PRELIMINARY ENVIRONMENTAL ASSESSMENT

Proposed Ammonium Nitrate Emulsion Production Facility and Continued Operation of Orica Mining Services Technology Park, Richmond Vale, NSW

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Preliminary Environmental Assessment - Proposed Ammonium Nitrate Emulsion Production Facility and Continued Operation of Orica Mining Services Technology Park, Richmond Vale NSW

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on behalf of

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1.0 Introduction

Orica Australia Pty Limited (Orica) is seeking development consent for the continuation of existing operations and the construction and operation of a proposed ammonium nitrate emulsion (ANE) production facility at their Mining Services Technology Park site (Technology Park), located at Richmond Vale, New South Wales (NSW) (refer Figure 1.1).

The Technology Park currently operates under three development consents granted by Cessnock City Council in 1991, 1998 and 2006. The existing operations include offices, research and manufacturing facilities, stores, water storage, sewage treatment and car parking. There are currently approximately 200 people employed at the Technology Park.

The proposed ANE production facility will involve the construction of new infrastructure within the existing Technology Park. The new facilities will allow for the production of up to 250,000 tonnes per annum of ANE which will be transported via road to other Orica operations and customers located in South Eastern Australia.

Orica is seeking to obtain a new project approval for the existing operations at the Technology Park and the proposed ANE production facility (the Project). The consolidation of the existing operations and the proposed ANE production facility under a single development consent will enable effective whole of site environmental management.

The Project is identified as a Part 3A Project as defined by the State Environmental Planning Policy (SEPP) Major Projects 2005, and requires the approval of the NSW Minister for Planning under Part 3A of the Environmental Planning and Assessment Act 1979 (EP&A Act). An Environmental Assessment (EA) report for the Project is planned to be lodged with the Department of Planning (DoP) following the receipt of the Director-General’s requirements.

This Preliminary Environmental Assessment (Preliminary EA) has been prepared by Umwelt (Australia) Pty Limited (Umwelt) for Orica in order to brief the Department of Planning and relevant government agencies about the Project, outline the environmental impact assessment conducted to date and identify key issues to be addressed in the EA.

1.1 The Proponent

The proponent for the Project is Orica Australia Pty Limited (Orica). Orica Mining Services is the world's leading supplier of commercial explosives. Orica offers commercial explosives, initiating systems, and blast-based services to the mining, quarrying and construction industries. Orica has operated the Mining Services Technology Park since 1991.

1.2 Site Description

Orica's Technology Park is located on the southern side of George Booth Drive which is a main arterial road in Richmond Vale, approximately 22 kilometres west of Newcastle, NSW (refer to Figure 1.1). The Technology Park is located on Lot 2, DP 809377 and is approximately 292 hectares in area. The land is owned by Orica. The Technology Park is located within the Cessnock local government area (LGA). The closest townships to the Technology Park are Kurri Kurri, approximately five kilometres to the north-west and Seahampton, approximately four kilometres to the south-east of the Technology Park.
The surrounding area encompasses a variety of land use activities including agriculture, bush land, rural residential area, rural industrial activities and transport corridors. Tasman Underground Mine is located approximately 2.5 kilometres to the south-east of the Technology Park.

1.3 Project Overview

The Project comprises:

- all existing operations undertaken at the Technology Park; and
- the proposed ANE production facility.

The existing operations which include office amenities, research facilities and other support at the Technology Park will remain unchanged. Further details relating to the existing operations are provided in Section 2.1.1.

The proposed ANE production facility will have the ability to produce up to 250,000 tonnes of ANE per annum. All ANE manufactured will confirm with the UN3375 classification. ANE is an explosive precursor which is sensitised to become an explosive only at the point of use, i.e. on a mine site. It is proposed to distribute ANE produced at the Technology Park via road transportation to other Orica operations for distribution or directly to customer sites in South Eastern Australia. Most of the ANE will be produced for customers located in the Hunter Valley.

Raw materials required for the production of ANE include ammonium nitrate solutions (ANS), fuel blend ingredients, thiourea, urea, acetic acid caustic soda and process water. All raw materials will be delivered to the Technology Park via road transportation from Orica’s Kooragang Island operations and various other locations.

The proposed ANE production facility will include:

- chemical, fuel and product storage tanks;
- an ANE manufacturing plant;
- truck weighing, loading and unloading facilities;
- utilities including hot water, cooling water and compressed air systems, electricity distribution cables and a transformer;
- stormwater/spill management structures; and
- an office, control room, switch room and quality control laboratory and mixing laboratory.

The construction of the proposed ANE production facility is expected to take up to 12 months to complete and is estimated to have a capital value of $35 million.

The proposed ANE production facility will require 10 additional staff on 3 shifts over 24 hours. The additional staff are expected to be existing employees currently working at other Orica facilities. Approximately 30 contractors will be involved with the construction of the proposed ANE production facility over a 12 month period.

A detailed description of the Project is provided in Section 2.0.
2.0 Description of Proposed Development

As outlined in Section 1.0, Orica is seeking approval for continuation of their existing operations and the construction and operation of a proposed ANE production facility at the Technology Park. The details of the existing operations and the proposed ANE production facility are outlined in this section.

2.1 Project Overview

2.1.1 Existing Operations

The Technology Park currently operates under three development consents DA118/690/257, DA118/698/53 and DA8/2006/809/1 all of which were granted by Cessnock City Council. The existing operations at the Technology Park are shown on Figure 2.1.

DA118/690/257 which allows for the majority of operations at the Technology Park was granted to ICI Australia Operations Pty Limited (now Orica) in 1991. The development consent allowed for explosives research and production activities. DA118/690/257 has been modified on two occasions in 1991 and 1992 to provide for changes to road arrangements and alterations to the site layout.

Two subsequent development consents DA118/698/53 and DA8/2006/809/1 also provide for activities at the Technology Park. DA118/698/53 was granted in 1998 for the construction and operation of a quarry services depot. DA8/2006/809/1 was granted in 2006 for the construction of a training room adjacent to the existing office facilities. Both the quarry services depot and the training room approved by the above development consents have been constructed and form part of the existing operations at the Technology Park (refer to Figure 2.1).

2.1.1.1 DA118/690/257

Operations approved under DA118/690/257 were to occur in a number of stages over a 10 year period according to market demand. Due the changes in market demand, some of the facilities provided for under DA118/690/257 have not been constructed to date. Descriptions of the facilities approved under DA118/690/257 which form part of the existing operations at the Technology Park are outlined below. The continuation of all existing operations undertaken under DA118/690/257 is sought as part of this Project Application.

Office Amenities

The existing operations at the Technology Park include offices comprising engineering offices, technical offices and office amenities. The existing office facilities onsite accommodate approximately 200 staff. The location of the existing office facilities is shown on Figure 2.1.

The office amenities are accompanied by car parking, water storage and sewage treatment facilities. The current car parking facilities comprise a visitor car park with 20 spaces and staff car parks with 180 spaces.

Rainwater is captured from the roofs of the office amenities and stored for use onsite. Water storage facilities include a number of rainwater tanks totalling up to 360 kilolitres of storage capacity. Sewage treatment facilities provide for the treatment of effluent collected from the office amenities and other buildings onsite. The sewage treatment facility is a rotating disc
packaged plant and has two effluent tanks of 90,000 litres each. The effluent is treated with ultra-violet prior to being pumped into an effluent retention tank. The effluent is disposed of onsite on lawns, gardens and a 10,000 square metre evapo-transpiration area.

**Research Facilities**

A number of research facilities approved under DA118/690/257 have been constructed onsite, including a research laboratory, mixing laboratory, research magazine and a test cell.

**Research Laboratory**

The research carried out at the laboratory primarily focuses on bulk and packaged explosives including:

- manufacture of pilot scale batches of experimental explosives for testing and market development;

- measuring the metering accuracy of pumps, augers and other devices used for conveying materials;

- measuring the efficiency and effectiveness of mixers and determining related effects on the quality of finished products; and

- testing and partial commissioning of mobile manufacturing units and other equipment.

The research laboratory site shown on Figure 2.1 is approximately 312 square metres in size. It comprises a two level laboratory building of approximately 23 square metres, accompanied by a chemical and spare parts store of 26 square metres.

The research laboratory includes facilities for the preparation of quantities of explosives and explosives precursors for use in various testing and experimental programs. The facilities include an oxidiser solution makeup and storage area, an ANS preparation area, a services and amenity area, and a mixing area. Oxidiser solution is an aqueous solution of chemicals that are oxidising agents. The raw chemicals utilised in the preparation of the oxidiser solution include ANS, sodium perchlorate, sodium nitrate, water and/or urea. Oxidiser solutions are created at the laboratory using one 10,000 litre tank and one 2,000 litre tank. The preparation of the solution involves oxidisers being dissolved in water. The other raw materials are delivered to the Technology Park in small quantities. The research laboratory currently produces up to 1800 litres of ANS for use each year, but has the capability of producing up to 3000 litres per day.

The oxidiser solution is combined with various fuel oils to create explosives precursors for use in testing in experiments undertaken at the research laboratory. Approximately 270 kilograms of ANE (a Class 5.1 dangerous good) and up to 600 kilograms of other Class 1.5/1.1 dangerous goods are currently produced at the laboratory for experimental use. The existing operations facilities have the ability to store up to 5 tonnes of Class 5.1 dangerous goods and 3 tonnes of Class 1.5/1.1 dangerous goods (only overnight).

The explosives and precursors produced are used for market development or utilised by the laboratory in storage trials, mixing tests and experiments testing the dispatch of materials to the end user and loading of materials from distribution vehicles to blast holes.
Mixing Laboratory

The existing mixing laboratory is located opposite the office amenities (refer to Figure 2.1) and is of a much smaller scale than the research laboratory. The analytical work undertaken at the laboratory focuses on testing the physical and chemical characteristics of emulsions and emulsion explosives.

Research Magazine

The research magazine utilised onsite is located to the south of Research Laboratory 1 (refer to Figure 2.1). The magazine has a capacity of up to 10,000 tonnes for the storage of explosives manufactured for research purposes. The research magazine is an igloo design with floor levels approximately one metre below ground level. The research magazine is buried under approximately one metre of earth.

Test Cell

A test cell is located to the south of the research magazine (refer to Figure 2.1). The test cell is an enclosed unit designed to determine the strength, velocity of detonation, sensitivity, and flammability of explosives and to also determine the principal reaction gases. The test cell contains a detonation chamber capable of accommodating the detonation of five kilograms charges and is designed to reduce noise and vibration to negligible levels. The test cell operates between 8:30 am and 5:00 pm on weekdays. The test cell also includes a detonator bed.

Support Facilities

The existing operations onsite also include an engineering depot and stores and a fenced compound (refer to Figure 2.1). The engineering depot is utilised for modifications and repairs to electronic and hydraulic equipment, minor maintenance work on equipment, development of new equipment and storage of parts. The site compound is utilised for the storage of general equipment.

Other Facilities Approved under DA118/690/257

A number of other facilities approved under DA118/690/257 have not been constructed. The approved activities are outlined below:

- an underwater test site;
- detonator magazine;
- a second research laboratory;
- two other minor research laboratories;
- production facilities for up to 7,000 tonnes per annum of packaged explosive, primers and AMEX (packaged ANFO); and
- numerous magazines.

Approval for the facilities outlined above is not sought as part of this Project Application.
2.1.1.2 DA118/698/53

DA118/698/53 was granted by Cessnock City Council in 1998 for the construction and operation of a quarry services depot. The quarry services depot is shown on Figure 2.1. The depot is utilised for the bulk storage of chemicals and includes a hard stand area. Heavy vehicles delivering bulk AN and ANE are directed to the depot for unloading. The bulk materials including AN and ANE are stored in above ground tanks.

The continued operation of the quarry services depot is sought as part of the Project Application.

2.1.1.3 DA8/2006/809/1

DA8/2006/809/1 allowed for the construction and operation of training and office facilities (refer to Figure 2.1). The additional 300 square metres of office space was constructed in addition to the office facilities approved under DA118/690/257. The continued use of the training and office facilities is sought as part of the Project Application.

2.1.2 Proposed ANE Production Facility

The proposed ANE production facility will be capable of producing up to 250,000 tonnes per annum (tpa) of ANE. The proposed ANE production facility will involve the construction of new infrastructure to the south of the existing infrastructure onsite, refer to Figure 2.2. The facility will occupy an area of approximately 12,000 square metres and will include a 1.2 kilometre access road (proposed ANE production facility disturbance area). The conceptual layout of the proposed ANE production facility is provided on Figure 2.3.

The proposed ANE production facility comprises of the following major components:

- ANS storage;
- weak ANS storage;
- acetic acid storage;
- caustic soda storage;
- thiourea storage;
- urea store and loading equipment;
- fuel storage;
- oxidiser solution batching;
- ANE manufacture;
- ANE surge capacity and loadout for export tankers;
- gasser and companion solution loadout;
- control room and quality control lab;
- utilities (compressed air, hot water, cooling water etc);
- process water and recycled water storage; and
- offices and amenities.
Legend
- Technology Park Boundary
- Proposed ANE Production Facility and Access Road


FIGURE 2.2
Existing Operations and Proposed ANE Production Facility
It is proposed that the facility will operate 24 hours a day, 7 days a week, depending on customer demand for ANE. The plant will incorporate an instrumented control system and will be designed for flexibility of operation.

The proposed ANE production facility will include a minimum 20 metre bushfire buffer zone. Further fire management controls will be incorporated in the building and infrastructure design.

2.1.2.1 Process Description

The process to manufacture emulsion is a semi-continuous blending process. The two main raw materials are oxidiser solution and a fuel oil/emulsifier blend. A process diagram of the ANE manufacturing process is provided on Figure 2.4. The four basic steps in the production of emulsion are outlined below.

Oxidiser Solution Preparation

Oxidiser solution is prepared by combining ANS and minor chemicals in a series of batch tanks. The insulated batch tanks are heated using circulating hot water. Batches of oxidiser solution are prepared by pumping quantities of ANS, recycled/imported or towns water, caustic soda, acetic acid as defined by the product recipe. Thiourea and urea are added via forklift and screw feeder if required. The batch is stirred and sampled for routine quality control testing. The oxidiser solution is cooled to the appropriate temperature inline as it is pumped to the ANE manufacturing area.

The details relating to the management, delivery and storage of the raw materials used in this process are outlined in Section 2.1.2.2.

Fuel Blend Preparation

The fuel oil blends are either created onsite or imported pre-blended. The raw materials utilised in the fuel oil blend include diesel, canola, paraffin, E25-66T (an Orica emulsifier) and SFBHPP90 (Orica pre-blend). These products are combined in-line for direct manufacture or combined in a blend tank for short term storage. The fuel oils are stored at ambient temperature and then blended and heated inline as they are pumped to the ANE manufacturing area.

ANE Manufacturing

ANE is formed by spray emulsification of oxidiser solution and fuel blend in a process commonly referred to as the ELK process. The freshly formed ANE is subsequently refined using static mixers. Two progressive cavity pumps are utilised, one pumps through the static mixers and the other to surge tanks or direct to a road tanker. The use of two pumps keeps ANE pressure lower, which is inherently safer, makes the sampling operation safer and extends the operating life of the pumps. The ANE manufacturing area has the capacity to produce ANE at a rate between 21 and 45 tonnes per hour.

ANE is a Class 5.1 dangerous good. The ANE is not classified as explosive until sensitised. The ANE is sensitised by a process of mixing and blending with other substances immediately prior to discharge into blast holes at the mine or quarry site.

ANE Storage

The ANE is either stored short term in surge tanks prior to distribution to customers or pumped directly to bulk road tankers. An overhead system will be provided for export tanker
FIGURE 2.4
ANE Manufacturing Process
loading. Production of ANE will be tailored to demand in order to minimise the quantities of ANE held in surge tanks prior to distribution.

2.1.2.2 Raw Material Delivery and Storage

A number of raw materials are utilised in the production of ANE, including ammonium nitrate solutions, fuel blend ingredients, thiourea, urea, acetic acid caustic soda and process water. All of the raw materials will be sourced from Orica’s Kooragang Island facility or from various other locations.

The delivery and storage of each raw material is outlined below.

**ANS and Weak ANS**

ANS and weak ANS will be delivered from Orica’s Kooragang Island facility and will be stored in three storage tanks. The ANS storage area will be bunded. Any spills and stormwater collected within the bunded area will be pumped to a storage tank for recycling. Stormwater will be tested for high ammonium nitrate concentration before pumping from the bund.

**Acetic Acid**

Acetic acid is used as a 75% aqueous solution, which is non-flammable. The acid will be delivered to the proposed ANE production facility by tanker and will be stored in a 33,000 litre storage tank in a dedicated bunded area.

Any minor spills during the unloading of acetic acid will be collected at a low point in the unloading bay. Stormwater collected in the bund will be tested for low pH prior to being pumped to a storage tank for recycling.

**Caustic Soda**

Caustic soda is used as a 50% aqueous solution. Caustic soda will be delivered to the proposed ANE production facility by tanker and will be stored in a 33,000 litre tank within a dedicated bund.

Any minor spills during the unloading of caustic soda will be collected at a low point in the unloading bay. Stormwater collected in the bund will be tested for high pH prior to being pumped to a storage tank for recycling.

**Thiourea**

Thiourea is an organic compound similar to urea and is used as a minor ingredient in oxidiser solution. Thiourea will be delivered and stored in bulk bags. The bags of dry thiourea will be stored in a bunded undercover area to prevent stormwater ingress. Any stormwater collected on the roof of the storage compound will be recycled as process water.

**Urea**

Dry urea will be delivered to the proposed ANE production facility in bulk bags and stored in an undercover, bunded area to prevent stormwater ingress.

**Fuels**

Fuels will be delivered to the proposed ANE production facility by tanker from various locations and will be stored in self bunded above ground storage tanks. The tanks for storage
will range from 64 kilolitres (kL) to 110 kL. Fuels will include distillate, Canola, D80 Paraffin and Orica pre-blend SFBHP90.

**Water**

The water required for the manufacturing process will be obtained from two sources, comprising:

- imported to the proposed ANE production facility by tanker, from the nearest towns water main; and
- recycled from rainwater tanks or treated stormwater captured in manufacturing or storage areas.

The average volume required from each source will be determined as part of the detailed design to be included in the EA.

**2.1.2.3 Waste Management**

The existing operations at the Technology Park generate a number of wastes including:

- water, including rainwater captured from buildings and waste water from the mixing laboratory;
- explosives waste;
- batteries;
- sewage; and
- general waste including cardboard, paper and glass.

The rainwater collected from all buildings within the existing operations is recycled as drinking water and fire water. The waste water from the mixing laboratory is tested prior to re-use onsite. As outlined in Section 2.1.1.1, sewage collected onsite is recycled and re-used on lawns and gardens, with excess amounts being used disposed of via an evapotranspiration area. Recyclable materials such as glass, paper and cardboard are recycled by specialist firms and batteries are recycled by a nominated metal recycler. Explosives waste is recycled in stemming material (material loaded behind the explosives in a blast hole).

Wastes which may be generated by the proposed ANE production facility include:

- contaminated stormwater collected within bunded areas;
- potential spills of the raw materials outlined in Section 2.1.2;
- waste oils and fuels from maintenance and fuel loading areas;
- clean stormwater captured from roofs of buildings;
- sewage from amenities at the office facilities and the control laboratory buildings; and
- general waste.

There are no waste products from the ANE manufacturing process apart from minor quantities of clean ANE collected during maintenance activities. This material is generally
recycled into the manufacturing process. Where this is not possible it is disposed of using an appropriately licenced waste disposal company.

Contaminated stormwater collected within bunded areas of the raw materials outlined in Section 2.1.2 will be tested for the relevant contaminant concentrations or chemical properties prior to being pumped to storage for recycling and inclusion in the process water used by the plant. The storage of all raw materials in discrete bunds is designed to prevent accidental mixing. This reduces the risk of having to treat or dispose of complicated effluent mixtures.

Potential spills of raw materials will be managed in accordance with the requirements for the substance. Depending on the raw material the contaminant concentrations or chemical properties will be tested accordingly prior to recovery of the material for reuse. Any minor spillage, which is not contaminated, can be re-used. Where reuse is not possible, the spill will be appropriately collected and disposed of by a licensed contractor.

All areas involving the storage or use of oils and fuels will be bunded. Any stormwater or spills captured within the bunded areas will be treated by an oil water separator, with the water being recycled and the waste oil being disposed of by a licensed contractor.

Depending on the volume of rainfall clean stormwater may be recycled as process water in the ANE manufacturing process. Smaller volumes of clean storm water will not be collected, but will be directed towards existing natural stormwater channels.

No empty drums will require disposal, as acetic acid and caustic soda will be delivered as bulk solutions. Empty bulk bags used for dry material storage will be disposed of appropriately.

The office facilities will contain toilet amenities. The effluent from the amenities will be treated by an Enviro-cycle system and recycled onsite. The control room/laboratory building will also contain toilet amenities. The effluent from the control room/laboratory will be pumped to the Enviro-cycle system for treatment.

2.1.2.4 Construction

Construction is expected to take up to 12 months. The proposed ANE production disturbance area will be cleared of vegetation and cut and fill will be balanced to minimise import or export of material. Road base will be imported as required.

Construction activities will generally be in the following sequence; laying of civil foundations, structural steel erection, equipment and piping installation and instrument and electrical installation. The proposed ANE production facility is well isolated from the existing operations at the Technology Park and will be a designated construction site. The area will be fenced off and the construction of the proposed ANE production facility will proceed under normal construction management and safety procedures.

Much of the equipment to be utilised in the proposed ANE production facility will be pre-fabricated offsite, including:

- cooling water system (based on air cooling);
- cooling water chemical dosing equipment;
- hot water generator;
- hot water chemical dosing equipment;
• air compressor and air drying system;
• urea and thiourea bag unloading equipment;
• all but the four largest tanks; and
• ANE manufacturing equipment.

Construction activities will require the use of a number of mobile cranes, welding machines, air compressors and heavy vehicles. It is expected that the proposed ANE production facility will be accessed by two to three delivery vehicles per day. During civil works, additional heavy vehicles will access the proposed ANE production facility to deliver the required volume of road base. Construction may be undertaken 24 hours a day, 7 days a week. Excessively noisy activities will be scheduled during daylight hours.

2.1.3 Workforce and Hours of Operation

The Technology Park currently has approximately 200 staff employed onsite. The operation of the proposed ANE production facility is expected to require 10 additional staff working 3 shifts to cover 24 hour periods. The operations positions are expected to be filled by existing Orica employees from other Orica operations in the region. The transportation of raw materials and product as part of the operations will utilise up to 58 drivers at peak production. The drivers and vehicles will not be based at the ANE Plant and are not considered to form part of the staff base at the Technology Park.

The proposed ANE production facility is proposed to operate up to 24 hours per day seven days per week, depending on customer demand.

It is estimated that approximately 30 staff will be utilised for construction. Construction may be undertaken 24 hours a day, 7 days a week over a period of up to 12 months.

2.1.4 Traffic and Access

The Technology Park is located on George Booth Drive, a state road maintained by the Roads and Traffic Authority (RTA). Access to the Technology Park is gained via a dedicated intersection between George Booth Drive and Echidna Drive, the internal site access road. The access road for the proposed ANE production facility will be connected to Echidna Drive via a round-a-bout (refer to Figure 2.2). The major transportation routes in relation to the Technology Park are shown on Figure 2.5.

Light vehicles accessing the Technology Park are expected to increase by approximately 10 per day. The Technology Park is currently accessed by up to 283 vehicles each weekday, excluding visitors and contractors.

All materials currently utilised by the existing operations are transported to the Technology Park by road. It is proposed to transport all raw materials for the proposed ANE production facility and all products from proposed ANE production facility by road. Raw materials will be delivered to the proposed ANE production facility from Kooralang Island and other locations, including Sydney. Trucks transporting raw materials from Sydney will travel via the F3 Freeway, John Renshaw Drive (also a state road) and George Booth Drive. Trucks will not access the Technology Park from the George Booth Drive exit on the F3 Freeway as the road traversing the Sugarloaf range is not suitable. Trucks transporting materials from Kooralang Island will access the Technology Park using the Pacific Highway for approximately 20 kilometres then continuing along John Renshaw Drive for approximately 12.4 kilometres and 2.5 kilometres down George Booth Drive.
ANE product will be delivered to Orica operations and customer sites in South Eastern Australia with most product used in the Hunter Valley. All deliveries are expected to be via road transportation. Trucks exporting product will travel to the Hunter Valley from George Booth Drive via John Renshaw Drive, Cessnock Road (through Kurri Kurri) and the New England Highway.

Approximately 23 heavy vehicles currently visit the Technology Park each day. The operation of the proposed ANE production facility will increase the number of heavy vehicles accessing the Technology Park each day by 58 during the week and by 46 on the weekends. These will be a mixture of articulated and B Double vehicles. The increase in heavy vehicles is associated with the delivery of the raw materials for the manufacture and the distribution of the ANE.

2.1.5 Utilities

Existing operations at the Technology Park are serviced by utilities such as electricity, water and sewerage. Additional utility connections will be required for the proposed ANE production facility.

Electricity will be supplied to the proposed ANE production facility from an existing 11 kV underground transmission line currently located onsite. The transmission line will need to be extended to the proposed ANE production facility, where a new transformer will be located. Orica will consult with the relevant authorities in relation to these works.

Potable water will continue to be imported by tanker. Process water is also to be imported by tanker. However the design of the proposed ANE production facility will incorporate the ability to capture stormwater from roofed areas and bunding for recycling and use as process water. Dilute effluent water will also be recycled and utilised as process water.

The office and amenities block at the proposed ANE production facility will have toilet facilities which will be serviced by an Enviro-cycle sewage treatment system. Effluent from toilet amenities in the control and quality control lab will be pumped to the office block for treatment by this system.

2.2 Alternatives and Justification

2.2.1 Alternatives

A number of alternatives to the proposed ANE production facility were considered during the project planning phase. Alternatives examined included:

- no development;
- the upgrade of an existing facility located at Liddell;
- construction of a new facility in the Upper Hunter Valley on a new site;
- localised production at customer sites;
- production at Orica’s Kooragang Island facilities; and
- the proposed Richmond Vale facility.

Further details relating to the alternatives examined will be provided in the EA.
2.2.2 Project Justification

Following the examination of alternative proposals, the Technology Park site was chosen as the best option for the construction and operation of the proposed ANE production facility because of the following advantages:

- located within the expanding south eastern region market for emulsion phase products;
- integration with Orica’s existing site;
- located in an area where there is sufficient suitable land for expansion;
- some established infrastructure and site services;
- located in an area which provides a good separation distance from residential areas;
- located in an area from which the required operating and maintenance workforce can be provided; and
- security of the proposed ANE production facility will be provided by a perimeter fence and integrating with the Technology Park’s existing security plan activities.

This option addresses the capacity and supply issues Orica faces in the next 10 years while utilising existing infrastructure and staff. The layout of the proposed ANE production facility will facilitate the safe movement of material inputs and outputs within the Technology Park, and will provide acceptable separation distances to existing site operations. Supply of product to customers and improved manufacturing efficiency will be secured by the Project, which will employ improved technologies and modern maintenance and spare parts management procedures.

The proposed upgrade is estimated to cost $35 million with at least 80 per cent of the Project budget spend within the local and national economy. The development is also likely to provide a boost to the local construction and engineering sectors. This is expected to benefit the Hunter Region by assisting in diversifying its economic base.

Further details of the justification for the Project will be provided in the EA.
3.0 Planning Considerations and Consultation

3.1 Planning Considerations

The proposed ANE production facility requires approval under Part 3A of the EP&A Act as it is of a class of development listed in Schedule 1 of SEPP (Major Projects) 2005. The listing in Schedule 1 of the SEPP (Major Projects) that applies to the Project is:

10 Chemical, manufacturing and related industries

   (1) Development that employs 100 or more people or with a capital investment value of more than $20 million for the purpose of the manufacture or reprocessing of the following (excluding labelling or packaging):

   (f) oils, fuels, gas, petrochemicals or precursors.

The proposed ANE production facility is estimated to have a capital investment of $35 million.

The Minister for Planning is the consent authority pursuant to Part 3A of the EP&A Act.

The land which is the subject of the Project Application is located wholly within Cessnock LGA. Under the Cessnock Local Environmental Plan (LEP) 1989, the land is zoned Rural 1(a). The land is subject to an exemption under the LEP which allows for the development within the Rural 1(a) zoning which would otherwise be incompatible. Clause 45 of the LEP states:

(1) Nothing in this plan prevents a person, with the consent of the Council, from carrying out development on land referred to in Schedule 5 for a purpose specified in relation to that land in that Schedule, subject to such conditions (if any) as are so specified.

Clause 5 of Schedule 5, of the LEP notes:

(5) Land fronting George Booth Drive, Richmond Vale, Parish of Stockrington, as shown edged heavy black on Sheet 1 of the map marked "Cessnock Local Environmental Plan 1989 (Amendment No 13) "-explosives research and production facility involving:

   (a) the construction and use of offices, laboratories and workshops for the purposes of research into, and development of, explosives and associated manufacturing processes, methods of application of explosives, related advanced engineering processes and blasting physics, and

   (b) the production, storage and testing of explosives.

The proposed ANE production facility is consistent with the activity description provided in Schedule 5 of the LEP and is therefore permissible.

In addition to approval under Part 3A of the EP&A Act, the Project may also require approvals under a number of additional Acts or assessment under State Environmental Planning Policies.

Under Section 75U of the EP&A Act, if the Project is granted project approval under Part 3A of the EP&A Act, the following approvals which may otherwise have been relevant, will not be required to carry out the Project.
Table 3.1 - Approvals Legislation Which Does Not Apply

<table>
<thead>
<tr>
<th>Act</th>
<th>Approval</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Heritage Act 1977</em></td>
<td>Disturbance to an item listed on State Heritage Register or Interim Heritage Order; Excavation permit.</td>
</tr>
<tr>
<td><em>National Parks &amp; Wildlife Act 1974</em></td>
<td>Preliminary research permit; consent to destroy relics.</td>
</tr>
<tr>
<td><em>Native Vegetation Act 2003</em></td>
<td>Authorisation to clear native vegetation or State protected land</td>
</tr>
<tr>
<td><em>Water Management Act 2000</em></td>
<td>Water use approval, water management work approval or activity approval.</td>
</tr>
</tbody>
</table>

If the Project is granted project approval under Part 3A of the EP&A Act, the following approvals, which will be required for the Project, must not be refused by the relevant approval authority and must be substantially consistent with the terms of the Project Approval.

Table 3.2 – Approvals Legislation to be Applied

<table>
<thead>
<tr>
<th>Act</th>
<th>Approval</th>
<th>Authority</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Protection of the Environment Operations Act 1999 (PoEO Act)</em></td>
<td>Environmental Protection Licence</td>
<td>Department of Environment and Climate Change</td>
</tr>
<tr>
<td><em>Roads Act 1993 (Roads Act)</em></td>
<td>Permit to impact on a public road</td>
<td>State Roads – Roads and Traffic Authority</td>
</tr>
</tbody>
</table>

The additional Acts and policies potentially relevant to this project are listed in Table 3.3 with an indication of any approvals likely to be required.

Table 3.3 – Potentially Relevant Legislation

<table>
<thead>
<tr>
<th>Planning Provision</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)</em></td>
<td>Two flora species listed in the EPBC Act have been recorded or potentially occur in the Technology Park and an assessment of the impact of the Project on these species is required. This assessment will be a component of the ecological assessment undertaken as part of the EA.</td>
</tr>
</tbody>
</table>

The ecological assessment for the EA has been completed. The assessment has found that the proposed ANE production facility will not have a significant impact on the EPBC listed species *Tetratheca juncea* and *Cryptostylis hunteriana*. Approval from the Commonwealth Minister for the Environment, Heritage and the Arts is not required for the Project.
### Table 3.3 – Potentially Relevant Legislation (cont)

<table>
<thead>
<tr>
<th>Planning Provision</th>
<th>Comments</th>
<th>Relevant Licences/ Approvals/Assessments</th>
</tr>
</thead>
</table>
| **Commonwealth Legislation**                                 | **Native Title Act 1993**  
The Commonwealth government enacted the *Native Title Act 1993* in response to the High Court of Australia decision in *Mabo v Queensland* (1992). The Act is administered by the National Native Title Tribunal (NNTT). The Act prescribes that native title can be extinguished under certain circumstances, including the granting of freehold land. Areas of land within the Technology Park where native title may not have been extinguished include public road reserves and Crown land. | The Technology Park does not contain any crown land however the Project may affect the public road reserve of George Booth Drive. There are currently no active NNTT applications in the Cessnock LGA.                                                                                                                                                                                                                                                                                   |
| **NSW Policies- State Environmental Planning Policies**       | **State Environmental Planning Policy 33 – Hazardous and Offensive Development**  
SEPP No. 33 requires the consent authority to consider whether an industrial proposal is a potentially hazardous industry or a potentially offensive industry. A hazard assessment is completed for potentially hazardous or potentially offensive development to assist the consent authority to determine acceptability of a Project. | A Preliminary Hazard and Risk Assessment will be undertaken for the Project as part of the EA process.                                                                                                                                                                                                                                                                                                                                  |
| **State Environmental Planning Policy 44 – Koala Habitat Protection** | SEPP No. 44 restricts a Council from granting development consent for proposals on land identified as core koala habitat without preparation of a plan of management.                                                                                                                                                                                                                                                                                                                                                                                   | A koala habitat assessment will be undertaken as part of the ecological assessment.                                                                                                                                                                                                                                                                                                                     |
| **State Environmental Planning Policy (Major Projects) 2005** | As discussed above, the Project is a class of development listed in the SEPP. The Project therefore requires approval under Part 3A if the EP&A Act and the Minister for Planning will be the consent authority.                                                                                                                                                                                                                                                                                                                                                                           | The Project will be assessed under Part 3A of the EP&A Act.                                                                                                                                                                                                                                                                                                                                   |
| **State Environmental Planning Policy (Infrastructure) 2007** | State Environmental Planning Policy (Infrastructure) 2007 establishes the Roads and Traffic Authority (RTA) as the sole traffic management authority to be consulted, and ensures that it is given the opportunity to make a representation on a development referred to in Schedule 3 of the SEPP.                                                                                                                                                                                                                                                                                                      | The Project is categorised as ‘Industry’ with a size or capacity of 20,000m² in area in Schedule 3 of the SEPP and is therefore classed as a ‘traffic generating development’. For this reason the Department of Planning will refer the Project to the RTA.                                                                                                                                 |
## Table 3.3 – Potentially Relevant Legislation (cont)

<table>
<thead>
<tr>
<th>Planning Provision</th>
<th>Comments</th>
<th>Relevant Licences/Approvals/Assessments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NSW Legislation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmentally Hazardous Chemicals Act 1985</td>
<td>Under the Environmentally Hazardous Chemicals Act 1985 a license is required for any storage, transport or use of prescribed chemicals. Should such a license be required under this Act during the life of the Project, Orica or the relevant sub-contractor will obtain a license prior to the storage, transport or use of prescribed chemicals.</td>
<td>A license will be required under this Act if any prescribed chemicals are proposed to be stored or used as part of the Project. Further details will be provided in the EA report.</td>
</tr>
<tr>
<td>Explosives Act 2003 &amp; OHS Amendment (Dangerous Goods) Act 2003</td>
<td>A person must not handle security sensitive dangerous substances (SSDSs) unless authorised to do so by a WorkCover approved license. Licenses cover activities such as manufacture, importation, supply, transport by vehicle or vessel, storage, blasting, pyrotechnics, fireworks, usage and unsupervised handling. Suppliers must record the particulars of all sales and must only supply security sensitive substances to licensed users.</td>
<td>The Project includes storage, transport and supply of SSDSs and as such may require an alteration to Orica’s existing WorkCover license.</td>
</tr>
<tr>
<td>Water Management Act 2000 (WM Act)</td>
<td>There is currently no Water Sharing Plan which applies to the land affected by the Project.</td>
<td>The Project will not require approval under the WM Act.</td>
</tr>
<tr>
<td>Water Act 1912</td>
<td>The licensing provisions of the Water Act still apply. The Water Act is administered by the Department of Water and Energy (DWE). Under the Act, a permit and/or licence must be obtained to extract surface water (Part 2 of the Act) or groundwater (Part 5 of the Act).</td>
<td>The Project will not involve the extraction of groundwater or surface water. No permit under the Water Act 1912 will be required.</td>
</tr>
<tr>
<td>Mine Subsidence Compensation Act 1961 (MSC Act)</td>
<td>The approval of the MSB is required for any construction within a mine subsidence district.</td>
<td>The land affected by the Project is not located within a mine subsidence district.</td>
</tr>
<tr>
<td>Threatened Species Conservation Act 1995 (TSC Act)</td>
<td>Under the EP&amp;A Act, impacts on threatened species listed under the TSC Act are required to be assessed.</td>
<td>All threatened species listed in the TSC Act potentially located within the proposed ANE production facility disturbance area will be assessed in the ecological assessment.</td>
</tr>
</tbody>
</table>
3.2 Authority Consultation

The authority consultation process for the Project has commenced with an initial briefing meeting held with Department of Planning (DoP) on 23 January 2009.

The next phase of the consultation process is the lodgement of a Project Application and this Preliminary EA with DoP. Following lodgement of these documents, DoP will distribute the Preliminary EA to all relevant agencies seeking their comments and requirements for consideration during the preparation of the EA for the Project. Based on consultation with DoP, it is understood that a planning focus meeting is unlikely to be called for the Project.

In addition to DoP, the key agencies for this Project will be:

- Cessnock City Council
- Department of Environment and Climate Change (DECC);
- Roads and Traffic Authority.

It is envisaged that there will be ongoing consultation with these authorities and other relevant organisations as required throughout the environmental assessment process.

3.3 Community Consultation

A community consultation strategy has been developed for the Project and will include consultation with land owners and residents in the immediate locality and services providers such as Hunter Water and Energy Australia. Eighteen private residences are located within two kilometres of the Technology Park boundary. The locations of the surrounding residents are shown on Figure 3.1.

Consultation with the above stakeholders, as well as any others identified during preparation of the consultation strategy, will be ongoing throughout the environmental assessment process, ensuring clear identification of issues, feedback on the findings of the EA and identification of appropriate community and environment management measures to be incorporated in the Project.
4.0 Preliminary Environmental Assessment

4.1 Environmental and Community Context

4.1.1 Land Ownership and Land Use

The Technology Park is located on Lot 2, DP 809377, which is wholly owned by Orica. As shown on Figure 3.1, the surrounding landholders comprise private landholders, government owned land and commercial landholders. Eighteen private residences are located within two kilometres of the Technology Park boundary. The nearest residential property is approximately 1.8 kilometres from the proposed ANE production facility (refer to Figure 3.1). The closest townships to the Technology Park are Kurri Kurri, approximately five kilometres to the north-west and Seahampton, approximately four kilometres to the south-east of the Technology Park.

Commercial land users in the surrounding area include Coal and Allied land located to the north-east and east of the Technology Park and a poultry farm approximately 1.3 kilometres to the north of the Technology Park. The Tasman Underground Mine mining lease adjoins the southern boundary of the Technology Park. The entrance to the surface facilities for Tasman Underground Mining is located approximately 3.5 kilometres to the east of the Technology Park on George Booth Drive.

The future F3 to Branxton link is to be located to the north of George Booth Drive. The future link may provide an alternative transport route for heavy vehicles to the Technology Park if constructed. A corridor of government owned land which would be used for the F3 to Branxton link is shown to the north of the Technology Park on Figure 3.1.

The Sugarloaf State Conservation Area borders the Technology Park directly to the south.

4.2 Preliminary Environmental Risk Analysis

To assist in identifying the key environmental and community issues that require further assessment, a preliminary environmental risk analysis has been completed for the Project and is included in Appendix 1. Environmental risks have been categorised as low, medium, high or extreme. The method used for the environmental risk analysis encompassed the following key steps:

1. establish the context for the risk analysis process;
2. identify environmental and community aspects and potential risks;
3. analyse risks; and
4. evaluate risks to determine the key issues requiring further assessment.

As shown in Appendix 1, the activities are rated as low, medium or high level risks. It is expected that with the completion of further studies and assessment as outlined in Section 4.3, the high level risks will be reduced to medium level risks or lower, due to better definition of potential impacts and effective implementation of management and mitigation measures. The scope of further assessment required for these issues as part of the EA is discussed in further detail in Section 4.3. Where appropriate, the proposed controls contained in the preliminary environmental risk analysis will be detailed in the EA and included in the draft Statement of Commitments. No further assessment is considered
necessary for some potential environmental issues as indicated in Appendix 1. The key environmental issues for the Project are outlined in Section 4.3.

The potential key environment and community issues identified as requiring further detailed assessment in the EA for the Project are:

- loss of threatened native flora and fauna;
- disturbance of Aboriginal places or objects;
- generation of traffic;
- degradation of noise amenity;
- transportation, storage and use of hazardous materials; and
- emission of greenhouse gases.

The scope of the further assessments required for these issues is discussed in further detail in Section 4.3. Where appropriate, the proposed controls contained in the preliminary environmental risk analysis will be considered and refined in the detailed investigations and in the draft Statement of Commitments in the EA.

4.3 Key Environmental and Community Issues

The key environment and community issues for the Project have been determined through the preliminary environmental risk analysis discussed in Section 4.2. These issues are discussed further in the following sections, including a description of the proposed assessment methodology. The assessment of these issues will form the impact assessment section of the EA prepared for the Project.

4.3.1 Ecology

Loss of threatened native flora and fauna has been identified as a key issue for the Project as there is a high potential for threatened and endangered species or communities to occur within the Technology Park. An ecological assessment is currently being undertaken to identify any potential impacts to threatened and endangered species or communities that may occur. The ecological study is being prepared in accordance with the requirements of the Threatened Species Conservation Act 1995 and the Environment Protection and Biodiversity Conservation Act 1999. The initial results of the ecological assessment (Umwelt, in prep) are outlined below.

4.3.1.1 Survey and Assessment Results

The field survey completed for the ecological assessment revealed that the proposed ANE production facility disturbance area contains the threatened ecological community Lower Hunter Spotted Gum – Ironbark Forest (as listed under the TSC Act) (refer to Figure 4.1). The Lower Hunter Spotted Gum-Ironbark Forests within the Cessnock-Kurri Kurri area are of state significance for the nationally endangered Swift Parrot. The preliminary results from the ecological assessment indicated that the community is unlikely to be significantly impacted due to the small area that will be affected and the relatively large area of the community currently protected in reserves.
Three threatened fauna species were detected during the ecological survey: large-footed myotis (*Myotis adversus*); yellow-bellied glider (*Petaurus australis*) and the little bent-wing bat (*Miniopterus australis*). One threatened flora species, *Tetratheca juncea*, was detected during the ecological survey. The threatened species locations are shown on Figure 4.1. A number of threatened species have potential to occur in the proposed ANE production facility disturbance area but were not recorded during the field survey: squirrel glider (*Petaurus nofolcensis*), powerful owl (*Ninox strenua*) and leafless tongue-orchid (*Cryptostylis hunteriana*). The field survey did not record the Swift Parrot. The assessment has determined that the proposed ANE production facility disturbance area does not provide suitable habitat for the Swift Parrot and there is no potential for it to occur. An assessment of significance will be included in the ecological assessment to assess the potential impact of the proposed ANE production facility on threatened species, populations or communities, or their habitat, however the initial results of the ecological assessment indicate that the impacts are unlikely to be significant.

### 4.3.1.2 Proposed Assessment Methodology

The objectives of the ecological assessment currently in preparation are to:

- document the terrestrial flora species, vegetation communities and fauna habitats occurring within and adjacent to the study area;
- identify the presence of, or potential presence of, threatened species, endangered populations or threatened ecological communities (TECs) listed under the relevant NSW and Commonwealth legislation; and
- undertake an assessment of the significance of likely impacts from the proposed ANE production facility on threatened species, populations and ecological communities using the assessment criteria specified in the EP&A Act and EPBC Act.

The ecological assessment will include a detailed account of the methods employed for the Project, the results of the field surveys and literature review, a discussion of threatened species, endangered populations and TECs with potential to occur within the proposed ANE production facility disturbance area, an assessment of significance to determine the impacts of the Project on any significant ecological values and recommended impact mitigation measures for the Project where required.

### 4.3.2 Aboriginal Archaeology

Disturbance of Aboriginal places or objects has been identified as a potential key issue for the Project. There are a number of sites listed on the DECC Aboriginal Heritage Information Management System (AHIMS) database located in the area surrounding the Technology Park (refer to Figure 4.2), however there are no AHIMS listed sites located within the site boundary of the Technology Park.

An Aboriginal archaeology assessment of the Technology Park has been undertaken previously as part of the 1991 Environmental Impact Statement titled ‘Mining Services Technology Park Environmental Impact Statement’ (1991 EIS) by Mitchell McCotter. The assessment did not identify any Aboriginal places or objects.

An Aboriginal archaeology assessment is currently in preparation for the proposed ANE production facility.
4.3.2.1 Survey Results

The survey for the Aboriginal archaeology assessment was completed on 8 January 2009 with the relevant Aboriginal stakeholders. No Aboriginal places or objects were located during the survey.

4.3.2.2 Proposed Assessment Methodology

An Aboriginal archaeology assessment will be completed for the Project. The assessment will involve the following:

- preparation of a review of relevant archaeological and cultural heritage literature, including a search of AHIMS, the Australian Heritage Database (which includes Commonwealth and National Heritage lists) and the Register of the National Estate for listed sites within or adjacent to the Technology Park;
- undertaking a Native Title search;
- development of an Indigenous community participation strategy in association with Indigenous groups to be implemented throughout the remainder of the Project;
- consultation with Aboriginal stakeholders to DECC standards;
- obtaining comment on the Aboriginal significance (provided by the Aboriginal stakeholder groups) of the sites/Potential Archaeological Deposits (PADs) (if found) for inclusion within the report;
- preparation of a discussion of past environmental factors which may influence the likelihood of sites being present within the proposed ANE production facility disturbance area;
- preparation of a predictive model for site location within the proposed ANE production facility disturbance area;
- a field inspection of the proposed ANE production facility disturbance area with identified Aboriginal stakeholders to identify sites/PADs which may be of archaeological significance/cultural heritage value (completed on 8 January 2009);
- recording any new sites (if found) on DECC (NPWS) standard recording forms and submitting to the DECC AHIMS site register, and recording any artefacts located within the sites to DECC standards;
- preparation of an assessment of the archaeological significance of the sites/PADs (if found), according to established significance assessment criteria outlined by DECC (NSW NPWS Guidelines 1997);
- preparation of a statement of the likely effect of the proposed ANE production facility on any sites/PADs discovered, known or predicted within the proposed ANE production facility disturbance area and whether further investigation is warranted;
- preparation of a draft report in relation to the findings of the survey and assessment process that provides clear guidance in relation to the significance of the sites/PADs (if any) and identifies requirements related to their preservation, further investigation and/or destruction. The report will include relevant plans and diagrams, and will clearly identify the best management options from an Aboriginal and archaeological perspective;
• provision of the draft report to the Aboriginal stakeholder groups for their written comment;
• incorporating the comments of the Aboriginal stakeholder groups into the report; and
• finalising the report for inclusion in the EA.

Aboriginal Stakeholder Group Consultation

Aboriginal stakeholders are the principal determinants of the significance of their heritage (DEC, 2004), and therefore the consultation process to be implemented as part of the Project will reflect the importance of Aboriginal stakeholder involvement in the identification, assessment and management of Aboriginal heritage objects/places. Specifically, the process will ensure that Aboriginal stakeholders have the opportunity to contribute to the assessment outcome through:

• involvement in the design of the methodology for the cultural heritage assessment;
• participation in the identification of Aboriginal archaeological sites through involvement in fieldwork;
• assessing the cultural significance of archaeological sites identified, and providing input on the cultural values of the area in general;
• identifying the impact of proposed ANE production facility on sites/areas of cultural heritage significance;
• contributing to the development of cultural heritage management recommendations; and
• providing comment on draft assessment reports prior to their submission.

Involvement of Aboriginal stakeholders throughout this assessment has proceeded in accordance with the Interim Community Consultation Requirements for Applicants (DEC 2004), which took effect on 1 January 2005.

4.3.3 Historic Heritage

As part of initial investigations, a review of the relevant planning instruments and historic heritage databases has been undertaken. The review included the:

• Cessnock Local Environmental Plan 1989;
• Hunter Regional Environmental Plan 1989;
• Australian Heritage Database;
• State Heritage Register; and
• State Heritage Inventory.

The Technology Park does not contain any listed heritage items. Richmond Main Colliery, located approximately 3 kilometres to the west of the Technology Park is the only item in the area which is classified by the National Trust. The Richmond Vale Railway Tunnel listed under the Hunter Regional Environmental Plan 1989 lies under George Booth Drive about 580 metres west of the Technology Park boundary. The tunnel forms part of the Richmond Vale Railway which operates on the north side of George Booth Drive. As George Booth
Drive is an approved heavy vehicle route, it is not anticipated that the traffic movements from the proposed ANE production facility would have any impact on the railway tunnel.

No further sites were identified within the proposed ANE production facility disturbance area during the field survey conducted for the Aboriginal archaeology assessment.

It is considered that further assessment of historic heritage is not required as part of the EA.

### 4.3.4 Traffic and Access

The generation of traffic and potential impact on traffic conditions and other road users is considered to be a potential key issue for the Project. The existing operations at the Technology Park currently generate approximately 283 vehicle movements per day. The majority of the vehicle movements are light vehicles including site personnel, visitors, deliveries and contractors, with 23 heavy vehicles accessing the Technology Park on a daily basis.

As outlined in Section 2.1.4, road transport will be used for all deliveries to the proposed ANE production facility and for the export of the product from the proposed ANE production facility to the Hunter Valley.

The primary road network which services the Technology Park includes:

- George Booth Drive;
- John Renshaw Drive/Lang Street/Main Road/Cessnock Road; and
- Echidna Drive (Orica internal site access road).

The proposed ANE production facility at full capacity, is predicted to generate approximately 58 heavy vehicle movements per day and approximately 10 light vehicle movements per day.

Construction traffic is expected to consist of two to three heavy vehicles a day as well as light vehicle movements associated with up to 30 contractors.

### 4.3.4.1 Proposed Assessment Methodology

A detailed Traffic Impact Assessment will be undertaken in accordance with the RTA’s Guide to Traffic Generating Development to assess potential impacts caused by traffic generated by the Project. The assessment will consider the potential impact of the Project on the primary road network outlined above and will include:

- an assessment of the existing road networks and existing traffic volumes using the road network, including road widths, intersection treatments, compliance with current standards, existing traffic volumes and vehicle classification using the road network;

- an assessment of the adequacy of intersections and the general traffic routes to accommodate the proposed increase in vehicle numbers; and

- an assessment of the traffic and transport impacts during both the construction and operational phases of the Project including:
  - level of service on the road network;
  - physical condition of the roads related to the Project including capacity of the networks;
road safety issues;
impacts of the Project on the road network;
an assessment of the validity and magnitude of any road maintenance contributions that may be sought to be levied on the Project;
potential cumulative impacts associated with the Project, Tasman Mine and/or other projects in the area; and
potential mitigation measures.

The assessment will not include an assessment of the potential traffic impacts on the New England Highway, Pacific Highway and F3 Freeway as it is considered that the traffic generated by the Project will form a very small proportion of the existing traffic on these roads.

4.3.5 Noise

Degradation of noise amenity has been identified as a potential issue for the Project. An assessment of noise generated by the proposal will be required and will include noise generated by the Project and any noise generated by traffic associated with the Project. The assessment will be prepared in accordance with the NSW *Industrial Noise Policy* (INP).

The land surrounding the Technology Park includes a number of privately owned properties. The nearest residential property is approximately 1.8 kilometres from the proposed ANE production facility (refer to *Figure 3.1*). The majority of the private residences are located along George Booth Drive. Heavy vehicles transporting raw materials to the Technology Park and exporting ANE from the Technology Park will utilise George Booth Drive (refer to *Section 2.1.4*). The proposed ANE production facility will operate 24 hours a day, 7 days a week, including the transportation of materials. Potential sources of noise during the operation of the proposed ANE production facility include:

- traffic;
- compressors;
- extraction fans; and
- pumps.

Given the distance to the nearest residential property and the existing background noise level associated with vehicle traffic along George Booth Drive, noise is considered to be unlikely to be a significant issue for the Project.

4.3.5.1 Proposed Assessment Methodology

A detailed noise impact assessment will be completed for the construction and operational phases of the Project in accordance with the INP. The assessment will include:

- identification of the nearest potentially affected residential receivers and the noise-sensitive localities to the facility;
- designing and conducting a background noise monitoring program to quantify the existing background and ambient noise levels. The determination of existing noise levels will be undertaken in accordance with the INP guidelines for low noise risk development;
- assessment of the existing noise environment;
• determining the construction noise criteria and Project specific noise levels that are relevant to the Project;

• determine the road traffic noise level criteria for traffic movements on George Booth Drive based on the existing noise levels;

• prediction of noise emissions for the construction and operational phases of the Project and calculation of the noise levels at the nearest potentially affected residential receivers and noise-sensitive localities, using a computer generated noise model;

• comparison of the predicted noise levels with the construction noise criteria, Project specific noise levels and traffic noise level criteria and assessment of impacts in accordance with the Environmental Noise Control Manual for the construction activities and the INP for the operational activities;

• consideration of feasible and reasonable noise mitigation strategies where criteria are exceeded and any recommendations relating to noise monitoring and management; and

• assessment of cumulative noise impact of the Project and other relevant nearby industrial operations including Tasman Mine.

The noise assessment to be included in the EA will consider the potential impact of the Project on road noise along George Booth Drive. The assessment will not include the broader road network (John Renshaw Drive, New England Highway, Pacific Highway and the F3 Freeway) as it is considered that the number of vehicles generated by the Project will form only a very small percentage of the existing traffic along these roads.

4.3.6 Hazard and Risk

A Preliminary Hazard Analysis (PHA) will be undertaken to confirm whether or not the Project is a potentially hazardous or offensive industry in accordance with State Environmental Planning Policy No. 33 – Hazardous and Offensive Development (SEPP 33).

The PHA will be undertaken in accordance with the following DoP documents: Applying SEPP 33 for Hazardous and Offensive Development Application Guidelines; Multi Level Risk Assessment; Hazardous Industry Planning Advisory Paper No. 6 – Guidelines for Hazard Analysis; Australian Standard AS/NZS 4360:1999 – Risk Management; and Hazardous Industry Planning Advisory Paper No. 4 – Risk Criteria for Land Use Safety Planning.

The assessment will include:

• identification of possible risks and causes of potentially hazardous incidents associated with proposed storage, handling and processing facilities;

• an assessment of the consequences of events identified;

• a qualitative estimation of the likely frequency of occurrence of identified scenarios;

• consequence/likelihood quantification of the most relevant hazardous incidents;

• estimation of the overall risk (depending on statutory authority requirements);

• assessment of cumulative risk levels and safety implications for surrounding land uses;
• identification of appropriate safeguards and procedures, which may be employed in the storage, handling and use of hazardous materials in order to minimise risk to the workforce and adjacent community;

• an outline of all operational and organisational safety controls; and

• evaluation of the adequacy of safeguards against identified risk levels.

4.3.7 Greenhouse Gas

A Greenhouse Gas and Energy Assessment (GHGEA) will be undertaken as part of the EA to determine projected energy consumption, energy production (if applicable), and greenhouse gas (GHG) emissions as a direct and indirect result of the Project. The GHGEA will include an assessment and analysis of Scope 1, Scope 2 and Scope 3 emissions.

Scope 1 covers direct emissions from the combustion of fuels (for example, diesel) and industrial processes within the boundary of the Project;

Scope 2 covers indirect emissions from the Project’s consumption of purchased electricity that is produced by another organisation; and

Scope 3 includes other indirect emissions as a result of the Project’s activities that are not from sources owned or controlled by the organisation or involve the offsite transportation (for example, road transportation) of the product.

A defined Full Energy and Greenhouse Life Cycle Analysis of the Project will be assessed. The assessment will also determine the Project’s contribution to potential climate change impacts and will provide recommendations of management and mitigation methods for the Project if required.

While the proposed ANE production facility will result in additional energy consumption and will generate GHG emissions, Orica is an industry leader in developing energy and greenhouse mitigation practices and implementing energy efficiency measures. The GHGEA and subsequent management and mitigation methodology will therefore be aligned with Orica’s existing Sustainability Policy, Energy Efficiency Opportunities (EEO) participation and corporate National Greenhouse and Energy Reporting System (NGERS) reporting considerations.

4.4 Other Environmental and Community Issues

4.4.1 Air Quality

Degradation of air quality has not been identified as a key issue for the Project. The existing operations at the Technology Park have limited impacts on air quality. All roads and parking facilities within the Technology Park are sealed. Exposed areas of land such as fire breaks are grassed. The operation of the mixing laboratory results in the emission of extremely small amounts of vapour from the fumehood. The 1991 EIS determined that these emissions would not be detectable as a result of atmospheric dilution.

The access road and pavement area of the proposed ANE production facility will be sealed and will not result in the emission of dust during operations.

Minor amounts of acetic acid vapour will be expelled from the storage tank during filling. A tank breather will be installed at a suitable height to safely dissipate the vapour. The diesel
fired hot water generator will also generate small amounts of exhaust emissions and will require an exhaust stack to be installed to the minimum statutory height or higher.

The construction phase of the proposed ANE production facility is likely to result in the short term minor emission of dust as a result of the operation of machinery. The nearest sensitive receptor is located approximately 1.8 kilometres from the proposed ANE production facility. The area to be cleared is relatively small, and based on the distance to the sensitive receptors it is considered unlikely that the construction of the proposed ANE production facility will result in a significant impact on air quality. Dust controls will be implemented during construction to minimise dust emissions and will include:

- minimisation of clearing to the minimum necessary area;
- prompt rehabilitation of disturbed land; and
- watering of disturbed areas.

With the above controls in place the potential impact of the proposed ANE production facility on air quality is expected to be minimal.

A qualitative assessment of potential air quality impacts will be undertaken to assess potential air quality impacts on nearby residents. It is proposed that the assessment will determine the need for any mitigation or management measures to be implemented to minimise any potential air quality impacts.

4.4.2 Water Resources

4.4.2.1 Surface Water

The impact on surface water resources was not identified as a key issue for the Project. The Technology Park is traversed by two tributaries. The tributaries flow north to meet Surveyors Creek, which is located on the northern side of George Booth Drive, refer to Figure 4.3. Surveyors Creek is part of the larger Wallis Creek catchment, which flows into the Hunter River downstream of Maitland. It is expected that with the appropriate management controls, the Project will have minimal impact on surface water features.

An assessment of the potential impacts of the Project on surface water resources and recommended mitigation measures will be included in the EA. Proposed mitigation measures will be recommended for construction of the proposed ANE production facility as well as operational controls. As the proposed ANE production facility will involve the storage and processing of a number of hazardous chemicals, detailed pollution control and spill containment measures will be developed and described in the EA. The EA will include an outline of the following:

- a proposed drainage concept plan for the proposed ANE production facility including:
  - clean and process water systems;
  - system segregation;
  - treatment requirements;
  - flow paths and potential detention capabilities within the surrounding landform;
  - contaminated and first flush water detention requirements;
  - dust suppression requirements; and
  - water sourcing and disposal options;
• a review of the Project with respect to the impact on the local drainage system;
• any potential constraints on the proposed ANE production facility associated with the local drainage system and the impact of design storm events;
• identifying measures to maintain the existing stormwater quality and the management of stormwater runoff from the Project;
• assessment and documentation of the impacts of the Project on:
  ▪ process area water management;
  ▪ flooding detention/retention requirements;
  ▪ water quality; and
  ▪ management and mitigation measures.

4.4.2.2 Groundwater

Impacts on groundwater was not identified as a key issue for the Project. The interaction of the Project with groundwater is expected to be minimal. The Project will not require the extraction of groundwater for water use or any other purpose. A qualitative assessment of potential impacts on groundwater will be included in the EA. The assessment will include an outline of the appropriate management controls for the Project which will be implemented to prevent groundwater contamination from the substances stored onsite and the process areas.

4.4.3 Waste Management

Waste management was not identified as a key issue for the Project. Appropriate management controls for the recycling and management of waste will be implemented at the Technology Park. Section 2.1.2.3 provides an outline of the existing waste management practices at the Technology Park. Orica operates a number of production facilities throughout Australia and has standard waste management controls which optimise the reuse of residual raw materials or raw material spills.

As outlined in Section 2.1.2.3, the proposed ANE production facility is likely to produce the following wastes:

• potentially contaminated stormwater collected within bunded areas;
• potential for limited volume spills of the raw materials outlined in Section 2.1.2;
• waste oils and fuels from maintenance and fuel loading areas;
• clean stormwater captured from roofs of buildings;
• sewage from amenities at the office facilities and the control laboratory buildings; and
• general waste.

There are no waste products from the ANE manufacturing process.
The EA will address specific controls for the effective management of the wastes outlined above. Primary management controls will include:

- recycling of raw material, ANS and ANE spills;
- treatment of hydrocarbon contamination using oil water separators followed by the recycling of treated water and the appropriate disposal of waste oil by appropriately licenced waste contractors;
- the operation of a new enviro-cycle sewage treatment facility at the proposed ANE production facility;
- recycling of potentially contaminated water as part of the process water system and the appropriate disposal of water which is not suitable for reuse;
- recycling of product packaging; and
- the management of general waste.

4.4.4 Visual Amenity

Degradation of visual amenity was not identified as a key issue for the Project. A preliminary visual assessment has been completed for the Project to determine the requirements for further assessment. The results of the preliminary visual assessment are outlined below.

4.4.4.1 Preliminary Assessment Results

Dominant land uses surrounding the Technology Park include the Sugarloaf State Conservation Area, rural residential properties, John Renshaw Drive and George Booth Drive, a poultry farm and Tasman Mine. The Technology Park is densely vegetated with some existing buildings and a 132 kV power transmission line running through the north east corner of the Technology Park, refer to Figure 2.2.

The 1991 EIS included a visual assessment of the Technology Park development. The visual catchment for the Technology Park identified by the assessment ranged from the ridgelines located to the north east of Surveyors Creek, and the Sugarloaf Range to the south and east. The tallest building to be constructed as part of the Technology Park was a storage hopper, with a height of 16 metres. The building would have been located within the Production Area, which has not been constructed (refer to Section 2.1.1.1).

The 1991 visual assessment concluded that the Technology Park would not have any visual impact on the immediate area (defined as a two kilometre radius around the Technology Park) or the visual catchment (extending to a four kilometre radius around the Technology Park). The viewing distance, acute angle of vision from the viewpoints in the visual catchment and the height of existing trees were the primary reasons for the Technology Park not having any visual impact.

A field survey of potential viewpoints surrounding the Technology Park was undertaken as part of the preliminary assessment. The existing office amenities facilities, located approximately 350 metres south of George Booth Drive, were not visible from the road due to the heavy vegetation. Echidna Drive (the Orica access road) is visible for approximately 100 metres from George Booth Drive. No other infrastructure is visible through the heavy vegetation. The immediate area surrounding the Technology Park is still heavily vegetated. The field survey confirmed that the viewing catchment and key features identified in the 1991 visual assessment have remained unchanged.
The nearest residents to the Technology Park boundary are located approximately 500 metres to the north-west of the site (refer to Figure 3.1), the nearest resident to the proposed ANE production facility is approximately 1.8 kilometres to the north-west. The Technology Park is not visible from the residences.

The tallest building to be constructed as part of the proposed ANE production facility will be the ANE storage and load out tanks at a height of 14 metres. The ecological survey completed for the EA confirmed that the Technology Park has an average tree height of 16 to 20 metres. As the average tree height of the Technology Park is at least two metres higher than the ANE storage and load out tanks, it can be concluded that the proposed ANE production facility would not appear above the tree line and would not be visible from any sensitive receptors or view points in the viewing catchment surrounding the Technology Park.

Based on the results of the visual assessment completed for the Technology Park in 1991 and the preliminary visual assessment conducted for the Project, it is considered that the Project will not result in any visual impact and that further assessment of visual impacts is not required for the Project.

4.4.5 Fire

The Technology Park is located within a bushfire prone area. The existing operations at the Technology Park are undertaken in accordance with an existing Fire Management Plan. The Fire Management Plan includes:

- compliance with separation distances for explosive facilities and buffer zones between the existing operations and neighbouring properties;
- hazard reduction burns in coordination with the NSW Rural Fire Service to maintain adequate asset protection zones;
- monitoring of the fire and emergency evacuation facilities by the NSW Fire Brigade 24 hours a day, 7 days a week;
- appropriate fire detection and management systems including restrictions on hot work and the use of open flames, designated smoking areas, fire hose reels and hydrants; and
- a dedicated fire water supply of 160,000 litres.

The conceptual design of the proposed ANE production facility has been developed with a focus on the needs for fire management. The overall layout of the proposed ANE production facility has been based on providing for best practice separation distances between materials. The following fire management controls will be implemented for the Project:

- appropriate design of fuel storage areas, including all areas being constructed in accordance with AS1940 – 2004 The storage and handling of flammable and combustible liquids;
- minimisation or elimination of combustible materials on site (including structural, packaging etc) except for fuels required as process raw materials;
- appropriate placement of infrastructure associated with fire risk such as fuel storage areas in relation to other infrastructure onsite;
• suitable design to prevent accidental mixing of substances in the event of a catastrophic incident;
• provision of adequate fire fighting facilities;
• a suitable fire buffer surrounding the facility; and
• adequate access for fire fighting purposes.

The EA will provide a detailed outline of the fire management controls to be implemented at the facility. The EA will consider the requirements of the Rural Fires Service Guidelines ‘Planning for Bushfire Protection 2006’ however it is acknowledged that these guidelines are for residential, rural residential, rural and urban areas and do not apply directly to the Project.

4.4.6 Cumulative Impacts

Potential cumulative impacts will be assessed and detailed in the EA and considered as part of relevant specialist studies to be completed for the EA. This will ensure that the potential impacts on the surrounding area are fully considered. The following studies will consider cumulative impacts:

• traffic – including traffic associated with the proposed ANE production facility, existing Orica operations and other traffic on the local road network (including traffic from other projects in the area such as Tasman Mine);
• noise – including noise generated by the existing operations at the Technology Park, the noise generated by the proposed ANE production facility and existing background noise;
• hazard and risk – including the suitability of the current hazard and risk management of the existing operations; and
• greenhouse and energy – including consideration of the existing operations.
5.0 Conclusion

This document provides an overview of the environmental issues associated with the Project. The following issues will be assessed as part of the EA of the Project:

- ecology;
- Aboriginal archaeology;
- traffic;
- noise;
- hazard and risk;
- water resources;
- waste management;
- air quality;
- bushfire risk; and
- greenhouse gas and energy management.

The following issues are not considered to be issues for the Project and are not proposed to be further assessed in the EA for the Project:

- historical heritage;
- groundwater; and
- visual amenity.

A summary of the results of the review of these issues will be included in the EA.
6.0 Project Schedule

Based on current project timing, Orica intends to lodge the EA following the receipt of the Director-General's requirements. Pending approval of the project Orica is seeking to commence construction in 2009, with a view to commencing operation of the ANE facility in late 2010.
7.0 References


Umwelt (Australia) Pty Ltd (in prep.) Ecological Impact Assessment, Proposed ANE Production Facility, Orica Mining Services Technology Park, Richmond Vale, NSW.
APPENDIX 1

Preliminary Environmental Risk Analysis
Appendix 1 – Preliminary Risk Assessment

Qualitative Risk Assessment Criteria

The qualitative risk assessment criteria have been developed to identify key risks to the environment, society, heritage and business reputation. The criteria are based on a risk assessment matrix consistent with Australian Standard AS4360 on Risk Management (AS4360). The qualitative assessments of risk severity and likelihood (refer to Tables 1.1 to 1.3) were used to help provide a general assessment of the risks to the environment and community. The overall risk level was determined by using the matrix in Table 1.3.

Table 1.1 - Qualitative Measures of Environmental Consequence

<table>
<thead>
<tr>
<th>Severity Level</th>
<th>Natural Environment</th>
<th>Legal/Government Heritage</th>
<th>Community / Reputation/Media</th>
</tr>
</thead>
<tbody>
<tr>
<td>(2) Minor</td>
<td>Minor effects on biological or physical environment. Minor short-medium term damage to small area of limited significance.</td>
<td>Minor legal issues, non-compliances and breaches of regulation. Minor prosecution or litigation possible. Significant hardship from regulator.</td>
<td>Minor medium-term social impacts on local population. Could cause first aid injury to people. Minor, adverse local public or media attention and complaints.</td>
</tr>
<tr>
<td>(3) Moderate</td>
<td>Moderate effects on biological or physical environment (air, water) but not affecting ecosystem function. Moderate short-medium term widespread impacts (e.g. significant spills).</td>
<td>Serious breach of regulation with investigation or report to authority with prosecution or moderate fine possible. Significant difficulties in gaining future approvals.</td>
<td>Substantial damage to items of moderate cultural or heritage significance. Infringement of cultural heritage/ scared locations.</td>
</tr>
</tbody>
</table>
Table 1.1 - Qualitative Measures of Environmental Consequence (cont)

<table>
<thead>
<tr>
<th>Severity Level</th>
<th>Natural Environment</th>
<th>Legal/Government</th>
<th>Heritage</th>
<th>Community / Reputation/Media</th>
</tr>
</thead>
<tbody>
<tr>
<td>(4) Major</td>
<td>Serious environmental effects with some impairment of ecosystem function. Relatively widespread medium-long term impacts.</td>
<td>Major breach of regulation with potential major fine and/or investigation and prosecution by authority. Major litigation. Future project approval seriously affected.</td>
<td>Major permanent damage to items of high cultural or heritage significance. Significant infringement and disregard of cultural heritage values.</td>
<td>On-going serious social issues. Could cause serious injury or disease to people. Significant adverse national media/public or NGO attention. Environment/management credentials significantly tarnished.</td>
</tr>
<tr>
<td>(5) Catastrophic</td>
<td>Very serious environmental effects with impairment of ecosystem function. Long term, widespread effects on significant environment (e.g. national park).</td>
<td>Investigation by authority with significant prosecution and fines. Very serious litigation, including class actions. Licence to operate threatened.</td>
<td>Total destruction of items of high cultural or heritage significance. Highly offensive infringements of cultural heritage.</td>
<td>Very serious widespread social impacts with potential to significantly affect the well being of the local community. Could kill or permanently disable people. Serious public or media outcry (international coverage). Damaging NGO campaign. Reputation severely tarnished. Share price may be affected.</td>
</tr>
</tbody>
</table>

Table 1.2 - Qualitative Measure of Likelihood

<table>
<thead>
<tr>
<th>Level</th>
<th>Descriptor</th>
<th>Description</th>
<th>Guideline</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Almost Certain</td>
<td>Consequence is expected to occur in most circumstances.</td>
<td>Occurs more than once per month.</td>
</tr>
<tr>
<td>B</td>
<td>Likely</td>
<td>Consequence will probably occur in most circumstances.</td>
<td>Occurs once every 1 month – 1 year.</td>
</tr>
<tr>
<td>C</td>
<td>Occasionally</td>
<td>Consequence should occur at some time.</td>
<td>Occurs once every 1 year - 10 years.</td>
</tr>
<tr>
<td>D</td>
<td>Unlikely</td>
<td>Consequence could occur at some time.</td>
<td>Occurs once every 10 years – 100 years.</td>
</tr>
<tr>
<td>E</td>
<td>Rare</td>
<td>Consequence may only occur in exceptional circumstances.</td>
<td>Occurs less than once every 100 years.</td>
</tr>
</tbody>
</table>

Source: AS/NZS 4360:2004 Risk Management
Table 1.3 - Qualitative Risk Matrix

<table>
<thead>
<tr>
<th>Likelihood of the Consequence</th>
<th>Maximum Reasonable Consequence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1) Insignificant</td>
</tr>
<tr>
<td>(A) Almost certain</td>
<td>11 High</td>
</tr>
<tr>
<td>(B) Likely</td>
<td>7 Moderate</td>
</tr>
<tr>
<td>(C) Occasionally</td>
<td>4 Low</td>
</tr>
<tr>
<td>(D) Unlikely</td>
<td>2 Low</td>
</tr>
<tr>
<td>(E) Rare</td>
<td>1 Low</td>
</tr>
</tbody>
</table>

Source: AS/NZS 4360:2004 Risk Management
### Appendix 1 – Orica Ammonium Nitrate Emulsion Production Facility Qualitative Preliminary Environmental Risk Analysis

<table>
<thead>
<tr>
<th>Activity</th>
<th>Aspect</th>
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<th>Further Assessment Requirements</th>
<th>Further Assessment in EA?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CONSTRUCTION PHASE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clearing and topsoil removal.</td>
<td>Clearing of Vegetation.</td>
<td>Significant loss of Flora and Fauna.</td>
<td>Clearing of vegetation will be required within the proposed ANE production facility disturbance area. An ecological assessment is currently being completed for the proposed ANE production facility. The field survey identified 2 threatened fauna species and 1 threatened flora species as well as the threatened ecological community (TEC) - Lower Hunter Spotted Gum – Ironbark Forest. The assessment has concluded that the proposed ANE production facility will not result in a significant impact on threatened species or the TEC should the relevant management controls be implemented during the clearing of vegetation.</td>
<td>2</td>
<td>D</td>
<td>L</td>
</tr>
</tbody>
</table>
### Appendix 1 – Orica Ammonium Nitrate Emulsion Production Facility Qualitative Preliminary Environmental Risk Analysis (cont)

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<th>Further Assessment in EA?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction of proposed ANE production facility</td>
<td>Clearing of Vegetation</td>
<td>Disturbance of Aboriginal places or objects without permission.</td>
<td>The removal of topsoil has the potential to impact on Aboriginal places or objects. A full Aboriginal Archaeology Assessment is currently being undertaken for the proposed ANE production facility. The field survey did not identify any Aboriginal objects or places within the proposed ANE production facility.</td>
<td>2 D L</td>
<td>An Aboriginal Cultural Heritage Assessment of potential impacts of the proposed ANE production facility on Aboriginal archaeology is currently in preparation and will be included in the EA. The assessment will be completed in consultation with the local Aboriginal community.</td>
<td>Yes</td>
</tr>
<tr>
<td>Disturbance to sites of European Heritage Significance.</td>
<td></td>
<td></td>
<td></td>
<td>2 E L</td>
<td>No further assessment will be required.</td>
<td>No</td>
</tr>
<tr>
<td>Soil erosion and sedimentation.</td>
<td></td>
<td></td>
<td>Appropriate erosion and sediment controls will be designed for all construction areas in accordance with Soils &amp; Construction (Landcom, 2004).</td>
<td>1 D L</td>
<td>Due to effective mitigation of this potential impact further assessment is not required.</td>
<td>No</td>
</tr>
<tr>
<td>Water Pollution.</td>
<td></td>
<td></td>
<td>Relevant surface water controls will be included as part of the construction design to divert clean waters away from surface facility areas during construction. Dirty water will be separated from clean water and the drains will be designed and constructed in accordance with Soils and Construction (Landcom, 2004).</td>
<td>1 D L</td>
<td>Due to effective mitigation of this potential impact further assessment is not required.</td>
<td>No</td>
</tr>
<tr>
<td>Activity</td>
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<td>Further Assessment in EA?</td>
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</tr>
<tr>
<td>Construction of proposed ANE production facility</td>
<td>Clearing of Vegetation</td>
<td>Noise pollution from machinery.</td>
<td>Construction of the proposed ANE production facility may be undertaken 24 hours a day, 7 days a week. Clearing of vegetation would be scheduled during the daytime hours. The nearest sensitive receptor is located approximately 1.8 kilometres from the proposed ANE production facility. Based on the distance to the nearest sensitive receptor it is unlikely that the Project will result a significant impact, however, a detailed noise impact assessment is required.</td>
<td>2</td>
<td>Construction noise impacts will be included in the Noise Impact Assessment currently being undertaken for the EA.</td>
<td>Yes</td>
</tr>
<tr>
<td>Air Pollution from dust generation.</td>
<td></td>
<td></td>
<td>The construction of the proposed ANE production facility will not involve significant ground disturbance. The nearest sensitive receptor is located approximately 1.8 kilometres from the proposed ANE production facility. Given the level of impact and the distance to receivers, potential impact from construction of the proposed ANE production facility is expected to be minimal.</td>
<td>1</td>
<td>A qualitative assessment of potential impact on air quality will be undertaken for the EA.</td>
<td>Yes</td>
</tr>
</tbody>
</table>
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</thead>
<tbody>
<tr>
<td>Construction of proposed ANE production facility.</td>
<td>Cut and Fill for construction.</td>
<td>Water Pollution from uncontrolled surface run-off.</td>
<td>Erosion and sediment controls will be implemented in accordance with <em>Soils &amp; Construction</em> (Landcom, 2004).</td>
<td>2 D L</td>
<td>Due to effective mitigation of this potential impact, further assessment is not required.</td>
<td>No</td>
</tr>
<tr>
<td>Land degradation</td>
<td></td>
<td>The 1991 EIS identified the Technology Park as being of low agricultural fertility. The use of the site for the purposes of the Project, will not result in land degradation as the land is not suitable for agricultural purposes.</td>
<td>1 E L</td>
<td>No further assessment will be required.</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Noise Pollution from machinery.</td>
<td></td>
<td>Construction of the proposed ANE production facility may be undertaken 24 hours a day, 7 days a week. Noisy construction activities would be scheduled during the daytime hours. The nearest sensitive receptor is located approximately 1.8 kilometres from the proposed ANE production facility. Based on the distance to the nearest sensitive receptor it is unlikely that the construction of the proposed ANE production facility will result a significant impact, however, a detailed noise impact assessment is required.</td>
<td>2 C M</td>
<td>Construction noise impacts will be included in the Noise Impact Assessment currently being undertaken for the EA.</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
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<th>Further Assessment in EA?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction of proposed ANE production facility</td>
<td>Traffic</td>
<td>Supply of materials for construction project resulting in increased traffic.</td>
<td>Construction activities of the proposed ANE production facility will result in increased traffic movements during the construction phase of the Project. This has the potential to impact upon traffic on surrounding roads during peak traffic periods.</td>
<td>2</td>
<td>B</td>
<td>H</td>
</tr>
<tr>
<td>Degradation of Noise Amenity.</td>
<td></td>
<td></td>
<td>The construction traffic from the proposed ANE production facility has the potential to impact on noise amenity. A number of residential properties are located along George Booth Drive, the transport route for materials. George Booth Drive is an approved heavy vehicle route and as a result residences are already exposed to heavy vehicle noise. Primary vehicle movements will occur during daytime hours. The noise impact assessment will include an assessment of the potential impact of traffic noise related to the Project as well as potential cumulative impacts.</td>
<td>2</td>
<td>B</td>
<td>H</td>
</tr>
<tr>
<td>Waste Disposal (including sewage).</td>
<td></td>
<td>Pollution and/or contamination due to incorrect disposal. Inefficient use of resources.</td>
<td>All wastes generated as part of the construction process will be managed in accordance with a Waste Management Plan to be developed for the proposed ANE production facility.</td>
<td>2</td>
<td>D</td>
<td>L</td>
</tr>
<tr>
<td>Activity</td>
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<td></td>
</tr>
<tr>
<td>OPERATION</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ongoing operation of existing operations and the proposed ANE production facility</td>
<td>European Heritage</td>
<td>Disturbance of sites of European heritage significance.</td>
<td>There are no state or locally listed heritage items located within the Technology Park. The Project will not impact on European heritage.</td>
<td>1</td>
<td>E</td>
<td>L</td>
</tr>
<tr>
<td>Ecology</td>
<td>Loss of native flora and fauna.</td>
<td></td>
<td></td>
<td></td>
<td>An ecological impact assessment will be included in the EA.</td>
<td>Yes</td>
</tr>
<tr>
<td>Cultural Heritage</td>
<td>Disturbance of Aboriginal places or objects.</td>
<td>No Aboriginal objects or places were identified during the survey conducted for the Aboriginal archaeology assessment currently being completed for the Project. The ongoing operation of the proposed ANE production facility should not result in any impact on Aboriginal Heritage. Should any Aboriginal sites be identified during operations recommended management controls will be implemented.</td>
<td>1</td>
<td>E</td>
<td>L</td>
<td>Proposed controls for the management of any newly identified Aboriginal heritage sites will be included in the EA.</td>
</tr>
</tbody>
</table>
## Appendix 1 – Orica Ammonium Nitrate Emulsion Production Facility Qualitative Preliminary Environmental Risk Analysis (cont)

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</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Consequence</td>
<td>Likelihood</td>
<td>Risk</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C</td>
<td>M</td>
<td>A detailed assessment of noise impacts associated with the Project will be undertaken.</td>
</tr>
<tr>
<td>Ongoing operation of the proposed ANE production facility</td>
<td>Noise Generation</td>
<td>Degradation of noise amenity (cumulative).</td>
<td>The existing operations and proposed operation of the proposed ANE production facility has the potential to impact on noise amenity. The nearest sensitive receptor is located approximately 1.8 kilometres to the west of the proposed ANE production facility. Based on the distance to the nearest sensitive receptors, the Project is unlikely to have a significant impact on noise amenity. A detailed noise impact will be undertaken as part of the EA.</td>
<td>2</td>
<td>C</td>
<td>M</td>
</tr>
<tr>
<td>Dust Generation</td>
<td>Degradation of air quality environment (cumulative).</td>
<td>The Project is not likely to result in impacts on air quality during operation. A qualitative assessment of potential air quality impacts will be undertaken as part of the EA.</td>
<td>1</td>
<td>E</td>
<td>L</td>
<td>A qualitative assessment will be undertaken.</td>
</tr>
<tr>
<td>Fuel and Electricity Usage.</td>
<td>Greenhouse Gas emissions from diesel and electricity use.</td>
<td>The operation of the proposed ANE production facility and existing operations will require the use of diesel and electricity. The greenhouse gas emissions resulting from this energy consumption will be assessed.</td>
<td>1</td>
<td>B</td>
<td>M</td>
<td>An assessment of energy use and greenhouse gas emissions will be undertaken.</td>
</tr>
<tr>
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<tr>
<td>Ongoing operation of the proposed ANE production facility</td>
<td>Fugitive Emissions from Production.</td>
<td>Greenhouse Gas emissions from the manufacturing process.</td>
<td>The operation of the proposed ANE production facility and existing operations have the potential to generate fugitive greenhouse gas emissions. The greenhouse gas and energy assessment will consider the potential for fugitive emissions.</td>
<td>2</td>
<td>D</td>
<td>L</td>
</tr>
<tr>
<td>Use of hazardous materials, spillage or release into the environment or atmosphere.</td>
<td>Risk to people and property.</td>
<td>The existing operations and the proposed ANE production facility will involve continuous use of hazardous substances. The design of the proposed ANE production facility and the existing operations has been completed in accordance with Orica’s risk management standards which determine the appropriate spacing between substance storage areas and operations with the aim of minimising risk. Relevant controls for the management of hazardous substances will be outlined in the EA.</td>
<td>3</td>
<td>D</td>
<td>M</td>
<td>A preliminary hazard and risk assessment will be required.</td>
</tr>
<tr>
<td>Clean water management.</td>
<td>Contamination of clean water.</td>
<td>Diversion drains will be constructed to divert clean waters away from surface facility areas. Clean water captured on roofs will be stored in rainwater tanks for reuse onsite. Dirty water will be captured and treated appropriately for re-use or disposal.</td>
<td>2</td>
<td>D</td>
<td>L</td>
<td>Due to effective mitigation of this potential impact further assessment is not required.</td>
</tr>
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<tr>
<td>Ongoing operation of the proposed ANE production facility</td>
<td>Erosion and sediment runoff.</td>
<td>Sedimentation of local waterways</td>
<td>Appropriate erosion and sediment controls will be designed and constructed for all surface facility areas in accordance with the relevant Australian Standards.</td>
<td>2 D L</td>
<td>Due to effective mitigation of this potential impact further assessment is not required.</td>
<td>No</td>
</tr>
<tr>
<td>Process water and wash down water, pipeline or storage failures.</td>
<td>Water Pollution</td>
<td>Dirty water will be separated from clean water by diversion or bunding. Drains will be designed and constructed in accordance with the relevant Australian Standards. Regular maintenance will be carried out.</td>
<td>2 D L</td>
<td>Due to effective mitigation of this potential impact further assessment is not required.</td>
<td>No</td>
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</tr>
<tr>
<td></td>
<td>Land Contamination</td>
<td>Dirty water will be separated from clean water and the drains will be designed and constructed in accordance with the relevant Australian Standards. Regular maintenance will be carried out on pipelines and storage structures.</td>
<td>1 D L</td>
<td>Due to effective mitigation of this potential impact further assessment is not required.</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Water Usage</td>
<td>Inefficient water usage.</td>
<td>The Project will require water for use in the manufacturing process at the proposed ANE production facility and potable water use such as drinking water. Where possible, captured rainwater will be recycled for use in the manufacturing process. The EA will provide an outline of the water sources to be utilised and will provide a water balance for the project.</td>
<td>1 D L</td>
<td>The EA will provide an outline of the expected water use of the proposed ANE production facility and will detail how these needs will be met.</td>
<td>No</td>
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</tbody>
</table>
### Appendix 1 – Orica Ammonium Nitrate Emulsion Production Facility Qualitative Preliminary Environmental Risk Analysis (cont)

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<tr>
<td>Ongoing operation of the proposed ANE production facility</td>
<td>Hazardous goods supply and storage.</td>
<td>Explosion hazard. Soil and/or water contamination from spills or leaks.</td>
<td>All hazardous goods will be handled using systems designed and operated in accordance with relevant legislation and Australian standards. The position of the proposed ANE production facility and existing operations has been determined based on Orica’s risk management standards. It is expected that the preliminary hazard analysis will determine that the safety zones for hazardous substances will fall inside the boundary of the Technology Park.</td>
<td>3 D M</td>
<td>A Preliminary Hazard Analysis will be undertaken for the Project.</td>
<td>Yes</td>
</tr>
<tr>
<td>Hazardous goods transport.</td>
<td>Risk of contamination from a spill during transportation.</td>
<td>The transport of hazardous goods from Sydney and Kooragang Island has the potential to impact on people and the environment should a vehicle accident occur. Relevant controls will be implemented for the management of hazardous goods during transport. The preliminary hazard analysis will include an assessment of the potential transport risk and will provide appropriate recommendations.</td>
<td>3 D M</td>
<td>Transport of hazardous goods will be considered in the preliminary hazard and risk assessment to be undertaken for the project.</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Oil, fuel and grease supply and storage.</td>
<td>Soil and/or water contamination from spills or leaks.</td>
<td>All fuels, oils, grease etc will be handled using systems designed and operated in accordance with relevant legislation and Australian Standards.</td>
<td>2 D L</td>
<td>Due to effective mitigation of this potential impact, no further assessment is required.</td>
<td>No</td>
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### Appendix 1 – Orica Ammonium Nitrate Emulsion Production Facility Qualitative Preliminary Environmental Risk Analysis (cont)

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<tr>
<td>Ongoing operation of the proposed ANE production facility</td>
<td>Bushfire</td>
<td>Loss of life or injury to personnel or community.</td>
<td>Orica has existing fire management systems as part of the existing operations to reduce the threat of fire. The design of the proposed ANE production facility will incorporate relevant fire management controls in order to minimise the risk to personnel and the community in the event of a bushfire.</td>
<td>3  D  M</td>
<td>Further assessment of bushfire risk is required.</td>
<td>Yes</td>
</tr>
<tr>
<td>Damage to infrastructure / property.</td>
<td>Bushfire</td>
<td>Loss of life or injury to personnel or community.</td>
<td>Orica has existing fire management systems as part of the existing operations. The design of the proposed ANE production facility will include relevant fire management controls in order to minimise the risk to infrastructure and property. Controls will include buffer zones, fire fighting access and fire fighting equipment.</td>
<td>3  D  M</td>
<td>Further assessment of bushfire risk is required.</td>
<td>Yes</td>
</tr>
<tr>
<td>Loss of threatened native flora and fauna.</td>
<td>Bushfire</td>
<td>Loss of life or injury to personnel or community.</td>
<td>Orica has existing fire management systems to reduce the threat of fire as part of the existing operations. The proposed ANE production facility will include relevant fire management controls in order to minimise the risk to threatened flora and fauna.</td>
<td>3  D  M</td>
<td>Further assessment of bushfire risk is required.</td>
<td>Yes</td>
</tr>
</tbody>
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### Appendix 1 – Orica Ammonium Nitrate Emulsion Production Facility Qualitative Preliminary Environmental Risk Analysis (cont)

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</tr>
<tr>
<td>Ongoing operation of the proposed ANE production facility</td>
<td>Air Pollution</td>
<td>Orica has existing fire management systems to reduce the threat of fire as part of the existing operations. The proposed ANE production facility will include relevant fire management controls in order to minimise the risk of air pollution in the instance of a fire.</td>
<td>2</td>
<td>D</td>
<td>L</td>
<td>Further assessment of bushfire risk is required.</td>
</tr>
<tr>
<td>Waste: scrap metal and parts, office waste, putrescible.</td>
<td>Inefficient use of resources.</td>
<td>Waste materials will be recycled and reuse where possible. If a material is not suitable for reuse or recycling it will be disposed of by a contractor at a licensed facility.</td>
<td>1</td>
<td>D</td>
<td>L</td>
<td>Due to effective mitigation of this potential impact further assessment is not required.</td>
</tr>
<tr>
<td>Waste oil and grease storage</td>
<td>Soil and/or water contamination from spills or leaks.</td>
<td>All fuels, oils, grease etc will be collected and handled using systems designed and operated in accordance with relevant legislation and Australian Standards.</td>
<td>2</td>
<td>D</td>
<td>L</td>
<td>Due to effective mitigation of this potential impact further assessment is not required.</td>
</tr>
<tr>
<td>Transport and access of vehicles.</td>
<td>Increase in traffic</td>
<td>The Project will result in an increase of 10 light vehicles and up to 58 heavy vehicles accessing the site each day. An assessment of the potential traffic impact of the Project will be undertaken.</td>
<td>2</td>
<td>B</td>
<td>H</td>
<td>An assessment of traffic impacts will be undertaken.</td>
</tr>
<tr>
<td>Increased local population.</td>
<td>Impact on services/local infrastructure.</td>
<td>The additional 10 employees will not result in any impact on services or local infrastructure.</td>
<td>1</td>
<td>E</td>
<td>L</td>
<td>Increase in employee numbers is minimal, no additional assessment is required.</td>
</tr>
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</table>
### Activity

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<tr>
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<tbody>
<tr>
<td>Ongoing operation of the proposed ANE production facility</td>
<td>Unauthorised access to the site from the general public.</td>
<td>Vandalism</td>
<td>The Technology Park facilities will be appropriately fenced and boundary inspections conducted. The Technology Park does not have a history of problems with vandalism.</td>
<td>1 E L</td>
</tr>
<tr>
<td>Illegal disposal of waste.</td>
<td>The Technology Park boundary is not completely fenced as this would restrict access to easements and bushfire response. The Technology Park does not have a history of problems with the illegal disposal of waste.</td>
<td></td>
<td>2 E L</td>
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</tr>
</tbody>
</table>

### Further Assessment Requirements

- No further assessment will be required. No further assessment will be required.

### Further Assessment in EA?

- No