

Orica Australia Pty Limited

**Environmental Management Strategy
for the Construction of Orica's
Ammonium Nitrate Emulsion (ANE)
Production Facility,
Richmond Vale, NSW**

September 2010



Environmental Management Strategy for the Construction of Orica's Ammonium Nitrate Emulsion (ANE) Production Facility, Richmond Vale, NSW

Prepared by

Umwelt (Australia) Pty Limited

on behalf of

Orica Australia Pty Limited

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1.0 Background

This Construction Environmental Management Strategy (CEMS) outlines the management measures proposed to mitigate the potential environmental impacts during construction of the Ammonium Nitrate Emulsion Facility (ANE Production Facility) at the existing Orica Australia Pty Limited (Orica) Mining Services Technology Centre (Technology Centre) at Richmond Vale, NSW (refer to **Figure 1.1**).

A separate Environmental Management Strategy will be prepared for the operational phase of the ANE Production Facility for which Orica will seek Director-General approval.

The ANE Production Facility project will involve the construction of a new ANE Production Facility within the existing Orica Technology Centre site allowing for the production of up to 250,000 tonnes per annum of Ammonium Nitrate Emulsion as outlined in **Section 3.0** and as illustrated in **Figure 1.2**.

1.1 Scope and Objectives

This CEMS has been developed in accordance with Schedule 4 Condition 1 of the ANE Project Approval (09_0090). The Project Approval requirements are outlined in **Section 3.2**.

The scope of this CEMS is to detail the mitigation measures associated with potential environmental impacts during the construction of the ANE facility.

A further Environmental Management Strategy will be developed for the ongoing operation of the site and facility.

2.0 Orica's SH&E Management System

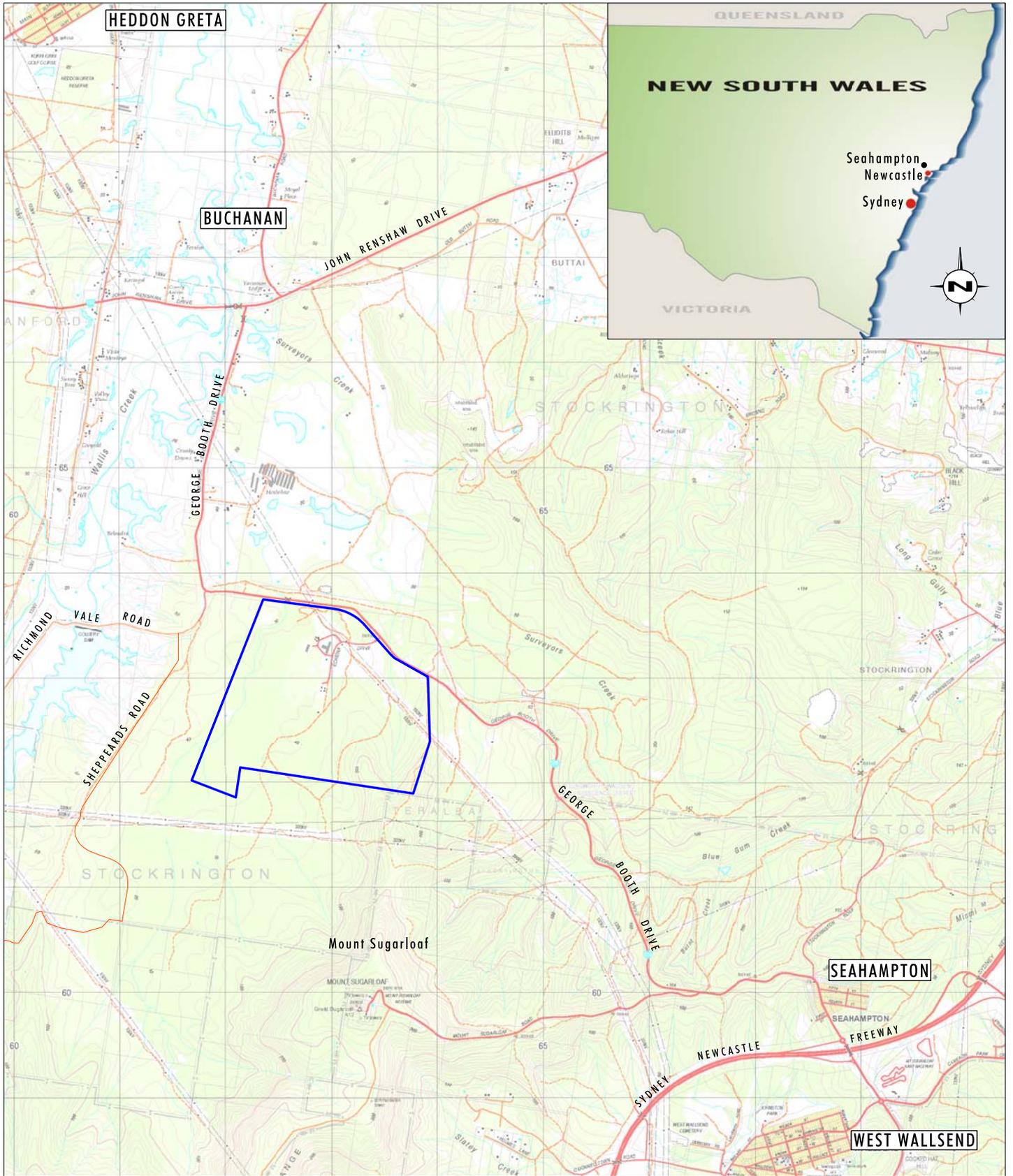
2.1 Overview

Orica seeks to be among the best performers internationally in Safety Health and Environment (SH&E) and its values include a commitment to operate to the highest standards of safety, health and environment, recognising that nothing is so urgent or important that the time cannot be taken to do it safely. Orica's SH&E Vision of:

'No Injuries to Anyone, Ever" and "No Harm to People and the Environment'

symbolises Orica's commitment to eliminate all injuries, illnesses, motor vehicle incidents, environmental incidents, complaints and other adverse SH&E incidents and acknowledges the belief that all such incidents are preventable. Orica's aim is to continually reduce the number of injuries and other adverse SH&E incidents. Orica's SH&E Policy is discussed in **Section 2.3**.

The objective is zero incidents during all phases of project activity including the construction, pre-commissioning, commissioning and start up phases of the Project. All work associated with the design and construction of the Orica ANE Production Facility shall conform to the Orica SH&E Management System.



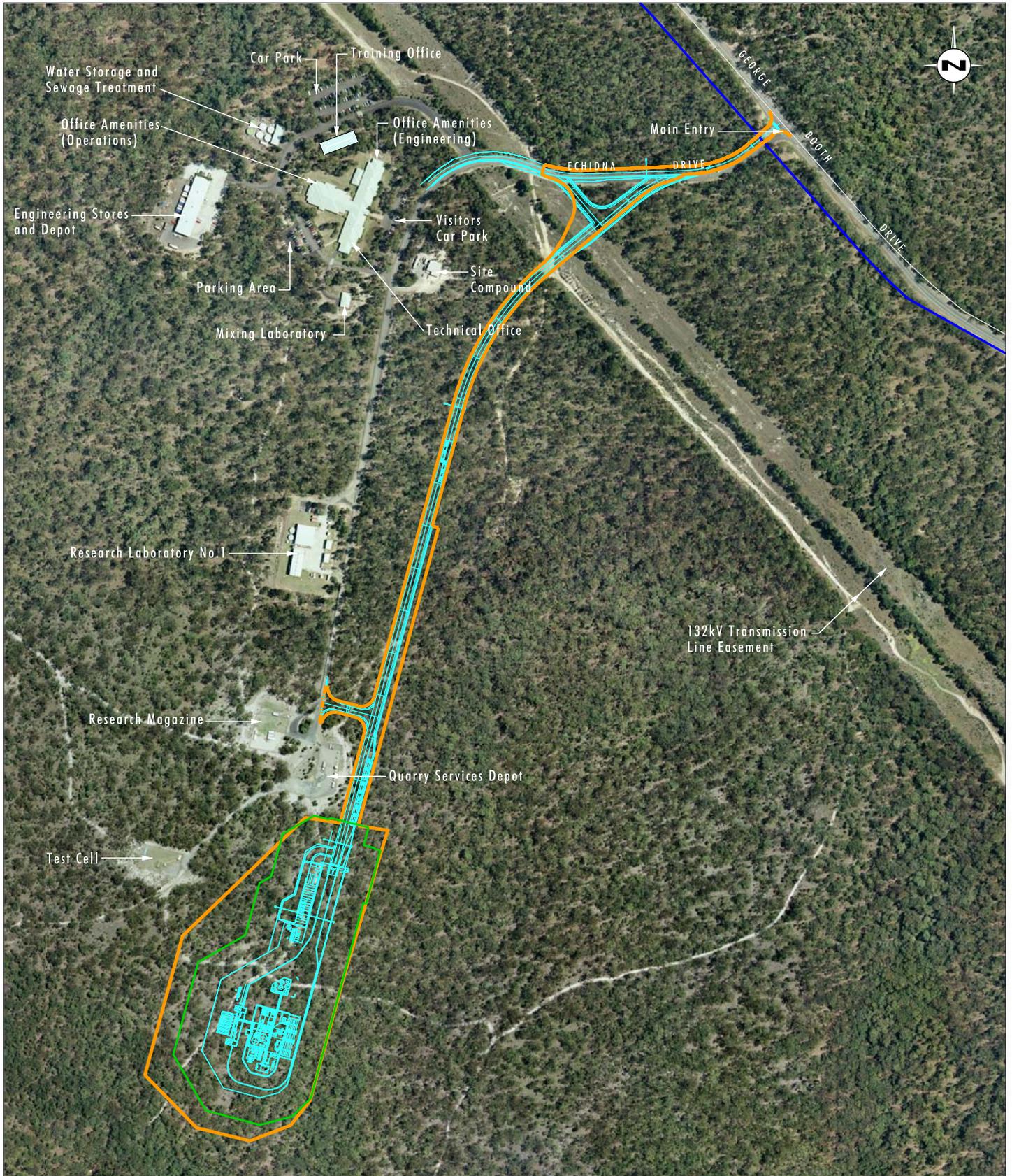
Source: Department of Lands, 2006

0 1 2 2.5 km
1:50 000

Legend

Technology Centre Boundary

FIGURE 1.1
Locality Plan



Source: Orica (2008), Department of Lands (2006), Google Earth (2009)

0 100 200 300m
1:6 000

Legend

- ▬ Technology Centre Boundary
- ▬ EA Approved Disturbance Boundary
- ▬ Revised Facility Configuration Reduced Disturbance Boundary
- ▬ 30m Bushfire Buffer Clearance Area

FIGURE 1.2

**Existing Operations
ANE Production Facility
and Access Road**

2.2 Construction Health Safety and Environment Strategy

Orica's approach to construction SH&E management is based on thorough identification of hazards and assessment and control of risks through:

- management ownership and responsibility for SH&E performance which is active and visible at all levels;
- clear SH&E expectations and objectives for managers and employees of both Orica and contractors;
- involvement of all project participants including Orica and Contractors in the SH&E management program;
- comprehensive SH&E procedures and instructions which:
 - comply with the Orica SH&E Management System and regulatory requirements, and
 - are understood by all personnel working on the Project.
- programs to help people anticipate potential injuries and incidents and to encourage personal action to minimise risk, such as:
 - Hazards of Construction (Hazcon) and Constructability review(s);
 - Job Safety and Environment Risk Analysis (JSERA) Program;
 - Job Start;
 - Periodic Toolbox Talk Meetings;
 - Behavioural Safety Program;
 - Incident Investigation Process.
- Project SH&E standards which are not compromised by conflicts in schedule, cost or quality objectives.

2.3 SH&E Policy

Orica's Safety, Health and Environment (SH&E) Policy notes:

"All environmental incidents are preventable.

Orica will manage its activities with concern for people and the environment and will conduct its activities for the benefit of society and without compromising the quality of life for future generations.

In particular Orica will:

- *Strive to ensure our facilities operate to the highest standards to protect our employees, contractors, neighbours and the environment;*
- *Continue to seek ways to efficiently use materials and energy;*
- *Sell only those products that can be produced, transported, stored, used and disposed of safely;*
- *Provide appropriate information and/or training on the safe use and disposal of its products to customer and consumers;*

-
- *Seek to develop new or improved products and processes to improve the contribution we make to the quality of people's lives and to minimise the impact on the environment;*
 - *Require every employee and contractor working for Orica to comply with relevant legislation and with the SHE policy, and Orica will provide them with the necessary training;*
 - *Encourage employee initiatives that contribute to a safer and improved environment at work, at home and in the community;*
 - *Set challenging targets and measure progress to ensure continuous improvement; and*
 - *Communicate openly about Orica activities and report progress on our safety, health and environmental performance.”*

2.3 Key Construction Environmental Management Plans

The key environmental management plans relating to construction of the ANE Production Facility include:

- Construction Environmental Management Strategy – prepared to detail the environmental management strategies and practices that will be utilised during the construction of the ANE Production Facility.
- Vegetation Clearing Protocol (**Appendix 1**) – developed to provide clear guidance on the process to be implemented during the clearing of vegetation for the construction of the ANE Production Facility to minimise impacts on fauna.
- Soil and Water Management Plan (**Appendix 2**) – developed to include the requirements for the management of soil and water during construction of the ANE Production Facility to minimise impacts on the surrounding environment, in particular as it relates to erosion and sediment control.
- Road Transport Protocol (**Appendix 3**) – developed to include controls relating to traffic associated with the construction of the ANE Production Facility.

The Vegetation Clearing Protocol, Soil and Water Management Plan, and Road Transport Protocol form appendices to the Construction Environmental Management Strategy. Where applicable they will be incorporated into operational management plans.

Health and Safety aspects associated with the construction of the ANE Production Facility are included in a separate Construction Safety and Health Management Plan.

3.0 Design and Construction

3.1 ANE Production Facility Design

The ANE Project Approval includes a conceptual design for the ANE Production Facility. Since the Environmental Assessment for the facility was lodged with the Department of Planning (DoP), Orica have finalised the detailed design for the facility.

The detailed design of the facility has resulted in a reduction in the facilities footprint by approximately 1.3 hectares resulting in less clearing of native vegetation, less civil works and a rearrangement of plant and equipment to optimise product flow. The total area of disturbance associated with the construction of the ANE Production Facility is now approximately 6.7 hectares compared with 8 hectares currently approved for disturbance.

The roundabout at the intersection of Echidna Drive and the ANE Production Facility access road has been redesigned as a T intersection, while still maintaining the ability of B double trucks to turn around if needed to exit the site in an emergency.

Figure 1.2 illustrated the revised ANE Production Facility layout, overlaid on the approved disturbance footprint.

3.2 Construction Activities

The ANE Production Facility will be built to the south of the existing Technology Centre operations, (refer to **Figure 1.2**). The construction of the ANE Production Facility will involve the following components:

- a manufacturing plant for the production of up to approximately 250,000 tpa of ANE;
- dedicated storage facilities for ammonium nitrate solution (ANS), weak ANS, acetic acid, caustic soda, thiourea, hydrocarbons and fuel, solid ammonium nitrate (AN), urea, calcium nitrate (CN), and recycled, potable, and process water;
- oxidiser solution batching;
- emulsion storage and load-out area including weighbridge for export tankers;
- Gasser (sodium nitrite) solution and Companion (ammonium nitrate) solution manufacture, storage and load-out;
- a new internal access road to the facility separate from the existing facilities roads and truck weighing facilities;
- an office, control room, switchroom and quality control laboratory;
- provision of relevant utility services to the facility (e.g. power, communications, water, sewer);
- an onsite transformer; and
- stormwater and spill management controls.

3.3 Construction Phases

The site of the ANE Production Facility and access road will be cleared of vegetation (refer to **Appendix 1** for a clearing protocol) and filled with clean compacted material as required.

The construction of the ANE facility is divided into the following phases:

- Phase 1: Site clearing and bulk earthworks;
- Phase 2: Civil works;
- Phase 3: Mechanical/structural installation; and
- Phase 4: Electrical and instrumentation installation.

The details of these activities are outlined in **Sections 3.3.1 to 3.3.6** below.

3.3.1 Site Clearing

This work includes clearing approximately 6.7 hectares of predominantly open forest vegetation as the area identified as being necessary to construct the works, roadways and associated fire-breaks.

Further details regarding the clearing of vegetation prior to construction are provided in **Appendix 1**.

3.3.2 Bulk Excavation, Roads and Drainage

This work typically includes:

- bulk excavation and placing of fill to the required levels to allow construction of the works;
- placing of fill to construct bunker mound;
- excavation, placement/construction and back-filling of drainage system;
- construction of fire-breaks;
- construction of permanent, access and maintenance roadways (including concrete pavement), kerb and guttering; and
- landscaping.

3.3.3 Civil Works

The typical civil works for the construction of the ANE Plant are as follows:

- concrete works for hardstand areas, retaining structures (earth and process), tank foundation and process buildings; and
- building construction for amenities and control room/laboratory and office.

3.3.4 Mechanical Works

The mechanical works for the construction of the ANE Plant are as follows:

- installation of process and effluent piping;
- installation of the prefabricated (off-site) process and water tanks ;
- construction of large process tanks; and
- supply and erection of structural steel (buildings and process related).

3.3.5 Electrical & Instrumental Works

Installation of the electrical and instrumentation systems.

3.3.6 Demobilisation

The typical activities associated with this phase may include the removal of facilities and services established to support the construction activities and rehabilitating areas disturbed by these activities.

3.4 Construction Hours

Whilst construction activities for the Project will generally occur during the hours of 7 am – 5 pm Monday to Friday and 8 am – 1 pm on Saturday, there may be a need to undertake construction activities outside of these hours, including some activities at night.

4.0 Statutory Requirements

4.1 Project Approval Requirements

The Project Approval for Orica was assessed under Part 3A of the Environmental Planning and Assessment Act 1979 (EP&A Act). Approval for the ANE facility was gained from the Minister for Planning in 26 July 2010. The requirement for this CEMS arises from Condition 1 of Schedule 4 of the Orica Project Approval. A table summarising the relevant Project Approval conditions that are relevant to the construction of the ANE Production Facility, and where they are addressed within this document are provided in **Table 4.1**.

Table 4.1 – Project Approval Conditions Relating to Construction

Condition No.	Condition Title	Condition Detail	Section of Document
SCHEDULE 3			
10	Road Transport Protocol	Details contained in Appendix 3	Appendix 3
15	Vegetation Clearing Protocol	Details contained in Appendix 1 – Vegetation Clearing Protocol not required to be submitted or approved by DoP	Appendix 1
16	Air Quality	The Proponent shall carry out all reasonable and feasible measures to minimise dust generated by the Project.	Section 6.2
17	Air Quality	During construction, the Proponent shall ensure that: <ol style="list-style-type: none"> a) All trucks entering or leaving the project site with loads have their loads covered; and b) Trucks associated with the Project do not track dirt onto the public road network. 	Section 6.2
18	Noise	The Proponent shall ensure that the noise generated from the construction and operation of the Project does not exceed 35dB(A) LAeq(15 minute) at the nearest residential receptor at any time ¹ .	Section 6.3
22	Bunding	The Proponent shall ensure that all chemicals, fuels and soils associated with the Project are stored in appropriately banded areas, with impervious flooring and sufficient capacity to contain 110% of the largest container stored within the bund. The bund(s) shall; be designed and installed in accordance with: <ol style="list-style-type: none"> a) The requirements of all relevant Australian Standards; and b) The DECCW's Storing and Handling Liquids: Environmental Protection, Participants Manual. 	Section 6.6
23	Soil and Water Management Plan	<ul style="list-style-type: none"> • Details contained in Appendix 2 	Appendix 2

Table 4.1 – Project Approval Conditions Relating to Construction (cont)

Condition No.	Condition Title	Condition Detail	Section of Document
25	Erosion and Sediment Control Plan	Details contained in Appendix 2	Appendix 2
26	Lighting	The Proponent shall ensure that all lighting associated with the Project: a) complies with the latest version of Australian Standards AS 4282 (INT) – Control of Obtrusive Effects of Outdoor Lighting; and b) is mounted, screened and directed in such a manner that it does not create a nuisance to surrounding properties of the public road network.	Section 6.9
27	Waste	The proponent shall ensure that all waste generated by the project during construction and operation is classified in accordance with the DECCW's Waste Classification Guidelines 2008 and if required, disposed of to a facility that may lawfully accept the waste.	Section 6.7
28	Aboriginal Heritage	In the event that skeletal remains, or an Aboriginal object is detected, all construction activities that will or would have the potential to impact on indigenous heritage item(s), shall cease until the DECCW is consulted and their directions complied with.	Section 6.5.1
SCHEDULE 4			
1	Environmental Management Strategy	The requirement for this CEMS arises from Condition 1 of Schedule 4 of the Orica Project Approval which states: 1. The Proponent shall prepare and implement an Environmental Management Strategy for the project to the satisfaction of the Director-General. This strategy must be submitted to the Director-General prior to the commencement of construction, and: a) Provide the strategic context for environmental management of construction and operation of the Project; b) Identify the statutory requirements that apply to the Project; c) Describe in general how the environmental performance of the Project would be monitored and managed; and d) Describe the procedures that would be implemented to: <ul style="list-style-type: none"> • Keep the local community and relevant agencies informed about the operation and environmental performance of the Project; • Receive, handle, respond to, and record complaints; 	Section 2.0 Section 2.0 Sections 4.0 and 6.0 Section 7.1 to 7.3 Section 7.2

Table 4.1 – Project Approval Conditions Relating to Construction (cont)

Condition No.	Condition Title	Condition Detail	Section of Document
		<ul style="list-style-type: none"> • Resolve any disputes that may arise in relation to operations at the Project; • Respond to any non-compliance; • Manage cumulative impacts; • Respond to emergencies; and <p>Describe the role, responsibility, authority, and accountability of all key personnel involved in the environmental management of the Project”</p>	<p>Sections 7.2 and 8.0</p> <p>Section 7.3 and 8.0</p> <p>Section 6.0</p> <p>Section 7.5</p> <p>Section 5.0 and Appendix 4</p>
3	Incident	<p>The Proponent shall notify the Director-General and any other relevant agencies of any incident or potential incident with actual or potential significant off-site impacts on people or the biophysical environment associated with the Project as soon as practicable after the Proponent becomes aware of the incident. Within 7 days of the date of the incident, the Proponent shall provide the Director-General and any relevant agencies with a detailed report on the incident.</p>	Section 7.3

5.0 Roles and Responsibilities

Relevant roles and responsibilities associated with this CEMS program are as follows:

Orica Project Manager

- Provide authority for environmental management in accordance with the Orica SH&E Policy and provide for the implementation of this CEMS.

Construction Project Manager

- Ensure that adequate resources are available to implement the requirements of this CEMS.
- Liaison with the Safety, Health and Environmental (SHE) Officer, as required to ensure that the CEMS is current and relevant to construction activities.
- Review monthly environmental compliance of the construction activities as relevant to construction activities.
- Co-ordinate investigation of any environmental impacts or enquiries and implementation of any relevant mitigation and control.

Construction Contractor SHE Officer

- Co-ordinate the ongoing environmental monitoring program, community enquiry system and incident reporting program of the ANE Facility and notify the Project Manager of any monitoring, enquiry or incident associated with construction activities.
- Conduct environmental monitoring as required for the project.
- Investigate any enquiry and/or incident associated with construction activities, where required.
- Ensure that the CEMS and all management plans and monitoring programs required under the approval are relevant to construction activities.
- Take responsible steps to avoid or minimise unintended or adverse environmental impacts, and failing the effectiveness of such steps, to direct that relevant actions be ceased immediately should an adverse impact on the environment be likely to occur.

Orica SHE Officer

- Investigate, in consultation with site construction contractors, any enquiry and/or incident associated with construction activities, where required.
- Coordinate the notification of regulatory authorities and affected stakeholders of any exceptions to relevant environmental criteria and/or standards and undertake necessary reporting.
- Liaise with regulatory authorities on matters relating to approvals and consent conditions.

-
- Be the principal contact point in relation to environmental performance of the project and with DECCW.
 - Be responsible for considering and advising on matters specified in the conditions of approval, and all other licences and approvals related to the environmental performance and impacts of the project, e.g. reviewing monitoring results against performance criteria.
 - Be responsible for receiving and responding to complaints and enquiries.

Other Employees and Contractors

All employees and contractors are required to:

- Comply with the requirements of this CEMS.
- Attend a site induction prior to the commencement of work on site.
- Report to their immediate supervisor any environmental incident that occurs while working on site.

6.0 Environmental Management Controls

A detailed assessment of environmental impacts relevant to the construction of the facility has been conducted and is documented in the EA for the ANE Production Facility (Umwelt, 2009).

This section includes the key management measures (activities and controls) to be implemented to minimise potential environmental impacts during the construction of the ANE Production Facility.

6.1 Soil and Water Management

Earthworks at the site will involve excavations of soil including topsoil stripping, stockpiling, and potential importation of suitable fill and material to create the necessary hardstands for site structures and pavements.

Due to the topography of the site and soil types present, Acid Sulphate Soils and Salinity are not considered to be issues for the site.

Further information on construction soil and water management for the site, are provided in the Construction Soil and Water Management Plan, which is attached as **Appendix 2**.

6.2 Air Quality

The construction of the ANE Production Facility is expected to result in minimal emissions to the air, with any potential impacts being short term and localised. Given the distance of the facility to nearby residents and vegetation screening surrounding the site it is not expected that the amenity of local residents would be impacted.

During construction, the air quality impacts are likely to be limited to exhaust emissions from vehicles and equipment, dust generation from exposed soils, materials handling and vehicle movements on unsealed roads.

The specific mitigation measures proposed to be implemented during construction of the proposed ANE Production Facility to ensure potential air quality impacts are minimised are tabulated in **Appendix 4**.

6.2.1 Odour

There are not expected to be any activities associated with construction of the proposed ANE Production Facility that are likely to result in emission of odour.

As such no specific mitigation measures are proposed to be implemented during construction of the proposed ANE Production Facility. Should any odour emissions be identified during construction investigations would be carried out and appropriate measures taken to ensure any impact is minimised.

6.3 Noise

6.3.1 Construction Noise Criteria

Construction noise was considered as part of the EA for the Project (Umwelt, 2009). Specific noise modelling and predictions were undertaken as part of the EA. Noise emissions from construction activities were incorporated into the noise model to determine potential noise impacts at the nearest receiver areas.

The closest residential receiver to the construction area of the ANE Production Facility is located at a distance of approximately 1.8 kilometres. The results of noise modelling indicated that construction noise is likely to be <15 dBA at all private residences, during day and night time activities. Whilst construction activities for the Project will generally occur during the standard day time hours, there may be a need to undertake construction activities outside of these hours, including some activities at night.

Table 6.1 details the noise criteria for the construction of the ANE Production Facility.

Table 6.1 - Project Approval Construction Noise Criteria (dBA)

Receiver Area	Project Approval Noise Criteria
George Booth Drive (R1 to R16)	35 ¹
Sheppard Drive (R17 to R21)	35 ¹

Note 1: As identified by Condition 18 Schedule 3 of the Project Approval

Construction noise levels are predicted to comply with the Project Approval noise criteria at all residential receiver locations, following the implementation of the management measures identified in **Appendix 4**.

6.4 Ecology

An ecological assessment has been undertaken to assess the potential impacts of the proposed ANE Production Facility on threatened flora and fauna species, endangered populations, threatened ecological communities and their habitat as part of the EA (Umwelt, 2009).

Approximately 6.7 hectares of native vegetation is expected to be cleared as a result of the proposed ANE Production Facility and access road.

The ecological assessment concluded that, subject to the use of appropriate mitigation measures, the ANE Production Facility will not have a significant impact on threatened species, populations or communities, or their habitat.

The measures proposed to manage and mitigate the ecological impacts as a result of the construction of the ANE Production Facility includes the development of a Biodiversity Offset Strategy and a number of other management measures as detailed in the Vegetation Clearing Protocol, (refer to **Appendix 1**) and as contained in **Appendix 4**.

6.5 Cultural Heritage

6.5.1 Aboriginal Heritage

A comprehensive Aboriginal archaeological assessment was undertaken for the Project as part of the EA (Umwelt, 2009).

One Aboriginal site was recorded during the survey undertaken for the EA (refer to **Figure 6.1**). This site, Orica AS, consists of an artefact scatter containing artefacts located in a five metre by five metre area within a 20 metre by five metre windrow exposure alongside the existing Orica access road. The artefacts included a banded mudstone core, a tuff core and a chert flake.

Orica AS will be impacted as a result of the Project, due to the construction of the proposed access road and its associated intersection on Echidna Drive. Orica AS will be managed as per the measures outlined in **Appendix 4**.

Mitigation measures have been developed in light of the archaeological context of the locality, the findings of the survey, the results of consultation with Aboriginal stakeholders, the potential impacts of the Project and current cultural heritage legislation.

6.5.2 Historical Heritage

An assessment of the potential impacts of the Project on historic heritage has been undertaken as part of the EA (Umwelt, 2009). No historical heritage sites were identified within the proposed ANE Production Facility and access road disturbance area during the field survey. If any historic heritage sites are located during construction of the ANE Production Facility, they are to be managed in accordance with the measures outlined in **Appendix 4**.

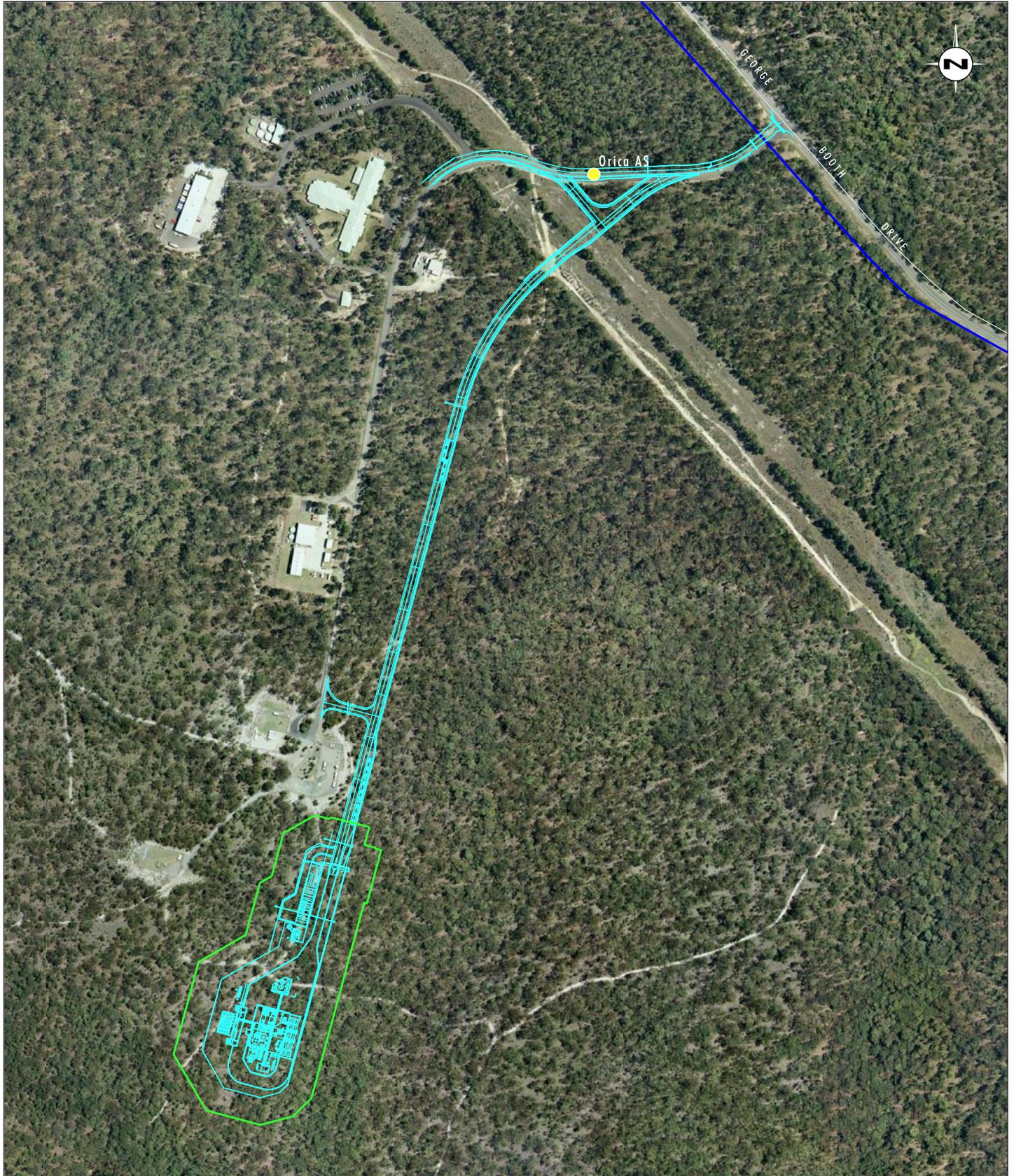
6.6 Hazardous Substances Management

Hazardous substances are to be managed in accordance with the mitigation measures outlined in **Appendix 4**.

6.7 Waste Management

Waste generated during the construction of the ANE Production Facility will fall into the following waste classes, based on the DECCW's 2008 Waste Classification Guidelines:

- general solid waste (putrescibles and non-putrescibles) including construction waste, general office waste and domestic waste;
- liquid waste including construction waste and ablution waste;
- hazardous waste; and
- special waste e.g. waste tyres.



Source: Orica (2008), Department of Lands (2006), Google Earth (2009)

0 100 200 300m
1:6 000

Legend

- Technology Centre Boundary
- Revised ANE Production Facility Configuration and Access Road
- 30m Bushfire Buffer Clearance Area
- Artefact Scatter

FIGURE 6.1

Location of Artefact Scatter Orica AS

The mechanical construction of the proposed ANE Facility will involve predominantly modular and prefabricated components, which are assembled off site and transported to the site for installation. The mechanical construction activities are therefore not expected to generate a significant amount of waste materials.

The civil construction, bulk excavation, and civil works of the proposed ANE Facility will involve predominantly earth works and associated civil works such as foundation construction. These activities are likely to result in the generation of unsuitable excess earth material and minor amounts of general construction waste.

All waste materials produced during the construction of the ANE Production Facility will be managed in accordance with the mitigation measures outlined in **Appendix 4**.

6.8 Traffic Management

A detailed traffic assessment considering the construction of the ANE Production Facility was undertaken as part of the EA (Umwelt, 2009). Construction traffic will be managed in accordance with the Construction Road Transport Protocol provided in **Appendix 3**.

6.9 Lighting

It is expected that there will be limited need for additional lighting during the construction of the ANE Facility. All on-site lighting associated with the construction of the ANE Production Facility will be managed in accordance with mitigation measures outlined in **Appendix 4**.

7.0 Monitoring, Review and Reporting

7.1 Environmental Monitoring, Inspections and Reporting

All environmental monitoring will be undertaken in accordance with the Project Approval and the EPL for the site.

As per Condition 2 of Schedule 4 of the Project Approval, Orica will submit an Annual Environmental Management Report (AEMR) to the Director-General of DoP by 26 July 2011 and annually thereafter, which will:

- identify the standards and performance measures for the Project;
- describe the works carried out in the past 12 months and the works to be carried out in the next 12 months;
- include a summary of complaints received in the past year and provide a comparison with previous years;
- report the results of all monitoring required by this approval and the EPL for the project;
- provide analysis of monitoring results in the context of relevant criteria and limits, previous monitoring results and the predictions made in the EA;
- identify any trends in monitoring results over the life of the Project;
- report on compliance with the Project Approval, summarise non-compliances in the previous 12 months and report on actions taken to rectify non-compliances; and
- provide a process for the regular review of monitoring results and the effectiveness of mitigation measures.

The construction contractor is required to maintain adequate records of implementation of this CEMS such that Orica's annual reporting requirements can be satisfied, including maintaining compliance records.

The SHE Officer or delegate will coordinate/undertake the following monitoring:

- noise monitoring to be undertaken during construction to demonstrate compliance with the noise criteria contained in the Project Approval. Should initial monitoring indicate a high level of compliance, additional monitoring will only be undertaken if there is a significant change in the level of construction activity or the noise sources on site ;
- undertake a weekly or as otherwise required inspection of the construction site and activities;
- inspection of all erosion and sediment control structures weekly and immediately after storm events (i.e. greater than approximately 20 millimetres of rainfall in 24 hours) to ensure erosion and sediment controls are performing adequately; and
- rainfall monitoring through the installation of a rain gauge on site to assist with identifying the required frequency of erosion and sediment control structure inspections during construction.

7.2 Community Enquiries

Orica has established a 24 hour Community Enquiry line for the construction and operation of the project.

- Enquiries relating to construction of the ANE Production Facility will be managed via the main Orica Technology Centre enquiry line, phone number is (02) 49395200.
- If outside of normal work hours the caller is given the option to leave a message which will be responded to on the next working day. This phone number has been listed with a telephone company and is advertised via signage at the Orica entrance on George Booth Drive.
- Any enquiries or complaints received will be documented and transmitted to Orica's SHE Officer immediately.
- Orica will maintain a register to record details of all enquiries received and actions undertaken in response. Orica will provide DECCW with a copy of the enquiries register on an annual basis.

7.3 Incident Reporting

Orica has a model procedure which details the requirements for immediate action, investigation and reporting of incidents and non-compliances (MP-SG-026) which will be adopted for use during the project. This includes events which cause, or have the potential to cause injury, illness or damage to personnel offsite, damage to the environment, cause concern to the public or are reportable to statutory agencies, including non-compliances with statutory approvals.

Additional requirements for the investigation of SH&E issues and management of corrective actions is also detailed in a procedure (MP-SG-045). The procedures include the following requirements:

- the undertaking of immediate action to minimise the severity of an incident or noncompliance;
- reporting of the initial incident or non-conformance details, any "quick fixes" undertaken and the longer term actions;
- initial assessment of the severity of an incident or non-conformance and notification of key personnel including the Site Manager, Plant Managers, Environmental Manager and Orica Business Management Team Members;
- investigation of the incident or non-conformance and development of corrective actions in accordance with the requirements of MP-SG-045;
- significant incidents are reviewed by a member of the General Management Team within four weeks of the incident; and
- details are entered into 'SHERMIS' (Orica's computer-based SH&E reporting system) and these records of the incident are retained indefinitely.

A summary of the response to an incident or non-conformance is detailed in **Section 8.0**.

In addition and in accordance with Condition 3 of Schedule 4 of the Project Approval, Orica will notify the Director-General of DoP and any other relevant agencies of any incident or potential incident with actual or potential significant offsite impacts on people or the biophysical environment associated with the Project as soon as practicable after Orica becomes aware of the incident. Within 7 days of the date of the incident, Orica will provide the Director-General of DoP and any relevant agencies with a detailed report on the incident.

7.4 Environmental Training

It is Orica policy that all personnel (including contractors) prior to or on commencement of employment attend an Orica Technology Centre site induction, It is the responsibility of the Construction Manager to ensure that all employees (including subcontractors) receive the appropriate induction on commencement of employment.

For the Orica ANE Production Facility Project, a Safety, Health and Environment (SH&E) Induction will be developed that will cover the requirements of working for Orica. Inductions shall be run to suit the requirements of the project, and be valid for the duration of the expected construction project life (12 months) for all employees and subcontractors.

As required by the EA Statement of Commitments (Umwelt, 2009), an Aboriginal Cultural Heritage module will be included in the site induction training package for construction personnel.

7.5 Emergency Response and Contacts

The SHE Officer shall ensure the Site Emergency Procedure is maintained and includes adequate arrangements to protect the subcontractors employees, as far as practicable in the event of foreseeable emergency conditions.

Explanation of the Site Emergency Plan and Procedures, with specific reference to the work to be carried out, shall be included in the Project SH&E Induction.

Contact details in the case of an emergency are as follows:

During normal business hours:		
Nick Davies Orica Project Manager Mobile: 0434 734790	Richard Sheehan Orica SH&E Officer Phone: (02) 49089169 Mobile: 0401 678504	Orica Technology Centre Switch No: (02) 49395200

Outside of normal business hours, contact should be made with Nick Davies, Orica Project Manager on the above contact number.

Orica may conduct simulated emergency exercises at any time, without warning. All contractors onsite at the time of emergency shall ensure their employees are aware of the emergency arrangements and shall ensure they follow all requirements in the event of an emergency alarm.

8.0 Corrective Action

Non-conformances may arise from routine inspections, audits or monitoring, or it can be from an external complaint or an internal incident. An environmental non-conformance can be defined as:

- any inspection/test result that does not meet the acceptance criteria specified in the Project Approval or EPL;
- any notice of non-compliance issued by DECCW or any other regulatory authority with environmental jurisdiction (e.g. NOW or DoP);
- any non-compliance with legislation, approvals or licences; or
- any non-conformance with identified site specific objectives and targets.

Should a non-conformance be identified, corrective and/or preventative actions are to be implemented in accordance with the relevant Orica procedures for incident reporting and investigation. They comprise:

- All non-conformances are to be classified as environmental incidents and documented.
- Investigate the cause of the potential non-conformance including stopping the activity if applicable.
- Identify potential corrective and/or preventative actions.
- Implement mitigation measures where applicable.
- Provide feedback to construction personnel, where relevant.

8.1 Review

The effectiveness of the corrective and/or preventative actions are to be assessed during the monthly inspections (refer to **Section 6.1**).

This document is to be reviewed periodically, as required, or as otherwise directed by the Director-General of DoP. The review process is to reflect changes in environmental legislation and guidelines, and changes in technology or construction procedures.

9.0 References

Landcom. 2004. *Blue book – Managing Urban Stormwater: Soils and Construction*. Volume 1, 4th edition, reprinted 2006, Sydney, NSW

NSW Department of Environment, Climate Change and Water. 2008. *Waste Classification Guidelines*. 2009 Revision.

NSW Department of Environment and Climate Change. 2009. *The Interim Construction Noise Guideline*.

NSW Environment Protection Authority, 2000. *NSW Industrial Noise Policy (INP)*. Sydney, NSW.

NSW Rural Bushfire Fire Service, 2006. *Planning for Bushfire Protection*. NSW Rural Fire Service.

Umwelt (Australia) Pty Ltd. 2009. *Orica Proposed ANE Production Facility Environmental Assessment*. Umwelt (Australia) Pty Limited

APPENDIX 1

Vegetation Clearing Protocol

APPENDIX 2

Soil and Water Management Plan

Orica Australia Pty Limited

ANE Production Facility Soil and Water Management Plan

September 2010



ANE Production Facility

Soil and Water Management Plan

Prepared by
Umwelt (Australia) Pty Limited
on behalf of
Orica Australia Pty Ltd

Project Director:	Michelle Kirkman	
Project Manager:	Rod Williams	
Report No.	2586/R09/A2	Date: September 2010



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APPENDICES

A	Preparation of Construction SWMP by a suitably experienced and qualified person
B	Design Construction Matrix For Erosion and Sediment Control Structures
C	Drawings of Typical Erosion and Sediment Control Structures

1.0 Background

This Soil and Water Management Plan (SWMP) has been prepared for Orica Australia Pty Limited (Orica) by Umwelt (Australia) Pty Limited (Umwelt), to address the soil and water management requirements during the construction phase of the ANE Production Facility. A separate Soil and Water Management Plan will be prepared for the operation of the ANE Production Facility. The operational Soil and Water Management Plan will be prepared and submitted to the Director-General of Department of Planning (DoP) for approval prior to the commencement of operations associated with the ANE Production Facility.

The SWMP has been developed as a supplementary management plan to the Construction Environmental Management Strategy (CEMS). Therefore this SWMP should be read in conjunction with the CEMS.

2.0 Project Approval

Table 2.1 – Soil and Water Management Plan Project Approval Conditions

Project Approval Condition	Condition Title	Condition Detail	Section of Document
SCHEDULE 3 <i>Condition 23</i>	Soil and Water Management Plan	<p>The Proponent shall prepare and implement a Soil and Water Management Plan for the project to the satisfaction of the Director-General. This plan must:</p> <ol style="list-style-type: none"> be submitted to the Director-General for approval prior to construction; be prepared by a suitably qualified and experienced expert; and include, where relevant: <ul style="list-style-type: none"> a Stormwater Management Plan; and an Erosion and Sediment Control Plan. 	<p>Appendix A</p> <p>Stormwater Management Plan is not relevant for construction phase – will be developed prior to the commencement of operations</p> <p>Section 3.1</p>
SCHEDULE 3 <i>Condition 24</i>	Stormwater Management Plan	<p>The Stormwater Management Plan must:</p> <ol style="list-style-type: none"> include detailed plans of the stormwater management system for the site, including any rainwater harvesting infrastructure; be consistent with the guidelines <i>Managing Urban Stormwater: Harvesting and Reuse (DECC)</i>; demonstrate that post development flows will not exceed predevelopment flows for a range of ARI from 1 year up to and including the 100 year ARI; 	<p>Stormwater Management Plan is not relevant for construction phase – will be developed prior to the commencement of operations</p>

Table 2.1 – Soil and Water Management Plan Project Approval Conditions (cont)

Project Approval Condition	Condition Title	Condition Detail	Section of Document
		d) describe the procedures for the installation, inspection and maintenance of the stormwater system; and e) include a stormwater quality monitoring program for including procedures to be undertaken if any non-compliance is detected..	
SCHEDULE 3 <i>Condition 25</i>	Erosion and Sediment Control Plan	The Erosion and Sediment Control Plan shall be prepared in accordance with <i>Landcom's 2004 Managing Urban Stormwater: Soils and Construction</i>	Section 3.1

2.1 Objective

The objective of this Construction SWMP is to:

- provide employees and contractors with a clear and concise description of their responsibilities in relation to soil and water control during the construction of the ANE Production Facility;
- describe the location, function and capacity of control structures required to minimise erosion and sediment impacts during the construction of the ANE Production Facility on the environment;
- minimise erosion and manage sediment through the construction and maintenance of a range of structures designed to prevent the discharge of sediment laden water off site and ensure that such structures are appropriately maintained;
- address the relevant commitments made within the Environmental Assessment; and
- address legislative requirements and guidelines relevant to the Construction SWMP.

Prior to the commencement of earthworks the Soil and Water Management be will tailored to the construction schedule and activities being undertaken through the preparation of a program of works for erosion and sediment control, incorporating the measures and principles contained in this Construction SWMP, the construction methodology and construction schedule proposed by the contractor.

The erosion and sediment control works program will consider site constraints, including topography, drainage pathways and soil characteristics and detail the erosion and sediment control measures to be implemented and a program for their installation.

2.2 Legislative Requirements

Orica will undertake stormwater, erosion and sediment control in accordance with:

- Project Approval (09_0090);
- *Protection of the Environmental Operations Act 1997* (POEO Act) administered by the NSW Department of Environment Climate Change and Water (DECCW);
- *Environmental Planning and Assessment Act 1979* (EP&A Act), administered by the NSW Department of Planning (DoP);
- *Water Management Act 2000*, administered by the NSW office of Water (NOW);
- *Managing Urban Stormwater – Soils and Construction (the Blue Book)*;
 - Volume 1 (Landcom, 2004); and
 - *Volumes 2C Unsealed Roads and 2D Main Road Construction* (DECC, 2008).

3.0 Soil and Water Management Plan for Construction

3.1 Soil Profile

The soil types occurring within the Project area are the Beresfield and Killingworth soil landscapes. The Beresfield soil landscape dominates the western section of the Project area and the Killingworth soil landscape dominates the eastern section of the Project area. These soil types are strong and textured contrast soils with relatively shallow and poorly structured topsoil.

These soils are also noted to be potentially highly erodible, highly acidic, prone to seasonally waterlogging, and are potentially dispersive (Landcom, 2004).

3.2 Sources of Erosion and Sediment

Construction of the ANE Production Facility will result in the alteration of existing surface drainage pathways and will create areas of land disturbance. The construction activities that have the potential to cause erosion and generate sediment laden water, potentially impacting on the surrounding catchment areas if not appropriately managed include:

- the clearing of land ahead of construction or for other related activities;
- the placement of topsoil and other bulk material stockpiles;
- rehabilitation of disturbed areas following completion of construction activities;
- runoff from the areas cleared for and associated with the construction of the ANE Production Facility and associated access road; and
- vehicle and equipment movements.

This Plan details control measures appropriate for these activities in order to minimise any potential adverse impacts on surrounding catchment areas.

4.0 Soil and Water Management Controls

Standard erosion and sediment control techniques will be utilised in accordance with the requirements of *Managing Urban Stormwater: Soils and Construction Volume 1* (Landcom, 2004) and *Volume 2C and 2D* (DECC, 2008) (the Blue Book). Volumes 2C and 2D have been referenced as the construction operations will occur for a period greater than 6 months.

A summary of the general erosion and sediment control principles employed by Orica to limit erosion on site are outlined in **Section 3.1**. Further site specific erosion and sediment control strategies and structures that will be utilised by Orica to control erosion and sedimentation are outlined in further detail in **Sections 3.2**.

The implementation of the controls outlined in the following sections will require the preparation of a site specific, job related plan of erosion and sediment control works to be implemented in support of each activity to be undertaken (refer to **Section 2.1**).

4.1 General Erosion and Sediment Control Principles

Orica will implement a range of general erosion and sediment controls in accordance with the Blue Book (Landcom, 2004 and DECC, 2008). These general controls have been designed to control and manage erosion and sediment that may result from the construction activities. The measures that will be implemented are included in **Table 4.1**.

Design details and drawings of typical erosion and sediment control structures are provided in **Appendix C**.

Table 4.1 – Erosion and Sediment Control Measures

Measure/Control	Responsibility	Timing
General		
<ul style="list-style-type: none"> Installation of erosion and sediment control measures prior to land disturbance. Note: selective clearing/land disturbance may be required to install the erosion and sediment control measures. 	<ul style="list-style-type: none"> Construction Contractor Project Manager Site Earthworks/Civil Foreman Construction Contractor SHE Officer 	<ul style="list-style-type: none"> Prior to land disturbance
<ul style="list-style-type: none"> Minimising all disturbed areas and stabilisation by progressive clearing and rehabilitation/stabilisation as soon as practicable. 	<ul style="list-style-type: none"> Orica Project Manager Construction Contractor Project Manager 	<ul style="list-style-type: none"> Pre Construction - Facility design During construction
<ul style="list-style-type: none"> Clearly identifying and delineating areas required to be disturbed and ensuring that disturbance is limited to those areas 	<ul style="list-style-type: none"> Construction Contractor Project Manager Site Earthworks/Civil Foreman Surveyor 	<ul style="list-style-type: none"> Prior to and during construction
<ul style="list-style-type: none"> Construction of diversion banks upslope of areas to be disturbed to direct clean water runoff away from disturbed areas where practical. The diversion banks will be designed to ensure effective segregation of sediment-laden runoff and allow clean surface water to return to natural watercourses. 	<ul style="list-style-type: none"> Construction Contractor Project Manager Site Earthworks/Civil Foreman Construction Contractor SHE Officer 	<ul style="list-style-type: none"> Pre Construction - Facility design Prior to land disturbance and during construction
<ul style="list-style-type: none"> Construction of catch drains to capture runoff from disturbed areas and direct runoff to sediment control structures. 	<ul style="list-style-type: none"> Construction Contractor Project Manager Site Earthworks/Civil Foreman Construction Contractor SHE Officer 	<ul style="list-style-type: none"> During construction

Table 4.1 – Erosion and Sediment Control Measures (cont)

Measure/Control	Responsibility	Timing
<ul style="list-style-type: none"> Construction of other erosion and sediment control measures such as sediment fences as required (refer to Section 3.2 and Appendices B and C). 	<ul style="list-style-type: none"> Construction Contractor Project Manager Site Earthworks/Civil Foreman Construction Contractor SHE Officer 	<ul style="list-style-type: none"> During construction
<ul style="list-style-type: none"> Construction of drainage controls such as table drains at roadsides and on hardstand areas and toe drains on stockpiles. 	<ul style="list-style-type: none"> Construction Contractor Project Manager Site Earthworks/Civil Foreman Construction Contractor SHE Officer 	<ul style="list-style-type: none"> During construction
<ul style="list-style-type: none"> Removal of any material which is tracked onto pavement surfaces at the end of each working day through methods such as placement of hardstand material or installation of rumble grids at exit points to minimise the tracking of soil onto pavement surfaces and off site. 	<ul style="list-style-type: none"> Construction Contractor Project Manager Site Earthworks/Civil Foreman Construction Contractor SHE Officer 	<ul style="list-style-type: none"> During construction
<ul style="list-style-type: none"> Construction of graded banks, where required, over the final reshaped landform to minimise erosion and re-direct runoff to catch drains and water disposal area. 	<ul style="list-style-type: none"> Construction Contractor Project Manager During facility design 	<ul style="list-style-type: none"> During construction Post construction landscaping
Stockpile Management (topsoil or fill material)		
<ul style="list-style-type: none"> Locate stockpiles away from watercourses. 	<ul style="list-style-type: none"> Construction Contractor Project Manager 	<ul style="list-style-type: none"> During construction
<ul style="list-style-type: none"> Select level or gently sloping areas for stockpile sites to minimise erosion and potential soil loss where possible. 	<ul style="list-style-type: none"> Construction Contractor Project Manager 	<ul style="list-style-type: none"> During construction
<ul style="list-style-type: none"> Install appropriate sediment controls upslope of stockpiles to divert water around the stockpiles and downslope of stockpiles to prevent material loss. 	<ul style="list-style-type: none"> Site Earthworks/Civil Foreman Construction Contractor SHE Officer 	<ul style="list-style-type: none"> During construction

Table 4.1 – Erosion and Sediment Control Measures (cont)

Measure/Control	Responsibility	Timing
<ul style="list-style-type: none"> Place topsoil stockpiles to a height generally less than three metres and setting out topsoil stockpiles where necessary in windrows to maximise seed growth from the soil seed bank and maintain biological activity. 	<ul style="list-style-type: none"> Site Earthworks/Civil Foreman Construction Contractor SHE Officer 	<ul style="list-style-type: none"> During construction
<ul style="list-style-type: none"> Soil stockpiles will be vegetated if they will be undisturbed for a period longer than three months. 	<ul style="list-style-type: none"> Construction Contractor Project Manager Site Earthworks/Civil Foreman Construction Contractor SHE Officer 	<ul style="list-style-type: none"> During construction
<ul style="list-style-type: none"> Revegetation of final landforms and disturbed areas as soon as practical. 	<ul style="list-style-type: none"> Construction Contractor Project Manager Site Earthworks/Civil Foreman Construction Contractor SHE Officer 	<ul style="list-style-type: none"> During construction
<ul style="list-style-type: none"> Immediate repair or redesign of erosion and sediment controls that are not performing adequately, as identified during field inspections. 	<ul style="list-style-type: none"> Construction Contractor Project Manager Site Earthworks/Civil Foreman Construction Contractor SHE Officer 	<ul style="list-style-type: none"> During construction
Sediment Fences & Other Temporary Controls		
<ul style="list-style-type: none"> Placement of geotextile liners and rock check dams in drains as required to reduce water velocities and prevent scouring in drainage lines, flow paths, and culverts. (Refer to Appendix B). 	<ul style="list-style-type: none"> Construction Contractor Project Manager Site Earthworks/Civil Foreman Construction Contractor SHE Officer 	<ul style="list-style-type: none"> During construction Post construction

Table 4.1 – Erosion and Sediment Control Measures (cont)

Measure/Control	Responsibility	Timing
<ul style="list-style-type: none"> Sediment fences, sediment traps, rock checks and other erosion and sediment control measures are to be designed and installed in accordance with the 'Blue Book' and installed in advance of, or in conjunction with, earthworks to prevent sediment laden water leaving the site or entering the clean water system (refer to Appendix C). 	<ul style="list-style-type: none"> Construction Contractor Project Manager Construction Contractor SHE Officer 	<ul style="list-style-type: none"> Prior to and during construction
<ul style="list-style-type: none"> Sediment fences and other controls where appropriate are intended to be used until a final stable landform is established. 	<ul style="list-style-type: none"> Construction Contractor Project Manager 	<ul style="list-style-type: none"> During construction Post construction
<ul style="list-style-type: none"> Where appropriate, sediment fences or other controls are to be installed immediately downstream of the areas to be disturbed. 	<ul style="list-style-type: none"> Site Earthworks/Civil Foreman Construction Contractor SHE Officer 	<ul style="list-style-type: none"> During construction
<ul style="list-style-type: none"> Sediment fences are to be installed along contours if practicable. Sediment fences are to be constructed using geotextile filter fabric with structural posts to be spaced no more than 1.5 metres apart. 	<ul style="list-style-type: none"> Site Earthworks/Civil Foreman Construction Contractor SHE Officer 	<ul style="list-style-type: none"> During construction
<ul style="list-style-type: none"> Sediment fences should not be installed in high flow areas where the effectiveness of the fences may be impeded (e.g. perpendicular across waterways or drains). 	<ul style="list-style-type: none"> Construction Contractor Project Manager 	<ul style="list-style-type: none"> During construction
<ul style="list-style-type: none"> Catchment areas of sediment fences and other temporary controls where practicable, are to be limited by constructing the fences or other controls with small returns at 20 metre intervals to create smaller contributing sub catchments so as to prevent failure in larger storm events. 	<ul style="list-style-type: none"> Construction Contractor Project Manager Construction Contractor SHE Officer 	<ul style="list-style-type: none"> During construction
<ul style="list-style-type: none"> Sediment fences and other such temporary controls should be designed to ensure a maximum of 50 L/s passes through the sediment fence during a storm event. 	<ul style="list-style-type: none"> Construction Contractor Project Manager 	<ul style="list-style-type: none"> During construction

Table 4.1 – Erosion and Sediment Control Measures (cont)

Measure/Control	Responsibility	Timing
Clean Water Diversion Drains		
<ul style="list-style-type: none"> Clean water diversions will be constructed to convey clean water runoff away from disturbed areas and prevent water from entering active areas and the dirty water management system. This clean water runoff will be diverted into nearby watercourses. 	<ul style="list-style-type: none"> Construction Contractor Project Manager Construction Contractor SHE Officer Site Earthworks/Civil Foreman 	<ul style="list-style-type: none"> During construction
<ul style="list-style-type: none"> All diversions are to be designed in accordance with the Blue Book to cater for a minimum 20 year Average Recurrence Interval (ARI) storm event. Further detailed design calculations are provided in Appendix B. 	<ul style="list-style-type: none"> Construction Contractor Project Manager Construction Contractor SHE Officer Site Earthworks/Civil Foreman 	<ul style="list-style-type: none"> Pre Construction and during construction
Catch Drains		
<ul style="list-style-type: none"> Catch drains will be established to convey runoff from the disturbed areas to appropriate discharge structures. 	<ul style="list-style-type: none"> Construction Contractor Project Manager 	<ul style="list-style-type: none"> During construction
<ul style="list-style-type: none"> All catch drains will be designed to convey peak discharges from a minimum critical duration 20 year ARI storm event. Further design details and a typical cross-section are included in Appendix C. 	<ul style="list-style-type: none"> Construction Contractor Project Manager 	<ul style="list-style-type: none"> Pre Construction design During construction

5.0 Inspections and Maintenance

The objectives of the ongoing monitoring and review process are to ensure:

- all soil and water management controls are inspected at a frequency commensurate with the level of risk that each of the respective structures address;
- ensure maintenance works are conducted as required;
- ensure soil and water control features are checked prior to high rainfall events: and
- that the program of stormwater management and erosion and sediment works, controls, and structures constructed are effective.

Further details of the inspection and maintenance requirements are included in **Table 5.1**.

Table 5.1 - Inspection and Maintenance Controls

Control Measure	Responsibility	Timing
<ul style="list-style-type: none"> • Regular maintenance of all controls. 	<ul style="list-style-type: none"> • Construction Contractor Project Manager 	<ul style="list-style-type: none"> • During construction
<ul style="list-style-type: none"> • The soil and water management controls are to be inspected weekly and/or following high rainfall events (i.e. greater than 20 millimetres of rainfall in 24 hours). 	<ul style="list-style-type: none"> • Construction Contractor SHE Officer 	<ul style="list-style-type: none"> • Weekly and following high rainfall events
<ul style="list-style-type: none"> • Material accumulated by Erosion and sediment control structures is to be removed before the efficiency of the sediment storage zone is reduced by more than 80% of its designed capacity. 	<ul style="list-style-type: none"> • Construction Contractor Project Manager • Construction Contractor SHE Officer 	<ul style="list-style-type: none"> • During construction and as required
<ul style="list-style-type: none"> • The sediment levels in the structures and the need for desilting will be determined through a visual assessment as part of the regular inspections. 	<ul style="list-style-type: none"> • Construction Contractor Project Manager • Construction Contractor SHE Officer 	<ul style="list-style-type: none"> • During construction and as required
<ul style="list-style-type: none"> • If inspections identify that the type, location or condition of the erosion and sediment control structures are ineffective, the control structure will be modified, repaired or replaced. 	<ul style="list-style-type: none"> • Construction Contractor Project Manager 	<ul style="list-style-type: none"> • During construction and as required
<ul style="list-style-type: none"> • If any ineffective erosion and sediment control structures cannot be addressed immediately, the timeframe for the modification, repair or replacement of the structures will be based on an assessment of the risk to the surrounding environment. 	<ul style="list-style-type: none"> • Construction Contractor Project Manager • Construction Contractor SHE Officer 	<ul style="list-style-type: none"> • During construction

5.1 Corrective Actions

Where a failure of stormwater management and/or erosion and sediment control structures has occurred, or an inspection identifies a non-compliance with this plan, the incident/non-compliance will be handled in accordance with the CEMS incident reporting requirements.

6.0 References

Department of Environment and Climate Change (DECC), 2008. *Managing Urban Stormwater – Soils and Construction, 2C – Unsealed Roads*.

Department of Environment and Climate Change (DECC), 2008. *Managing Urban Stormwater – Soils and Construction, 2D – Main Road Construction*.

Kovac, M. & Lawrie, J.W., 1991. *Soil Landscapes of the Newcastle 1:250 000 Map Sheet*. Department of Land and Water Conservation of NSW, Sydney.

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APPENDIX A

**Preparation of Construction SWMP by
a suitably experienced and qualified
person**

Appendix A - Preparation of Construction SWMP by a suitably experienced and qualified person

Project Approval was granted for Orica Richmond Vale by the Minister for Planning on 26 July 2010 (PA 09_0090). Condition 23, Schedule 3 of the project approval requires that a Soil and Water Management Plan be prepared by a suitably experience and qualified person prior to carrying out any development on site.

Umwelt (Australia) Pty Limited (Umwelt) has been engaged to prepare the Soil and Water Management Plan for the Project.

The plans will be prepared by Susan Shield (ME (Water), BE (Hons), MIEAust, CPEng) Umwelt's Technical Engineering Manager. A summary of Susan's relevant experience is outlined below.

Susan Shield, (ME (Water), BE (Hons), MIEAust, CPEng) Associate, Technical Engineering Manager

Susan has extensive experience working as a civil/environmental engineer for private consultancies, public government authorities and private industry. Susan has developed a broad range of skills including investigations and modelling of natural and man made system, civil engineering design, operations and asset management, project management and construction supervision. These skills enable Susan to offer a comprehensive range of engineering and project management services to a diverse client base.

As Technical Engineering Manager with Umwelt (Australia) Pty Limited, Susan specialises in projects involving civil and environmental engineering components. These components have included hydrology, hydraulics and mathematical modelling of urban and rural catchments; total catchment management including erosion and sediment control and impacts of development on water quality; and floodplain management including flood modelling and hazard assessment.

Susan also has experience in the design of urban and rural stormwater drainage and detention basins; technical assessments for inclusion in environmental impact statements and statements of environmental effects; preparation of environmental management plans; and water balance analysis.

APPENDIX B

Design Construction Matrix For Erosion and Sediment Control Structures

Appendix B – Design Construction Matrix for Erosion and Sediment Control Structures

The following matrix provides design details for the construction of erosion and sediment control structures outlined in the Orica Soil and Water Management Plan.

Table 1 – Drain Design Details

Drain Type	ARI Storm Event	Storm Duration	Freeboard	Typical Grade	Side Batters	Comments
Diversion	20 year	Time of concentration ¹	Minimum of 0.5 metres	0.5% to 1.0%	No steeper than 1:3 (v:h)	Where velocity > 1.5 m/s in 20 year ARI storm event place rock bars every 100 metres to reduce scour potential. All drains to be vegetated. Level spreaders to be located at ends of all drains.
Catch	20 year	Time of concentration ¹	Minimum of 0.5 metres	0.5% to 1.0%	No steeper than 1:3 (v:h)	Where velocity > 1.5 m/s place rock bars every 100 metres to reduce scour potential. Level spreaders to be located at ends of all drains.

Note 1: To be determined based on methods outlined in Australian Rainfall & Runoff (AR&R) (Institution of Engineers, 1987) – Time of concentration for storm event and Mannings Equation for flow rate.

APPENDIX C

Drawings of Typical Erosion and Sediment Control Structures

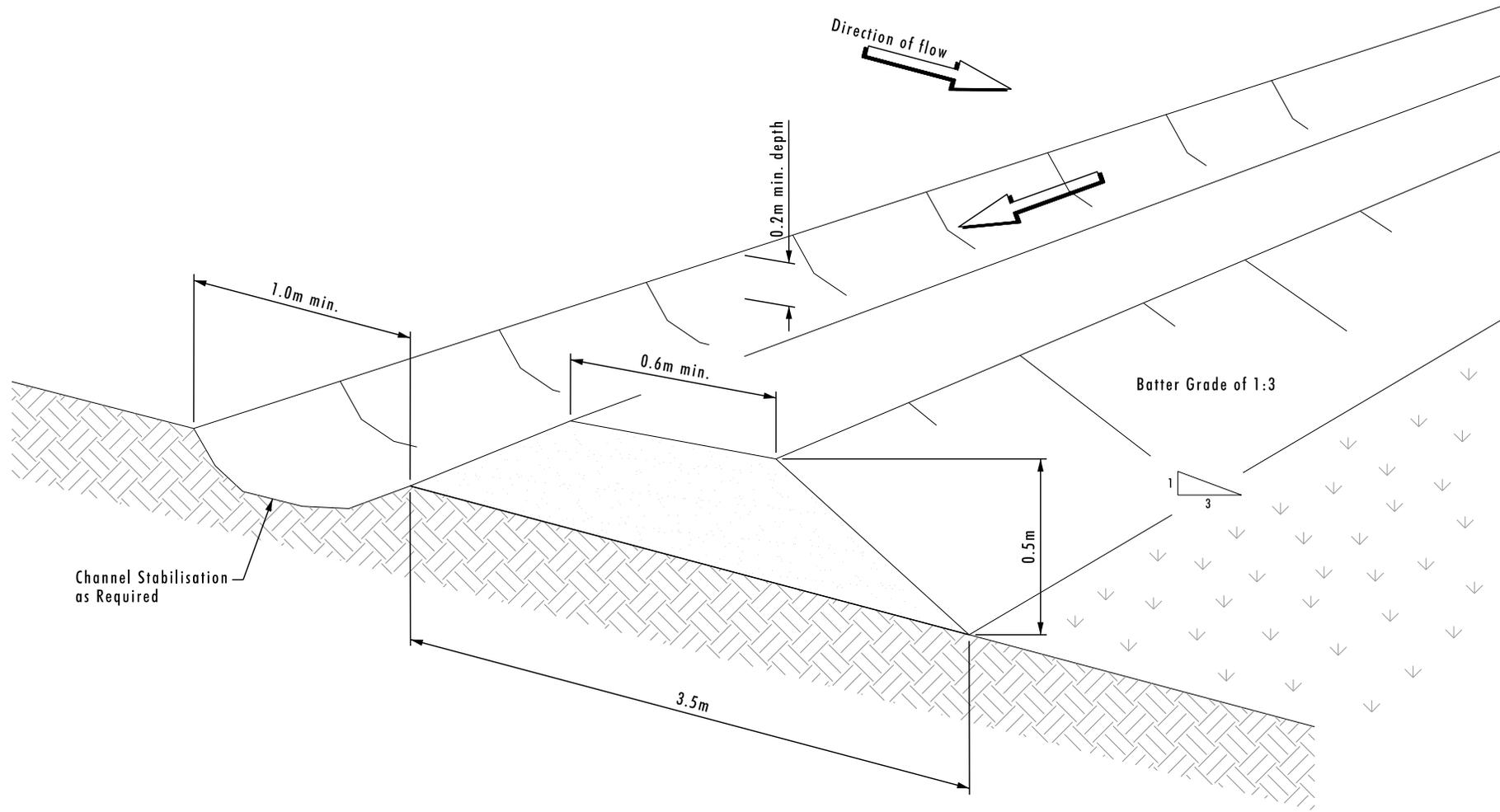


FIGURE 1

Typical Catch / Diversion Drain

Drainage area 0.6ha. max.
Slope gradient 1:2 max.
Slope length 60m max.

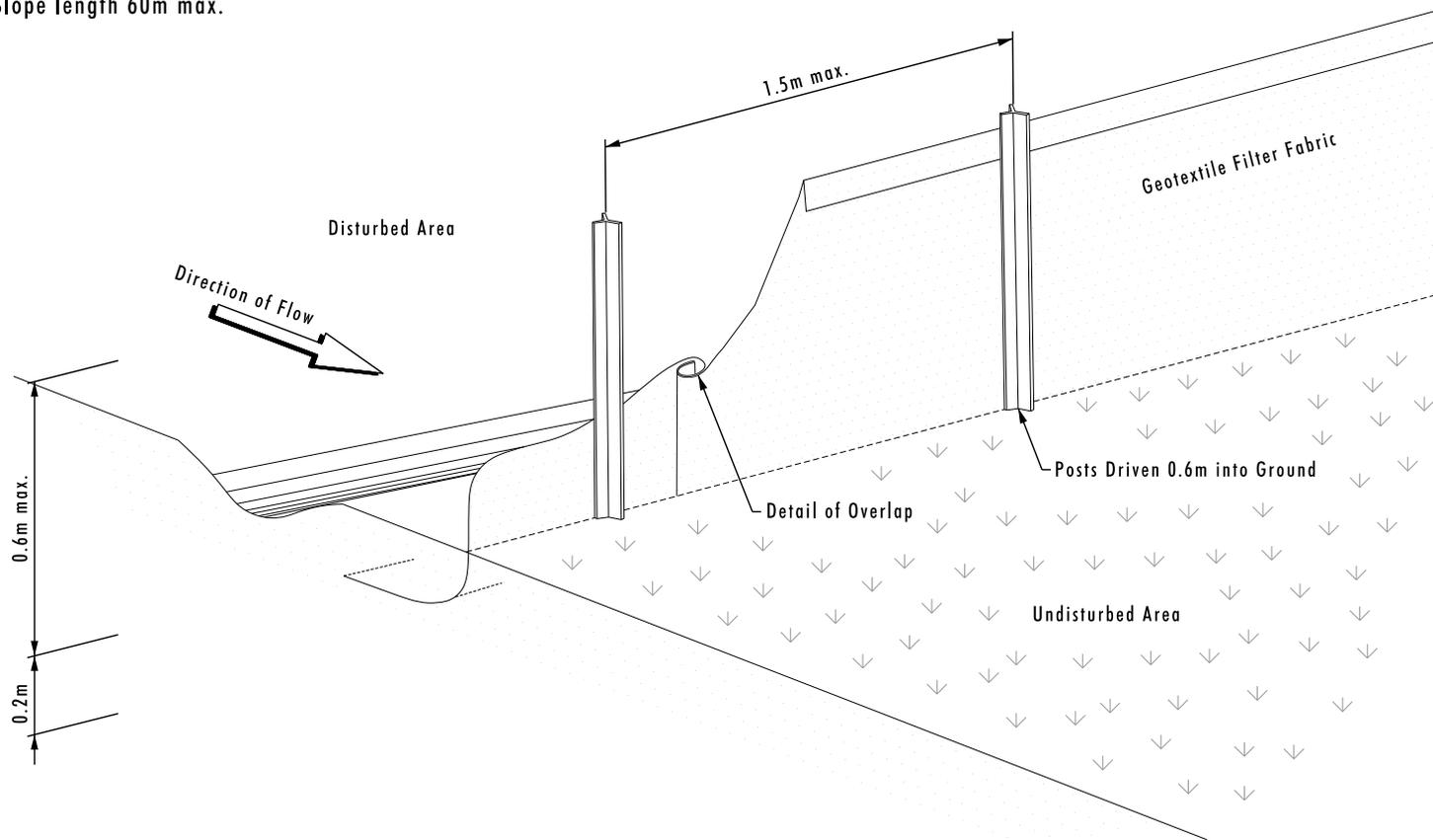


FIGURE 2
Sediment Fence

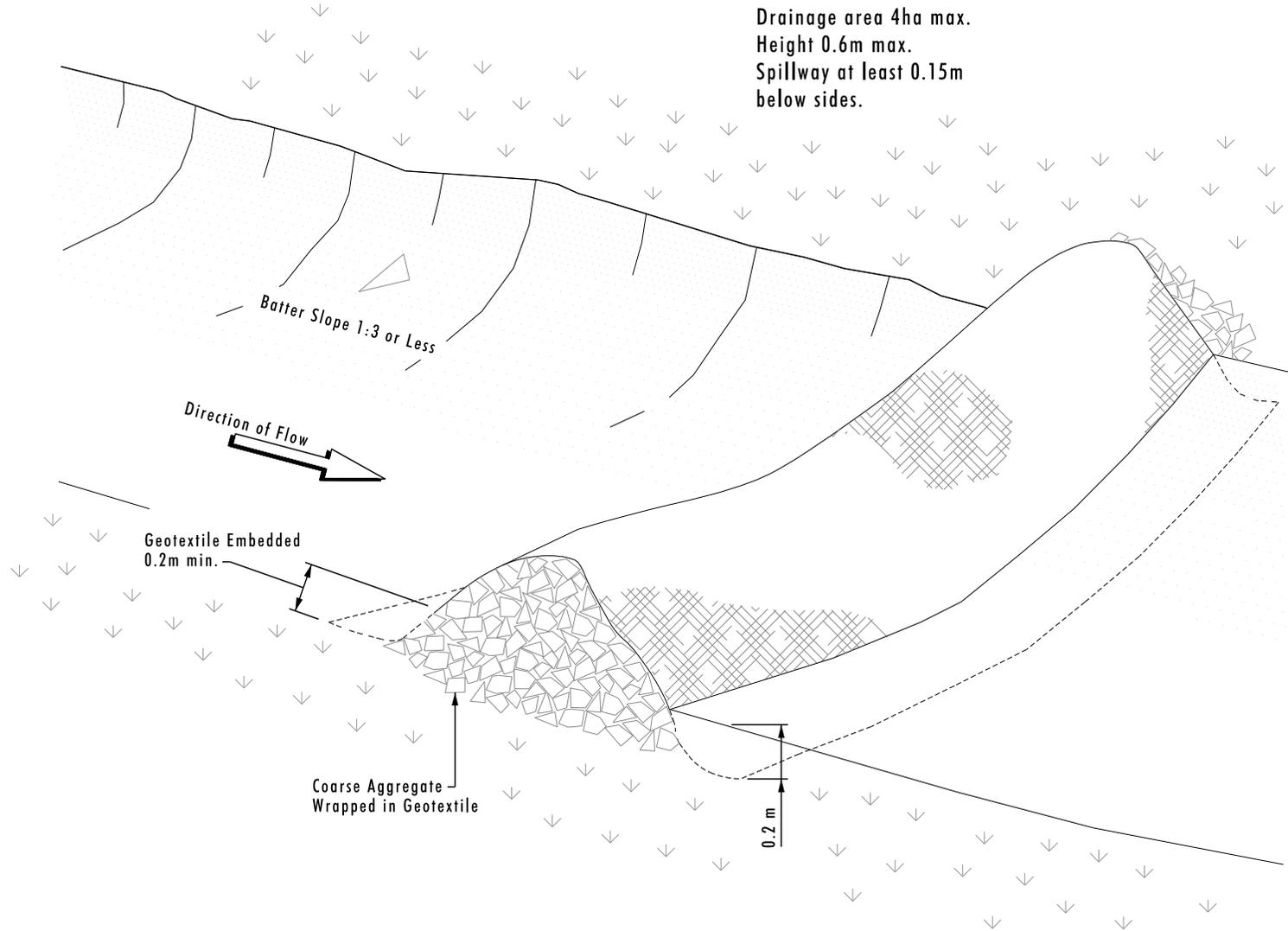


FIGURE 3
Rock Check Dam

APPENDIX 3

Road Transport Protocol

Orica Australia Pty Ltd

Orica ANE Production Facility Road Transport Protocol

September 2010



Orica ANE Production Facility Road Transport Protocol

Prepared by
Umwelt (Australia) Pty Limited
on behalf of
Orica Australia Pty Ltd

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1.0 Background

1.1 Context

This Construction Road Transport Protocol (CRTP) has been prepared for Orica Australia Pty Limited (Orica) by Umwelt (Australia) Pty Limited (Umwelt), to address the traffic management requirements during the construction phase of the ANE Production Facility. A separate Road Transport Protocol will be prepared for the operation of the ANE Production facility. The operational Road Transport Protocol will be prepared in consultation with the RTA and then submitted to the Director-General of Department of Planning (DoP) for approval prior to the commencement of operations associated with the ANE Production Facility.

The CRTP has been developed as an appendix to the Construction Environmental Management Strategy (CEMS). Therefore this CRTP should be read in conjunction with the CEMS, as this CRTP is applicable only to the management of construction phase traffic management impacts.

1.2 Project Approval

This CRTP has been prepared in accordance with Schedule 3 Condition 10 of the Project Approval (09_0090). The CRTP details how road traffic impacts will be mitigated and managed during the construction of the ANE Production Facility. While some of the RTP requirements are related to the transportation of dangerous goods associated with the operational phase of the facility, Orica has adopted the intention of these requirements within the CRTP for the vehicular movements associated with the construction phase, where relevant.

2.0 Project Approval

Table 1 – Road Transport Protocol Project Approval Conditions

Project Approval Condition	Condition Title	Condition Detail	Section of Document
SCHEDULE 3 <i>Condition 10</i>	Road Transport Protocol	Prior to the commencement of construction of the ANE Facility, the Applicant shall prepare and implement a Road Transport Protocol for heavy vehicles, in consultation with the RTA, to the satisfaction of the Director-General. The Protocol shall detail the management of heavy vehicles during both construction and operation of the ANE Facility, and where relevant:	
SCHEDULE 3 <i>Condition 10a</i>	Road Transport Protocol	Define the routes to be used for heavy vehicles; the maximum number of road movements and the haulage hours;	Section 3.0

Table 1 – Road Transport Protocol Project Approval Conditions (cont)

Project Approval Condition	Condition Title	Condition Detail	Section of Document
<p>SCHEDULE 3 <i>Condition 10b</i></p>	<p>Traffic Management Plan</p>	<p>Include a Traffic Management Plan, which incorporates the requirements of the site’s existing Traffic Management Protocol and addresses:</p> <ul style="list-style-type: none"> • Procedures to ensure that drivers adhere to the designated haulage route as required under this protocol; • Measures to achieve a low-frequency, regular trucking schedule during normal business hours rather than a high-frequency, campaign trucking schedule; • Contingency plans where, for example the designated transport route is disrupted. This shall also address procedures for notifying relevant agencies and affected communities of the required implementation of any such contingency plans; • Details of procedures for receiving and addressing complaints from the community concerning traffic issues associated with haulage from the site; and • Measures to ensure that the provisions of the Traffic Management Plan are implemented, e.g. education of drivers and any contractual agreements with operators of heavy vehicles which service the site; 	<p>Section 3.2</p> <p>Section 3.2</p> <p>This condition relates to haulage of ANE product during the operational phase of the Project</p> <p>Section 6.2 of the CEMS</p> <p>Section 4.0</p>
<p>SCHEDULE 3 <i>Condition 10 c</i></p>	<p>Driver Code of Conduct</p>	<p>Include a Driver Code of Conduct that addresses:</p> <ul style="list-style-type: none"> • Driver licensing and training requirements in relation to the transport of dangerous goods; • Travelling speeds; • Staggering of truck departures to ensure a regular trucking schedule throughout the day; • Instructions to drivers not to overtake each other on the haulage route, as far as practicable, and to maintain appropriate distances between vehicles; • Instructions to drivers to restrict the use of exhaust brakes in accordance with the Submissions Report; 	<p>Section 4.0</p> <p>Section 4.0</p> <p>This condition relates to haulage of ANE product during the operational phase of the Project</p> <p>Section 3.2 and Section 4.0</p> <p>This condition relates to haulage of ANE product during the operational phase of the Project</p>

Table 1 – Road Transport Protocol Project Approval Conditions (cont)

Project Approval Condition	Condition Title	Condition Detail	Section of Document
		<ul style="list-style-type: none"> • Instructions to drivers to adhere to the designated haulage route; • Instructions to drivers to be especially safety conscious and to ensure that traffic regulations are obeyed strictly; • Driver training in the Code to ensure that all drivers are made aware and to adhere to the code; and • Procedures for ensuring compliance with and enforcement of the Code. 	<p>This condition relates to haulage of ANE product during the operational phase of the Project</p> <p>Section 4.0</p> <p>Section 4.0</p> <p>Section 4.0</p>

3.0 Traffic Management Plan

The maximum daily traffic generated during construction is expected to be a total of approximately 53 vehicles per day two way consisting of:

- 50 light vehicles (workforce); and
- 3 heavy vehicles (delivering materials and equipment to the site).

The workforce will be split evenly between arrivals and departures from/to the north and south.

The majority of construction traffic will be through the day; however there may occasionally be minor traffic movements outside of normal working hours. The heavy vehicles delivering materials and equipment to the Orica site are expected to arrive and depart from/to the north along George Booth Drive to John Renshaw Drive. Other construction related traffic may access the site from the north or south along George Booth Drive.

Based on the existing traffic volumes set out in the EA, the construction traffic will represent less than a 1 per cent increase in the weekday and daily traffic volumes currently using George Booth Drive, north and south of the Technology Centre. Impacts associated with construction traffic for the ANE Production Facility are not expected to be significant. However, a number of mitigation measures, as outlined in this Road Transport Protocol, have been developed to minimise impacts.

Construction traffic management measures are provided in **Section 3.2** and **Section 4.0**.

3.1 Complaints Handling

Complaints will be managed in accordance with **Section 6.2** of the CEMS.

3.2 Construction Traffic Management Measures

The following management measures will be implemented in order to minimise the potential for impact as a result of construction related traffic at the ANE Production Facility:

Mitigation Measure	Responsibility	Timing
<ul style="list-style-type: none"> The Safety, Health and Environment (SHE) induction provided to construction contractors will include construction traffic components. 	<ul style="list-style-type: none"> Site Safety/Environment Representative 	<ul style="list-style-type: none"> Prior to commencement of construction
<ul style="list-style-type: none"> Construction traffic is expected to be predominantly during standard construction hours (i.e. hours of 7 am – 5 pm Monday to Friday and 8 am – 1 pm on Saturday). Construction activities such as concreting works may need to be undertaken outside these times. 	<ul style="list-style-type: none"> Site Project Manager 	<ul style="list-style-type: none"> During construction
<ul style="list-style-type: none"> Reinforcement of the community impacts of construction traffic noise during toolbox talks and the site induction. 	<ul style="list-style-type: none"> Site Project Manager 	<ul style="list-style-type: none"> During construction
<ul style="list-style-type: none"> Where practicable heavy vehicle departures from the site will be staggered to minimise noise and traffic impacts on nearby residents. 	<ul style="list-style-type: none"> Site Project Manager 	<ul style="list-style-type: none"> During construction
<ul style="list-style-type: none"> Monitoring of truck movements will be undertaken to ensure drivers are complying with the Driver Code of Conduct. 	<ul style="list-style-type: none"> Site Safety/Environmental Representative 	<ul style="list-style-type: none"> During construction
<ul style="list-style-type: none"> Incident investigation in response to any concerns raised by the community, regarding traffic noise associated with the construction of the ANE Production Facility. 	<ul style="list-style-type: none"> Orica Safety, Health, Environment Officer 	<ul style="list-style-type: none"> Following incident/community complaint
<ul style="list-style-type: none"> Oversize loads will be transported according to the requirements of the RTA and police, and have the appropriate approvals and escorts as required. 	<ul style="list-style-type: none"> Site Project Manager Haulage contractor 	<ul style="list-style-type: none"> During construction

4.0 Driver Code of Conduct

The Driver Code of Conduct was a mitigation measure proposed by Orica to primarily manage potential impacts from traffic associated with the haulage of ANE product from the site during the operational phase of the Project. However, a number of management measures are also applicable to construction traffic, as outlined below. A further Code of Conduct will be developed prior to the commencement of operation of the ANE Production Facility.

In accordance with Condition 10c of Schedule 3 of the Project Approval, construction vehicle drivers:

- will be appropriately licensed to operate the vehicle;
- will obey the road rules at all times;
- in the case of heavy vehicles, will not overtake each other on George Booth Drive, as far as practicable and maintain appropriate distances between vehicles;
- will undertake an induction prior to the commencement of undertaking construction activities that includes familiarisation with this Road Transport Protocol.

The Road Transport Protocol will be provided, where practicable, to all drivers involved in making deliveries to site during the construction of the ANE Production Facility. This may be by way of inclusion with all purchase orders issued for construction activities, or some other similar process.

4.1 Compliance

Compliance with the Driver Code of Conduct will be ensured via periodic monitoring of vehicle movements.

Where appropriate, measures will be implemented to ensure that the code is enforced via the monitoring process. Drivers found to be non-compliant may be subjected to Orica's disciplinary process or prevented from delivering to site in the case of contract or delivery drivers.

APPENDIX 4

Mitigation Measures

Appendix 4 – Mitigation Measures

Table 1 - Mitigation Measures to be implemented during the construction of the ANE Production Facility

Specific mitigation measures proposed to be implemented during construction of the proposed ANE Production Facility include:

Mitigation Measures	Responsibility	Timing
Soil and Water		
<ul style="list-style-type: none"> During construction of the ANE Production Facility soil and water will be managed in accordance with the Construction Soil and Water Management Plan, which is provided as Appendix 2. 	<ul style="list-style-type: none"> Construction Contractor Project Manager 	<ul style="list-style-type: none"> Pre-Construction and Construction
Air Quality		
<ul style="list-style-type: none"> Minimise all disturbance and ensure progressive rehabilitation/stabilisation of disturbed areas as soon as practicable; 	<ul style="list-style-type: none"> Construction Contractor Project Manager 	<ul style="list-style-type: none"> Construction
<ul style="list-style-type: none"> Clearly identify and delineating areas required to be disturbed and ensuring that disturbance is limited to those areas; 	<ul style="list-style-type: none"> Construction Contractor Project Manager 	<ul style="list-style-type: none"> Pre-Construction and Construction
<ul style="list-style-type: none"> Plant and equipment will not be left idling while not in use where practicable; 	<ul style="list-style-type: none"> All employees 	<ul style="list-style-type: none"> Construction
<ul style="list-style-type: none"> All equipment used on site will be maintained in good working order and in accordance with manufacturers specifications to minimise emissions; 	<ul style="list-style-type: none"> Construction Contractor Project Manager 	<ul style="list-style-type: none"> Construction
<ul style="list-style-type: none"> Disturbed and/or exposed soils and stockpiles will be stabilised and/or revegetated (where practical) as soon as possible; 	<ul style="list-style-type: none"> Construction Contractor Project Manager 	<ul style="list-style-type: none"> Construction
<ul style="list-style-type: none"> Vegetation of soil stockpiles will be undertaken if they will be undisturbed for an expected period longer than three months; 	<ul style="list-style-type: none"> Construction Contractor Project Manager 	<ul style="list-style-type: none"> Construction
<ul style="list-style-type: none"> Exposed soils and stockpiles will be covered or watered as soon as possible if excessive dust is generated; 	<ul style="list-style-type: none"> Construction Contractor Project Manager 	<ul style="list-style-type: none"> Construction
<ul style="list-style-type: none"> Heavy vehicles carrying loads of potentially dust generating material will be covered; 	<ul style="list-style-type: none"> Heavy vehicle operators Construction Contractor Project Manager 	<ul style="list-style-type: none"> Construction
<ul style="list-style-type: none"> Placement of hardstand material or installation of rumble grids at exit points to minimise the tracking of soil onto pavement surfaces; 	<ul style="list-style-type: none"> Construction Contractor Project Manager 	<ul style="list-style-type: none"> Pre-Construction
<ul style="list-style-type: none"> Removal of any material which is tracked onto pavement surfaces at the end of each working day; 	<ul style="list-style-type: none"> Construction Contractor Project Manager 	<ul style="list-style-type: none"> Construction
<ul style="list-style-type: none"> Vehicle movements will be confined to designated areas. 	<ul style="list-style-type: none"> All employees 	<ul style="list-style-type: none"> Construction

Table 1 - Mitigation Measures to be implemented during the construction of the ANE Production Facility (cont)

Mitigation Measures	Responsibility	Timing
Noise		
<ul style="list-style-type: none"> Where possible higher noise generating activities will be conducted during the day, where this is not possible an assessment of the potential of the activities to generate noise will be undertaken to ensure compliance with the noise levels using standard construction equipment noise levels. 	<ul style="list-style-type: none"> Construction Contractor Project Manager Construction Contractor SHE Officer 	<ul style="list-style-type: none"> Construction Prior to undertaking construction outside normal hours
Ecology		
<ul style="list-style-type: none"> Utility easements needing to be created will, where possible, follow existing fire trails/roads and other cleared areas to minimise vegetation clearing; 	<ul style="list-style-type: none"> Orica Project Manager 	<ul style="list-style-type: none"> Pre-Construction
<ul style="list-style-type: none"> Any noxious weeds will be identified prior to clearing activities commencing in the area. This material is to be kept separate from other vegetation and topsoil stockpiles and disposed of as soon as possible; 	<ul style="list-style-type: none"> Orica Project Manager 	<ul style="list-style-type: none"> Pre-Construction
<ul style="list-style-type: none"> sedimentation controls will be installed during construction to ensure that soil material does not leave the construction site and enter drainage lines and waterways; 	<ul style="list-style-type: none"> Construction Contractor Project Manager 	<ul style="list-style-type: none"> Pre-Construction and construction
<ul style="list-style-type: none"> the security fencing for the proposed ANE Production Facility will be restricted to the building perimeter at the 30 metre fire break and will not require vegetation clearing; 	<ul style="list-style-type: none"> Construction Contractor Project Manager 	<ul style="list-style-type: none"> Construction
<ul style="list-style-type: none"> Vegetation clearing will be undertaken in accordance with the Vegetation Clearing Protocol contained in Appendix 1. 	Refer to Appendix 1	<ul style="list-style-type: none"> Construction
Aboriginal Heritage		
<ul style="list-style-type: none"> A surface collection of artefact scatter Orica AS prior to disturbance of the site is to be conducted in accordance with the methodology present in the Aboriginal Cultural Heritage Assessment in the EA (Umwelt, 2009). 	<ul style="list-style-type: none"> Orica Project Manager 	<ul style="list-style-type: none"> Prior to disturbance of the site
<ul style="list-style-type: none"> All topsoil removal within the survey area will be subject to monitoring by representatives of the Aboriginal community and conducted in accordance with the methodology present in the Aboriginal Cultural Heritage Assessment in the EA (Umwelt, 2009). 	<ul style="list-style-type: none"> Construction Contractor Project Manager 	<ul style="list-style-type: none"> During topsoil stripping

Table 1 - Mitigation Measures to be implemented during the construction of the ANE Production Facility (cont)

Mitigation Measures	Responsibility	Timing
<ul style="list-style-type: none"> An Aboriginal Cultural Heritage module will be developed in consultation with the registered Aboriginal stakeholders for inclusion in the site induction training for construction personnel. 	<ul style="list-style-type: none"> Orica Project Manager 	<ul style="list-style-type: none"> Prior to disturbance of the site Site Induction
<ul style="list-style-type: none"> If any skeletal material is discovered and identified during ground disturbance works all work must cease and the NSW Police, DECCW and the Aboriginal stakeholders contacted immediately; 	<ul style="list-style-type: none"> Construction Contractor Project Manager 	<ul style="list-style-type: none"> During construction
<ul style="list-style-type: none"> All ground disturbing works are to be monitored by Aboriginal stakeholders, and should any previously unidentified artefactual material such as sandstone with evidence of Aboriginal axe grinding grooves be exposed during ground disturbance works an archaeologist will be notified and the artefacts will be collected in accordance with the collection methodology in the Aboriginal Cultural Heritage Assessment. 	<ul style="list-style-type: none"> Orica Project Manager 	<ul style="list-style-type: none"> During construction
Historical Heritage		
<ul style="list-style-type: none"> If any places, sites or items of potential European heritage significance are identified during the construction phase of the Project, all activities will cease in the immediate area of the site until such time as an appropriate assessment of heritage significance is undertaken and plans to manage the site have been developed in consultation with DoP and, where relevant, the NSW Heritage Office. 	<ul style="list-style-type: none"> Orica Project Manager 	<ul style="list-style-type: none"> If heritage sites are identified during Construction
Hazardous Substances Management		
<ul style="list-style-type: none"> No hazardous substances or chemicals will be brought onto site without the appropriate Material Safety Data Sheets (MSDS). 	<ul style="list-style-type: none"> Construction Contractor Project Manager 	<ul style="list-style-type: none"> Pre-Construction and Construction
<ul style="list-style-type: none"> If any potentially hazardous substances or chemical material is spilt or contaminated material encountered during the construction works, the contaminated material will be collected, appropriately contained, tested if required, and disposed of at an appropriately licensed facility. 	<ul style="list-style-type: none"> Construction SHE Officer 	<ul style="list-style-type: none"> Construction
<ul style="list-style-type: none"> All hazardous substances (chemicals, fuels and soils) associated with the ANE Production Facility will be stored appropriately in bunded areas accordance with the MSDS and Dangerous Goods legislation. 	<ul style="list-style-type: none"> Construction Contractor Project Manager 	<ul style="list-style-type: none"> Construction

Table 1 - Mitigation Measures to be implemented during the construction of the ANE Production Facility (cont)

Mitigation Measures	Responsibility	Timing
<ul style="list-style-type: none"> All bunds will be designed and installed in accordance with the requirements of all relevant Australian Standards; and The DECCW's <i>Storing and Handling Liquids: Environmental Protection, Participants Manual</i>. This includes such measures as ensuring Bunds will be constructed with impervious flooring and sufficient capacity to contain 110% of the largest container stored within the bund. 	<ul style="list-style-type: none"> Construction Contractor Project Manager 	<ul style="list-style-type: none"> Construction
Importation of Fill		
<ul style="list-style-type: none"> Fill imported onto the site shall be assessed, classified and managed in accordance with the NSW DECC Waste Classification Guidelines, Part 1: Classifying Waste (NSW DECC 2009). 	<ul style="list-style-type: none"> Construction Contractor Project Manager 	<ul style="list-style-type: none"> Prior to the importation of fill material
<ul style="list-style-type: none"> All fill imported onto the site should be validated by either one or both of the following methods: to ensure it is suitable for the proposed land use and free from contamination <ul style="list-style-type: none"> Imported fill should be accompanied by documentation from the supplier which certifies that the material is not contaminated based upon analyses of the material or the known past history of the site where the material is obtained; and/or Sampling and analysis of fill material should be in accordance with the EPA Sampling Design Guidelines (1995) to ensure that the material is not contaminated with samples analysed for chemicals of concern based on the previous site usage/site history of the source site. As a minimum samples should be analysed for TPH, BTEX, heavy metals (As, Cd, Cr, Cu Ni, Pb, Zn and Hg), PAHs, OCPs and PCBs. 	<ul style="list-style-type: none"> Construction Contractor Project Manager 	<ul style="list-style-type: none"> Prior to the importation of fill material
Waste Management		
<ul style="list-style-type: none"> Unsuitable soil material not used in construction will be classified in accordance with the DECCW's <i>Waste Classification Guidelines 2008</i> and where appropriate made available for reuse. 	<ul style="list-style-type: none"> Construction Contractor Project Manager 	<ul style="list-style-type: none"> Construction
<ul style="list-style-type: none"> All waste generated during construction of the ANE Production Facility will be classified in accordance with the DECCW's <i>Waste Classification Guidelines 2008</i> and if required, disposed of to a facility that may lawfully accept the waste. 	<ul style="list-style-type: none"> Construction Contractor SHE Officer Earthworks Civil Foreman 	<ul style="list-style-type: none"> Construction

Table 1 - Mitigation Measures to be implemented during the construction of the ANE Production Facility (cont)

Mitigation Measures	Responsibility	Timing
<ul style="list-style-type: none"> Felled trees containing hollows would be re-used onsite where possible for fauna habitat in areas adjoining the cleared habitat. 	<ul style="list-style-type: none"> Construction Contractor Project Manager Construction Contractor SHE Officer Earthworks Civil Foreman 	<ul style="list-style-type: none"> During site clearing
<ul style="list-style-type: none"> Timber waste will be or mulched for use in landscaping or sediment control onsite. Where this is not possible it is to be transported offsite and disposed of appropriately 	<ul style="list-style-type: none"> Construction Contractor SHE Officer Earthworks Civil Foreman 	<ul style="list-style-type: none"> Construction
<ul style="list-style-type: none"> Topsoil will be re-used on site where possible for revegetation. Where this is not possible the material will be stored for use elsewhere on the Technology Centre site or sent offsite for reuse or disposal. 	<ul style="list-style-type: none"> Construction Contractor Project Manager 	<ul style="list-style-type: none"> During topsoil removal
Traffic		
<ul style="list-style-type: none"> Construction traffic will be managed in accordance with the Construction Road Transport Protocol provided in Appendix 3. 	<ul style="list-style-type: none"> As per Appendix 3 	<ul style="list-style-type: none"> Construction
Lighting		
<ul style="list-style-type: none"> All lighting on-site associated with the construction of the ANE Production Facility shall comply with the latest version of <i>Australian Standard AS 4282(INT)-Control of Obtrusive Effects of Outdoor Lighting</i>; 	<ul style="list-style-type: none"> Construction Contractor Project Manager 	<ul style="list-style-type: none"> Construction
<ul style="list-style-type: none"> All construction lighting will be mounted, screened and directed in such a manner that it does not create a nuisance to surrounding properties or the public road network. 	<ul style="list-style-type: none"> Construction Contractor Project Manager 	<ul style="list-style-type: none"> Construction

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