0.05 g/m^2/mth	<0.05 g/m^2/mth	<0.05 g/m^2/mth	<0.05 g/m^2/mth	<0.05 g/m^2/mth	<0.05 g/m^2/mth	2.6 g/m^2/mth
adopted annual (monthly average) background TSP deposition n of 2 g/m^2/month							
worse case residential annual TSP concentration impact of <2.5 g/m^2/month. 4 g/m^2/month cumulative criterion satisfied							
annual PM_{10} incremental concentration	0.844 µg/m^3	0.614 µg/m^3	0.334 µg/m^3	2.04 µg/m^3	0.492 µg/m^3	0.769µg/m^3	26.9 µg/m^3
adopted annual background PM_{10} concentration of 18.6 µg/m^3							
worse case residential annual PM_{10} concentration impact of <25 µg/m3. 30 µg/m^3 cumulative criterion satisfied							
peak 24 hour PM_{10} incremental concentration	11.4 µg/m^3	7.6 µg/m^3	4.2 µg/m^3	13.6 µg/m^3	9.7 µg/m^3	10.8µg/m^3	87.7 µg/m^3
comparing incremental PM_{10} concentration impacts to the adopted 2003 data indicates that for 2003, the 50 µg/m^3 cumulative criterion would have been exceeded on four occasions only. NEPM requirements are expected to be achieved throughout.							
peak 1 hour Ammonia concentration	0.027 mg/m^3	0.036 mg/m^3	0.018 mg/m^3	0.045 mg/m^3	0.037 mg/m^3	0.041 mg/m^3	0.380 mg/m^3
99.9th % 1 hour Ammonia concentration	-	-	-	-	-	-	0.29 mg/m^3
0.33 mg/m^3 criterion satisfied for all receptors. 99.9th percentile impacts satisfied at the boundary.							
peak 1 hour Hydrogen Chloride concentration	0.012 mg/m^3	0.016 mg/m^3	0.008 mg/m^3	0.019 mg/m^3	0.016 mg/m^3	0.018 mg/m^3	0.167 mg/m^3
99.9th % 1 hour Ammonia concentration	-	-	-	-	-	-	0.128 mg/m^3
0.14 mg/m^3 criterion satisfied for all receptors. 99.9th percentile impacts satisfied at the boundary.							
peak 1 hour Cyanide concentration	0.008 mg/m^3	0.011 mg/m^3	0.005 mg/m^3	0.013 mg/m^3	0.011 mg/m^3	0.012 mg/m^3	0.112 mg/m^3
99.9th % 1 hour Ammonia concentration	-	-	-	-	-	-	0.08 mg/m^3
0.09 mg/m^3 criterion satisfied for all receptors. 99.9th percentile impacts satisfied at the boundary.							

Table 6.6 Predicted Operational Air Impacts (Hydrogernation of Re-refined Base Lube Oils – Hydrogenation emissions), Rutherford 2001 data

Parameter Modelled	Catchment 1 - NW	2 – NW	3 - S	4 - SE	5 - NE	6 - NE	near field
	Receiver A, B	C, D	E, F	G, H, I, J	K, L, M	N, O, P	boundary
Hydrogenation Emissions							
peak 10 minute incremental SO_2 concentration	56.7 µg/m^3	58.0 µg/m^3	50.9 µg/m^3	77.6 µg/m^3	72.0 µg/m^3	113 µg/m^3	202 µg/m^3
no background 10 minute SO_2 concentration data adopted							
712 µg/m^3 cumulative criterion expected to be satisfied							
peak 1 hour incremental SO_2 concentration	47.0 µg/m^3	40.8 µg/m^3	40.2 µg/m^3	58.1 µg/m^3	61.2 µg/m^3	78.9 µg/m^3	145 µg/m^3
adopted 1 hour background SO_2 concentration of 199.5 µg/m^3							
worse case 1 hour SO_2 concentration impact of <150 µg/m^3. 570 µg/m^3 cumulative criterion satisfied							
peak 24 hour incremental SO_2 concentration	5.0 µg/m^3	7.7 µg/m^3	2.9 µg/m^3	4.4 µg/m^3	4.7 µg/m^3	4.9 µg/m^3	54 µg/m^3
no background 24 hour SO_2 concentration data adopted							
228 µg/m^3 cumulative criterion expected to be satisfied							
Annual incremental SO_2 concentration	0.4 µg/m^3	0.6 µg/m^3	0.2 µg/m^3	0.8 µg/m^3	0.6 µg/m^3	0.4 µg/m^3	5.2 µg/m^3
adopted annual background SO_2 concentration of 5.7 µg/m^3							
worse case annual SO_2 concentration impact of <10 µg/m^3. 60 µg/m^3 cumulative criterion satisfied							
Annual incremental Lead concentration	0.034 µg/m^3	0.051 µg/m^3	0.017 µg/m^3	0.068 µg/m^3	0.051 µg/m^3	0.034 µg/m^3	0.44 µg/m^3
0.5 µg/m^3 criterion satisfied							
peak 1 hour incremental iron concentration	< 0.001 mg/m^3	< 0.001 mg/m^3	< 0.001 mg/m^3	0.001 mg/m^3	0.001 mg/m^3	0.002 mg/m^3	0.003 mg/m^3
0.09 mg/m^3 criterion satisfied							
peak 1 hour incremental copper concentration	< 0.001 mg/m^3	< 0.001 mg/m^3	< 0.001 mg/m^3	< 0.001 mg/m^3	< 0.001 mg/m^3	< 0.001 mg/m^3	< 0.001 mg/m^3
0.0037 mg/m^3 criterion satisfied							
peak 1 hour incremental zinc concentration	0.001 mg/m^3	0.001 mg/m^3	0.001 mg/m^3	0.001 mg/m^3	0.002 mg/m^3	0.002 mg/m^3	0.004 mg/m^3
0.09 mg/m^3 cumulative criterion satisfied							
peak 1 hour incremental magnesium concentration	< 0.001 mg/m^3	< 0.001 mg/m^3	< 0.001 mg/m^3	< 0.001 mg/m^3	< 0.001 mg/m^3	< 0.001 mg/m^3	0.001 mg/m^3
0.18 mg/m^3 criterion satisfied							

Table 6.7 Predicted Operational Air Impacts (Hydrogernation of Re-refined Base Lube Oils – Hydrogenation Emissions), Lochinvar 1980 data

Parameter Modelled	1 - NW	2 – NW	3 - S	Catchment 4 - SE	5 - NE	6 - NE	near field
	A, B	C, D	E, F	Receiver G, H, I, J	K, L, M	N, O, P	boundary
Hydrogenation Emissions							
peak 10 minute incremental SO_2 concentration	77.4 µg/m^3	93.5 µg/m^3	76.1 µg/m^3	83.7 µg/m^3	82.8 µg/m^3	97.3 µg/m^3	213 µg/m^3
no background 10 minute SO_2 concentration data adopted							
712 µg/m^3 cumulative criterion expected to be satisfied							
peak 1 hour incremental SO_2 concentration	54.7 µg/m^3	65.5 µg/m^3	59.4 µg/m^3	58.5 µg/m^3	58.0 µg/m^3	69.1 µg/m^3	149 µg/m^3
adopted 1 hour background SO_2 concentration of 199.5 µg/m^3							
worse case 1 hour SO_2 concentration impact of <150 µg/m^3. 570 µg/m^3 cumulative criterion satisfied							
peak 24 hour incremental SO_2 concentration	5.8 µg/m^3	7.4 µg/m^3	3.7 µg/m^3	7.6 µg/m^3	3.5 µg/m^3	7.2 µg/m^3	29.4 µg/m^3
no background 24 hour SO_2 concentration data adopted							
228 µg/m^3 cumulative criterion expected to be satisfied							
Annual incremental SO_2 concentration	1.0 µg/m^3	0.9 µg/m^3	0.5 µg/m^3	2.1 µg/m^3	0.5 µg/m^3	0.7 µg/m^3	2.1 µg/m^3
adopted annual background SO_2 concentration of 5.7 µg/m^3							
worse case annual SO_2 concentration impact of <5 µg/m^3. 60 µg/m^3 cumulative criterion satisfied							
Annual incremental Lead concentration	0.085 µg/m^3	0.077 µg/m^3	0.043 µg/m^3	0.179 µg/m^3	0.043 µg/m^3	0.059 µg/m^3	0.179 µg/m^3
0.5 µg/m^3 criterion satisfied							
peak 1 hour incremental iron concentration	0.001 mg/m^3	0.001 mg/m^3	0.001 mg/m^3	0.001 mg/m^3	0.001 mg/m^3	0.002 mg/m^3	0.003 mg/m^3
0.09 mg/m^3 criterion satisfied							
peak 1 hour incremental copper concentration	< 0.001 mg/m^3	< 0.001 mg/m^3	< 0.001 mg/m^3	< 0.001 mg/m^3	< 0.001 mg/m^3	< 0.001 mg/m^3	< 0.001 mg/m^3
0.0037 mg/m^3 criterion satisfied							
peak 1 hour incremental zinc concentration	0.001 mg/m^3	0.001 mg/m^3	0.001 mg/m^3	0.001 mg/m^3	0.002 mg/m^3	0.002 mg/m^3	0.004 mg/m^3
0.09 mg/m^3 cumulative criterion satisfied							
peak 1 hour incremental magnesium concentration	< 0.001 mg/m^3	< 0.001 mg/m^3	< 0.001 mg/m^3	< 0.001 mg/m^3	< 0.001 mg/m^3	< 0.001 mg/m^3	0.001 mg/m^3
0.18 mg/m^3 criterion satisfied							

Table 6.8 Predicted Operational Air Impacts (Hydrogernation of Re-refined Base Lube Oils – Flare Stack Emissions), Rutherford 2001 data

Parameter Modelled	Catchment Receiver						
	1 - NW	2 – NW	3 - S	4 - SE	5 - NE	6 - NE	near field
	A, B	C, D	E, F	G, H, I, J	K, L, M	N, O, P	boundary
Flare Stack Emissions							
peak 15 minute incremental CO concentration	0.06 mg/m^3	0.05 mg/m^3	0.05 mg/m^3	0.05 mg/m^3	0.07 mg/m^3	0.09 mg/m^3	0.13 mg/m^3
no background 15 minute CO concentration data adopted							
100 mg/m^3 cumulative criterion expected to be satisfied							
peak 1 hour incremental CO concentration	0.09 mg/m^3	0.16 mg/m^3	0.11 mg/m^3	0.12 mg/m^3	0.13 mg/m^3	0.09 mg/m^3	0.29 mg/m^3
adopted 1 hour background CO concentration of 18.4 mg/m^3							
worse case 1 hour CO concentration impact of <20 mg/m^3. 30 mg/m^3 cumulative criterion satisfied							
peak 8 hour incremental CO concentration	0.03 mg/m^3	0.07 mg/m^3	0.02 mg/m^3	0.02 mg/m^3	0.03 mg/m^3	0.03 mg/m^3	0.13 mg/m^3
no background 8 hour CO concentration data adopted							
10 mg/m^3 cumulative criterion expected to be satisfied							
peak 1 hour incremental NO_X concentration	16.0 µg/m^3	29.8 µg/m^3	20.6 µg/m^3	22.2 µg/m^3	23.3 µg/m^3	14.2 µg/m^3	52.9 µg/m^3
adopted 1 hour background NO_2 concentration of 82 µg/m^3							
worse case 1 hour NO_2 concentration impact of <120 µg/m^3. 245 µg/m^3.cumulative criterion satisfied							
Annual incremental NO_X concentrations	0.13 µg/m^3	0.20 µg/m^3	0.06 µg/m^3	0.17 µg/m^3	0.15 µg/m^3	0.12 µg/m^3	0.96 µg/m^3
adopted annual background NO_2 concentration of 18.5 µg/m^3							
worse case residential 1 hour NO_2 concentration impact of <20 µg/m^3. 62 µg/m^3.cumulative criterion satisfied							

Table 6.9 Predicted Operational Air Impacts (Hydrogernation of Re-refined Base Lube Oils – Flare Stack Emissions), Lochinvar 1980 data

Parameter Modelled	Catchment 1 - NW	2 – NW	3 - S	4 - SE	5 - NE	6 - NE	near field
	Receiver A, B	C, D	E, F	G, H, I, J	K, L, M	N, O, P	boundary
Flare Stack Emissions							
peak 15 minute incremental CO concentration	0.07 mg/m^3	0.08 mg/m^3	0.06 mg/m^3	0.08 mg/m^3	0.08 mg/m^3	0.08 mg/m^3	0.12 mg/m^3
no background 15 minute CO concentration data adopted							
100 mg/m^3 cumulative criterion expected to be satisfied							
peak 1 hour incremental CO concentration	0.42mg/m^3	0.15 mg/m^3	0.22 mg/m^3	0.34 mg/m^3	0.43 mg/m^3	0.50 mg/m^3	0.19 mg/m^3
adopted 1 hour background CO concentration of 18.4 mg/m^3							
worse case 1 hour CO concentration impact of <20 mg/m^3. 30 mg/m^3 cumulative criterion satisfied							
peak 8 hour incremental CO concentration	0.06 mg/m^3	0.02 mg/m^3	0.03 mg/m^3	0.11 mg/m^3	0.05 mg/m^3	0.03 mg/m^3	0.05 mg/m^3
no background 8 hour CO concentration data adopted							
10 mg/m^3 cumulative criterion expected to be satisfied							
peak 1 hour incremental NO_X concentration	77.0 μg/m^3	27.0 μg/m^3	40.4 μg/m^3	62.5 μg/m^3	79.3 μg/m^3	37.1 μg/m^3	32.8 μg/m^3
adopted 1 hour background NO_2 concentration of 82 μg/m^3							
worse case 1 hour NO_2 concentration impact of <160 μg/m^3. 245 μg/m^3.cumulative criterion satisfied							
Annual incremental NO_X concentrations	0.33 μg/m^3	0.24 μg/m^3	0.13 μg/m^3	0.75 μg/m^3	0.13 μg/m^3	0.17 μg/m^3	0.25 μg/m^3
adopted annual background NO_2 concentration of 18.5 μg/m^3							
worse case residential 1 hour NO_2 concentration impact of <20 μg/m^3. 62 μg/m^3.cumulative criterion satisfied							

Table 6.10 Predicted Operational Air Impacts (Hydrogernation of Re-refined Base Lube Oils – Boiler Emissions), Rutherford 2001 data

Parameter Modelled	Catchment / Receiver						
	1 - NW	2 – NW	3 - S	4 - SE	5 - NE	6 - NE	near field
	A, B	C, D	E, F	G, H, I, J	K, L, M	N, O, P	boundary
Boiler Emissions							
peak 1 hour incremental NO_X concentrations	6.3 µg/m^3	9.51 µg/m^3	8.45 µg/m^3	5.34 µg/m^3	4.69 µg/m^3	5.68 µg/m^3	72 µg/m^3
adopted 1 hour background NO_2 concentration of 82 µg/m^3							
worse case residential 1 hour NO_2 concentration impact of <160 µg/m^3. 245 µg/m^3.cumulative criterion satisfied							
Annual incremental NO_X concentrations	0.02 µg/m^3	0.05 µg/m^3	0.02 µg/m^3	0.04 µg/m^3	0.03 µg/m^3	0.02 µg/m^3	0.54 µg/m^3
adopted annual background NO_2 concentration of 18.5 µg/m^3							
worse case residential 1 hour NO_2 concentration impact of <20 µg/m^3. 62 µg/m^3.cumulative criterion satisfied							

Table 6.11 Predicted Operational Air Iimpacts (Hydrogernation of Re-refined Base Lube Oils – Boiler Emissions), Lochinvar1980 data

Parameter Modelled	Catchment 1 - NW	2 – NW	3 - S	4 - SE	5 - NE	6 - NE	near field
	Receiver A, B	C, D	E, F	G, H, I, J	K, L, M	N, O, P	boundary
Boiler Emissions							
peak 1 hour incremental NO_X concentrations	31.5 μg/m^3	12.6 μg/m^3	8.3 μg/m^3	34.7 μg/m^3	40.6 μg/m^3	14.6 μg/m^3	69 μg/m^3
adopted 1 hour background NO_2 concentration of 82 μg/m^3							
worse case residential 1 hour NO_2 concentration impact of <160 μg/m^3. 245 μg/m^3.cumulative criterion satisfied							
Annual incremental NO_X concentrations	0.08 μg/m^3	0.06 μg/m^3	0.03 μg/m^3	0.18 μg/m^3	0.04 μg/m^3	0.05 μg/m^3	0.3 μg/m^3
adopted annual background NO_2 concentration of 18.5 μg/m^3							
worse case residential 1 hour NO_2 concentration impact of <20 μg/m^3. 62 μg/m^3.cumulative criterion satisfied							

6.4.2.2 Oily Water Treatment and Waste Oil Recovery

Assessment of air emissions of the oily water treatment and waste oil recovery have not been considered as part of this technical paper.

Tanks associated with the oily water and waste oil treatment recovery works would contain minor components of VOC compounds only.

Due to the minor quantities of VOC compounds expected, and relatively low vapour pressure of the oils contained in the mix, significant emissions from VOCs are not expected.

The oily water and waste oil treatment recovery process tanks would be designed to meet relevant Australian Standards and Regulations for vent emissions. It is recommended that the requirements of the *Protection of the Environment Operations (Clean Air) Amendment (Industrial and Commercial Activities and Plant) Regulation 2005* be adhered to.

Adverse off site air impacts are not anticipated.

Case Study

Given the semi-quantitative assessment prepared for air emissions from the oily water treatment and waste oil recovery works, a review of operations and complaint history for the oily water treatment and waste oil recovery works at the Narangba (Queensland) plant was carried out.

Transpacific Industries have indicated that the oily water treatment and waste oil recovery works at Narangba run at approximately 12 million litres per annum. A maximum of 15.6 million litres per annum is expected to be output at the Rutherford site. Although a higher throughput is expected for Rutherford, the separation distance of greater than 1,000 metres is expected to provide a suitable buffer to minimise any loss of local air quality

The nearest resident to the Narangba operations is approximately 750 metres to the north of the site.

Air emissions from the oily water treatment and waste oil recovery works are not an issue for the Narangba facility. Operations of the oily water treatment and waste oil recovery works at Rutherford are similarly not expected to result in potential adverse off-site impacts.

6.4.2.3 CFS

The results of the assessment indicate that adverse off-site impacts would not be likely. Comparing incremental PM_{10} concentration impacts to the adopted 2003 data indicates that for 2003, the 50 $\mu g/m^3$ cumulative criterion would be expected to be achieved throughout.

Maximum boundary impacts of the toxic compounds considered (Ammonia, Hydrogen Chloride and Cyanide) were noted to be slightly above the adopted guidelines. 99.9th

percentile values at the boundary satisfied the adopted criterion. The levels predicted are not considered a major issue given the conservative nature of the assessment. A more detailed assessment, in the form of a health risk assessment, is not considered warranted in this instance.

It should be noted that emissions from the CFS curing area, in particular dust, have not been considered in detail. Although the material will be housed within an enclosed structure, with significant internal entrainment expected, release of particulates from vents and openings may occur.

Case Study

Similar to the approach taken for the oily water treatment and waste oil recovery works, comparison to existing operations at Narangba has been made.

Transpacific Industries have indicated that the CFS works at Narangba run at approximately 20,000 tonnes per annum of fixated material. A maximum of 26,000 tonnes per annum of fixated material is expected to be output at the Rutherford site. Throughput values are equivalent.

The Narangba CFS operations are undertaken within an enclosed structure with one open side to the building. The nearest resident to the Narangba operations is approximately 750 metres to the north of the site.

Air emissions from the CFS works are not an issue for the Narangba facility. Operations of the CFS works at Rutherford are similarly not expected to result in potential adverse off-site impacts.

6.4.2.4 Hydrogenation of Re-refined Base Lube Oils

No adverse impacts from the hydrogenation works are anticipated.

NO_X boundary levels are predicted to comply with the adopted air quality goals. It was assumed that a 100% conversion of site NO_X emissions would be converted to NO_2. As the distance of separation increase, impact potential decreased significantly.

Combined emissions of NO_X from the boiler and flare operating simultaneously were not assessed.

Predicted SO_2 impacts were below the adopted air quality goals. However, the potential for elevated off site levels may occur where assumed emission rates are not achieved.

Detailed assessment of VOC emissions from feed stock tanks has not been carried out. Although the feed stock oil is pre-treated at Wetherill Park, potential emissions during fill should adhere to the requirements *Protection of the Environment Operations (Clean Air) Amendment (Industrial and Commercial Activities and Plant) Regulation* 2005.

US EPA, Document AP42 – Chapter 4.7 *Waste Solvent Reclamation* indicated that VOC emission rates form storage tank venting is in the order of 0.01 kg/Mg from a storage tank of fixed roof design. A 200 kL tank, with typical liquid specific gravity of 0.8, would equate to a weight of approximately 160 tonnes (160 Mg). VOC emissions in the order of

1.6 kg may occur per tank from venting. Over a 24 hour period, this would be expected to result in emissions less than 0.019 g/s. The fugitive emissions would be expected to oxidise and volatilise quickly upon release to atmosphere. Assuming the tank comprises 10 percent of Benzene, associated boundary impacts would be below the NSW DEC guideline value of 0.029 mg/m^3 (1 hour average).

Air displaced during tank load, assuming a maximum allowable emission rate of 1.5 g/m^3 and a nominal flow rate of 750 m^3/hr (consistent with flow conditions at the Wetherill Park plant), a maximum VOC emission rate of 0.3 g/s could be expected to result in a maximum indicative boundary impact of 0.02 mg/m^3 (with the impact level interpolated based on the results of impact profiles presented in **Table 6.3** and **Table 6.4**). Again assuming this entirely comprises the VOC indicator Benzene, the DEC 1 hour criterion of 0.029 mg/m^3 would be expected to be satisfied

6.4.3 Impact Amelioration

Although minor off-site impacts are predicted, a number of mitigation measures and safeguards are proposed to provide further confidence in maintaining the local air quality environs.

6.4.3.1 Oily Water Treatment and Waste Oil Recovery

The oily water and waste oil treatment recovery process tanks would be designed to meet relevant Australian Standards and Regulations for vent emissions. It is recommended that the requirements of the *Protection of the Environment Operations (Clean Air) Amendment (Industrial and Commercial Activities and Plant) Regulation 2005* be adhered to.

Nitrogen blankets will be utilised on all oily water and waste oil treatment recovery process tanks. Volatile organic emissions from storage tanks can be reduced by as much as 98 percent by converting from fixed to floating roof tanks. Emission reduction is, however, dependant on solvent evaporation rates, ambient temperatures, loading rates and tank capacities.

Post commissioning monitoring would verify the findings of this technical paper.

The site-specific air quality management plan will itemize further mitigation measures and safeguards in the event of adopted site-specific air quality trigger levels being exceeded.

6.4.3.2 CFS

The extraction system implemented within the subject site would be designed to have design flow rates that correspond to values adopted within this assessment. The exhaust hoods would be designed to allow entrainment and capture of particulates and compounds released from the mixing pits.

The reverse pulse filter would reduce particulate emissions to less than 0.03 g/m^3. Emissions of TSP and PM_{10} would be maintained to emission rates below those assumed within this technical paper (1.5 g/s and 1 g/s from the CFS curing structure for TSP and PM_{10} respectively).

It is proposed that a misting system be installed in both the CFS Processing Area and CFS Curing area. Internal watering within the CFS Curing Area would also be undertaken as required. These measures would reduce dust emissions from the CFS works significantly.

The use of chemical deodorants (generally strong oxidising agents) that chemically oxidise compounds that lead to a given undesirable odour mixture would be utilised as required within the CFS mixing and curing areas. Oxidising agents such as hydrogen peroxide, potassium permanganate and ozone chemically oxidise odour-causing compounds.

A number of products are available that are injected into a building climate through high-pressure mister systems. The function of a periodic mist injection is to neutralise odour compounds that accumulate in a building prior to being exhausted. At the writing of this technical paper, no published results have been found on this form of system.

Post commissioning validation monitoring and compliance works would determine the requirement for further controls and management practices. Consideration would also be given to implementing fast shutting roller doors at the CFS Processing Area access point.

6.4.3.3 Hydrogenation of Re-refined Base Lube Oils

Validation of the assumptions made within this technical paper for the hydrogenation plant, flare and boiler would be undertaken. Manufacturers performance specifications (after equipment is selected) and post-commissioning source monitoring would be undertaken.

A number of control options would be implemented for the storage tanks for hydrogenation feed stock. Transpacific Industries' have indicated that a vapour control system would be constructed based on a recovery system that limits the total concentration of unrecovered vapour to the atmosphere during any period of 4 hours does not exceed 100 milligrams per litre of volatile organic liquid passing into the tank during that period.

A close capture water trap system with overflow to an enclosed sump will be implemented. Light ends will be recovered back into the light end fuel tank. The vapour recovery system will be designed and implemented by Transpacific Industries. Further details are not available at this stage.

The feed stock tanks will ducted and vented to a single emission point.

6.4.3.4 General Air Quality Management Recommendations

Based on the results of the predictive air emission modelling presented, there is a potential for off-site air emissions to become elevated if not managed satisfactorily. It is essential for industrial sites to actively manage air emissions and to minimise any potential problems.

The following management practices and air release mitigation techniques would be implemented during the standard operational phases of the site. Each point detailed should be outlined in detail within the site-specific operational environmental management plan.

Best Management Practices

The adoption of Best Management Practice (BMP) is encouraged by the NSW DEC. BMP includes the encouragement of a general staff attitude to reducing air (especially odorous) emissions. All staff would be made aware of the problems associated with off-site air impacts and the proximity of residences to the site. Transpacific would ensure the established BMP attitudes are continued by all site personnel.

Measures to ensure general cleanliness and avoiding spills would be implemented with the primary benefit being in the general reduction in all site-related environmental issues under BMP principles.

Complaints Procedure

Site management would initiate and maintain a suitable complaints register. All complaints would be taken seriously with their verification followed up. All complaints would be recorded, with all appropriate details logged (such as time of the complaint, reason for complaint, operations and meteorological conditions during the complaint event).

A complaint telephone number and procedure to log any complaints and provide management follow up would be established.

6.5 Noise

Parsons Brinckerhoff undertook a noise impact assessment for the proposed Facility. A copy of the noise impact assessment is contained in **Appendix K**.

6.5.1 Existing Environment

6.5.1.1 Noise Monitoring Methodology

Background noise measurements were carried out using a RION NA27 Precision Sound Level Meter (operator attended noise monitoring) and Acoustic Research Laboratories statistical environmental noise loggers, type EL-215 (long-term unattended noise monitoring). The instrument sets comply with AS 1259.

Instrument sets were calibrated by a NATA accredited laboratory within two years of the measurement period. Copies of the instrument set calibration certificates have been included in **Appendix K**.

Microphones were positioned at 1.2 metres above ground level and were fitted with windsocks. Each instrument was calibrated before and after the measurement period to ensure the reliability and accuracy of the results. No significant variances were noted.

The instruments were set on A-weighted fast response and logged noise levels over fifteen minute statistical intervals. Observations of source influencing the current ambient noise environment were made during logger placement and the attended noise monitoring intervals.

Long term monitoring was conducted between Friday 17 June 2005 and Monday 27June 2005. Attended noise monitoring was carried out during the day on Monday 27 June 2005.

6.5.1.2 Measurement Locations

Noise measurement locations were selected for each nominated noise catchment area (representative locations with the potential to be influenced by noise impacts for the proposal). The information obtained during the noise monitoring program provides an adequate characterisation of existing ambient profiles for the study area.

For noise monitoring reference locations refer to **Appendix K**. A description of the selected locations follows.

Table 6.12 Selected Background Noise Monitoring Locations

Location	Address	Form of Monitoring	Comments
1	9 Denton Close	Long Term	Receiver elevated.
		Day Time Attended	Suburban noise amenity. No constant day time industry observed. Road traffic noise present.
			≈ 1,300 metres north west of TPI site.
			≈ 350 metres from New England Highway.
			Environmental noise monitoring location.
2	96 Anambah Road	Long Term	Suburban noise amenity. Nearby New England Highway audible. No day time industrial noise influence noted.
		Day Time Attended	
			≈ 1,000 metres north east of TPI site.
			≈ 900 metres from New England Highway.
			Environmental noise monitoring location.

6.5.1.3 Data Exclusion

Hourly meteorological data was obtained from the nearest Bureau of Meteorology operated all-weather station to the noise monitoring locations (Paterson-Tocal AWS, #61250). Although not ideal, the use of this data is generally considered to be slightly conservative and therefore acceptable.

Data obtained from the unattended noise monitoring during periods of inclement weather conditions, such as wind speeds greater than five metres per second or during

rainfall were not included in the analysis of unattended noise levels. Periods of noted anomalies were also excluded from the recorded unattended noise levels.

Approximately 55 percent of the noise measurements were excluded. Periods excluded from recorded noise levels are shown as shaded on the compiled daily noise logger graphs (**Appendix K**).

Given the amount of data excluded, a conservative approach has been applied to criterion establishment.

6.5.1.4 Measured Background Noise Levels

Unattended Noise Monitoring

The results of the ambient noise monitoring program are presented in **Table 6.13**.

Table 6.13 Unattended Noise Monitoring Results

Period	L_{A10}		L_{Aeq}		L_{A90}	
	Average	Range	Median	Range	Median	Range
Location 1: 9 Denton Close (north west) ARL EL 215 noise logger #194447						
Day Time (7am – 6pm)	54.5	52.5 – 57.5	55	52 – 56.5	44	38.5 – 49
Evening (6pm – 10pm)	51.5	48.5 – 55.5	50.5	45.5 – 53	41.5	38 – 45.5
Night Time (10pm – 7am)	49	45.5 – 53.5	47	42.5 – 53.5	35	28.5 – 42.5
Location 2: 96 Anambah Road (north east) ARL EL 215 noise logger #194446						
Day Time (7am – 6pm)	55.5	50.5 – 61	57	55 – 64.5	41	32 – 47
Evening (6pm – 10pm)	52	46.5 – 66	54.5	51 – 64	40.5	34 – 47
Night Time (10pm – 7am)	50	44 – 62	51.5	46.5 – 63.5	34	29 – 45

Notes
Values expressed as dB(A) and rounded to nearest 0.5 dB(A)
Range based on analysed daily levels
L_{A10} = Noise level 10% of time
L_{Aeq} = Equivalent noise level (average)
L_{A90} = Noise level 90% of time (background)

The unattended noise monitoring was carried out continuously between the dates of Friday 17 June 2005 through to Monday 27 June 2005.

The daily noise logger graphs compiled for unattended noise monitoring Locations 1 and 2 (**Appendix K**) were found to fluctuate throughout each daytime, evening and night-time period.

Background noise levels for the area are typical of a suburban or urban environment. Variations of 5 dB(A) to 10 dB(A) in the analysed day, evening and night time noise levels is noted (L_{Aeq} and L_{A90}).

A slight increase in measured noise levels was apparent between the hours of 06:00 – 22:00. This is likely to be the result of noise impacts associated with traffic movements along the New England Highway.

The measured L_{Aeq} and L_{A90} median noise levels varied between 10 dB(A) to 15 dB(A) for each period. The night time period shows the greatest difference between L_{Aeq} and L_{A90} levels indicating the sporadic nature of existing local noise environs. The difference observed can be largely attributed to the characteristics of local noise sources impacting the local ambient noise environment (such as fauna and traffic pass-by).

The median L_{Aeq} and L_{A90} values presented in are used to set the project-specific noise design goals.

Attended Noise Monitoring

Attended noise monitoring was carried out at each noise monitoring location during daytime hours. Meteorological conditions during the attended noise monitoring program were observed to be satisfactory for noise monitoring purposes with a slight northerly breeze, some cloud cover and a temperature of approximately 16°C. **Table 6.14** presents the results of the attended noise monitoring.

Table 6.14 Operator Attended Noise Monitoring Results (27/06/05)

Location	Address	Time	Measured Noise Level			Comment
			LA10	LAeq	LA90	
1	9 Denton Close (north west)	13:05 – 13:20	53.5	51	46	No industry audible during monitoring interval New England Highway audible throughout, road transport trucks observed at 52 – 54 dB(A) at pass by Local fauna (birds) observed at 49 – 57 dB(A) S.S. ≈ 44 – 46 dB(A) minimal traffic S.S. ≈ 48 – 49 dB(A) standard traffic
2	96 Anambah Road (north)	13:35 – 13:50	55	52.5	42.5	No industry audible during monitoring interval New England Highway audible throughout, road transport trucks observed at 45 – 46 dB(A) at pass by

Location	Address	Time	Measured Noise Level			Comment
			LA10	LAeq	LA90	
						S.S. ≈ 42 – 43 dB(A)

Notes Values expressed as dB(A) and rounded to nearest 0.5 dB(A)]

S.S.: observed steady state noise level

L_{A10} = Noise level 10% of time

L_{Aeq} = Equivalent noise level (average)

L_{A90} = Noise level 90% of time (background).

Noise levels measured at each location were consistent during the day time attended noise monitoring period. Presented day time measurements for each descriptor were generally within 2 dB(A).

6.5.1.5 Adopted Criteria and Guidelines

The *Protection of the Environment Operations Act, 1997* (POEO Act) regulates noise generation and prohibits the generation of "offensive noise" as defined by the *POEO Act*.

In addition to the regulatory requirements under the *POEO Act*, the NSW Department of Environment and Conservation provides guidelines in relation to acoustic criteria and noise controls.

Construction Noise Criteria

Noise criteria for construction sites are established in accordance with Chapter 171 of the *Environmental Noise Control Manual* (NSW DEC ENCM, 1994). It is important to note that the recommended criteria are planning goals only. Numerous other factors need to be considered when assessing potential noise impacts from construction works such as the social worth of the activity, economic constraints, nature and duration of a proposed construction program.

The NSW Department of Environment and Conservation recognise that individuals accept higher perceived noise impacts for emission sources with a limited duration and identified end date.

Table 6.15 Acoustic Ddesign Objectives for Construction Activities

Construction Period	Acoustic Design Objective
<4 weeks	Received $L_{A10} \leq L_{A90}$+ 20 dB(A)
>4 weeks and <26 weeks	Received $L_{A10} \leq L_{A90}$ + 10 dB(A)
>26 weeks	Received $L_{A10} \leq L_{A90}$ + 5 dB(A)

Notes to *Table*: L_{A10} = Noise level 10% of time

L_{A90} = Noise level 90% of time (background)

Although the final construction schedule and construction methods statements have not been determined at the writing of this document, construction activities and indicative time frames are expected to require between 4 weeks and 26 weeks.

The appropriate constriction criteria for the site is likely to be the following:

Received $L_{A10} \leq L_{A90}$ + 10 dB(A)

Day time L_{A90} noise levels ranged from of 38.5 dB(A) – 49 dB(A), with a median of 44 dB(A) reported for Location 1. Day time L_{A90} noise levels at Location 2 ranged from of 32 dB(A) – 47 dB(A), with a median of 41 dB(A) reported for Location 2. The following resultant constructive noise design goals would therefore apply:

'medium term' construction work: **51 dB(A)** [L_{A10} impacts], $L_{A90, median}$ + 10 dB(A).

Construction works with the potential to generate noise impacts would be undertaken during the day time period only (7am – 6pm, weekdays, 7am – 1pm Saturdays and no work on Sundays or public holidays).

Operational Noise

Noise emissions from the operations of the site would require adherence to the NSW *Industrial Noise Policy* (NSW DEC INP, 2000).

The policy sets out two criteria that are used to assess potential off-site noise impacts. The first criterion aims at controlling intrusive short-term noise impacts for residences (intrusive criterion). The second criterion aims at maintaining the long-term amenity of particular land uses (amenity criterion). The more conservative of the two limits are established as project-specific operational noise goals.

The relevant intrusive criterion can be summarised as follows:

$L_{Aeq\ (15\ min)} \leq$ rating background levels + 5 dB(A)

The amenity criterion is determined based on guidelines presented in the INP. The acceptable amenity limits for a rural area are listed in **Table 6.16**.

Table 6.16 NSW INP Amenity Criteria – Suburban Setting

Type of Receptor	Period of day/ day of week	Acceptable Noise Level (LAeq)
Residential-Day-Time interval	7am – 6pm, Monday to Saturday	55 dB(A)
	8am – 6pm, Sundays and Public Holidays	
Residential-Evening interval	6pm – 10pm	45 dB(A)
Residential-Night-Time interval	remaining periods	40 dB(A)
Commercial Premises	when in use	65 dB(A)
Industrial Premises	when in use	70 dB(A)

Notes L_{Aeq} = Equivalent noise level (average)

Source Table 2.1 NSW DEC INP

Amenity criterion is established with reference made to the L_{Aeq} noise levels for the area and the existing industrial noise influence. The amenity criterion is then corrected with reference being made to Table 2.2 of the INP.

No industrial noise influence was noted for the setting. Referencing the attended noise monitoring results, the existing industrial noise influence can be conservatively set at less than 36 dB(A) (Location 1 attended L_{A90} of 46 dB(A) – 10 dB(A)). Therefore, NSW

DEC recommended acceptable night time noise levels have been modified (to account for the existing level of stationary industrial noise).

Based on the existing noise environs, amenity limits consistent with the NSW DECs recommended acceptable noise levels would apply:

Day Time Amenity Noise Limit (7am – 6pm): 55 dB(A) [$L_{Aeq, day}$]

Evening Time Amenity Noise Limit (6pm – 10pm): 45 dB(A) [$L_{Aeq, evening}$]

Night Time Amenity Noise Limit (10pm – 7am): **38 dB(A) [$L_{Aeq, night}$].**

Referencing the RBL (L_{A90}) values measured at Location 2 during the unattended noise monitoring program and the formula to assess the intrusive noise criterion, the following intrusive noise limits would apply:

Day Time Intrusive Noise Limit (7am – 6pm): **46 dB(A) [$L_{Aeq, 15\ min}$]**

Evening Time Intrusive Noise Limit (6pm – 10pm): **45 dB(A) [$L_{Aeq, 15\ min}$]**

Night Time Intrusive Noise Limit (10pm – 7am): 39 dB(A) [$L_{Aeq, 15\ min}$].

The day time and evening intrusive noise criterion is more stringent and would therefore govern. Amenity limits would likely apply during the night time period. The values assume there would be no annoying characteristics associated with site-related operational noise impacts.

Boundary noise limits should not exceed a level of **70 dB(A)** [$L_{Aeq, 15\ min}$]. Compliance with the adopted design goals would maintain the acoustic amenity for the area.

The established operational noise design objectives are consistent with the requirements of the NSW INP. The noise limits have been established to minimise the potential for degradation to local ambient noise levels.

Sleep Disturbance

The emission of peak noise levels for an instant or very short time period may cause sleep disturbance to residents. In accordance with the *Environmental Noise Control Manual* (NSW DEC ENCM, 1994), the L_{A1} level of any specific noise source should not exceed the background noise level (L_{A90}) by more than 15 dB(A) when measured outside the bedroom window of the nearest potentially affected receptor.

A night time L_{A90} noise level of 34 dB(A) was measured at Location 2. Adopting this level provides a sleep disturbance criterion of **49 dB(A)** [L_{A1} impacts].

Road Traffic Noise

Road traffic noise criteria have been established for the project. It is considered the primary road traffic noise generating activities would be associated with the proposed construction program. Criterion establishment is generally applied for long-term planning purposes only.

The *Environmental Criteria for Road Traffic Noise* (NSW DEC ECRTN, 1999) recommended 'base' and 'allowance' criteria.

The recommended 'base' criteria for land use developments with the potential to create additional traffic on existing freeways/ arterials are day time $L_{Aeq, 15hr}$ levels of **60 dB(A)** and night time $L_{Aeq, 9hr}$ levels of **55 dB(A)**.

The recommended 'base' criteria for land use developments with the potential to create additional traffic on existing collector roads are day time $L_{Aeq, 1hr}$ levels of **60 dB(A)** and night time $L_{Aeq, 1hr}$ levels of **55 dB(A)**.

The 'allowance' criteria is generally established where the 'base' criteria are already exceeded. In such circumstances, traffic arising from a development should not lead to an increase in existing noise levels of more than 2 dB. The base criterion is unlikely to be exceeded in the study area, and therefore the allowance criteria would not apply.

Vibration

In establishing vibration limits (particularly for the construction works), it is common practice to set vibration limits to protect buildings against damage in accordance with German Standard DIN 4150-3 1999 *Structural Vibration Part 3 Effects of Vibration on Structures*. Typical vibration limits for building damage are as follows:

- residences 10 millimetres per second
- heritage buildings and sensitive structures 3 millimetres per second.

The criteria outlined to protect occupants of buildings from discomfort are more stringent. A number of British, German and Australian standards have been referenced with respect to protecting amenity including: ENCM (Chapter 174); AS 2670 *Evaluation of Human Exposure to Whole-body Vibration*; BS 6472 1992 *Evaluation of Human Exposure to Vibration in Buildings (1 Hz to 80 Hz);* BS 7385 1990 *Evaluation and Measurement for Vibration in Buildings*; and DIN 4150-3 1999 *Structural Vibration Part 3 Effects of Vibration on Structures*. Vertical (as opposed to horizontal) limits would be established consistent with the following:

- residential levels (night time) **0.14 – 0.2 millimetres per second**
- residential levels (day time) **0.28 – 0.56 millimetres per second.**

The 'comfort' limits vary across the frequency spectrum, although they are generally a constant level across the frequency range generated by most construction activities.

6.5.2 Impacts of the Proposal

6.5.2.1 Construction Noise

Modelling has indicated that the construction noise impacts are not expected to exceed the adopted noise design goals. The adopted goal of 51 dB(A) (L_{A10}) was achieved for each receiver. The results of the modelling are summarised in **Table 6.17**.

Construction noise controls and management practices should be implemented to ensure noise impacts do not occur.

Table 6.17 Predicted Construction Noise Impacts (Indicative Values)

Noise Source	SWL	Received Noise Level (dB(A))					
		Noise Catchment					
		1 – NW	2 – NW	3 – S	4 – SE	5 – NE	6 - NE
		Receiver					
		A, B	C, D	E, F	G, H, I, J	K, L, M	N, O, P
Preparatory Works							
Excavator	**112**	40	42	43	43	42	44
Graders	**117**	45	47	48	48	47	49
Backhoes	**103**	31	33	34	34	33	35
Concrete Supply Truck (24t)	**110**	38	40	41	41	40	42
Crane (10t, lorry mounted)	**118**	46	48	49	49	48	50
Installation / Fit Out							
Hand held tools	**105**	33	35	36	36	35	37
Semi-Trailers (10t / 20t)	**108**	36	38	39	39	38	40
Anticipated Range of Impacts		31 – 46	33 – 48	34 – 49	34 – 49	33 – 48	35 – 50
Typical Mid-Point		38	40	41	41	40	42
Impact Potential – Preparatory Works Adopted Day Time Planning Goal = 51 dB(A) [LA10]		Low	Moderate	Moderate	Moderate	Moderate	Moderate
Impact Potential – Installation / Fit Out Adopted Day Time Planing Goal = 51 dB(A) [LA10]		Low	Low	Low	Low	Low	Low

During the construction phase, works would be primarily manual. Construction noise emissions would include the use of hand tools and short term movements of mobile sources throughout the site.

Noise emissions from the construction works would be sporadic and intermittent, and would depend on the activities conducted. Significant variations in noise emissions may be present throughout each daily period.

6.5.2.2 Operational Noise

Modelling has indicated that the operation of the proposed facility is unlikely to result in a degradation of the existing ambient noise environment (refer to **Table 6.18** and **Table 6.19**).

Received noise levels were calculated at ground level for 16 adjacent existing residential receivers (a total of six noise catchments).

Residential L_{Aeq} predictions of 30 dB(A) and below were reported for still conditions. Under noise enhancing meteorological conditions, residential L_{Aeq} noise impact of 36.5 dB(A) and below were predicted.

Boundary noise levels of less than 70 dB(A) are anticipated.

Compliance with the noise design objectives established for this proposal were achieved for all assessed operations.

As reported in **Table 6.13** background (median L_{A90}) noise levels at Location 1, Dent Street to the north west, were reported at 44 dB(A), 41.5 dB(A) and 35 dB(A) (for the day time, evening and night time periods respectively). Background (median L_{A90}) noise levels at Location 2, Anambah Road to the north east, were reported at 41 dB(A), 40.5 dB(A) and 34 dB(A) (for the day time, evening and night time periods respectively).

No increase in long-term degradation to the existing off-site residential noise profiles is expected, that is, the site would be inaudible to barely audible at each nearest potentially affected receiver during all periods of operations.

Potential intrusive noise impacts during the night time period may occur from the short term movement of mobile sources throughout the site.

Table 6.18 Predicted Operational Noise Impacts (all operations)

Meteorological Condition	Received Noise Level (dB(A))															
	Noise Catchment															
	1 - NW		2 - NW		3 - S		4 - SE				5 - NE			6 - NE		
	Receiver															
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
A – neutral	28	26.5	23.5	22	24.5	23	19.5	26	22.5	20	20.5	19.5	23	25.5	24	21
B – 3 m/s SEly	34.5	36.5	28	26.5	21	19	16	22.5	19.5	16.5	18.5	18	21.5	26	28	23
C – 3 m/s Nly	26.5	24	22	21	33	32	24	30	24.5	22	19.5	18	21.5	22	20	16.5
D – 3 m/s Wly	25.5	23	19.5	18.5	28	28	26.5	32.5	31.5	30	27.5	26	30.5	29	26.5	21
E – 3 m/s SWly	27.5	25	22	20	22	21.5	21	27	26.5	24.5	26.5	26.5	31	33	31	24
F – Inversion	30.5	32.5	25.5	24	30	28.5	22.5	29	25.5	23.5	23	22	26	28	27.5	22.5
Criteria																
- Day Time 46 dB(A)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
- Evening 45 dB(A)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
- Night Time 38 dB(A)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Notes to *Table*: L_{Aeq} levels presented

values rounded to nearest 0.5 dB(A)

✓ - criterion satisfied

✗ - potential exceedance

Table 6.19 Primary Noise Sources (neutral conditions)

Meteorological Condition	Received Noise Level (dB(A))															
	Noise Catchment															
	1 - NW		2 - NW		3 - S		4 - SE				5 - NE			6 - NE		
	Receiver															
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
A-1 oily water treatment and waste oil recovery	<10	<10	10.5	<10	20.5	19.5	15	18.5	18	15.5	15	14	17	21	19	15.5
A-2 hydrogenation of re-refined base lube oils	14.5	10.5	17.5	15.5	10.5	10	12	12.5	12	12.5	11.5	10.5	<10	12	12.5	<10
A-3 treatment of non-sewerable aqueous wastes by neutralisation, chemical fixation, stabilisation and solidification (CFS)	28	26.5	22	21	22.5	20	16.5	24.5	20.5	17.5	18.5	17.5	21.5	23	22	19
Σ	**28**	**26.5**	**23.5**	**22**	**24.5**	**23**	**19.5**	**26**	**22.5**	**20**	**20.5**	**19.5**	**23**	**25.5**	**24**	**21**

Notes to table: L_{Aeq} levels presented

values rounded to nearest 0.5 dB(A)

6.5.2.3 Sleep Disturbance

No sleep disturbance issues are anticipated from the operations of the facility. L_{A1} impacts of less than 49 dB(A) were reported.

6.5.2.4 Road Traffic Noise

No operational road traffic noise issues are anticipated.

Detailed assessment of road traffic noise impacts for the operations works has not been undertaken due to existing heavy traffic flows along the New England Highway and negligible incremental impacts from the proposal.

As the distance of separation from the New England Highway increases, road traffic noise impacts would reduce significantly. Further attenuation would also be provided by existing structures located along the noise transmission path (being the façade of the residential dwellings).

Existing road traffic noise impacts would be well above the NSW DECs 'base' criterion. The NSW DEC road traffic noise 'allowance' criterion would be readily achieved.

Controlling existing road traffic noise impacts from a source such as the New England Highway is considered beyond the principles of reasonable and feasible for a single industrial development.

6.5.2.5 Vibration

No construction vibration issues are anticipated. Similarly, minimal potential for operational related vibration impacts are expected. Given the separation distances between the nearest resident and the site, no vibration impact is considered likely.

The intermittent and transient activities would not result in structural damage. Minimal potential for annoyance is anticipated.

6.5.3 Impact Amelioration

6.5.3.1 Construction Noise

The contractor should address each of the following items to ensure every reasonable effort is made to meet the identified noise design goals, and so that no unnecessary exceedances occur:

- intensive construction activities (with the potential to be audible off site) should be scheduled between Monday to Friday, 7.00 am to 6.00 pm, and Saturdays, 8.00 am to 1.00 pm. No intensive construction activities should be undertaken on Sundays or Public holidays.
- restricted hours of access for contractors to prevent early starts or late finishes.

- construction activities should be undertaken in accordance with Australian Standard AS 2436-1981 *Guide to Noise Control on Construction, Maintenance and Demolition Sites*. All equipment used on site should be required to demonstrate compliance with the noise levels recommended within AS 2436-1981.
- use of trucks and machinery fitted with appropriate noise reducing devices.
- use of defined traffic routes to minimise noise impacts during construction.

A noise management plan should be developed as part of the construction environmental management plan to be prepared by the construction contractor prior to the commencement of construction activities.

The noise management plan would identify and address noise impact for all potentially affected receivers and provide procedures, noise mitigation measures and noise management practices proposed throughout the duration of the works.

6.5.3.2 Operational Noise

The works carried out as part of this assessment have been based on conservative factors and all potential operating conditions, with an emphasis being placed on worse case events.

Given the potential for short-term elevated site operations (particularly vehicle movements) and nature of the existing ambient noise environment, several environmental management procedures will be implemented aimed at limiting potential noise emission issues.

Analysis of the ENM output files has shown that auxiliary equipment such as an articulated semi-trailer significantly contribute to the noise emissions from the site when operating on the internal access road. Therefore, the use of this equipment should be carried out in a reasonable manner, with the associated off-site noise impacts considered at all times.

Scheduling of truck movements should be undertaken. No more than six road transport trucks should be in operation (manoeuvring or idling) on the site at any one time.

Each item outlined below should be considered to minimise the potential for adverse off-site noise impacts:

- a contact number should be provided to the public so that information can be received or complaints made in relation to noise. A log of complaints should be maintained and actioned by the contractor. A complaint handling procedure should be formulated and adhered to.
- residential class mufflers and where applicable, engine shrouds (acoustic lining) will be fitted to permanent on site mobile engine sources. Noise emissions should be an important consideration when selecting equipment for the site. All equipment should be maintained in good order including mufflers, enclosures and bearings to ensure unnecessary noise emissions are eliminated.
- appropriate use of all plant and equipment. Reasonable work practices are to be applied with no extended periods of 'revving', idling or 'warming up' within the

proximity of existing residential receivers. Any excessively loud activities should be scheduled during periods of the day when an increase in general ambient noise levels is apparent. This would reduce the potential for cumulative noise impacts (relating to worst-case elevated operations) and extended periods of off-site annoyance.

- plant and equipment to be selected based on minimal noise emissions.
- fixed noise generating devices such as a compressors will be housed within insulated enclosures and have appropriate noise reducing devices.
- vehicle speeds will be limited on the site.

The final design of the plant should consider the impact potential presented within the noise assessment. Source selection and noise emission levels have been assumed in the assessment of impact potential. Process operations additional to, or that emit noise at levels higher than, those adopted in the predictive modelling may result in changes to received operational noise impacts.

Post commissioning source emission and ambient background monitoring should be undertaken prior to each stage of the development to confirm the noise source levels and associated received noise levels.

Assessment of any identified annoying characteristics would need to be undertaken at this stage.

An operational environmental management plan (noise issues) should outline procedures that specifically address potential noise impacts and the requirements for corrective measures in the event of elevated off-site noise levels or residential complaints.

6.5.3.3 Sleep Disturbance

No site-specific mitigation measures or safeguards are deemed necessary. The operational environmental management plan (noise issues) should outline procedures that specifically address the requirements for corrective measures in the event that sleep disturbance noise impacts occur.

6.5.3.4 Road Traffic Noise

The inclusion of a road traffic noise management plan (completed as part of the construction and operational noise management plan) would be prepared. Factors such as route selection, preferred movement times, scheduling of movements, speed limits and 'community friendly' driving practices should be clearly outlined.

Truck movements should be limited to no more than six movements per hour (excluding peak hour flows). This would provide a safeguard for protecting local residential noise amenity. Site management is to ensure that the necessary timetabling and organisation of contractors is conducted in a manner that accommodates this need.

It is recommended that trucks entering the site during the night time period have air bag suspensions. Engine brakes can not be used. Access would be via Kyle Street, with a

creep speed of 5 km/hr should be exercised. Limiting the potential for night time noise impacts would significantly reduce the potential for local residential annoyance and potential sleep disturbance issues.

No queuing of road transport trucks along Kyle Street should take place at any time. The following practical on-site vehicle movement practices are also recommended:

- low on-site speed limits
- no use of horns or engine brakes
- adequate access road design

6.5.3.5 Vibration

No site-specific mitigation measures or safeguards are deemed necessary.

6.6 Visual Context

Parsons Brinckerhoff undertook a visual assessment of the proposed Facility. This assessment has been included as **Appendix L**.

6.6.1 Existing Environment

The site is located just off the New England Highway on the western edge of Rutherford. Access is via a narrow driveway from Kyle Street. To the west of the site, on the opposite side of the New England Highway, is the Rutherford aerodrome. The surrounding area is in a state of land use change, with previous rural land being replaced by developing industrial land surrounding the site as part of the Rutherford industrial zone. A new industrial area has also been recently approved for future development across the highway, to the south of the main aerodrome area.

There are older and more recently developed residential areas surrounding the site to the east, west and south, with more areas planned for release in the near future along Anambah Road. The topography is generally flat, with the site in a natural low point surrounded by low ridges. Nearby residential areas are generally situated on local ridges that allow some longer views over both the aerodrome and existing Rutherford industrial areas.

The Anambah land-fill site is nearby on the east side of Anambah Road. This is planned for future recreational uses. There is also a golf course and the Main Northern Railway Line to the south of the site.

The site was previously used for textile manufacturing from 1941 until closure in 2000. It currently consists of several disused, large, factory-style buildings that were part of the previous textile mill. The topography is very flat and includes several groupings of mostly native trees around the boundary.

The scenic quality of the City of Maitland is strongly defined by its interspersed rural and urban areas. Large areas of open pasture and pockets of native vegetation to the west of Rutherford form a defined western boundary to the urban area of Rutherford and

the greater Maitland area. The local government area has a variety of landscape types such as highly scenic rural and natural landscapes, heritage streetscapes, existing and new residential areas and commercial and industrial development.

The site and its immediate environs have an industrial character and a rather low scenic quality. Factors that contribute to defining this level of scenic quality include the flat topography, low height of surrounding trees and adjacent industrial and commercial development.

6.6.2 Impacts of the Proposal

6.6.2.1 Impacts on Landscape Character and Scenic Quality

There would be little change in landscape character as a result of the proposed development, as one industrial use would be replaced by another. The existing buildings have a neglected and aged appearance and are of moderate aesthetic value. This low scenic quality provides an opportunity to improve the site and surrounding views to it through the proposed re-development.

There are several groups of native trees that currently serve to relieve and improve the look of the site. The site layout has been designed so as to retain as many established, native trees as possible. Additional landscape works are also proposed to improve the final overall character and aesthetics of the site.

The site would be affected by the removal of some native and other trees. This would have a short term impact of 5-10 years that would be slowly ameliorated as planned landscape works mature.

6.6.2.2 Visual Catchment and Potential Viewers

Visual catchments are areas of land usually defined by major ridgelines that prevent views beyond. The subject site falls into a visual catchment defined most strongly by the surrounding ridgelines to the immediate west, south, and east. North of the New England Highway flat pastoral land extends for some kilometres to distant low ranges. Generally, the proposed re-developed parts of the site would not be higher than the existing buildings, which means the existing visual catchment would remain constant and not impact on additional viewers.

The following assessment describes views for local and mid-distant to distant viewers. Local views (within one kilometre) are generally the most sensitive due to their closeness.

Local Views

Views of the site of less than one kilometre are currently possible from the New England Highway, the surrounding industrial area and from the edge of the Rutherford Aerodrome site. There are no residential areas within one kilometre.

New England Highway

The proximity of the New England Highway, and its high number of users, means that any change to views from the highway towards the development would be sensitive to change. There are currently limited glimpses of the site buildings possible while travelling on the New England Highway.

Maitland City Council (2001) has identified this part of the New England Highway as part of the gateway to Maitland for travellers from the west, from areas such as the Upper Hunter Valley and the Central Tablelands.

The proposed development would generally not be any higher than the existing buildings and would therefore remain visible from very few points along the New England Highway. These glimpses would be likely to be further reduced as other intervening sites along the Highway are re-developed in the future. Therefore there would be little impact on the character of the highway as a result of the development.

Existing Industrial Area

There are views of the existing building from the surrounding industrial area. Direct views from Kyle Street are partially screened by trees on both the subject site and alongside the adjacent industrial site's boundary. The site is also partially screened by buildings and vegetation from Kyle street to the south. There would be little change to the general character of the surrounding area and views from within the industrial estate.

Rutherford Aerodrome

There is a dense band of trees within the aerodrome site that currently prevent most views toward it. It is understood that this intervening vegetation would remain with the planned development of the eastern part of the aerodrome site to industrial uses.

Mid–distant and Distant Views

Mid-distant views of the site are currently possible from a number of locations, such as the residential areas of Rutherford to the east, Wollombi Road to the south (and rural properties along it) and residents along Beacon Hill Road to the west of the aerodrome. However, many potential views from these locations are obscured by existing vegetation and industrial buildings.

Residential Areas

The newer Rutherford residential subdivision to the east is about 1.5 kilometres away at its closest point, with elevated areas that have some views towards the site (from about two kilometres away). Those on more elevated areas include residents in Christine Close, Robert Close and Rebecca Close, with those in Adam Avenue, Carol Avenue, and Joshua Close at a slightly lower elevation. The residents on the lowest areas do not view the site.

Present views of these residents already include the existing industrial subdivision, which displays a range of visually dominant building types and colours. The re-development of the subject site would be unlikely to be noticeable to these residents.

Anambah House

Anambah House is a recognised heritage building located approximately one kilometre along Anambah Road from the highway, and over two kilometres from the subject site. Although slightly elevated, the rolling landscape and intervening vegetation and buildings between the house and the site mean that there are, and would continue to be, no views of the subject site from the house or its immediate surrounds.

Other Viewpoints

Some residents along Beacon Hill Road just west of Rutherford Aerodrome have views towards the site, but would be unlikely to notice the change from the existing buildings to the proposed development. Viewers along Wollombi Road and older parts of Rutherford to the east would similarly be unlikely to notice any change due to distance and intervening trees, landform and buildings.

6.6.3 Impact Amelioration

TPI will implement the following mitigation measure in order to minimise potential detrimental visual impacts:

- buildings will be designed with a human-like scale where possible, by using techniques such as defined entrances of one storey (about three metres) height and using colour tones or different materials to break up the visual scale (such as darker colours or different materials on the lower section
- plant and towers to be constructed in locations of minimal visual impact where possible
- main building colours will be limited to a defined colour palette (eg colorbond colours elephant and dune) with only other brighter colours used in a minor way to highlight features
- the use of black-coloured security fencing (including black - coloured poles) for perimeter fencing, where such new fencing is needed will be specified
- signs will be of a high quality presentation and limited in number and overall size
- a high standard of landscape planting as shown on the concept landscape plan in **Appendix L** will be implemented as soon as practically possible. The Landscape Concept Plan has been prepared for the site to mitigate potential visual impact and enhance the final scenic quality and landscape character. The basic design objectives of this plan are to:
  - provide partial screen planting along perimeter areas
  - undertake rehabilitation works along the site's watercourse to remove weeds and revegetate
  - use locally-native plant species
- existing vegetation to be retained wherever possible
- irrigation systems to be installed around the site

6.7 Traffic and Transportation

A traffic study was undertaken by NTPE in April 2005 to determine the existing traffic and transportation environment and impacts of the Facility on traffic and transportation. The full report is contained within **Appendix M**[1].

6.7.1 Existing Environment

The intersection of Kyle Street and the New England Highway is controlled as a 'seagull' intersection, allowing vehicles turning right out of Kyle Street to access the New England Highway and accelerate before merging with the eastbound traffic flow. The intersection of the New England Highway and Kyle Street were constructed to suit industrial purposes and therefore will be able to accommodate all types of heavy vehicles likely to be generated by the proposed development. Proposed access to the site is via a sealed driveway off Kyle Street.

Existing traffic conditions were determined from traffic counts undertaken during April 2005 at key intersections, automatic vehicle counts on Kyle Street and intersection modelling using SIDRA.

Surveys of existing vehicle movements were carried out on the intersection of New England Highway and Kyle Street and the intersection of Kyle Street and access to the Facility intersection during peak periods, that is, between 7.00am – 9.30am and 3.00pm – 5.30pm. These counts were used as the basis of the SIDRA modelling.

Vehicular access to the site is via an existing access connecting to Kyle Street. The access to the proposed Facility is 20 metres at the property line, narrowing down to 15 metres internally. Pedestrians and cyclists access will be facilitated through the vehicular access.

Results of modelling key intersections using SIDRA in the study area during peak periods indicate that the New England Highway and Kyle Street currently performs at Level of Service 'A' during the morning and afternoon peaks, representing the best operating condition and indicating that there is substantial reserve of capacity during peak periods. The model indicated that during the morning and afternoon peaks that turning right from the western approach of the New England Highway into Kyle Street and turning left and right from Kyle Street onto the New England Highway provided a Level of Service 'B', representing good service with acceptable delays and spare capacity.

Bus Route 182, operated by Blue Ribbon coaches, travels along the New England Highway past Kyle Street four times per day in each direction between Maitland and Sydney. The low frequency of this service combined with the distance from the nearest bus stop to the site make these existing bus services unattractive to employees of the proposed development. However, the recent connection of Racecourse Road to Kyle

[1] The traffic impact assessment contained within Appendix M has been prepared based on proposed operations at the Facility, including compost and soil conditioner manufacturing operations. Compost and soil manufacturing operations formed part of the original proposal and have since been withdrawn. Therefore the impact assessment is considered to be conservative.

Street provides the opportunity for a bus service to be established that would run past the access to the site. Accordingly, it is expected that with further development in the surrounding area an improved bus service could be established at some time in the near future.

There are currently 32 car parking spaces provided onsite.

6.7.2 Impacts of the Proposal

The proposed development will generate heavy vehicle trips to and from the site. A proportion of these trips are already on the New England highway between places such as Branxton, Singleton, Newcastle, Sydney and Queensland and thus will not be new trips on the local network. It is anticipated that a maximum of 163 weekday daily heavy vehicle movements will be generated from the Facility.

There is also expected to be a small increase in light vehicle movements to and from the site, generally associated with employee work trips. Analysis of staff and shift times indicate that most employee shift times will start and finish outside of the design peak hours.

Table 6.20 shows the resultant number of trips anticipated to be generated by the proposed development.

Table 6.20 Estimate of Trip Generation

	AM Peak Hour	PM Peak Hour
Light Vehicle Trips	22	22
Heavy Vehicle Trips	22	17

Due to safety considerations with right in/right out movements at the intersection of the New England Highway and Kyle Street, heavy vehicles accessing the Facility will be instructed to use the roundabout intersection of New England Highway and Racecourse Road.

The assessment of the impact of the proposed development on the surrounding network has been focused on the nearby intersections of the New England Highway/Kyle Street and Kyle Street/Facility Access. Based on the traffic volumes predicted to be generated by the proposed development, it was considered that the impact on intersections such as the New England Highway/Annambah Road and the New England Highway/Racecourse Road would be negligible. These intersections are also a significant distance away from the proposed development and accordingly are considered to be outside of the area of direct impact.

There is a proposal to develop an industrial estate on the northern side of the New England Highway, which would have access to the New England Highway at Kyle Street. NTPE performed the traffic impact assessment for this development and

recommended that the intersection of Kyle Street and the New England Highway be upgraded to a 4 way roundabout.

Impacts of the proposed development have been assessed by generating SIDRA models for 2005 and 2015 based on current intersection design and potential intersection design of the intersection of the New England Highway and Kyle Street. A linear growth rate of 2% per annum has been applied to existing through traffic flows on the New England Highway and existing turning movements in and out of Kyle Street. This growth rate is considered conservative.

SIDRA analysis predicts that in the year 2005 and 2015 with both current intersection design and the potential roundabout intersection design the intersection of the New England Highway and Kyle Street performs at a Level of Service 'A' during the morning and afternoon peak hours with the proposed development implemented.

SIDRA analysis predicts that in year 2005 and 2015 the intersection of Kyle Street and Facility Access performs at a Level of Service 'A' during the morning and afternoon peak hours with the proposed development implemented.

SIDRA analysis of the key intersections shows the proposed development will only marginally impact on the local network past the planning year 2015.

Turning path analysis undertaken by NTPE has shown that the existing vehicular access to the site will need minor modification to provide additional pavement for the swept path of B-double vehicles entering the site.

The Maitland City Council Development Control Plan requires that one car space be provided per every two employees. Based on the maximum number of employees (59) expected to be onsite at any one time (59) to be onsite, the 32 parking spaces provided will exceed the requirements of Maitland City Council by two spaces. Further car parking is proposed as part of the development along with truck parking.

6.7.3 Impact Amelioration

The NTPE traffic impact assessment has predicted that impacts of the proposal are minimal and will be further minimised by directing a proportion of the heavy vehicle movements to the intersection of the New England Highway and Racecourse Road intersection.

The following mitigation measures will be implemented during the construction and operation phase of the Facility to prevent impact upon traffic:

- a Traffic Management Plan will be developed for the site in order to mitigate any impacts and will include the following:
  - designated transport and access routes
  - specified speed limits for heavy vehicles on local routes and at the site
  - designated parking and transfer areas at the site
  - on-site weighbridge to ensure vehicles do not exceed weight limits

- procedures for the delivery and despatch of materials
- hours of operation for construction and deliveries to be limited
- restricted vehicular access outside business hours
- liaison with the RTA will be undertaken regarding the movement of oversize vehicles

6.8 Service Utilities

Correspondence with Service Utilities is included in **Appendix C**.

6.8.1 EnergyAustralia

EnergyAustralia recently completed the construction of the Rutherford Zone substation, which feeds the Rutherford Industrial Estate. EnergyAustralia electricity services are currently available and connected at the site. EnergyAustralia has advised that there is a kiosk transformer installed, currently supplying a low voltage power supply of a maximum 400amps to the site.

The proposed development would be a low voltage customer requiring approximately 660 kilowatts of power per hour and a peak demand of 925 kilowatts per hour.

EnergyAustralia has advised that if, in the future additional high voltage electricity supply is required at site, TPI will be required to apply to EnergyAustralia to increase the amps available. EnerServe or an accredited service provider will be engaged to undertake the upgrade works.

EnergyAustralia owns all electrical infrastructure up to the meter, TPI would own, design and construct all infrastructure from the meter.

6.8.2 AGL

An existing gas main runs along the western boundary of the site, a decommissioned existing gas connection main exists to the south of the existing sheds. The existing gas main and connection point on the site was constructed for use by National Textiles.

The gas supply network infrastructure is owned by AGL Retail Energy Limited and the distribution network is operated by Agility Management Pty Ltd.

AGL will provide a metering pressure of 35kPa to the site based on an annual consumption estimate of 100 tetra joules per annum and a maximum usage of 11.000 MJ per hour.

6.8.3 Telstra

Telstra services are available and connected at the site with sufficient capacity to incorporate additional activities proposed at the subject site. A Telstra main cable runs along the eastern boundary of the site.

6.8.4 Hunter Water Corporation

Town water supply is provided by Hunter Water. Most water is sourced from Chichester Dam and is stored locally in the Rutherford Reservoir. An easement along the southern boundary of the site carries the Hunter Water main. Numerous effluent lines (sewer mains) have been established across the site as part of National Textiles operations.

The site is currently connected to mains sewerage which runs to the Farley Waste Water Treatment plant approximately 3km south east of the site via a 5 mega litre per day capacity discharge pipeline. This waste water treatment plant currently services a population of 24,000 but has a design capacity of 50,000 equivalent persons (EP). It services Telarah, Rutherford, Aberglassyn and Gilleston Heights and parts of Maitland as well as receiving septic effluent and commercial wastes via road tankers from neighbouring areas.

Hunter Water has advised that upgrades to the Rutherford Carrier System are planned in the near future with a large diameter gravity sewer main parallel to the existing carrier.

It is planned to derive water required for the process and ancillary purposes from the Hunter Water Corporation water supply network.

The existing sewerage system has the capacity to accept the sewage loads from the proposal.

6.8.5 Impact Amelioration

The following features will be designed and incorporated into the Facility in order to conserve energy, minimise power and water requirements:

- wherever possible, low energy consumption equipment will be installed and will include variable speed electric motors and PLC isolation steps to best manage the use of power
- energy efficient pumps, motors, lighting and other equipment will be installed
- smart and high efficiency lighting systems will be employed in all cases that will have photosensors fitted, where possible, to best manage the life of the equipment and the use of power
- steam pipelines from the boiler will be lagged to retain heat
- where possible steam condensate lines will be reused as heat exchangers for incoming products into the same process or for other processes within the Facility
- steam condensate will be reused where possible
- the boiler will be powered by recycled oil or natural gas
- skylights will be installed to minimise daytime lighting requirements
- treated effluent will be mixed with clean potable water and reused onsite wherever possible.

6.9 Socio Economic

6.9.1 Existing Environment

This section describes the socio-economic profile of the area potentially affected by the proposed Facility. This report encompasses the Hunter Region as defined by the Hunter Valley Research Foundation as the Local Government Areas of Cessnock, Dungog, Great Lakes, Gloucester, Lake Macquarie, Maitland, Merriwa, Murrurundi, Muswellbrook, Newcastle, Port Stephens, Scone and Singleton.

6.9.1.1 Populations Trends

According to the Hunter Valley Research Foundation (2003), the population of the Hunter Region was 563,586 in 2001 (including around 2,000 overseas visitors). The population has grown from 513,701 in 1991, representing an increase of 0.8%. Approximately 9.5% of the population of the Hunter Region or 53,803 people reside within the Maitland LGA, this has grown from 9.1% of the population of the Hunter Region or 46,909 people representing an increase of 1.5%.

According to 'medium growth' population projections prepared by the Hunter Valley Research Foundation (2003), the population of the Hunter Region is expected to reach 706 000 by 2026. The population of the Maitland LGA is expected to reach 76,000 by 2026. These figures are summarised in **Table 6.21**.

Table 6.21 Medium Growth Projections 2006 - 2026

	2006	2011	2016	2021	2026
Hunter Region	591,297	620,122	648,564	677,312	706,338
Maitland LGA	58,466	63,028	67,467	71,856	76,237

6.9.1.2 Employment, Age Structure and Income

Employment

According to the Hunter Valley Research Foundation (2003) the number of people employed in the Hunter Region has steadily grown in conjunction with population growth, the expansion and diversification of the regional economy and an increased female participation in the labour force. Census data indicates that total employment rose from 200,466 in 1991 to 220,642 in 2001, an increase of 10.1%.

22% of the Hunter Region workforce was directly employed in wholesale and retail trade, 19% in health, education and community services and 12% in manufacturing (Hunter Valley Research Foundation, 2003) (refer to **Figure 6**).

The unemployment rate in the Hunter Region has traditionally been higher than in the State. In 2002, the unemployment rate for the Hunter Region averaged 8.6% compared with the state average of 6.0% (Hunter Valley Research Foundation, 2003).

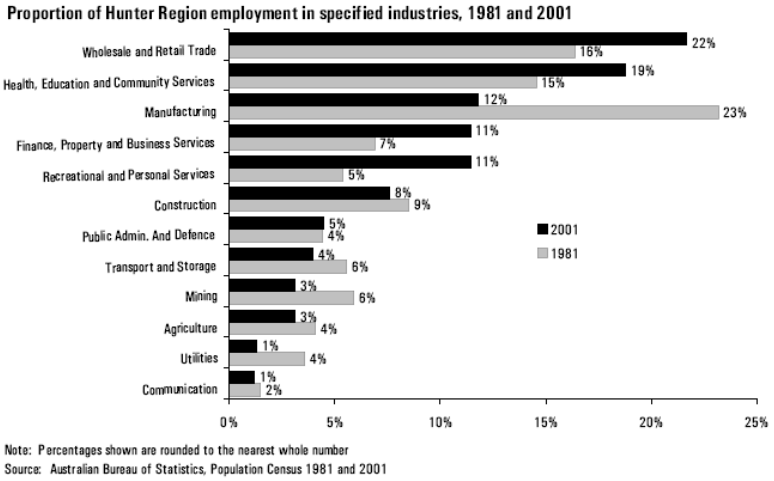

Figure 6 Proportion of Hunter Region Employment in Specified Industries, 1981 and 2000

Age Structure

Compared to state averages, the Hunter Region's population is a little older. In 2001, roughly 20% of people were of pre school-leaver age (14 or less), a further 20% were of retirement age (60 and above), whilst 60% were of working age (15-59). The State had a relatively larger working age population (62% of those aged 15 and 59) to support a relatively smaller proportion of people aged 60 and over (17%).

The Hunter Region's population is ageing at a faster rate. In the Hunter between 1996 and 2001, the proportion of the pre school-leaver age population remained about the same. The working age population rose by 4%, while the size of the retired population (aged 60 and over) rose by 10%. Increases in excess of 20% were recorded for the 50-59 years age group (including the first of the 'baby boomers'), and for those aged 75 and over.

In the State, over the same period there was a 2% rise in the proportion of 0-14 year olds, a 5% increase in the proportion of those aged between 15 and 59, and a 9% increase in the proportion aged 60 plus.

These figures are summarised in **Table 6.22**.

Table 6.22 Age Distribution of the Population in the Hunter and NSW, 2001

Hunter				NSW	
Age group	No.	%	% Change 1996-2001	%	% Change 1996-2001
0-4	18,911	6.6	-4.6	6.7	-1.3

Hunter				NSW	
Age group	No.	%	% Change 1996-2001	%	% Change 1996-2001
5-9	20,648	7.2	1.2	7.1	3.6
10-14	20,711	7.2	3.7	7.1	4.1
15-19	20,077	7.0	5.7	6.9	5.8
20-24	17,409	6.0	-9.7	6.5	-6.2
25-29	17,146	6.1	-4.9	7.1	-0.4
30-34	18,273	6.6	-4.2	7.4	-0.4
35-39	19,736	7.1	-3.2	7.7	1.3
40-44	20,750	7.5	7.3	7.6	9.8
45-49	19,495	7.0	6.8	6.9	4.6
50-54	18,454	6.6	24	6.5	24
55-59	15,349	5.4	23.8	5.2	18.6
60-64	12,583	4.6	13.0	4.2	12.2
65-69	10,875	4.0	-6.0	3.6	-3.9
70-74	10,553	4.0	3.9	3.4	3.5
75-79	8,325	3.3	23.2	2.8	19.4
80-84	4,602	2.1	20.5	1.8	17.1
85-89	1,973	1.1	33.6	1.0	28.5
90+	719	0.5	41.1	0.5	39.8
Total	**276,589**	**100**	**4.1**	**100**	**5.3**

Source Hunter Valley Research Foundation (2003)

Income

Census and Australian Tax Office (ATO) data indicate that annual wage and salary incomes are generally lower in the Hunter than in the State, although notable exceptions are in the Muswellbrook and Singleton LGAs where both average and median incomes are well above those for NSW as a whole.

In 2001, in the Hunter Region 24.8% of people earned $200-$399 per week, 24.2% of people earned $1 - $199 per week, 14.6% of people earned $400-$599 per week and 14.6 % of people earned $600 -$900 per week.

6.9.2 Impacts of the Proposal

The proposal would require a capital investment of approximately $18.65 million. The cost of the proposal would be born by the proponent, with no economic costs to the community.

6.9.2.1 Employment

Construction of the Facility is anticipated to take 6 - 9 months. The construction workforce of 50 – 75 is expected to be drawn primarily from the construction industry within the Hunter Valley. Specialist contractors, particularly in relation to the hydrogenation process will be sourced from South Africa, Sydney and Brisbane.

The full operational workforce is expected to be 75 employees. A breakdown of the employees of the Facility is provided in **Table 6.23**.

Table 6.23 Rutherford Resource Recovery and Recycling Facility Staff Breakdown

Facility Employment Area	Staff Numbers
Oily Water/Oil Storage/Waste Water Treatment Plant	4
Hydrogenation Plant	6
CFS Plant	6
Flammable and Combustible Liquids (Bulk and Packaged)	5
Onsite Laboratory	4
Workshop	5
Maintenance	3
Administration	20
Truck Drivers	20
Total	73

It is expected that most of the existing TPI workforce will be relocated to the Rutherford Facility. The remainder of the workforce is likely to be drawn from the local Hunter Region.

6.9.2.2 Population

The population of the Hunter region, approximately 570,000, is unlikely to change as the result of the Facility proceeding.

6.9.2.3 Housing

The proposal is unlikely to result in any noticeable increase in the demand for housing. During construction of the Facility, a temporary workforce of 50 – 75 will be employed for the construction phase of the project. This will be made up of primarily local employees. Should any itinerant workers requiring accommodation be employed, there is a variety of temporary accommodation available in the Hunter Region in the form of hotels, motels and caravan parks. Permanent and rental accommodation is also readily available.

The permanent workforce of 73 is unlikely to place demands on the provision of housing as most workers are expected to be local residents.

6.9.2.4 Education

The Maitland Area and surrounding Hunter Region are served primarily by a variety of preschools, State and Local Schools at primary and secondary levels, colleges of TAFE and the University of Newcastle.

The proposal will not affect the demand for education in the Hunter Region.

6.9.2.5 Health and Welfare

Health Services are provided throughout the Hunter Region by the Hunter Area Health Service. The Maitland Hospital is located in close proximity to the proposed Facility. The Maitland Hospital is a referral facility for the Upper and Lower Hunter Regions and provides a comprehensive range of medical and surgical services.

The proposed development is considered unlikely to increase the demand on health facilities.

6.9.2.6 Recreation

There are a range of sporting and recreational services available within Maitland and the Hunter Region including bowling, swimming netball, football, swimming, golf etc.

The proposed development is unlikely to impact upon the demand for recreational facilities.

6.9.2.7 Local, Regional and National Economies

The development of the Facility will have flow on effects to the local, regional and national economy. Using multipliers based on input output studies carried out by the Australian Bureau of Statistics (2001) it is possible to estimate the direct and indirect induced effects of the proposed Facility on output income, and employment. Multipliers for the miscellaneous manufacturing industry have been used to determine the income effect of the Facility.

Type 1a multipliers represent the direct and indirect, or local industrial support effects. Type 1b multipliers represent the direct, indirect and induced effects.

Table 6.24 Annual Income Multiplier Effect of Rutherford Resource Recovery and Recycling Facility

Output Effect	Multiplier		$ Million
Direct			$4 million
Direct and Indirect	Type 1a	1.546	$6.184 million
Direct, Indirect and Induced	Type 1b	2.292	$9.168 million

Source Australian Bureau of Statistics (2001)

Table 6.25 Employment Multiplier Effect of Rutherford Resource Recovery and Recycling Facility

Output Effect	Multiplier	No. Of Jobs

Output Effect	Multiplier		No. Of Jobs
Direct			73
Direct and Indirect	Type 1	1.329	97
Direct, Indirect and Induced	Type 2	1.745	128

Source Australian Bureau of Statistics (2001)

The wages and salaries at the Facility have an estimated value of $3 – 4 million per annum (at an average annual salary of $50,000) and will generate up to $9.168 million of regional income per annum.

In addition to the 73 operational jobs maintained at the Rutherford Facility, a further 97 jobs are expected to be created, mainly in the transport and service industries.

In addition, the proposed Facility will result in significant levels of revenue accruing at the various levels of government through rates and taxes.

6.9.2.8 Costs and Benefits of the Facility

Socio economic costs to the community will be minimal. There will be minor social impacts associated with a minimal increase of heavy transport vehicles on the New England Highway. The proposal would not have a significant direct impact on housing, education health and welfare and recreation within the Hunter Region.

Socio economic benefits to the community would include the direct employment of 50-75 temporary construction jobs, 73 permanent employees at the Facility, and the generation of an additional 97 jobs such as raw material suppliers, transporters, product distributors and ancillary service providers. Development of the proposed Facility would also benefit local regional and national economies by contributing an estimated additional $9.168 million into the economy per annum.

6.9.3 Impact Amelioration

As there are no detrimental socioeconomic impacts of the Facility predicted, no impact amelioration is proposed or required.

6.10 Waste Management

6.10.1 Existing Environment

The site is currently serviced by Maitland City Council's domestic waste services.

6.10.2 Impacts of the Proposal

Waste management impacts of the Facility are discussed in detail in other sections of this EA particularly relating to water, soil and land contamination, flora and fauna,

heritage, air quality, noise, visual context, traffic and transportation, services, socioeconomics, hazard and risk, and energy.

Listed below are some potential benefits and impacts associated with waste management:

- expansion in recovery and recycling of waste products will minimise waste going to landfill and other disposal routes
- reduction of impacts on sewage treatment plants and downstream catchment systems
- CFS treatment plant will utilise fly ash, which is effectively a waste stream from the power generation process, therefore reducing landfill requirements overall
- waste spills and related incidents from onsite processes and activities potentially impacting on soils, surface water, groundwater and human health
- waste spills and related incidents offsite from waste transportation activities potentially impacting on soils, surface water, groundwater and human health
- cross contamination of wastes, making wastes unsuitable for treatment, reuse and recycling therefore increase the quantity of waste being disposed of at landfill
- overall, the waste management impacts of the proposed Facility will be positive by reducing the quantity of waste being directed to landfill by reusing and recycling wastes that would have otherwise been disposed of
- conversion of organic wastes into beneficial products
- waste oil recycled to lube grade specification

6.10.3 Impact Amelioration

The following mitigation measures will be undertaken during construction and operation of the Facility:

- portable toilets to be used during construction of the Facility for human waste, to be emptied and disposed of offsite in accordance with regulatory requirements.
- wastes to be managed in accordance with the DEC's *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-liquid Wastes* (1999).
- waste minimisation, reduction, reuse and recycling principles to be utilised wherever possible.
- wastes to be segregated to assist in recovery and recycling.
- chemical and industrial wastes to be separated and clearly identified to ensure appropriate waste disposal methods.
- construction and demolition wastes to be reused and recycled, wherever possible.

- materials to be fabricated offsite where possible to minimise the generation of waste.
- in order to reduce waste volumes, where possible, all wastes generated from construction and operational activities will be reused on site or sent to recyclers. Disposal to appropriately licensed waste facilities will only be undertaken where reuse or recycling is not possible or feasible.
- where possible components of the proposed development will be constructed and operated within existing site buildings and with existing infrastructure in order to minimise the need for new materials and to minimise waste generated from the site.
- where appropriate waste generators will be encouraged to segregate wastes to minimise cross contamination.
- waste will only be transported by appropriately licensed transporters (inclusive of TPI).
- all pre-screening, transportation and receival of waste will be carried out in accordance with EPA requirements. The results of testing will determine the most appropriate recycling or treatment process of the waste. Wastes will only be stored in appropriately designated areas.
- should any anomalies be detected between the pre-screening analysis and onsite analysis waste may be quarantined or rejected.
- all transfer of waste will be undertaken within imperviously bunded areas and, where possible, waste transfers will be undertaken in undercover areas.
- records of waste quantities removed from the site to be maintained.
- a waste audit will be conducted when the site is operational on an ongoing basis to identify:
  - types and volumes of wastes generated
  - opportunities for waste avoidance, re-use and recycling
  - waste storage and segregation methods
  - waste treatment and disposal techniques
  - destination of waste materials
- a waste management plan to be developed and implemented following the initial waste audit. The waste management plan will be reviewed at least annually. Waste audits will be conducted regularly.

6.11 Hazardous Materials

6.11.1 Existing Environment

TPI undertook a hazardous materials audit of the subject site, a copy of this report attached as **Appendix N**. The hazardous materials audit consisted of a desktop review of historical information, followed by a visual and physical assessment of the site, the facilities and the infrastructure taking into account the former activities of the site.

The site was used by the Commonwealth of Australia for the production of munitions between 1943 and 1945. Between 1945 and 2000, the site was used for textile manufacturing and processing. The site has a number of large buildings which, since operations have ceased at the site, are vacant and in various states of dereliction. There are also remains of infrastructure (tanks, sheds, pipework, wastewater treatment plant, etc) which have been decommissioned and partially dismantled. Service utilities at the site have been disconnected including natural gas, water, electricity, sewerage and trade waste. In 2005, TPI constructed a new office building and renovated part of an existing shed into a truck depot.

Hazardous materials associated with munitions and textile manufacturing that may potentially be expected at the site include:

- asbestos (lagging, insulation, fire protection and cladding)
- transformer oils containing PCBs including ballast resistors in fluorescent lights
- hazardous chemicals and chemical wastes associated with textile manufacture such as dyes
- process wastes
- poisons and toxic chemicals
- buried ordnance and drums
- contents of underground storage tanks
- fuels
- chlorofluorocarbon (CFC) and halon fire extinguishers
- gas
- bituminous wastes such as tar
- fill and contaminated soils
- ash waste from boilers and furnaces.

6.11.1.1 Asbestos

Asbestos has been confirmed on site in various forms. Asbestos cement sheeting was used for roofing on all existing buildings. Asbestos cement sheeting has also been used for wall cladding and ceilings in sections of existing buildings. The condition of

asbestos in building varies from good non friable condition to damaged sheeting. Dust has been noted on the floors of the buildings. Due to the poor condition of the structures, open ventilation and long period of disuse (in addition to the exposure of the underside of the asbestos cement roof sheets), there is a high potential for asbestos fibres to be present throughout the interior of each of the buildings.

Sections of the pipework and ducting in some of the existing buildings contain potentially asbestos containing insulation. It is highly probable that further asbestos will be encountered, particularly within walls, ceiling and as pipe in lagging.

6.11.1.2 Polychlorinated Biphenyls (PCBs)

During operation of the textile mills, the site had a number of transformer substations and transformer component storage areas. According to records and site inspections (ERM 2001), the transformers contained PCBs. Following shutdown and closure of the mills, all transformers and transformer components were removed from the site.

PCB analyses were conducted by ERM on core soil samples taken from areas adjacent to the former transformer substation, from the transformer component storage areas and from a number of random grid locations across the site. PCB levels were determined to be below detection limits for all the sample locations.

Due to the age of the buildings, it is highly likely that the large quantity of fluorescent lights within the buildings have ballast resistors containing small PCB capacitors.

6.11.1.3 Hazardous Chemicals and Chemical Wastes

The site was examined for bulk, containerised and packaged goods. No drums or containers remain at the site and all hazardous chemicals have been removed. Assessment included a review of the textile plant layout and examination of former hazardous, Dangerous Goods and chemical storage areas, processing areas and bunds.

Review of the site records show that all chemicals were stored in stainless steel, above-ground tanks or within concrete-bunded stores. According to site records and interviews, no underground storage tanks were located at the site.

Bulk chemicals used at the site included:

- hydrogen peroxide
- flocculant (unknown type)

These chemicals have been removed and the tanks emptied and demolished.

Packaged chemicals used for textile manufacture were received in drums and 1,000 litre IBCs and stored undercover in concrete-lined bunds. Packaged chemicals received at the textile mill included:

- sodium hypochlorite
- hydrochloric acid
- potassium hydroxide

- naphthanilide
- liquid and powder dyes
- sodium hydrosulphite
- hydrogen peroxide

Some surface corrosion was noted in the bund floors of the acid and sodium hypochlorite drum stores. However, the seams and floors of the bunds are intact and the integrity of the bunds has not been compromised. The bunds appear to have been washed as there are no chemical residues remaining in the bunds but there is some evidence of staining. All drums and packaged chemicals have been removed from the site.

Tests were conducted on the contents of all tanks and pits and no hazardous chemicals were detected with the exception of the Caustic Storage Bund.

Traces of crystalline sodium hydroxide (caustic soda) were detected in the drain at the wall within the former Caustic Storage Bund adjacent to the new Workshop Building. A coating of sodium hydroxide crystals were also observed within the drain and pipe.

No other hazardous chemicals or chemical wastes were detected at the site.

6.11.1.4 Process Wastes

All plant processes and associated infrastructure from the manufacture of textiles have been decommissioned, disconnected or removed. Assessments were conducted on the lagoon, tanks, pits, drains, sumps, bunds and collection wells. No process wastes or hazardous wastes were detected.

All process tanks have been emptied and cleaned or removed.

6.11.1.5 Poisons and Toxic Chemicals

No poisons or toxic chemicals were detected at the site. All drums and containers have been removed.

6.11.1.6 Buried Ordnance and Drums

Cross-sectional sample pits excavated across the site by ERM did not detect any buried ordnance or drums.

6.11.2 Impacts of the Proposal

The presence of asbestos, PCBs, hazardous chemicals and chemical waste and buried ordnance and drums are expected to be encountered at the subject site. Asbestos has been identified at the site. PCBs, hazardous materials, chemical waste, drums and ordnance may also be encountered at the subject site. The development of the proposed Facility will require the demolition and renovation of existing structures. TPI will implement the mitigation measures detailed in sections below to ensure that hazardous materials do not present undue health or environmental risks.

6.11.3 Impact Amelioration

The following mitigation measures will be implemented with respect to hazardous materials during the construction and operation phases of the proposed Facility.

6.11.3.1 Asbestos

- qualified auditors to undertake a detailed assessment, identification and inventory of all asbestos materials and residues at the site
- develop an asbestos and synthetic mineral fibre register in accordance with Section 44 of the *Occupational Health and Safety Regulation 2001* (NSW) which requires that a register identifying the type, condition and location of all asbestos and asbestos-containing materials be prepared and maintained
- implement an asbestos management programme
- arrange for specialist asbestos contractors to remove and clean each building of asbestos and synthetic mineral fibres before any construction or demolition work commences
- handling and removal only by licensed contractors in accordance with Worksafe Australia's requirements. Disposal to licensed landfills in accordance with legislative requirements
- contractors required to complete Job Safety and Environmental Analysis forms (JSEAs) and Work Permits in accordance with legislative requirements and TPI policies before handling, removing and disposing of asbestos. This will ensure that the asbestos register is consulted prior to any work being conducted on any of the buildings
- implement control measures to minimise the risk of air-borne asbestos, e.g., by applying a sealant such as PVA
- monitor the condition of asbestos-cement sheeting and remove and replace as required. Where PVA coating is applied to asbestos, regular integrity checks to be conducted on the sealant by qualified personnel
- the risk of asbestos fibres from the PVA-coated sheeting is minimal unless disturbed or broken. In such cases, TPI will remove and replace the damaged sheets with non-asbestos cement sheeting in accordance with asbestos handling and disposal requirements
- induction training to include an asbestos awareness programme for presentation to all personnel and relevant contractors. This will cover types of asbestos and typical locations such as floor tiles, pipe lagging (including around pipes set in concrete), switch boards, bathroom walls and ceilings
- develop emergency procedures to quarantine areas when materials suspected of containing asbestos or synthetic mineral fibres are found and train all staff and relevant contractors

6.11.3.2 Polychlorinated Biphenyls (PCBs)

- qualified contractors will be engaged to remove all fluorescent light fittings
- contractors to review and assess whether any fluorescent light ballast resistors contain PCBs
- PCB resistors will be disposed of only at appropriately licensed facilities
- emergency procedures will be developed to handle and dispose of fluorescent lights which may potentially contain small PCB capacitors and train site personnel and contractors

6.11.3.3 Hazardous Chemicals and Chemical Wastes

- the pipe outfall point or nearest manway from the Caustic Storage Bund drain to be identified and blocked to allow the line to be flushed with water to dissolve and remove the sodium hydroxide residues (identified from the Hazardous Materials Audit)
- wash waters to be collected and removed for appropriate treatment at a licensed facility
- bund surface areas to be cleaned and the liquids collected and removed for appropriate treatment
- drum storage areas identified in the plans should be cleaned prior to commencement of construction and demolition work to remove any chemical residues and the washings disposed of at an appropriately licensed treatment facility

6.11.3.4 Buried Ordnance and Drums

- prior to any excavation and road works, metal detectors to be used to clear the area of any possible buried ordnance and drums
- a site management plan to be developed and implemented to ensure areas are cleared prior to excavation

6.12 Preliminary Risk Assessment

A preliminary risk assessment was conducted by Parsons Brinckerhoff, and is included as **Appendix O**.

6.12.1 Existing Environment

Currently the site is used for administration purposes within the newly constructed office block and for heavy vehicle maintenance in the new constructed vehicle workshop. Current industry located on the site is not considered to be potentially hazardous nor offensive.

6.12.2 Impacts of the Proposal

The Director General's requirements for the preparation of an EIS for the facility (30 January 2004), included a requirement for a screening of potential hazards on site to determine the potential for off-site impact and the need for a preliminary hazard analysis, in accordance with the Department's guideline *Applying SEPP 33*.

As a result of the proposed activities to be undertaken at the site and the nature of materials used and stored as part of the recovery operation, the proposed development could constitute a potentially hazardous industry. This preliminary hazard analysis (PHA) of operations has therefore been prepared to satisfy the requirements of NSW State Environmental Planning Policy No 33 – Hazardous and Offensive Development (SEPP 33) for the TPI development application for the proposed resource recovery facility.

The methodology used in the preliminary hazard analysis has generally followed the guidelines issued by the NSW Department of Urban Affairs and Planning (now the Department of Planning), in particular the publication Multi-Level Risk Assessment Guidelines. It has also been undertaken in accordance with relevant titles in the series of Hazardous Industry Planning Advisory Papers issued by the Department, and with the Australian Standard AS/NZS 4360:2004 Risk Management.

The objective of the PHA is to:

- qualitatively assess the risks posed to the human, social and biophysical environment in the locality by all activities associated with the proposed facility
- to determine whether any significant risk remains after the project design (including all appropriate risk mitigation measures) are considered
- provide the consent authority and any concurrence agencies with sufficient information regarding the risks involved in the proposal to enable them to properly determine the development application.

The PHA focuses on assessing potential risks associated with the construction and operation of the resource recovery and recycling facility, in particular the proposed hydrogenation plant and the Dangerous Goods store. A detailed description of the methodology and findings of the PHA is provided in **Appendix O**.

6.12.2.1 Methodology

The PHA was conducted in accordance with HIPAP 6 and entailed using a classical risk assessment approach which systematically analysed a range of potentially hazardous events or scenarios, the likely risk probability and consequences of these events and the effectiveness of the proposed mitigation or safeguard measures to reduce risks from these events to within acceptable limits.

The methodology employed in this PHA is generally in accordance with AS/NZS 4360:2004 Risk Management, and relevant Department of Planning guidelines:

- Hazardous Industry Planning Advisory Paper: No 4 (HIPAP No 4) Risk Criteria for Land Use Planning (DUAP 1997a)
- Hazardous Industry Planning Advisory Paper: No 6 (HIPAP No 6) Guidelines for Hazard Analysis (DUAP 1997b)
- Multi-Level Risk Assessment Guidelines (DUAP 1999)
- Applying SEPP 33 (DUAP, 1997c).

In accordance with the recommendations of the guideline Multi-Level Risk Assessment (DUAP 1999), a screening process comparing the quantities of hazardous materials against screening thresholds was applied to determine whether further assessment was required.

In accordance with HIPAP No 6 (DUAP 1997b), the PHA process followed was generally as follows:

- identify all possible sources and causes of hazardous incidents
- detail all operational and organisational safety controls
- identify the likely consequences and frequency of incidents and quantify the risks for the most relevant hazards identified
- assess likely cumulative risks
- compare expected risks against risk criteria detailed in HIPAP No 4
- assess the adequacy of proposed mitigation measures and controls.

However, for the purpose of the preliminary hazard analysis, the level of assessment has been limited in accordance with the results of the screening process recommended in the multilevel risk assessment guidelines (DUAP 1999). No quantitative risk analysis has been attempted where it is clear from the screening process, or from the preliminary consequence analysis or the qualitative assessment that no significant risk is likely to exist.

The qualitative assessment has generally followed principles outlined in the companion to AS/NZS 4360:2004, handbook HB436:2004 Risk Management Guidelines.

This PHA considers only the risks to the human, social and biophysical environment arising from sudden and unexpected events such as accidents and the results of equipment failure, operator error and the results of external events involving (but not under the direct control of) the proponent. Therefore the assessment does not consider risks that are unrelated to a single event such as may result from discharges to the environment as a normal part of operation approved under an operating licence. Any such longer term risks are generally treated in other sections of the EA.

6.12.2.2 Risk Criteria

The risk criteria relevant to this proposal are provided by the Department of Planning in *Hazardous Industry Planning Advisory Paper No 4- Risk Criteria for Land Use Safety Planning* (HIPAP 4). HIPAP 4 requires an evaluation of potential risks in terms of the following risk categories:

- individual risk
- risk of property damage
- societal risk
- biophysical environmental risk.

Detailed descriptions on what each risk category entails are provided in HIPAP 4 and have been summarised in subsequent sections for ease of reference.

Individual Risk

Individual risk is the risk experienced by an individual in a given time period and reflects the severity of the hazards and the amount of time the individual is exposed to them. The number of people present does not significantly affect individual risk although there could be second-order effects – for example in case of fire, the number of people in the vicinity would affect how quickly they could be evacuated.

For the purposes of this assessment, individual fatality risk has been assessed according to the relevant land use zoning criteria and has been assessed in terms of potential heat radiation effects.

Risk of Property Damage

When assessing potential risks, the assessment needs to consider the potential for an incident at the facility to cause damage to other buildings at the facility and spread to neighbouring installations causing a potential escalation or domino effect.

For the purposes of this assessment property damage has been considered with regard to the closest receptors.

Societal Risk

Societal risk is the risk experienced in a given time period by the whole group of people exposed. It reflects the severity of the hazard and the number of people exposed to it.

Societal risk combines the frequency and consequence assessments of specific events with population information. For the purposes of this assessment societal risk has been assessed qualitatively using the relevant land use criteria.

Biophysical Environmental Risk

Biophysical environmental risk considers the risk to the environment from accidental releases. For the proposed Facility, accidental releases relate to the hazards of fire and explosion and have been assessed in relation to the previous risk criteria. Potential risks or impacts to the biophysical environment have been assessed in the other chapters of this environmental assessment.

6.12.2.3 Hazard Identification

Potential hazards arising from the operation of the facility were identified through a hazard identification process. For each of the hazardous events identified, causes, consequences and the effectiveness of the proposed safeguard measures were assessed. A detailed description of the hazard identification study is provided in Section 3 of **Appendix O**. A summary of the finding from this study is provided below.

Activities occurring or undertaken as a result of the operation of the proposed Facility that could lead to off-site risk include transport of waste and other materials to and from the site, storage of waste and other materials on site and processing of waste and recyclable materials on site.

Materials that could lead to significant risk have been identified as follows. Wastes in dangerous goods classes 3 (flammable liquids), 5 (oxidising substances), 6 (toxic substances), 8 (corrosive substances) and 9 (miscellaneous) will be accepted, stored, processed or consolidated and dispatched from the site. In addition, a significant volume of lubricating oil, classed as a combustible liquid, will be accepted for treatment in a hydrogenation unit. Hydrogen will be generated from natural gas by a high pressure and temperature steam reforming process, and used in the oil hydrogenation unit, which also operates at high temperature and pressure. A by-product of this process will be a liquid stream of light, flammable hydrocarbons that will be sent off-site for use as a fuel or feedstock at other sites. All activities and transport operations associated with the site are consistent with existing uses of land in the surrounding industrial estate.

Hazardous materials that would or might be stored on the Rutherford site have been subjected to a screening process in accordance with the publication Applying SEPP 33 guidelines (DUAP 1997). The results of the screening process show that the maximum quantity of hydrogen (if considered to be stored), oxidising substances, toxic substances and corrosive substances could all exceed the basic screening thresholds. Therefore the conclusion from the basic screening process is that the risks associated with the development require further assessment of Class 2.1, 5, 6 and 8 materials under the provisions of SEPP 33.

The sum of the ratios of all Class 3 materials to their respective thresholds at the relevant distance of each storage from the nearest boundary is 0.76, and the screening threshold is therefore not exceeded in aggregate for Class 3, which is the principal source of fire risk.

A development such as the Rutherford facility might also result in a transport-related risk. The SEPP 33 Guidelines provide screening thresholds for transport-generated risk.

No class of dangerous goods exceeds the weekly movements screening threshold except for Class 6.1 materials, for which the threshold is set to zero, so that any movement of Class 6.1 material is considered potentially hazardous. SEPP 33 Guidelines also provide lower limits for load size that are potentially hazardous, which for Class 6.1 are 1 tonne for bulk material and 3 tonnes for packages. It is possible that loads might exceed these limits. Therefore, there is the potential for transport-related risk arising from operation of the Rutherford facility based on the SEPP 33 screening criteria.

6.12.2.4 Risk Assessment Results

The assessment of potential risks associated with the operation of the proposed Facility was conducted using preliminary design information, produced during the concept design phase. It is proposed that refinement of the findings of this assessment would be conducted during the detailed design phase where more detailed project information would be available.

A preliminary hazard analysis has been undertaken for those classes of material that exceed the screening thresholds specified in the SEPP 33 guidelines.

The IAEA analysis has indicated that the most significant estimated societal risk items are all of relatively low consequence but in some cases are likely to be quite frequent, and generally fall outside the societal risk guidelines. The risk of toxic combustion products from Class 6.1 toxic materials in the event of a fire is the most significant.

The analysis shows that events with consequences extending beyond the boundary and a frequency of more than once in 10^7 years are possible, so the risks can not be assumed to be negligible and further risk assessment is appropriate. However, the events with higher frequencies are seen to have relatively limited consequences in terms of the number of potential fatalities that might result.

The materials and processes are all well understood for the Rutherford plant. Transpacific Industries already operates similar resource recovery sites in other parts of Australia. The methane reforming plant is a unit designed and built by a specialist company in the USA. The hydrogenation plant is being designed by FFS in South Africa, based on a plant operating successfully there. The significant risk items are seen to be material in storage and not the process plants. These risks must be managed by appropriate procedures and engineering. Technical staff will be based on site to ensure that appropriate testing and control procedures are observed at all times.

There are no sensitive land uses in the vicinity of the plant that would be affected by any off-site impacts. It would be expected that occupants of surrounding areas would be able to avoid any affects such as toxic emissions. Existing land uses are similar to the proposed facility.

Class 2.1 – Hydrogen and Natural Gas

No hydrogen will be stored in the plant. Hydrogen will be generated in the hydrogen plant and fed directly to the hydrogenation plant as required. In the event of a hydrogen plant shutdown, the hydrogenation plant would be shut down shortly after. Any excess hydrogen would be vented safely to the flare system. The total quantity of hydrogen present in the system would be unlikely to exceed 20 kg based on estimated plant operating volumes. The maximum quantity of natural gas (principally methane) plus other light hydrocarbon components that together would constitute Class 2.1 gases at the elevated process temperatures in the hydrogen and hydrogenation plants would be unlikely to exceed 200 kg. Using the IAEA method recommended, this is below the minimum effect category.

From this analysis, the conclusion is drawn that the risk of an accident involving hydrogen, natural gas or other light hydrocarbon gases having significant consequences external to the site are very low or negligible where their source is the process plant.

Class 3 – Flammable Liquids

Class 3 materials likely to be present on the site will be stored separately from combustible materials to minimise the risk of a fire spreading to the larger quantity of that material being stored. The SEPP 33 threshold quantities are not exceeded for Class 3 materials.

Class 5 – Oxidising Materials

Class 5 materials comprise Class 5.1: oxidising substances that are not necessarily combustible themselves but may cause or contribute to the combustion of other material by providing oxygen; and Class 5.2: organic peroxides, which are typically unstable and prone to undergoing spontaneous and self-accelerating decomposition, including explosive decomposition.

It is not likely that Class 5.2 materials would be sent to, and would not be knowingly accepted by, the Rutherford facility, because of the unstable nature of these compounds and the need for highly specialised treatment processes for their neutralisation.

Class 5.1 materials that might be accepted include substances such as ammonium nitrate (a fertiliser, but also a bulk explosive when it is mixed or contaminated with a fuel such as diesel) or calcium hypochlorite (solid pool chlorine, which can initiate a fire in contact with combustible material). A Class 5.1 material such as calcium hypochlorite could also generate toxic chlorine fumes if it was accidentally mixed with an acid due to a leak or a processing error. For these reasons, Class 5.1 materials will be carefully segregated from Class 3 and Class 8 materials.

There is a very small chance that waste material such as ammonium nitrate accepted by the facility could be contaminated with a source of fuel such as diesel in the appropriate proportions, or some other contaminant that would increase its sensitivity to

heat or shock, either before or following receipt. Such material could subsequently explode as a result of some initiating event. The need for both a source of fuel or other contaminant and an initiating event makes an explosion unlikely given the testing and acceptance criteria for wastes and the segregation of incompatible dangerous goods classes.

Class 5 – Oxidising Materials - Explosion

No material classed as explosive would be accepted by the facility. As explosive material would only be formed by the inadvertent mixing of Class 5.1 ammonium nitrate, it is extremely unlikely that this quantity would be produced, and the consequence and frequency estimates are therefore likely to be very conservative. It is assumed that 50% of Class 5 movements (i.e. 250 per annum) would involve potentially explosive material such as ammonium nitrate. The effectiveness of any explosion that did occur would probably be small.

Class 5 – Oxidising Materials- Toxic Release

The maximum quantity of Class 5.1 materials that would be held is 60 m^3, assumed to be approximately 60 tonnes of mixed waste. Analysis, based on possible worst case scenario has predicted risk below the (extrapolated) negligible societal risk criterion. This analysis assumes that the dangerous material is present as a liquefied toxic gas under pressure. It would actually be present as a solid or liquid at ambient conditions that would need to be mixed with an incompatible material such as acid for a hazard to exist. Given that stringent controls would be in place to segregate incompatible dangerous goods, it is likely that the actual frequency of hazardous events would be much smaller, probably by an order of magnitude. The probability of significant quantities of incompatible materials mixing is also small, so the estimated consequences are probably also conservative.

Class 6.1 – Toxic Materials

Toxic materials such as cyanides and pesticides will be stored at the Facility and will be segregated and bunded in accordance with Australian Standards. The precise nature of the material in storage will be subject to continual change, but the presence of high toxicity material in liquid form is assumed in order to be conservative.

Classes 6.2 and 8 – Toxic (infectious) and Corrosive Materials

No Class 6.2 (infectious waste) material will be accepted by the facility.

All storage and handling of Class 8 corrosive materials will be strictly in accordance with the relevant Australian Standards AS3790 – 1994: The storage and handling of corrosive substances, AS3833 – 1998: The storage and handling of mixed classes of dangerous goods and referenced standards within those documents.

All materials in these classes will be tested and classified prior to acceptance at the Facility and retested on delivery by trained, technical staff. Details will be recorded to

allow tracking of individual batches and to control processing, and all containers will be suitably labelled. Incompatible classes of materials will be segregated in storage.

Compliance with the Australian standards, together with implementation of the proposed testing, stock control and safety management systems, is considered adequate to ensure that the risk to persons located off-site is kept below the acceptable criteria, and that no significant risks will be created.

Cumulative F-N Assessment for Societal Risk

The risk arising from each class of dangerous material is generally independent of risk for each other class, and the total risk is therefore considered additive. The exception in the case of the Rutherford operation is that Class 5.1 material might give rise to an explosive risk or a toxic release (depending on the nature of the material at any time and the initiating event), but probably not both together for any particular material. However, since the risk of a toxic release assumed only a single container of waste, the risk of a toxic release and an explosion of material up to the total inventory could exist concurrently. It is assumed that the risk from both may exist simultaneously at the maximum estimated levels for each.

It should be noted that this analysis does not take into account the potential for reducing the frequency of incidents that is afforded by applying above-average industry practices for risk management at the facility, which TPI proposes to implement. In addition the facility will be new and well documented. These factors would reduce the frequency by a factor of 3, but have not been included in order to be conservative in the screening process.

The ranking of risks by the number of fatalities estimated using the IAEA method is summarised in **Table 6.26**.

Table 6.26 Risk plot for Rutherford facility

Hazard	Effect radius	Buffer Distance	Consequences N	Frequency F
Class 2	Below minimum quantity		0	0
Class 3 – fire	25 m	25 m	0 fatalities offsite	3×10^{-7} pa
Class 5.1 – explosion	50-100 m	90 m	0.75 fatalities	3×10^{-6} pa
Class 5.1 – toxic	50-100 m	90 m	0.075 fatalities	1×10^{-5} pa
Class 6.1 – toxic	50-100 m	90 m	0.075 fatalities	1×10^{-5} pa
Class 6.1 – combustion products	100-200 m	90 m	0.25 fatalities	1×10^{-2} pa

With no point having a value of N exceeding one, no event is likely to result in a fatality off-site, although the estimated frequency of events involving combustion products from Class 6.1 toxic substances is significant. With all points below N=1, it is not clear how the F-N curve for the facility should be interpreted against the guideline criteria. The F-N curve indicates that there is only a small probability of a fatality per event as a result of relatively frequent events. Low consequence events are generally considered

acceptable by society even where events are relatively frequent and the average rate of death is therefore similar to events with higher consequences but lower frequency.

6.12.3 Impact Amelioration

Risk management systems including relevant Australian Standards, design codes and company procedures are available and will be implemented as part of the design and operation of the Facility to ensure that its operation will not expose persons living or working in the area to unacceptable levels of risk.

6.12.3.1 Pre-construction Activities

During the detailed design phase it is proposed to conduct a series of studies to ensure the construction, commissioning and operation phases of the proposal are implemented in a safe and effective manner without undue risks to the community and the environment. The following studies would be conducted:

- *Fire Safety Study* - the study would cover all aspects detailed in Hazardous Industry Planning Advisory Paper No 2 – Fire Safety Study Guidelines (HIPAP 2) and the Best Practice Guidelines for Contaminated Water Retention and Treatment Systems. The study would be submitted to NSW Fire Brigades for review and approval prior to the commencement of construction activities
- *Hazard and Operability (HAZOP) Study* - the study would be conducted in accordance with *Hazardous Industry Planning Advisory Paper No 8 – HAZOP Guidelines* (HIPAP 8). A HAZOP study is used to critically analyse potential hazardous events during the construction and operation of the proposal and identifies appropriate design and operational measures which would ensure the identified risks are avoided or minimised. The study would be chaired by a suitably qualified independent person, to be appointed by the design contractor and approved by the Director-General
- *Construction Safety Study* - the study would be developed in accordance with *Hazardous Industry Planning Advisory Paper No 7 – Construction Safety Study Guidelines* (HIPAP 7). The construction safety study process would critically review all of the risks associated with the construction and commissioning phases of the proposal to ensure risk levels to land uses that may be affected by the proposal remain within acceptable limits.

Relevant outputs from the above studies would be incorporated into the construction environmental management plan which would be developed by the nominated construction contractor prior to the commencement of construction activities.

6.12.3.2 Risk Reduction Measures

Based on the preliminary hazard assessment, the proposal meets the land use safety criteria defined by Department of Planning for all land uses on the basis that the proposed mitigation measures are implemented during the construction, commissioning and operation phases of the proposal.

A range of risk reduction measures have been identified as design safeguards and procedures to be incorporated into specific components of the proposal to avoid or reduce the identified hazards within acceptable levels.

The following sections provide a brief summary of the proposed measures. It is envisaged that these measures would be finalised during the detailed design phase when more precise design information would be available.

The principal methods by which risk might be reduced for the operation include:

- elimination or reduction of dangerous material inventories, where possible
- substitution of dangerous materials with less dangerous materials, where possible
- moderation of process conditions to ideal operating conditions (eg temperature, pressure)
- separation of hazardous process plant and storages from other parts of the operation in accordance with separation distance requirements
- all incompatible dangerous goods classes properly and completely segregated with appropriate fire separation distances created and maintained (including use of fire walls etc where necessary) according to AS1940
- development and implementation of management systems, policies, procedures and plans to appropriately manage operational risk
- continuously staffing of the site with and maintenance of appropriate security fencing and other systems to resist malicious attack
- full renovation of warehouse sheds with a new electrical system designed to meet relevant explosion protection (ExP) standards
- prohibition of equipment operating in warehouses that might generate friction or other sources of heat and contribute to risk of ignition
- a strict smoking ban in all hazardous warehouse and process areas
- ongoing maintenance of equipment (such as fork lifts) suitable for the relevant hazardous area classification
- no transfer operations to be conducted in the warehouse area, all transfer operations via properly earthed systems
- no dangerous goods will be accepted unless in packaging complying with the Australian Dangerous Goods Code with steel drums preferred where possible to limit rate of spread of fire
- warehouse sections to be fully bunded to limit the spread of fire and prevent the discharge of contaminated fire-water
- installation of fire services including fire hoses with foam suppressants, extinguishers, fixed sprinklers. The fire control system will be designed to meet the

requirements of the Building Code of Australia and to the satisfaction of the NSW Fire Brigade. Elements of the system will include:

- provision of potable water to supply to the site
- provision of booster pumps to meet the specified pressure requirements
- provision of permanent water storage, if necessary, to meet the supply volume requirements
- provision of fire hydrants, hose reels and foam suppressants as required
- installation of a suitable fire alarm system with actuating points distributed at key points throughout the Facility
- flammable and combustible liquid stores will be adequately bunded in accordance with Australian Standards and regulatory requirements.

- dedicated fire management system for the Hydrogenation Plant
- installation of explosion protection techniques for electrical equipment in hazardous areas
- utilisation of sensors and detectors linked to PLCs
- use of flammable gas detectors strategically placed to ensure gas releases are detected and appropriate action taken before combustible vapours can be generated
- installation of pressure regulators, shutdown valves and monitoring equipment at key process points
- installation of bunding to relevant Australian Standards and regulatory requirements
- separation of tank farms and storage areas to minimise cumulative or off-site effects
- installation of site stormwater system that can be isolated and contained
- installation of alarm systems (audio-visual)
- employment of full-time chemists and technicians within on-site laboratories to conduct risk assessments on all wastes received at the Facility; identify, classify and/or label wastes and chemicals prior to storage, treatment and transport and undertake regular testing and monitoring of processes
- an Emergency Response Plan will be developed and implemented based on risk assessments of the Facility's activities. The Emergency Response Plan will include the procedures to be followed in the event of an emergency and the relevant emergency contact details
- appointment of an Emergency Co-ordinator for each shift as well as an Emergency Response Team

- all employees will be required to attend training in emergency response prior to commencing work at the Facility and attend specialised training, as required for specific tasks. Simulated emergencies will be utilised regularly to ensure all personnel are competent in responding to and aware of their roles in an emergency
- all personnel and contractors will receive induction training with particular emphasis on emergency response procedures, evacuation, spill management and fire fighting techniques. Visitors will also receive induction training sufficient to permit supervised access to the site
- all transport vehicles to be fitted with fire extinguishers and communications systems. Tankers will be constructed in accordance with relevant Australian design standards, regulatory requirements and the Australian Dangerous Goods Code, where applicable. Design features will include recessed valves, rollover protection, and locking valves. Each vehicle will have a Drivers' Manual incorporating procedures to be followed in the event of an emergency. All drivers will be required to attend emergency response training prior to commencing work and specific training, as required
- spill response procedures to be developed for the site and spill management kits will be distributed throughout the plant and vehicles, all spills to be immediately contained and cleaned
- regular inspections to be conducted on fire protection and emergency control devices to ensure their operability and use in accordance with manufacturers instructions. All inspections will be recorded and copies of inspection logs kept on site for not less than five (5) years

6.13 Cumulative Impacts

6.13.1 Existing Environment

The proposed Facility is located within the established Rutherford Industrial Estate. The Facility is surrounded by varying industrial developments including a waste facility, tank manufacturers, a transport depot, surrounding land uses are discussed in **Section 6.2**

In addition to existing developments and the proposed Facility, a new industrial area has recently been approved for future development on the northern side of the New England Highway at Kyle Street to the south of the main aerodrome.

6.13.2 Impacts of the Proposal

Cumulative impacts have been considered for air, noise and traffic.

6.13.2.1 Air

Cumulative air impacts were not assessed as part of the air quality impact assessment as offsite impacts are expected to be minor.

6.13.2.2 Noise

Cumulative construction noise impacts were not assessed as part of the noise assessment based on the intermittent nature of noise emissions during operation of the Facility, cumulative impacts have not been assessed in detail as part of this study.

No significant cumulative increases in existing road traffic noise impacts would occur due to the proposal. The plant would likely reduce total network movements as movements to Branxton, Singleton Newcastle, Sydney and Queensland would not be required as frequently.

6.13.2.3 Traffic

A linear growth rate of 2% per annum has been applied to existing traffic flows on the New England Highway and exiting turning movement in and out of Kyle Street. The growth rate is conservative based on the results that indicated traffic volumes have remained static between 1995 and 2001. The proposal to develop an industrial estate on the northern side of the New England Highway on land owned by the Newcastle Aero Club which would have access to the New England Highway at Kyle Street has been considered in the study. The traffic study has assumed that, if the development is approved, it would be fully operational by planning year 2015. As part of the plan for the industrial estate on the northern side of the New England Highway, cumulative impacts would be significant and the intersection of the New England Highway and Kyle Street would be required to be upgraded to a 4 way roundabout. If the development on the northern side of the Highway is not approved no such upgrades would be required for the intersection of the New England Highway and Kyle Street.

6.13.3 Impact Amelioration

Air, noise and traffic cumulative impacts will be managed through the mitigation measures outlines in **Section 6.4.3**, **Section** 6.5.3 and **Section 6.7.3** respectively.

7. Natural Environment and Impacts

7.1 Climate

Information was obtained from the East Maitland Bowling Club (Bureau of Meteorology Station No. 061034), located approximately 9km south east of the Facility. The station has been collecting climatic data since 1902 (refer to **Table 7.1**).

The Hunter Valley is located in the sub tropical climatic zone in the border zone between the belts of sub-tropical highs and the mid-latitude westerlies (Hunter Valley Research Foundation, 2003). The spring months are the driest times of year with high pressure systems dominating weather patterns.

Average annual rainfall is 894.9mm per annum ranging from an average minimum of approximately 50mm in the drier months to and average maximum of 97 mm in the wetter months.

Summer is characterised by hot temperatures of approximately 30°C. Minimum temperatures during winter tend to be low with temperatures reaching as low as 6°C.

Table 7.1 Rainfall Data for East Maitland Bowling Club

	Rainfall			Mean Monthly Temperature (°C)	
Month	**Minimum**	**Maximum**	**Mean**	**Minimum**	**Maximum**
January	0.0mm	430.2mm	89.0mm	17.6°C	30.7°C
February	0.0mm	455.8mm	94.1mm	17.6°C	29.6°C
March	0.0mm	263.6mm	96.5mm	15.7°C	27.7°C
April	0.0mm	454.7mm	87.4mm	12.3°C	24.3°C
May	0.8mm	328.5mm	70.3mm	8.9°C	20.1°C
June	1.5mm	554.2mm	84.2mm	7.0°C	17.1°C
July	0.0mm	237.2mm	58.1mm	5.8°C	16.5°C
August	0.3mm	440.1mm	52.2mm	6.8°C	18.6°C
September	0.0mm	217.3mm	54.8mm	8.9°C	21.9°C
October	1.1mm	279.4mm	65.5mm	11.8°C	25.3°C
November	0.0mm	201.8mm	61.6mm	14.3°C	28.3°C
December	0.0mm	300.0mm	81.3mm	16.4°C	30.1°C
Annual	N/A	N/A	894.9mm	11.9°C	24.2°C

Source – Bureau of Meteorology, August 2004

7.2 Groundwater

A series of groundwater investigations were undertaken by PB from August 2005 to November 2005. Groundwater investigation reports are included in **Appendix D.**

7.2.1 Existing Environment

7.2.1.1 Geology

The 1:250,000 Singleton Regional Geology Sheet (Geological Survey of New South Wales, 1966) indicates that the site is underlain by alluvium and the Permian Rutherford Formation. The Rutherford Formation consists of mudstone, conglomeritic sandstone, sandstone and shale.

From site investigation (ERM, 2001) the geology below the site was found to be predominantly a clayey-silt alluvium to a depth of approximately 2m. In addition a surficial ash fill to a depth of 0.4 m was also encountered in 29 of 56 pits across the site and a unit of silty sand fill approximately 2m thick was found adjacent to the eastern boundary (an area referred to as the "ash disposal area"). Furthermore, at two locations across the site weathered sandstone was reported to be encountered at 1.5m below ground level.

A truck mounted drill rig capable of both soil auguring and rock drilling was used to dig nine boreholes. All boreholes were logged and then converted into monitoring wells. Eight shallow wells were constructed which were to intercept any perched groundwater and one deeper bore that would sample the groundwater in the underlying alluvium.

All of the shallow monitoring wells that were installed to target the perched water within the ash/fill layer did not produce any water. The only well that produced any water was MW10 which was drilled to 20mBGL and into the regional aquifer (refer to **Figure 8**).

Lithology encountered during drilling works consisted of gravely clayey sand fill to a depth of between 0.8m and 1.0m Below Ground Level (BGL) overlying alluvial sandy clays to at least 7.0mBGL. Below 7m the lithology was coarse sand. No bedrock was encountered. A generalised summary of the subsurface geological profile is presented in **Table 7.2** below.

Table 7.2 Generalised Stratigraphic Log

Depth (mBGL)	Lithology
0.0-0.9mBGL	Fill – Gravelly Clayey SAND, fine to coarse, grey/brown, gravel fine to medium, low plasticity fines.
0.9-7.0mBGL	ALLUVIAL: Sandy CLAY, dark brown, fine-coarse grained sand, with some fine to coarse grained gravels.
7.0-20.0mBGL(end of hole)	ALLUVIAL: gravelly SAND, fine to coarse grained, orange/brown, fine to coarse grained gravels and low plasticity fines.

Notes: mBGL (metres below ground level)

7.2.1.2 Hydrology

During August 2005 PB was engaged to install and monitor one (1) deep and eight (8) shallow wells across the site.

The groundwater level in monitoring well MW10[2] measured in the underlying alluvial sand was 12.75mBGL (metres below ground). No groundwater was encountered in the shallow fill.

The shallow monitoring wells (MW02-MW07) that were installed to target a suspected perched groundwater table within the fill/ash layer remained dry after installation. It is possible however that the wells may produce groundwater after a heavy rain event.

The groundwater gradient in the underlying alluvium could not be determined with the single deep well currently available on site (MW10). Given the lithology of fine to coarse grained gravely sand the likely hydraulic conductivity is between 10^{-2} m/s and 10^{-4} m/s (Freeze and Cherry 1979). If a groundwater gradient the same as the surface gradient (0.0025) is assumed groundwater flow beneath the site is likely to be very slow 0.02 m/d and 2 m/d.

In September 2005 Parsons Brinckerhoff constructed two additional on-site wells into the alluvium to establish the groundwater gradient and to further sample groundwater in the alluvium.

Two additional groundwater monitoring wells were installed in November 2005 (refer to **Figure 8**). These wells were subsequently developed and all three deep monitoring wells were sampled on the 11 November 2005.

The wells were constructed using direct flush rotary drilling with a guar gum additive to prevent collapse. Well screen (50mm ID) was installed between 12 and 15 mBGL with plain (unslotted) casing above. Groundwater was encountered between 12 and 13 mBGL. The wells were subsequently developed by pumping with a Grundfos MP1 electric submersible pump.

There are no visible areas of groundwater recharge or discharge on the site.

Site specific hydrogeology is summarised in **Table 7.3.**

[2] note MW10 referred to as MW01 in original groundwater assessment

Table 7.3 Site Specific Hydrology

Depth to Groundwater	12.75mBGL
Groundwater Occurrence	Possible perched water in all wells except MW10 (Wells MW02-MW09 produced no water). Deeper aquifer in MW10
Gradient and Groundwater Flow Direction	Unknown but possibly south towards Stony Creek

7.2.1.3 Quality

Groundwater analysis of extracted samples has shown that the groundwater has been impacted by contaminants.

24 August 2005 primary samples were analysed by Amdel Laboratories and secondary samples were analysed by ALS Laboratories. Analysis was carried out for total petroleum hydrocarbons (TPH), Metals, polyaromatic hydrocarbons (PAH) and volatile organic compounds (VOC).

Table 7.4 indicates analysis above detection limits in MW10 and compares this with the ANZECC trigger values (where available).

Groundwater impacts detected at MW10 consist of C_6-C_{28} fractions, which could indicate fuel and oil impacts. Groundwater impacts of tetrachloroethene (PCE) and chloroform could originate from the textile manufacturing or ammunition manufacturing processes that were formerly carried out on this and/or surrounding sites.

Further sampling and analysis of groundwater was undertaken on 11 November 2005. All three wells (MW10, MW11 and MW12) were purged using the Grundfos MP1 pump for approximately 30 minutes or until pH and electrical conductivity (EC_{25}) stabilised. Samples (MW10A, MW11 and MW12) were then taken using a dedicated disposable bailer. Analysis was carried out for TPH and VOC only based on the previous groundwater data from 24 August 2005. One additional sample (MW10B) was taken from MW10 after an additional period of 30 minutes pumping to gauge whether the concentrations of contaminants varied with time. A sample was also taken of the water that was supplied by the drillers and used as a drilling fluid.

The following table indicates analysis above detection limits in MW10, MW11 and MW12 and compares this with the ANZECC trigger values (where available).

Table 7.4 Grondwater Sample Results

Analyte	Concentration (µg/L)						
	MW10	MW10 'A'	MW10 'B'	MW11	MW12	Drill Fluid	ANZECC 2000
Date	**24/8/05**			**11/11/05**			
TPH (C_6-C_9)	160	130	57	<	<	25	n/a
TPH (C_{10}-C_{14})	100	<	<	<	<	<	n/a
TPH (C_{15}-C_{28})	276	<	<	<	<	<	n/a
Total TPH	536	<	<	<	<	<	n/a
Chloroform	6	<	<	26	29	68	370
Tetrachloroethene	**78**	**110**	42	<	<	<	70
Trichloroethene	<	<	5	<	<	<	330
Cadmium	0.2	-	-	-	-	-	0.2
Cobalt	40	-	-	-	-	-	90
Chromium	<1	-	-	-	-	-	1
Copper	3	-	-	-	-	-	1.4
Manganese	1,026	-	-	-	-	-	1,900
Nickel	**47**	-	-	-	-	-	11
Lead	<1	-	-	-	-	-	3.4
Strontium	892	-	-	-	-	-	n/a
Zinc	**32**	-	-	-	-	-	8
Mercury	<1	-	-	-	-	-	0.6
Iron	160	-	-	-	-	-	300
Total Nitrogen	**1,000**	-	-	-	-	-	500
Total Phosphorus	**300**	-	-	-	-	-	50
Conductivity at 25^0C	4,300 (us/cm)	-	-	-	-	-	n/a

Notes:
n/a No investigation levels available
Figures in **bold** indicate analysis above trigger value
Guidelines 95% species Level of Protection, Trigger Values for Freshwater
< below detection level
- not analysed

The key results of the groundwater monitoring undertaken at the site are summarised below:

- *Tetrachloroethene (TeCE)* - also known as perchloroethene – PeCE or "Perc" is a dense chlorinated organic solvent used for degreasing, dry cleaning and wool scouring. Tetrachloroethene is only slightly soluble in water, biodegrades slowly but does not significantly bio-accumulate. Tetrachloroethene is toxic to aquatic life and a suspected carcinogen.

Samples taken from MW10 indicate the presence of Tetrachloroethene marginally above the ANZECC Guideline Levels in two of the three samples (for comparison the drinking water guideline for Tetrachloroethene is 50µg/L).

- *Trichloroethene (TCE)* - also known as Trichloroethylene or 1,1,2 Trichloroethylene is a degradational production of *Tetrachloroethene* and is also a dense chlorinated organic solvent. Trichloroethene is only slightly soluble in water, biodegrades slowly but does not significantly bio-accumulate. Trichloroethene is toxic to aquatic life and is a suspected carcinogen.

  Trichloroethene was only detected in one sample analysed (MW10B) at a level significantly below guideline levels.

- *Chloroform* - also known as trichloromethane is chlorinated methane which is commonly used as a solvent as a specialty chemical and as a cleansing agent in dry cleaning. Chloroform is only slightly soluble in water, biodegrades slowly but does not significantly bio-accumulate. Chloroform is toxic to aquatic life and is a suspected carcinogen.

  Chloroform was detected in the water used for drilling and in wells MW11, MW12 and the original sample taken from MW10 (24/8/05). However it was absent from subsequent samples taken from MW10. It is therefore possible that the source of the chloroform was the drilling water. The analysis indicated only very low levels of chloroform which were significantly below the ANZECC guideline levels (and at a level significantly below the drinking water standard of 250µg/L)

- *Total Petroleum Hydrocarbon (TPH)* - TPH (C_{10}-C_{28}) was observed in MW10 in August but was not observed in any of the samples taken in September. The reason for this is unknown. The TPH (C_6-C_9) fraction observed in MW10 (Samples A and B) was reported by the lab to be primarily composed of Tetrachloroethene and in the drilling water to be primarily chloroform. Consequently, apart from the low levels of Tetrachloroethene, Trichloroethene and chloroform there appear to be no other organic contaminants detected in the groundwater.

- *Metals* - copper and nickel were detected marginally above the guideline value in MW10 (24/08/05). All other metals were below detection or below guideline levels except strontium. There is no guideline level for strontium

7.2.1.4 Fate and Transport

The datum levels of all three wells were surveyed to a reduced level (RL) in meters above Australian Height datum (mAHD). The relative heights of the groundwater table at the three locations were then able to be compared (see **Figure 4**).

The levels were found to be nearly identical with only 2cm difference over a distance of approximately 150m. This suggests a groundwater gradient of 10^{-4} which, assuming a hydraulic conductivity of 10m/d, suggests a groundwater flow velocity of just 10^{-3} m/d (1mm/d). The flow direction is not possible to determine (or contour) from the available data because of the little or no difference between the levels. However, from the limited data available a groundwater flow direction towards the south seems possible.

A further longer term pumping test of MW10 will be undertaken to further investigate the hydraulic gradient.

7.2.2 Impacts of the Proposal

Groundwater in the alluvial sand is protected from surface contamination by overlying sandy clay alluvium. The vulnerability of groundwater is therefore considered to be low.

Therefore, the risk of groundwater contamination resulting from the proposed development is assessed as minimal due to overlying sandy clay alluvium. The risk of groundwater contamination is also considered to be minimal as all activities on site will be conducted on imperviously bunded areas.

In the event that groundwater contamination occurs, the potential for offsite migration is minimal as the groundwater gradient of 10^{-4} with an assumed hydraulic conductivity of 10m/d, suggests a groundwater flow velocity of just 10^{-3} m/d (1mm/d).

7.2.3 Impact Amelioration

The following monitoring will be undertaken to increase the level of knowledge about the groundwater flow direction and the concentration of contaminants:

- a further longer term pumping test of MW10 will be undertaken to further investigate the hydraulic gradient.

The following mitigation measures will be undertaken during the construction of the Facility:

- quarterly monitoring of all wells will be undertaken with sampling and analysis for VOCs
- monthly measurement of groundwater levels to determine if there is any season variation in the water table and determine the groundwater flow direction
- infiltration of water into excavations and footings will be pumped out and transferred to sedimentation traps
- housekeeping and spill management procedures will be implemented throughout the site to prevent potential groundwater contamination
- emergency response procedures will be written and implemented to manage and clean up spills immediately, if they occur

The following mitigation measures will be implemented during the operational phase of the project:

- a network of groundwater monitoring wells consisting of three deep wells and eight shallow wells have been established strategically around the site in the vicinity of any activities that occur at sub-level. These monitoring wells will be able to identify changes in groundwater composition over time. Groundwater wells will be monitored as per the requirements specified in the EPL

- quarterly monitoring of all wells will be undertaken with sampling and analysis for VOCs
- monthly measurement of groundwater levels to determine if there is any season variation in the water table and determine the groundwater flow direction
- housekeeping and spill management procedures will be implemented throughout the site to prevent potential groundwater contamination
- all areas used for transfers, cleaning, drum and container handling, treatment and storage will be surfaced with impervious materials such as concrete and bitumen in accordance with Building Codes and Australian Standards
- pipelines will be inspected weekly and detected leaks rectified and any maintenance required to be undertaken promptly
- bunded areas to be maintained free from spills and debris. Spills to be contained and cleaned as soon as practical after spill event

7.3 Surface Water

7.3.1 Existing Environment

7.3.1.1 Topography

The site is at an approximate elevation of 22-23mAHD. There is a gentle slope across the site towards the south-west.

7.3.1.2 Hydrology

Surface water runoff from the site flows to a wide trapezoidal concrete drain that runs along the western boundary. This drain collects water from other properties on the Racecourse Business Park (and the New England Highway). For much of the time there is little or no flow in the drain and water stands and stagnates. However, following periods of rainfall it may overflow and discharge into the headwaters of Stony Creek approximately 800m to the south of the site. Stony Creek flows 4km eastwards to discharge into an area of low lying swampy ground (Wentworth Swamp) south of Telarah. This in turn drains into Fishery Creek (also known as Swamp Creek) which drains after approximately 3km into Wallis Creek (combining with effluent from the Farley Waste Water Treatment Plant). Wallis Creek flows approximately a further 5km to drain into the Hunter River east of Maitland. The distance from the site to the Hunter River along the channel of the tributaries is therefore approximately 13 km.

7.3.1.3 Quality

The quality of the water (sampled from the drain above the point of site discharge) was tested by Parsons Brinckerhoff on 23 June 2005. The results of the field and laboratory analysis are shown below, alongside the appropriate water quality objectives. The water quality objectives (WQO) for the Hunter River have been published by DEC using data

from ANZECC (1992). As ANZECC (1992) has been superseded by ANZECC (2000) data from the more recent document have been used as applicable. Both sets of data are derived from water quality monitoring carried out in NSW by the Department of Land and Water Conservation (DLWC now Department of Natural Resources) and are the 80th percentile of the dataset. Therefore, they are intended to be trigger values above which the water quality identifying the higher level of the parameter in question (i.e. 20 % of values would lie above this trigger value).

Table 7.5 documents the results of field and laboratory testing conducted on water samples collected on 23 June 2005. These results are compared against the water quality objectives (WQO) for the Hunter River.

Table 7.5 Water Quality Testing Results and Corresponding Water Quality Objectives

	23 June 2005 (µg/L unless shown)	WQO Lowland River (µg/L unless shown)
Total phosphorous	**80**	50
Total nitrogen	500	600
Chlorophyll-a	**14**	3
NOx as N	**50**	5
Salinity	588 µS/cm	300-900[1]
Dissolved oxygen	**30%** (3.2 mg/L)	60%-120%
pH	**5.4**	6.5 – 9.0
Temperature	11.4 C	-

Notes: [1] Salinity WQO for an "unspecified tributary" of the Hunter River (from Hunter River Management Committee). Figures in **bold** indicate concentrations above the WQO

With the necessary caveat that a single sample cannot determine the normal water quality of the receiving waters it appears that the quality of the water in the drain is likely to be generally poor. The dissolved oxygen is low (there was little or no through-flow on the day of sampling) and with a rise in temperature (the sample was taken on a cold day) the oxygen saturation would be lower still. The levels of nutrients (NO_2 and NO_3 and phosphorous) are above the 80th-percentile trigger value and the chlorophyll-a is high. Using the chlorophyll-a alone as an indicator of the trophic status of the water is an indication that potential eutrophic conditions exist (see the following table from ANZECC 2000).

Table 7.6 Annual mean and Maximum Chlorophyll-a Concentration for Reservoirs and Lakes

Annual Mean Chlorophyll-a (μg/L)	Annual Maximum Chlorophyll-a (μg/L)	Trophic Status
<2	<5	Oligotrophic, aesthetically pleasing, very low phytoplankton levels
2-5	5-15	Mesotrophic, some algal turbidity
5-15	15-40	Eutrophic, obvious algal turbidity and oxygen depletion
>5	>40	Hyper-eutrophic, extensive algal turbidity, loss of amenity, serious oxygen depletion

No previous water quality monitoring was known at the time of reporting (June 2005).

7.3.1.4 Annual Rainfall and Potential Evaporation

Annual rainfall and potential evaporation (PE) data for the period 1998 – 2004 is summarised in the following table. Records from Maitland VC started mid way through 1997 so this year is excluded.

Table 7.7 Annual Rainfall and Potential Evaporation (1998 - 2004)

Year	Total Annual Rainfall Maitland VC (mm/a)	Total Annual PE Paterson AWS (mm/a)
1998	965	1,488
1999	840	1,243
2000	791	1,449
2001	791	1,538
2002	738	1,632
2003	657	1,413
2004	838	1,502
Mean (1997-2004)	803	1,460

This data is illustrated in the following figure.

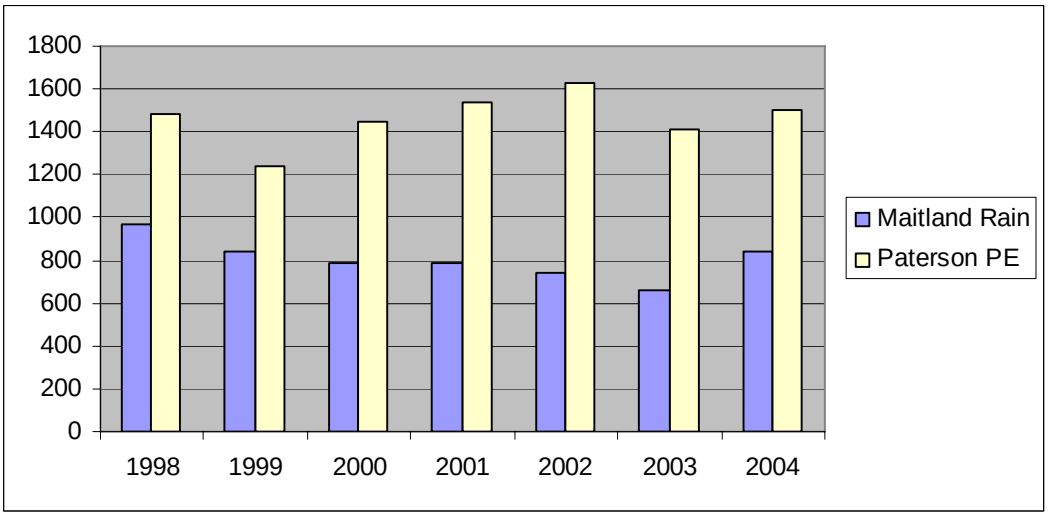

Figure 9 Annual Rainfall and Potential Evaporation (1998 -2004)

The data shows that in all years there is significantly more evaporation than rainfall.

Seven complete year's data was determined to be insufficient for statistical analysis and frequency distribution. Therefore, the annual rainfall from Paterson AWS (1998-2004) was correlated with the annual rainfall at Maitland VC (1998-2004). This correlation was then used to synthesise the rainfall at Maitland VC between 1967-1997 using annual rainfall data from Paterson and this was combined with the recorded data at Maitland VC. A statistical frequency analysis was applied to this combined data for Maitland VC and the resultant distribution (using 38 years data) used to determine "wet" and "dry" years. A wet year for the purposes of this report is defined at the 90th percentile whereas a dry year is defined as the 10th percentile. The results were as follows:

Table 7.8 Annual Rainfall Statistics – Maitland VC 1967 - 2004

Percentile (1967-2004)	Wet/dry	Annual Rainfall (mm)	Comparable Year (1998-2004)	Comparable Year Rainfall
10	Dry	687	2003	657
50	Normal	799	2000	771
90	Wet	893	1998	965

7.3.1.5 Monthly Rainfall and Potential Evaporation

To understand rainfall and potential evaporation distribution it is useful to examine monthly rainfall and potential evaporation. For the purposes of easy comparison and convenience, and because of a greater period of record (1902-1993) it was decided for this purpose to use a statistical summary provided by the Bureau of Meteorology (BoM) for the "East Maitland" site (discontinued). This data (obtained from the BoM website) is illustrated below in **Figure 10**.

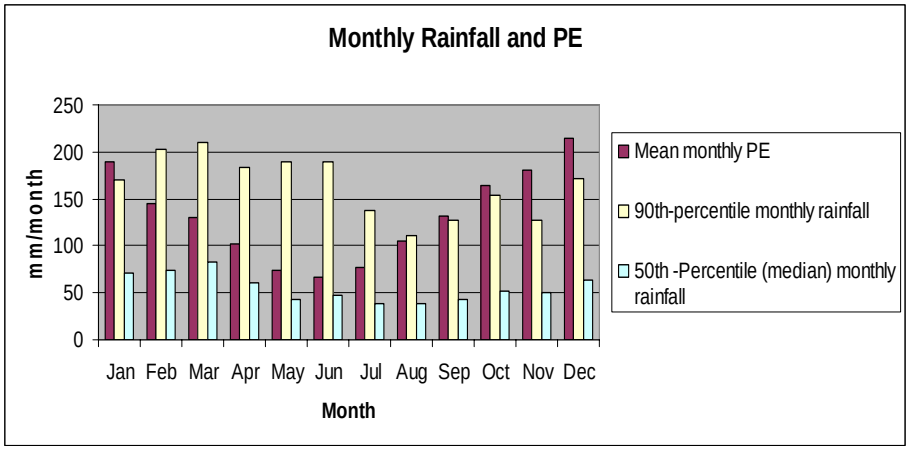

Figure 10 Monthly Rainfall and Potential Evaporation

The significant feature of this graph is that it shows that on average (as indicated by the 50th-percentile), and apart from two months in winter, there is significantly more monthly potential evaporation than monthly rainfall. However, in a wet year (indicated by the 90th-percentile) then for half the year (between February and August) rainfall is significantly greater than PE. The greatest disparity between monthly rainfall and PE is in the month of June when rainfall could be greater than twice PE. During such months there will be significant excess rainfall runoff, which must either be stored and used on site or discharged to surface watercourse or sewer.

7.3.1.6 Daily Rainfall and Potential Evaporation

Daily rainfall and potential evaporation data is summarised in the following table. Data (obtained from the Bureau of Meteorology) from both Maitland VC and Paterson AWS stations has been used.

Table 7.9 Daily Rainfall and Potential Evaporation

	Rainfall (mm/d)*			PE (mm/d)*	
Station Name	**Maitland VC**	**Paterson AWS**	**Paterson AWS**	**Paterson AWS**	**Paterson AWS**
Period of Record	**1997-2005**	**1967-2005**	**1997-2005**	**1967-2005**	**1997-2005**
Maximum Daily	104	194	143	0	0
Minimum Daily	0	0	0	21	21
Mean Daily	2	3	3	4	4
10th Percentile	0	0	0	1	1
50th Percentile	0	0	0	4	4
90th Percentile	6	7	6	8	8
95th Percentile	14	15	16	10	9
99th Percentile	32	40	39	13	13

(*Data rounded to nearest mm)

The statistics above, extracted from the daily data (up to June 2005) for rainfall and PE provides a useful picture of the pattern of daily rainfall and PE distribution. It is possible to say for example that on more than 50% of days no rain would normally be expected whereas on 95% of days no "significant" rainfall would be expected ("significant" rainfall defined as 15mm/d for these purposes). Furthermore, PE has much less statistical variability with only 4mm/d difference between the median (the 50th-percentile) value and the 90th-percentile. Although this daily data analysis is useful in providing qualitative interpretation on the daily rainfall and PE distribution, no further use is made of this data in this report. For the purposes of calculating a water balance, annual data will be used and for stormwater runoff calculation, intensity-frequency-duration (IFD) data will be used. Daily data is however useful for detailed water balance modelling, but this is outside the scope of this report.

7.3.1.7 Flood Plain

According to Maitland City Council Flood Management Plan (2000) the site is not within:

- the "declared" flood plain
- the Hunter River "Floodway"
- the 1% (1 in 100 year) floodplain; or
- the area flooded in February 1955.

Reference to the Flood Management Plan shows that the 1% floodplain boundary for the Hunter River north of the proposed site is along the 20mAHD contour (the closest point is 1.5km north, beyond the airfield). The 1% floodplain boundary in the Stony Creek/Fishery Creek catchment is along the 10 mAHD contour which is located south of Telarah, approximately 4 km east of the site.

Therefore, the site is not considered at risk from flooding of the Hunter River or Stony Creek. Furthermore, localised flooding of the site is not considered likely due to the large capacity of the drain that runs along the west boundary.

7.3.1.8 Town Water Supply

Town water supply is provided by Hunter Water. Most water is sourced from Chichester Dam and is stored locally in the Rutherford Reservoir. An easement along the southern boundary of the site contains the Hunter Water main.

7.3.1.9 Sewerage

The site is connected to mains sewerage which runs to the Farley Waste Water Treatment plant approximately 3km south east of the site. This waste water treatment plant currently services a population of 24,000 but has a design capacity of 50,000 EP (equivalent persons). It services Telarah, Rutherford, Aberglassyn and Gilleston Heights and parts of Maitland as well as receiving septic effluent and commercial wastes via road tankers from neighbouring areas. Farley waste water treatment plant has recently received improvement expenditure of $350,000.

The Farley waste water treatment plant is located off Owl Pen Lane and consists of an extended aeration, activated sludge process which was commissioned in 1983. This treatment process is vulnerable to discharges of fats, oils, greases, petrol, paints, thinners and pesticides to sewer which can all have a detrimental impact on the treatment process.

7.3.2 Impacts of the Proposal

Generally impacts on surface water quality are anticipated to be minimal provided mitigation measures outlined below are implemented during the construction and operation of the Facility. Waste water will be treated in the waste water treatment plant prior to disposal, clean stormwater will be retained and reused on site where possible.

7.3.3 Impact Amelioration

7.3.3.1 During Construction

Sediment and Erosion Control

Swales and sediment ponds and traps will be used to retain coarse suspended particles. Sediment and erosion control will be carried out according to the “Blue Book” (Landcom, 2004 “Managing Urban Stormwater: Soils and Construction

Fire and Emergency Services Water

The proposed building will be categorised in accordance with the Building Code of Australia (2005) as a class 7/8 building. The fire fighting system specifications for this building class are determined in accordance with AS2419.1 – 1994 (for fire hydrants) and AS2118.1, 1995 (for sprinklers).

7.3.3.2 Oily Water and Industrial Waste Water Treatment Plant

Runoff

All activities are to be undertaken on sealed and imperviously bunded areas fitted with blind sumps to prevent any contact with the external environment. Gradients of process and bunded areas will be towards blind sumps which will be periodically pumped out.

Sump drainage and any wash waters will be recovered and treated on-site.

Roof runoff water from this area will discharge to stormwater drains.

Surface Water

All activities, including transfer processes, are to be undertaken within sealed and bunded areas.

7.3.3.3 Lube Oil Hydrogenation Process

Runoff

The hydrogenation process will be conducted within sealed and bunded concrete areas that drain to blind sumps.

Any wash waters will be recovered and treated on-site.

Roof runoff water from the control room and amenities building in this area will discharge directly to stormwater drains.

Surface Water Quality

Waste waters generated by the hydrogenation operation will be discharged to the waste water treatment plant.

7.3.3.4 Chemical Fixation, Stabilisation and Solidification (CFS) of Non-sewerable Industrial Wastes

Runoff

All activities are to be undertaken under cover on a sealed and bunded concrete area that drains to a blind sump to prevent any contact with the external environment. Gradients of process and bunded areas will be towards blind sumps which will be periodically pumped out.

Sump drainage and any wash waters will be recovered and treated on-site.

Roof runoff water from this area will discharge directly to stormwater drains.

Surface Water Quality

Waste waters will be discharged to the waste water treatment plant.

7.3.3.5 Dangerous Goods Storage

Runoff

All activities including loading and unloading are to be undertaken under cover on a sealed and bunded concrete area that drains to a blind sump to prevent any contact with the external environment. Gradients of process and bunded areas will be towards blind sumps which will be periodically pumped out.

Sump drainage and any wash waters will be recovered and treated on-site.

Roof runoff water from this area will discharge directly to stormwater drains.

7.3.3.6 Transport Vehicle Depot and Car Park

Runoff

Truck cleaning operations will be undertaken in a sealed and bunded concrete wash down area that drains to a blind sump which will fully contain dirty water. This water will be treated in the waste water treatment plant prior to discharge to sewer.

The bitumen entrance and car park areas drain via an interceptor to a grass swale area to the south of the site which discharges into the surface watercourse drain.

Surface Water Quality

To minimise the chance of impact on surface water quality the car park run off will be discharged via an interceptor to a grassy swale area to the south of the site which discharges to the surface water.

7.3.3.7 Other Areas

Roadways

Roadways around the site are to be constructed of crushed and compacted rock or gravel aggregate. Drainage from the road surfaces will be directed into grassed swales constructed alongside the road. These swales shall run into the main lagoon.

These areas will be constructed so that runoff will be drained to one or both sides of the roadway. Runoff should be allowed to accumulate in swales and allowed to infiltrate and evaporate. These swales will be constructed at an early stage in the construction phase.

The remaining areas not covered by building, car park and roadways will retain existing vegetation. No discharges from the remainder of the site will be directed to these areas, unless that forms part of a secondary treatment process for runoff from the car parking areas. Any of these areas disturbed during the construction process will be reinstated to prevent sediment erosion.

7.3.3.8 Water Quality

The following mitigation measures will be implemented to maintain water quality:

- drains will be constructed and channels to collect and divert stormwater runoff to silt traps or sedimentation ponds
- silt traps or sedimentation ponds will be constructed along site drainage points to settle silt, particulates and gross solids
- the area of exposed ground surfaces will be minimised during construction
- clean stormwater to be segregated using kerbs and channels
- off-site stormwater to be diverted away from the site using earth mounds and landscaping

- resealing and revegetating works to be undertaken in areas as soon as practicable following disturbance
- straw bales, silt fencing or similar will be utilised to prevent sediment runoff
- erosion controls to be utilised at all discharge points
- trafficable areas, roadways and construction areas to be regularly cleaned of soil and other materials
- vehicle access to the site will be restricted
- site traffic during or following wet weather to be minimised
- site maintenance procedures to be implemented to ensure regular removal of excess soil and other materials
- all sediment control devices to be maintained to ensure efficient and effective operation
- any tanks, drums and fuel stores to be adequately bunded in accordance with Australian Standards
- excavated soils to be utilised for fill and landscaping wherever possible

7.3.3.9 Stormwater

A Stormwater Management Plan (SWMP) will be prepared to minimise the impact of potentially contaminated stormwater runoff on the groundwater and local waterways.

All areas used for transfers, cleaning, drum and container handling, treatment and storage will be surfaced with impervious materials such as concrete and bitumen in accordance with Building Codes and Australian Standards.

Non-contaminated stormwater from roofs, gardens and lawns will be reused for plant wash water to minimise the use of potable water or discharged directly to off-site stormwater systems.

Potentially contaminated stormwater from roadways, hardstand areas and operational areas will be segregated from non-contaminated stormwater by pipes, drains and channels, and diverted to interceptor traps capable of removing gross pollutants, fine particulate matter and oils and greases prior to discharging to off-site stormwater systems. Alternatively, it may be collected and reused on site for irrigation and wash water.

The proposed mitigation measures include:

- separation of clean stormwater from potentially contaminated stormwater via the following measures:
  - clean stormwater from roofs will be directed to the lagoon for storage and reuse as wash water, irrigation, or discharge to the off-site stormwater system
  - runoff from gardens and lawns will be directed to the off-site stormwater system

- runoff from neighbouring properties will be diverted around or away from the site
- transfers of materials will be conducted in bunded areas and, where possible, under cover
- the drainage system will be designed for a 1 in 10 year, 24 hour period ARI storm event (Q_{10})
- runoff from the roadways and hardstand areas will be directed to interceptor traps before discharging to the off-site stormwater system
- interceptor traps to be capable of removing gross pollutants, particulate matter and oil and grease
- interceptor traps will be maintained and cleaned regularly in accordance with manufacturer's recommendations to ensure optimal operation
- chemical, fuel or oil spills that occur within storage areas will be contained inside impervious bunds. Bund floors will be constructed with sufficient gradient to direct liquids towards blind collection sumps. Contaminated liquids will be removed by pumps or vacuum tankers and recycled or disposed to the waste water treatment plant or CFS Plant for further treatment
- for uncovered bunds, collected stormwater will be removed as soon as possible after the rainfall event to ensure adequate capacity is available within the bund
- housekeeping and maintenance programmes will be implemented to ensure bunds will be kept clean and functional. Bunds will be inspected regularly for contamination. If no contamination is evident (no floating oils and greases, gross pollutants or colloidal matter) the stormwater will be discharged to the stormwater lagoon. Stormwater assessed to be contaminated will be removed and transferred to the waste water treatment plant for further treatment;
- spill trays will be placed under pumps
- pumps will be elevated within bunds to prevent damage
- in the event of a fire, the drains will be able to be shut off at the discharge points to prevent pollutants from leaving the site. Runoff will be directed or transferred to the lagoon for further assessment, treatment and appropriate disposal

- design of a first flush system to reduce volumes of potentially contaminated stormwater stored on site
- construction of impervious surfaces for trafficable areas, parking, roadways, transfer bays, etc
- collection and discharge of potentially contaminated stormwater via stormwater interceptors to remove pollutants
- daily site inspections
- regular housekeeping

- regular cleaning of the stormwater systems
- implementation of spill management procedures
- tank farms bunded with impervious materials
- covering tank farms and transfer areas, where possible
- implementation of a stormwater quality monitoring programme.

The structures and systems described below will be integral to the management of stormwater at the proposed Facility.

- *lagoon* - the lagoon has a capacity of 10 ML and will be available to retain clean stormwater for further assessment and treatment. The lagoon will also be available as extra storage in the event of a fire so that contaminated liquids do not leave the site
- *interceptor traps* - the interceptor traps will be dual purpose capable of removing gross pollutants and particulates as well as oils and greases. The capacity and size of the interceptors will be designed in accordance with a 1 in 10 year ARI, 24 hour period storm event (Q_{10}) and will be designed to give sufficient retention time to remove particulates and oils and grease
- *bunds and transfer areas* - all bunds at the Facility will be designed and constructed in accordance with Australian Standards and regulatory requirements. Wherever possible, bunds will be under cover to minimise the ingress of rainfall and minimise the risk of contamination of bund contents. Bunds will be constructed with impervious materials and the bund floors will be designed with sufficient gradient to direct liquids towards blind collection sumps.

  Pipes and valves will be constructed in accordance with Australian Standards, Dangerous Goods legislation and any associated regulations. Pipes will run over bund walls and valves and manifolds will be recessed inside the bund walls.

  Rollover bunds will be provided for the transfer of wastes and chemicals from road tankers and transport vehicles to ensure containment of any spills. Bunding will be in accordance with Australian Standards and constructed with sufficient gradient to direct liquids to blind sumps to enable recovery or transfer to storage tanks. Wherever possible, rollover bunds will be undercover.

  All spills be will be immediately cleaned up and spill management kits will be available throughout the site.

7.4 Landform, Soils and Land Contamination

7.4.1 Existing Environment

7.4.1.1 Landform

The site is at an elevation of 22mAHD. The site is predominantly flat with a gentle slope towards the south-west. A number of buildings, tanks, roads and other facilities remain on site, the majority of the remainder of the site has been previously cleared and is dominated by introduced grasses and herbaceous weeds, however, four small, highly degraded, remnants of native vegetation exist at the site.

According to the Maitland City Council Flood Map (2000) the site is not within a recognised flood plain.

7.4.1.2 Soil Characteristics

The 1:100 000 Newcastle Coalfield Regional Geology Sheet (Geological Series Sheet 9231 Edition 1995), indicates that the site is underlain by basalt, siltstone and sandstone of the early Permian, Lochinvar Formation of the Dalwood Group.

In July 2001, Environmental Resources Management Australia (ERM) was commissioned by National Textiles to prepare a Phase II Environmental Assessment of the site at Rutherford **(Appendix F)**. The objective of the assessment was to assess the current site condition by investigating the extent of potential soil and/or groundwater impact, as a result of the former activities associated with munitions and textile manufacturing.

Intrusive investigation undertaken by ERM as part of the Phase II environmental assessment, found that the generalised geological profile encountered below ground level is as described below:

- ash fill was encountered to a depth of approximately 0.4 metres below ground level. A horizon of Silty Sand – Fill approximately 2.0 metres thick was encountered in a 50 square metres area in the 'Ash Disposal Area'
- clayey silt, light brown, low permeability, Alluvium/Residual Soil to a depth of approximately 0.9 metres below ground level, overlain in places by a thin horizon of Silty Clay, organic Topsoil
- clay, light brown mottled yellow, high plasticity, very low permeability, Residual Soil to a depth of approximately 2.0 metres below ground level
- residual Sandstone was encountered in two inspection test pits at a depth of approximately 1.5 metres below ground level.

ERM's report stated that the potential contaminants of concern associated with munitions manufacturing include compounds such as dinitrotoluene (DNT), urea, acetone, nitric acid, ammonia nitrate, pentachlorophenol, ammonia, sulphuric acid, calcium cyanamide, ethylene glycol, methanol, di-n-butyl phthalate and sodium hydroxide. Potential contaminants associated with textile manufacturing include

solvents and inorganic analytes used for the dyeing process. Given the range of potential contaminants analysis for volatile organic compounds (VOC), semi-volatile organic compounds (SVOC) and inorganic compounds (As, Cd, Cr, Cu, Ni, Pb, Zn and Hg) was carried out. The areas of ash fill were analysed for polycyclic (polynuclear) aromatic hydrocarbons (PAHs) and PCBs, Total Petroleum Hydrocarbons (TPH) and benzene, toluene, ethylbenzene and xylene (BTEX).

Site works involved the excavation of 56 inspection pits (IP) in areas of identified potential impacts, and at random grid locations. 45 soil samples were analysed for either one or a combination of TPH, BTEX compounds, selected inorganic compounds, PAHs, PCBs, VOCs and SVOCs. The analytes selected for each sample were chosen based upon the location of each sample and the potential contaminants associated with the sample location. TPH in the C_6-C_9 hydrocarbon group and BTEX compounds were not detected in any of the samples analysed. TPH in the C_{10}-C_{36} hydrocarbon group was detected above the sensitive land use criteria of 1000mg/kg in the samples collected from IP19 (0.5-1.2m), IP20 (0-1.5m) and IP21-1.5m). TPH C_{10}-C_{36} was above the DIL criteria of 5000mg/kg in the silty sand fill of IP46(1.0-1.5m).

PAHs and benzo [a] pyrene, PCBs, VOCs and SVOCs in the soils were either below the site investigation criteria or below the laboratory detection limits.

A 33 metre deep water bore was identified within Lot 211. At the time of the report the classification of the groundwater indicated that the water quality was poor and not suitable for drinking water, irrigation, livestock watering or for the textile industry with respect to one of the following: chloride, total hardness, total dissolved solids or iron.

7.4.2 Impacts of the Proposal

7.4.2.1 General

As the site is predominantly flat, development of the Facility will only require minimal modification to landform, therefore any impact on landform is expected to be negligible to minimal provided the appropriate mitigation measures as outlined below are implemented.

The proposed use of the site is consistent with previous land use. The risk of potential soil and land contamination during the construction and operation of the Facility is considered to be minimal provided appropriate mitigation measures as outlined below are implemented.

Waste treatment processes (including oily water treatment and waste oil transfer, hydrogenation process, and CFS treatment) and other site activities (such as the waste water treatment process, onsite laboratory, Dangerous Goods Store, drum wash/conditioner, industrial services cleaning depot, Environmental Recovery Services depot, truck wash and tank washout facility and transport vehicle depot) will be conducted within bunded areas constructed from impervious, reinforced concrete with blind sumps installed to contain and capture any potential spills.

7.4.3 Impact Amelioration

7.4.3.1 Soil

The following mitigation measures will be undertaken prior to construction of the Facility:

- soils will be tested to identify acid sulphate soils. If an acid sulphate soil environment exists, an acid sulphate management plan will be prepared
- contaminated or potentially contaminated land will be analysed prior to disposal.

The following mitigation measures will be undertaken during construction of the Facility:

- erosion and sediment controls to be implemented and maintained as per erosion and sediment control plan to be prepared
- any excavation and earth works to be halted during significant rainfall events
- groundwater monitoring to be undertaken as per EPL requirements
- emergency response procedures will be written and implemented to manage and clean up spills immediately, if they occur
- an acid sulphate soils management plan will be prepared for the construction phase. The management of acid sulphate soils will be undertaken in accordance with the NSW Acid Sulphate Soil Manual (1998). Mitigation measures shall include:
  - assessment of soil profiles to identify acid sulphate soils
  - restricted earthworks in acid sulphate areas
  - where necessary, alkaline agents will be introduced to neutralise soil acidity
  - any residual acid sulphate soils will be stockpiled for later treatment at the Facility

The following mitigation measures will be undertaken during the operation of the Facility

- all waste treatment and other activities to be conducted within imperviously bunded areas fitted with blind sumps to contain and capture any potential spills and prevent contamination of the soil
- sumps to be inspected weekly and dewatered as required and/or immediately after a rainfall event
- housekeeping and spill management procedures will be implemented throughout the site to prevent potential soil and land contamination
- site maintenance programmes and regular inspections will be conducted to ensure proper, functional operation of plant and equipment. The maintenance programme will also daily, weekly and monthly inspection checklists
- bunded areas to be maintained free from spills and debris. Spills to be contained and cleaned as soon as practical after spill event

- pipelines will be inspected weekly and detected leaks rectified and any maintenance required to be undertaken promptly
- groundwater monitoring to be undertaken as per EPL requirements

All bunded and production areas will be maintained under the site's environmental management system and, therefore, a low risk of adverse affect to the soil and groundwater environment exists.

7.5 Natural Events

7.5.1 Fire

The threat of fire originating from the site will be addressed in specific operational plans that reduce the risk of fire and enforce the education and training of personnel in initial fire response and fire fighting actions in the event of fire or the threat of fire.

The Facility will have adequate fire fighting equipment installed in accordance with government fire regulations and design requirements. Specific site rules in relation to ignition sources and Permit to Work procedures will be developed and implemented. Structures, storage areas and bunds will be designed in accordance with fire regulations, where required.

The site will be landscaped with vegetation mainly along fence lines and roadways. Firebreaks will be maintained along the perimeter of the site to minimise the risk of any brush fire damaging or reaching the Facility's infrastructure. Firebreaks will also be maintained along the outside of the fence line, where possible, and debris and undergrowth will be cleared seasonally to reduce the risk of fire.

The site emergency plan will also address the actions to be taken when the site is threatened by fire from external properties.

The on-site lagoon will be available as an additional water source in the event of a fire.

7.5.2 Wind

The vertical structures such as buildings, work platforms and storage tanks will be designed and installed in accordance with Australian Design and Building Codes and the relevant Australian Standards.

7.5.3 Storm

High risk plant and machinery will be fitted with automatic and manual emergency shutdown devices should loss of power occur. In addition, an emergency power source may be required for some plant and equipment, such as:

- fixed fire fighting and safety equipment

- hydrogenation control equipment safety mechanisms
- emergency lighting

Where necessary, lightning rods or similar conductors will be strategically placed on taller structures to minimise the potential for damage from lightning strikes.

7.5.4 Earthquake

No specific seismic data for the Maitland Local Government Area (LGA) exists from Geoscience Australia. The closest data to the site is recorded for the Newcastle – Lake Macquarie area. The calculated earthquake risk of that area is from events that have a probability of occurrence in the range of 0.02 to 0.001 (return periods of 50 to 1,000 years). The risk of impact from earthquake and seismic events is therefore considered very low.

An Emergency Response Plan will be developed to manage the effects of potential earthquake damage.

7.5.5 Flood

According to the Maitland City Council Flood Map (2000) the subject site is not within a recognised flood plain. Existing drainage channels on the site will be utilised and regularly maintained to ensure efficiency.

The stormwater lagoon which forms part of the on-site water treatment plant will be kept as empty as possible during the summer months so that sufficient capacity remains available.

7.6 Flora and Fauna

Parsons Brinckerhoff undertook a flora and fauna survey of the site on 2 and 3 June 2005. The Flora and Fauna Assessment report is included as **Appendix G**.

7.6.1 Existing Environment

7.6.1.1 Vegetation Communities

A number of large buildings, tanks, roads and other facilities remain on the site from previous land uses so that approximately one fifth of the site is not vegetated. Of the remainder, the majority of the site has been previously cleared and is dominated by introduced grasses and herbaceous weeds, such as *Cynodon dactylon* (Couch Grass), *Trifolium repens* (White Clover), *Chloris gayana* (Rhodes Grass), *Paspalum dilatatum* (Paspalum), *Panicum maximum var maximum* (Guinea Grass), *Setaria gracilis* (Slender Pigeon Grass), *Sida rhombifolia* (Common Sida), *Plantago lanceolata* (Lamb's Tongues), *Sporobolus africanus* (Parramatta Grass), *Verbascum sp.* (Mullein), *Ricinus communis* (Castor Oil Plant) and *Ambrosia sp.* (Ragweed). Much of the site is maintained in a mown condition. Within this area a few isolated large trees remain standing and two close lines of *Casuarina cunninghamia* (River She-oak), *Eucalyptus*

spp., and *Grevillea robusta* (Silky Oak) trees have been planted along the eastern side of the existing buildings.

Otherwise only four small and highly modified remnants of native vegetation remain on site refer to **Figure 11**.

Remnant 1 occurs at the northern end of the existing buildings on the site. The remnant is an isolated group of eight *Eucalyptus tereticornis* (Forest Red Gum) trees in an area 20 by 10 metres over previously cleared ground now dominated by introduced species *Cynodon dactylon*, *Chloris gayana*, *Sida rhombifolia*, *Bidens pilosa* (Cobblers Pegs), *Melinis repens* (Red Natal Grass) and *Phytolacca octandra* (Inkweed). This is probably a remnant of Hunter Lowland Redgum Forest, an ecological community listed as endangered under the TSC Act (NSW Scientific Committee 2003). The remnant is in poor condition, completely lacking a shrub layer and lacking all but one native species (*Hardenbergia violacea, False Sarsaparilla*) in the ground layer. It is also very small and isolated from other native vegetation.

Remnant 2 is approximately 60 by 30 metres in extent and occurs adjacent to the southern part of the western boundary of the site and includes a group of 12 large trees (*Corymbia maculata* Spotted Gum, *E. fibrosa* Broad-leaved Ironbark and *E. tereticornis*), amongst which the understorey has been highly modified both floristically and structurally by clearing and continued mowing. Two large piles of spoil have been dumped around some of the trees, but most of the area is maintained as mown grasses. The shrub layer consists of only scattered shrubs of Eucalyptus regeneration, *Acacia parvipinnula* (Silver-stemmed Wattle) and *Melaleuca decora* (White Feather Honeymyrtle), as well as the introduced weed *Ricinus communis*. The ground layer is dominated by the introduced species *Paspalum dilatautm*, *Sida rhombifolia*, *Bidens pilosa*, *Verbena bonariensis* (Purpletop), *Setaria gracilis*, *Plantago lanceolata* and the native species *Hardenbergia violacea* and *Dichondra sp. A*. This remnant is consistent with either Lower Hunter Spotted Gum – Ironbark Forest or Hunter Lowland Redgum Forest or the ecotone between them. Both of these communities are listed as Endangered Ecological Communities under the TSC Act (NSW Scientific Committee 2003, 2005), though the severe modification of the understorey layers makes it difficult to confirm this.

Remnant 3 occurs along the southern boundary, south of the existing buildings on the site. The remnant is approximately 70 by 40 metres in extent and includes three large trees (*C. maculata* and *E. fibrosa*) and a number of 10 – 20 metres high regrowth of *C. maculata*, *E. fibrosa* and *E. tereticornis*. A sparse shrub layer consists of few *Melaleuca decora*, *M. lineariifolia* and *A. parvipinnula*. The ground layer is highly modified, being dominated by introduced grasses and weeds, particularly *Stenotaphrum secundatum* (Buffalo Grass), *Paspalum dilatatum*, *Ehrharta erecta* (Panic Veldtgrass), *Cynodon dactylon* and *Bidens pilosa*. This remnant is consistent with the Lower Hunter Spotted Gum–Ironbark Forest community listed as an Endangered Ecological Communities under the TSC Act (NSW Scientific Committee 2005). While very degraded, remnant 3 has the potential to regenerate if maintained for such a purpose.

Remnants 2 and 3 retain marginal connectivity between each other through native shrub regeneration (or possibly plantings) around the banks of the existing effluent pond in the

south-western corner of the site. These remnants are also within 100 metres of a large area of native forest on the western side of Kyle Street and are tenuously connected to an even larger area of native forest approximately 400 metres south-west of the site via a narrow, but continuous, north-south corridor of regrowth eucalypts along a constructed channel which runs through the industrial area to the south of the site.

Remnant 4 is situated near the north-eastern boundary of the site and comprises an area of approximately 80 by 40 metres of *E. tereticornis*, *Angophora floribunda* (Rough-barked Apple) and *Brachychiton populneus* (Kurrajong) trees to 20 metres height and a small nearby clump of *Casuarina glauca* (Swamp Oak) trees. It retains a sparse native shrub layer of Eucalyptus and Angophora regeneration, *Callistemon salignus* (Willow Bottlebrush) and *Acacia parramattensis*. Ground cover is dense and includes the native species *Themeda australis* (Wallaby Grass) and *Viola hederacea*, but consists primarily of introduced species, predominantly *Paspalum dilatatum*, *Plantago lanceolata*, *Bidens pilosa*, *Chloris gayana*, *Cynodon dactylon* and *Verbena bonariensis*.

Remnant 4 is consistent with the Hunter Lowland Redgum Forest community listed as an Endangered Ecological Community under the TSC Act (NSW Scientific Committee 2003). Of the four remnants remnant 4 is in the best condition despite being quite degraded and has the potential to regenerate if maintained for such a purpose.

7.6.1.2 Plant Populations and Species

A total of 49 species of plant was recorded on site. Slightly more than half the recorded species (31) are introduced. No noxious weeds for the Maitland City local government area were recorded on site.

Threatened species are listed under the *TSC Act* and *EPBC Act*. The likelihood of occurrence of nine threatened plant species known from or possibly occurring within 20 kilometres of the site was considered and species possibly occurring were targeted during survey. No threatened plant species was identified during the surveys. Based on targeted survey, habitat assessment and the known distribution of these species, none of the species are considered likely to be present on site.

Endangered populations are listed under Schedule 1 Part 2 of the TSC Act. No species of plant has an endangered population in the Maitland City local government area.

7.6.1.3 Animal Populations and Species

39 vertebrate animal species were detected on site during general and targeted surveys. These comprised one (1) native species of amphibian, 30 native species of bird, one (1) native species of mammals and three (3) introduced bird and three (3) introduced mammal species.

Threatened species are listed under the *TSC Act* or *EPBC Act* and migratory species are listed under the *EPBC Act*. The likelihood of occurrence of 63 threatened or migratory animal species known from within 20 kilometres of the site was considered and species possibly occurring were targeted during survey. Only one (1) threatened animal species, *Pteropus poliocephalus*, the Grey-headed Flying-fox, was detected during the survey. Four migratory bird species were detected during the surveys. These

were the Black-shouldered Kite *Elanus axillaris*, Chestnut Teal *Anas castanea*, Masked Lapwing *Vanellus miles* and Australian Hobby *Falco longipennis*.

Endangered populations are listed under Schedule 1 Part 2 of the TSC Act. No species of animal has an endangered population in the Maitland City local government area.

7.6.1.4 Fauna Habitat

Fauna habitat values provided by the site generally reflect the condition of the vegetation communities as described above. While numerous bird species, including four migratory species, were observed, primarily in the native forest remnants, and one threatened species, the Grey-headed Flying Fox (*Pteropus poliocephalus*) was observed foraging at night in flowering Spotted Gums (*Corymbia maculata*), there is not a wide variety of fauna habitats present within the site. The highly simplified structure and low diversity of the vegetation present on the site and the low number (less than 20) of mature trees, only a few of which were beginning to develop hollows, significantly reduces its habitat value for woodland birds, microchiropteran bats and other arboreal mammals.

Furthermore, remnants 1 and 4 are isolated by more than 100 metres from other remnants or other areas of native vegetation outside the site. However, remnants 2 and 3 are proximate and retain some connectivity to each other as well as to larger areas of native vegetation outside the site. Furthermore, remnant 3 has potential to be easily regenerated. These factors increase their value as habitat.

Alone, each of the remnants provides fauna habitat of low quality, but there is value in retaining them as remnants for fauna habitat in a landscape. Such trees can provide animals with hollows for shelter and nectar and pollen for food. They can also act as 'stepping stones' for animals moving from one area of bushland to another. Individual trees can also be an important seed source for regeneration (NSW Scientific Committee 2005).

Critical Habitat

Critical Habitat is listed under both the *TSC Act* and *EPBC Act* and the Directors General of both State and Federal relevant departments maintain a register of this habitat. Critical habitat is the whole or any part or parts of an area or areas of land comprising the habitat of an endangered species, an endangered population or an Endangered Ecological Community that is critical to the survival of the species, population or ecological community (NPWS, 1996).

There is no listed critical habitat within the site or study area and none is likely to be affected by the proposed development.

SEPP 44 – Koala Habitat

The site is located in the Maitland City local government area which is listed under Schedule 1 of State Environmental Planning Policy - 44 Koala Habitat Protection (SEPP 44). The site includes one preferred Koala feed tree species listed in Schedule 2 of the policy, being *Eucalyptus tereticornis* (Forest Red Gum). However, the site does not contain a density of Koala feed trees that would meet the SEPP 44 definition of core or

potential Koala habitat. The site does not contain significant habitat for the Koala and the proposal does not require further consideration of SEPP 44.

7.6.1.5 Conservation Significance

The site provides habitat for two vegetation communities – Lower Hunter Spotted Gum—Ironbark Forest and Hunter Lowland Redgum Forest – listed as threatened (endangered) at the state level under the *TSC Act*.

7.6.2 Impacts of the Proposal

7.6.2.1 Vegetation Clearing and Removal of Debris

The proposal involves the removal of a maximum of approximately 0.7 hectares of vegetation that meet the definitions of Endangered Ecological Communities listed under the NSW *Threatened Species Conservation Act*. The proposed development requirements that remnants 1 and 2 will be completely removed. Remnant 3 will be partially retained where possible, the northern section of this remnant will be removed to allow for the construction of an internal roadway and hardstand area and Remnant 4 will be retained. Potentially important habitat features such as trees that have or have the potential to form hollows and ground debris will be removed.

The field assessment, however, identified few tree hollows presently occurring, although several of the large trees in remnants 2 and 3 are beginning to develop them. Likewise, there is little ground debris in the remnants and the vegetation within them is not structurally complex with shrub layers being generally absent.

7.6.2.2 Fragmentation, Edge Effects and Reduced Connectivity

Two of the four remnants of native vegetation (remnants 1 and 4) are separated by considerable distance from the other remnants and other areas of native vegetation in the locality. The remaining two remnants (remnants 2 and 3) are somewhat connected to larger areas of forest or woodland habitat to the east and south, but being already at the edges of these larger patches their removal will not increase fragmentation of or edge effects on remaining native vegetation.

However, removal of vegetation as part of the proposal is likely to impact negatively on connectivity between remnants of native vegetation in the locality as the remnants within the site could function as important elements for the movement and dispersal of wildlife in a landscape that has been substantially cleared for grazing, coal mining and industrial and residential development and has a low proportion of native vegetation remaining (Department of Environment and Conservation 2005).

As a likely consequence of continuing habitat loss and degradation of Lower Hunter Spotted Gum–Ironbark Forest, local bird observers have noted declines in species associated with spotted gum/ironbark forests, including the Swift Parrot, Regent Honeyeater, Brown Treecreeper, Black-chinned Honeyeater, Diamond Firetail, Turquoise Parrot, Fuscous Honeyeater, Eastern Shriketit and Spotted Quailthrush (NSW National Parks and Wildlife Service 1996). Remnants and even isolated trees can provide animals with hollows for shelter and food resources. They can also act as

'stepping stones' for animals moving from one area of bushland to another and for the dispersal of plants and as important seed sources for vegetation regeneration (Department of Environment and Conservation 2005).

7.6.2.3 Weeds

The site is already highly weed-infested and the proposed development may have high potential for promoting the dispersal and establishment of weed species. Appropriate measures need to be implemented during construction to minimise the spread of weeds from this area into the site and adjacent areas, especially into adjacent and proximate areas of native vegetation.

7.6.2.4 Key Threatening Processes

Key threatening processes to threatened populations, species and ecological communities are listed under Schedule 3 of the *TSC Act* and also under the *EPBC Act*. Clearing of native vegetation is listed as a key threatening process under the *TSC Act* and land clearance is listed under the *EPBC Act*. Removal of dead wood, dead trees and logs is listed as a key threatening process under the *TSC Act*.

The proposed action involves both the clearing of native vegetation and the removal of dead wood, dead trees and logs.

7.6.2.5 Threatened Ecological Communities

The presence within the site of remnants of two Endangered Ecological Communities listed under the *Threatened Species Conservation Act 1995* – Lower Hunter Spotted Gum–Ironbark and Hunter Lowland Redgum Forest – has been determined. Under the current proposal these remnants are to be cleared.

Impact assessments for the threatened species concluded that the proposal would not have a significant impact on threatened species or populations An assessment of significance of the impact of this proposal on these Endangered Ecological Communities has been carried out under the *TSC Act* guidelines (Lower Hunter and Central Coast Regional Environmental Management Strategy 2003, NSW Scientific Committee 2003). This assessment has determined that the proposal is unlikely to have a significant impact on those Endangered Ecological Communities.

7.6.2.6 Threatened Flora Species

No threatened plant species was detected during the surveys and it is considered unlikely that any threatened plant species is present on site. The proposal is therefore unlikely to impact significant on any threatened plant species.

7.6.2.7 Threatened Fauna and Migratory Species

One threatened mammal and four migratory bird species were detected during the surveys. Other species are considered unlikely to be present on site. However, even if utilising the site, no threatened or migratory species is considered to be significantly affected by the proposal for one or more of the following reasons:

Core habitats were not recorded in the study area as:

- the area is outside the normal range of the species and records are likely to be of vagrants or invalid
- the species is considered locally extinct
- resources used by the species are unlikely to be adversely affected, or only likely to be minimally affected by the proposal
- for migratory species the site is not classed as 'important habitat' as defined under the administrative significance guidelines of the EPBC Act, in that it does not contain:
  - habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species
  - habitat utilised by a migratory species which is at the limit of the species range
  - habitat within an area where the species is declining.

Hence, although removal of vegetation has a negative impact in terms of habitat values, the amount of vegetation to be removed is unlikely to significantly affect the habitats of threatened animals that are likely to occur in the study area.

7.6.3 Impact Amelioration

In order to minimise impacts on ecological values of the site, TPI will implement the following mitigation measures as outlined in the flora and fauna assessment:

- wherever possible existing vegetation will be retained
- where it is unavoidable to clear some of the remnant areas of Endangered Ecological Communities, the impact of the proposal will be to off-set by retaining and rehabilitating other remnants, where possible
- colour tape or 'parawebbing' should be used to delineate the maximum work area permitted. This should be implemented prior to any work commencing on site. If any tape is disturbed then it should immediately be replaced along the appropriate alignment
- a clearing management plan should be prepared and implemented including inspection of tree hollows. The clearing protocols should include the following
  - shaking the tree using a bulldozer
  - slowly pushing the tree to the ground so that it largely remains intact
  - leaving the tree in place once felled for at least one day/night before removing to allow animals to relocate to nearby vegetation
  - all contractors having the contact numbers of wildlife rescue groups should animals be injured during clearing
- sediment control devices should be installed prior to clearing vegetation to ensure that no impacts affect surrounding vegetation or creeks

- control measures to be implemented to ensure that weed species are not further promoted into retained native vegetation areas on site or in adjacent lands and the excess growth of vegetation which may increase the risk of fire
- the site is to be landscaped following the completion of construction activities. In order to offset cleared vegetation, similar native species will be planted to complement local ecological values. Landscaping will be designed to enhance the local environment. Not only would this minimise the impacts of the proposal on biodiversity, but it would provide benefits to the site such as
  - providing visual and sound barriers between the site and neighbouring industrial premises
  - improving the amenity of the worksite for staff
- drought tolerant species will be selected to reduce the requirement for irrigation
- trees and shrubs will be planted along boundaries to provide an aesthetic, visual barrier which will functionally act as a wind break

8. Environmental Management and Monitoring

8.1 Approach to Environmental Management

8.1.1 Environmental Management System

An Integrated Environmental Management System (IEMS) based on the Australian Standard *AS/NZS ISO 14001:2004 – Environmental Management Systems* will be developed and implemented for the Facility.

The IEMS will be developed for the Facility to provide one environmental management system in which the various operations and TPI subsidiary companies operating at the Facility will comply. The TPI subsidiary companies of Nationwide Oil and Transpacific Industrial Solutions that will be operating onsite have Environmental Management Systems that are ISO 14001 certified with the view to the IEMS forming part of a national EMS that will be ISO 14001 certified. The IEMS will be developed to comply with the requirements of ISO 14001:2001 – Environmental Management Systems. The IEMS will:

- identify and evaluate existing and potential environmental aspects, impacts and risks caused by site activities
- achieve the levels of environmental performance required by legislation and company policies
- prevent, minimise and/or control environmental impacts to the environment and surrounding community within acceptable regulatory and company standards during the construction and operation of the Facility
- provide opportunities for continuous improvement.

The IEMS will be reviewed and audited not less than annually.

8.1.2 Operational Environmental Management Plan

A Site-based Operational Environment Management Plan (OEMP) will be developed to provide operational support to the IEMS and set environmental objectives and targets, commitments and implementation strategies. The OEMP will identify and outline potential environmental impacts, performance criteria, mitigation measures, monitoring and reporting requirements, auditing procedures, emergency contacts, and, if an incident occurs, the corrective actions to be followed. The development of the OEMP will be based upon this EA and associated specialist studies, statement of commitments, conditions of consent arising from the approvals process and any other relevant legislative and regulatory requirements.

Environmental training will be included in the site induction to ensure best practice and due diligence is achieved by management, operational staff and contractors.

The OEMP will be reviewed and audited at least annually.

The following management plans will also be developed:

- stormwater management plan
- erosion and sediment control plan
- water quality management plan
- waste management and minimisation plan
- odour management plan
- noise management plan including road traffic noise
- traffic management plan
- health and safety plan
- energy use plan
- quality, service and administrative plan; and
- site emergency plan.

Environmental training will be included in the above mentioned management plans to ensure best practice and due diligence is achieved by both management and operational staff and contractors. Both the CEMP and OEMP will contain all the mitigation measures and monitoring strategies outlined in this EA and other measures required by regulatory agencies or outlined in the conditions of consent.

8.1.3 Environmental Management Responsibilities

Environmental management will be the responsibility of all employees. The site General Manager will be responsible for the coordination of environmental responsibilities at a site level across the various TPI subsidiary companies operating onsite.

The Compliance Officer will ensure the implementation of environmental management and monitoring.

The TPI Group Environment Manager will oversee the implementation of environmental management and monitoring at a national corporate level.

8.1.4 Community Complaints Register and Incident Investigation

A community complaints register will be established and maintained by the Compliance Officer. The Compliance Officer will be responsible for the receival, recording and resolution of all complaints. Details including the complainant, date, nature of the complaint and actions taken to resolve the issue will be recorded in the complaints register.

The Compliance Officer will be responsible for coordinating and investigating environmental incidents. An incident reporting procedure will form part of the IEMS and site environmental management plans.

Where investigative monitoring is required that cannot be performed by TPI, technical staff or external consultants will be contracted to conduct and report the investigation.

The relevant Government agencies will be notified of any complaints and/or incidents in accordance with management reporting tools and any specific regulatory requirements.

TPI will participate in any community meetings as required, or alternatively TPI will facilitate communication with the community through the establishment of a hotline/emergency contact number for the site.

8.1.5 Monitoring Programme

To ensure compliance with legislation, licensing conditions and site-based environmental management requirements, the following monitoring programme will be undertaken during construction and operation of the Facility.

Environmental monitoring will be conducted to assess the level of environmental harm, and the results and conclusions presented to management for review. Environmental monitoring will be addressed in the OEMP. Monitoring will be in accordance with the OEMP requirements and regulatory requirements. The OEMP will identify the type and frequency of environmental monitoring in accordance regulatory requirements.

Where no limits are set by environmental regulatory authorities, the Facility will operate so that activities do not adversely impact the air, water, groundwater and soil environments on site and beyond the property's boundary.

Environmental licensing conditions will be set by the Environment Protection Authority (EPA) in accordance with relevant legislation such as *Protection of the Environment Operations Act 1997.*

8.1.5.1 Water

Water will be managed according to the water management plan as outlined in **Appendix E**, monitoring will be conducted in accordance with this plan.

Groundwater

As well as the existing monitoring well (MW10) into the underlying alluvial sand, two additional groundwater monitoring boreholes will be established around the perimeter of the site. Regular monitoring will be undertaken of the groundwater in these three wells and the groundwater will be tested for:

- pH
- dissolved oxygen
- electrical conductivity
- nutrients (Total N and Total P)

- volatile organics (including PCE and chloroform)
- total petroleum hydrocarbons (TPH)
- metals

Surface Water

Surface water will be sampled quarterly at the point of discharge and tested for:

- pH
- electrical conductivity
- nutrients (Total N and Total P)
- volatile organics (including PCE and chloroform)
- total petroleum hydrocarbons (TPH)
- dissolved oxygen
- total petroleum hydrocarbons (TPH)
- metals

Stormwater

Stormwater collected within bunds will be discharged from the site following assessment via the:

- lagoon
- sewer following treatment in the on-site waste water treatment plant
- stormwater system via the stormwater interceptor units

Visual inspections of bunded areas for contaminants such as sediments, oils and greases or other contaminants will be conducted regularly. Stormwater contained within bunds will be assessed prior to release into the stormwater management system. If contamination has occurred, the stormwater will be transferred to the waste water treatment plant for treatment.

A stormwater quality monitoring programme will be implemented in accordance with the parameters set by regulatory authorities.

Daily inspections of bunds and tanks will be conducted as part of the OEMP. All spills will be cleaned up immediately in accordance with site procedures.

8.1.5.2 Heritage

No formal indigenous or non indigenous heritage monitoring program will be implemented at the site. However, any evidence of Aboriginal relics discovered during construction or operation of the Facility shall be reported to the Department of Environment and Conservation (NPWS). Work in the subject area will cease. If any disturbance to any suspected relics is proposed, an excavation permit shall be sought from the Department of Environment and Conservation. Any relics or site of non-

indigenous sites are discovered during construction or operation of the Facility shall be reported to the NSW Heritage Office. Work in the subject area will cease. If disturbance to any suspected relics or site is proposed, an excavation permit shall be sought from the NSW Heritage Office.

8.1.5.3 Air Quality

8.1.6 Compliance monitoring

Detailed rounds of air emission compliance monitoring be undertaken on an annual basis during the first two years of site operation. Details of the proposed monitoring would be provided in an air quality management plan to be developed for operation of the facility.

The installation of proposed control equipment is expected to result in minimal emissions of all other products.

Longer term actions for the recording and managing of potential air emissions from the site would be carried out. These works would form the basis of the site-specific air quality management plan.

The monitoring program would be extended to include potential compound-specific emissions (through the use of a gas chromatograph). Applicable NSW DEC and Australian Standards would be adhered to. Each compound identified within this technical paper should be addressed as part of stack sample analysis program.

Any measured exceedances of the site-specific air emission limits would be addressed where appropriate.

During the first year's implementation of the air quality management plan, the odour management practices and effectiveness gauged by observations would be recorded. Corrective action taken as a result of this experience would be built into the environmental management plan / manual (EMP) for the site. It is anticipated that the requirements for the monitoring program would vary after detailed review and assessment of the results from the initial assessment.

8.1.6.1 Noise

Noise monitoring is to be undertaken during the initial construction works. The noise compliance monitoring would ensure that any assumptions made in the calculations are verified and would also allow an opportunity for liaison with the local community. The compliance monitoring would provide the contractor with feedback relating to operating practices and the adoption of technically feasible and/or economically reasonable noise control measures for key sources affecting residential noise levels.

Noise monitoring will be conducted if a complaint is received during construction or operation of the Facility. Noise monitoring will be conducted by a qualified person in accordance with the DEC's *NSW Industrial Noise Policy* (2000). Noise monitoring will also be conducted to monitor equipment performance and impacts on health and the environment.

Post commissioning source emission and ambient background monitoring should be undertaken prior to each stage of the development to confirm the noise source levels and associated received noise levels.

8.1.6.2 Waste

Incoming and outgoing waste and waste products are monitored on an ongoing basis by the onsite laboratory. Monitoring of waste is outlined in further detail in **Section 2.3.2**.

8.1.7 Record Keeping

Records of all monitoring, incident and complaint investigation and audits will be retained on site for review and inspection. Environmental non-conformances will be identified by inspections, audits, testing and monitoring, incidents and complaints.

Monitoring conditions will be identified in the site environmental management plans and licensing conditions administered by the EPA.

Operational staff will be trained in corrective and preventative actions and procedures to ensure any environmental non-conformances are managed immediately.

8.1.8 Environmental Audits

Audits of the IEMS and OEMP will be conducted to review the level of environmental performance, ensure compliance with legislation and regulatory standards, and review the effectiveness of environmental management procedures. The proposed audit and inspection schedule is as follows:

- regular environmental inspections will be conducted to determine the compliance status of the business units and their activities, identify environmental issues and analyse the practices of operation of the Facility
- audits of the OEMP will be conducted at least annually as part of the Company's auditing program

Environmental audits provide a measurement of performance and an analysis of potential issues associated with:

- regulatory compliance
- identification of potential risks and liabilities
- operational efficiency in relation to environmental practice
- identification of existing environmental hazards
- reduction of risk and liability
- remedial action and mitigation of risk
- emergency response

8.2 Approach to Safety Management

Prior to the commencement of construction, the Principal Contractor will develop a Contractor Safety Management Plan. This safety plan will be prepared in accordance with the *Occupational Health and Safety Act 2000*.

A Site Safety Management Plan (SSMP) will be developed prior to operation of the Facility to ensure compliance with TPI Occupational Health Policy and other Company policies. Training requirements for all staff will also be outlined in the SSMP.

8.3 Approach to Emergency Response

A site specific emergency management plan will be prepared prior to construction and operation of the Facility.

9. Project Justification

The proposal is justified on the basis of low impact on the biophysical and social environment and considerable economic, social and technological benefits on local, regional and national levels. The proposal would incorporate a range of management measures to mitigate potential environmental impacts and would comply with all regulatory authority guidelines, licence agreements and approvals. The proposal is based on the principles of ecological sustainable development.

Arguments supporting the proposal are:

- the site of the proposed development has been used for industrial purposes since the 1940's and the proposed use of the site is consistent with previous land use. Groundwater investigations have revealed that some groundwater contamination is present. With the implementation of appropriate mitigation measures, the risk of additional potential groundwater contamination occurring as a result of activities occurring on site during the construction and operation of the Facility is considered to be minimal
- proposed activities are not anticipated to have an impact on surface water quality. the stormwater strategy for the site has been designed to ensure that peak flows from the developed site are mitigated to existing levels and to provide water quality treatment of sewage from the site via treatment in the onsite waste water treatment plant. This Facility would reuse water in the process to minimise requirements for clean potable water
- a Phase I and II Environmental Assessment undertaken by Environmental Resources Management has revealed impacted fill on the site confined to one area adjacent to the eastern boundary as a result of previous land use. Existing impact fill will be removed as part of this proposal if it is to be disturbed. With the implementation of appropriate mitigation measures, the risk of potential soil and land contamination during construction and operation of the Facility would be minimal
- the proposed site is extensively disturbed by past land clearing operations and previous industrial activities. Four small and highly modified remnant endangered ecological communities exist at the site and are required to the cleared as part of the proposal. An Eight Part Test undertaken under the TSC Act has determined that the proposal is unlikely to have a significant impact on those endangered ecological communities. The impact of clearing some of these endangered ecological communities will generally be offset by planting similar native species on the site. The proposal is therefore unlikely to have a significant impact on threatened species, populations, ecological communities or their habitats
- the air quality impact assessment undertaken for the site has found that, with adherence to mitigation measures proposed in this Environmental Assessment, the operation of the proposed site would not significantly degrade the existing environment, nor detract from the existing local ambient air quality of the nearest

potentially affected receptors. No long term loss or degradation to the existing local amenity is expected from the operation of the proposed Facility

- significant noise impacts from the proposed Facility during construction and operation are not expected. Noise modelling undertaken has shown the Facility will meet construction, operational noise goals and road traffic noise and will not result in sleep disturbance or vibration
- there would be little change to landscape character as the proposed Facility replaces an existing industrial development. The proposed Facility will improve the existing visual context by improving the neglected and aged appearance of existing buildings on the subject site through redevelopment and landscaping
- the proposed development will generate heavy vehicle trips to and from the site, however a portion of these trips are already on the road network and therefore will not be new trips on the local network. A small increase in light vehicles to and from the site is also expected. The intersection of the New England Highway and Kyle Street is still expected to operate at an acceptable level of service in 2005 and 2015 with consideration of cumulative impacts, therefore the proposed development is not expected to have a significant impact on traffic and transportation
- all services utilities required are available at site
- the proposed Facility is not expected to have a detrimental impact on the socioeconomic environment. The proposed development is likely to improve the socioeconomic environment by creating an anticipated additional $9 million of regional income per annum and a further 100 jobs
- the proposed Facility is likely to benefit the environment in terms of waste management by minimising the quantity of waste directed to landfill by reusing and recycling wastes that would have otherwise been disposed off by reducing the demand for raw oil product through completely recycling base lube oil through the hydrogenation process. The potential risks associated with the waste treatment processes on site are expected to be minimal provided the appropriate mitigation measures are implemented
- although hazardous materials are currently present onsite, the proposed development incorporates the removal and/or appropriate management of hazardous materials, therefore minimising any potential risks presented
- the proposal is considered to be a potentially hazardous industry under SEPP 33. Accordingly a PHA has been conducted that has shown that societal risk levels are likely to be below the guidelines for negligible risk or ‘as low as reasonably practical’ and that individual risk is likely to be below the NSW risk criteria for land use safety planning in industrial areas

The proposed development is permissible in the current zoning 4a - Industrial General with development consent. Under the Major Projects SEPP 2005 the proposal is classified as a major development. Therefore, the Minister for Planning can approve the project.

The potential risks of adverse impacts associated with the project would be negligible to low. The proposal presents benefits such as improved waste management options for Australia, minimised waste through increased opportunity for the recovery and recycling of waste products and the social and economic benefits such as increased employment and an increased injection to the regional economy. TPI has been awarded a Grant by the Federal Government to develop, install and commission the hydrogenation process and will therefore become the first recycler in Australia to use hydrogenation to completely recycle oil to refinery grade lubricant specification.

9.1 Ecologically Sustainable Development

Ecologically sustainable development is based on four interrelated principles. These are:

- the precautionary principle
- inter-generational equity
- conservation of biological diversity
- ecological integrity and improved valuation, pricing and incentive mechanisms

9.1.1 The Precautionary Principle

The precautionary principle provides that if there are threats of serious or irreversible environmental damage, lack of full scientific knowledge should not be used as a reason for postponing measures to prevent environmental degradation.

The EA has included a detailed assessment of the potential impacts of the proposal. Consultation with government authorities, the community, utility providers and other stakeholders has enabled potential issues of concern to be identified and addressed in its preparation. Analysis of the existing environment and potential impacts of the proposal has been detailed and involved field surveys, computer modelling and consideration of cumulative impacts.

The threat of irreversible environmental damage arising from the proposal is low. The implementation of the environmental management measures described in **Section 6** and **Section 7** would substantially mitigate any threats of serious or irreversible environmental damage occurring during both the construction and operational phases of the proposal.

9.1.2 Inter-generational Equity

The principle of inter-generational equity is concerned that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations. The mitigation measures included in the design of the proposal would minimise the impact of the Facility on the current generation as well as future generations. The proposal would provide social and economic benefits to the community through the creation of employment, and the opportunity to recover and recycle waste.

9.1.3 Conservation of Biological Diversity

The principle of conservation of biological diversity and ecological integrity provides that the conservation of biological diversity and ecological integrity should be a fundamental consideration. The site has been the subject of significant disturbance by extensive past clearing, however, four small and highly modified endangered ecological remnants of native vegetation remain onsite. Whilst the proposal requires the removal of these endangered ecological communities, the eight part test conducted under the TSC act has determined that the proposal is unlikely to have a significant impact. Planting of similar species will be undertaken to offset the impact. The proposal would have a negligible impact on both local and regional biological diversity.

9.1.4 Improved Valuation and Pricing of Resources

The principle of improved valuation and pricing of environmental resources involves including environmental factors in the valuation of assets and services. Valuations for this proposal have included the cost of mitigation measures and environmental monitoring.

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