

Bushfire Threat Assessment

Orica Mining Services

Lot 2 DP 809377 George Booth Drive,
Richmond Vale, NSW, 2327

'Proposed Ammonium Nitrate Emulsion Production Facility'

Bushfire Threat Assessment

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1 AMMONIUM NITRATE EMULSION PRODUCTION FACILITY

1.1 BACKGROUND

Bushfire Consulting Specialists (BCS) has been commissioned by Orica Mining Services (Orica) to undertake a bushfire threat assessment of Lot 2 DP 809377 George Booth Drive, Richmond Vale NSW. This report will accompany a development application (DA) for the proposed construction of an Ammonium Nitrate Emulsion (ANE) Production Facility.

For the purpose of this report, Lot 2 will be referred to as 'the site'. Refer to *Figure 1* for the site locality. The approximate location of the proposed ANE Production Facility has been identified on *Figure 1*.

The site is located within the Cessnock Council Local Government Area. It is dominated by open forest vegetation and covers an area of approximately 292 hectares (ha). Some areas have been previously cleared for the construction of existing development. The land surrounding these facilities is regularly maintained.

The existing Orica Mining Services Technology Centre has been in operation since 1991.

1.2 THE PROPOSAL

The ANE Production Facility would be used for the production of ANE which are precursors for the manufacture of mining explosives at the mine site. The facility is expected to be constructed in 2010 with a maximum production rate of 250,000 tonnes per annum of ANE at peak demand.

ANE and Ammonium Nitrate Solution (ANS) are listed as dangerous goods (DG) Class 5.1 and are not classified as explosives until sensitised at the final delivery site. This occurs by a process of mixing and blending within mobile processing units immediately prior to discharge into blast holes at the mine site (Advitech, 2008). No explosives will be manufactured or stored at the proposed ANE Production Facility, although explosives are manufactured in small quantities and stored at the existing facility in accordance with previous approvals.

The proposed ANE Production Facility involves the following:

- Chemical, fuel and product storage tanks;
- An ANE manufacturing plant;
- Truck weighing, loading and unloading facilities;

- Utilities including hot water, cooling water and compressed air systems, a diesel generator, electricity distribution cables and transformer;
- Stormwater / spill management structures;
- An office, control room, switch room and quality control laboratory.

The proposed ANE Production Facility would require 10 additional staff on 3 shifts over 24 hours 7 days a week during peak production.

The proposed ANE Production Facility layout over an aerial photo is shown on *Figure 2* and a detailed site plan is shown on *Figure 3*.

1.3 EXISTING FACILITIES ON THE SITE

Existing facilities located on the site include:

- Water storage and sewage treatment facilities;
- Car parking;
- Training office;
- Research laboratory and magazine;
- Mixing laboratory;
- Site compound and carparks;
- Offices, amenities and technical office; and
- Engineering stores and depot.

1.4 LEGISLATIVE REQUIREMENTS

1.4.1 Environmental Protection and Assessment Act 1979

The Project is a class of development listed in Schedule 1 of State Environmental Planning Policy (SEPP) (Major Projects) 2005 and falls under the ambit of Part 3A of the *Environment Protection & Assessment (EP&A) Act 1979*. The Department of Planning (DoP) is the consent authority pursuant to Part 3A of the EP&A Act.

As the land is classified as bushfire prone land in accordance with local planning legislation the NSW Rural Fire Service (RFS) was consulted by the DoP. Their response to the Department has provided key issues and

assessment requirements for the Project in accordance with 75F (4) of the EP&A Act.

The following requirements were raised by the RFS:

- Asset protection zones in accordance with Appendix 2 of *Planning for Bushfire Protection 2006*;
- Public access in accordance with Section 4.1.3 and 4.2.7 of *Planning for Bushfire Protection 2006*. This includes the provision of internal and perimeter roads where applicable;
- Water supply for fire fighting purposes in accordance with Section 4.1.3 and 4.2.7 of *Planning for Bushfire Protection*;
- Construction of future dwellings in accordance with Appendix 3 of *Planning for Bushfire Protection 2006* and *Australian Standard 3959*;
- Landscaping in accordance with Appendix 5 of *Planning for Bushfire Protection 2006*;
- Emergency evacuation measures in accordance with Section 4.2.7 of *Planning for Bushfire Protection 2006*.

1.4.2 Planning for Bushfire Protection

In NSW *Planning for Bushfire Protection (PBP) 2006*, developed by the NSW RFS, applies to all Development Applications (DA's) on land that is deemed 'bushfire prone'. As such the PBP guidelines have been used in accordance with legislation and the DGRs for this assessment of bushfire risk and development of adequate protection measures.

A development on bushfire prone land must satisfy the broad aims and objectives of PBP guidelines, the specific objectives for the development type and the detailed performance criteria for proposed bushfire protection measures (RFS, 2006).

The broad aims and objectives of PBP are to:

- (i) Afford occupants of any building adequate protection from exposure to a bushfire;
- (ii) Provide for a defensible space to be located around buildings;
- (iii) Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition;
- (iv) Ensure that safe operational access/egress for emergency service personnel and residents relocating is provided and/or available;

- (v) Provide for ongoing management and maintenance of bushfire protection measures, including fuel loads in the asset protection zone (APZ);
- (vi) Ensure that utility services are adequate to meet the needs of the fire & emergency services.

Source: Beresfield 1:25000 Topographic Map



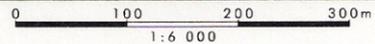
0 250m
Approximate Only



Figure 1
Site Locality



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



- Legend**
- Technology Centre Boundary
 - Proposed ANE Production Facility and Access Road
 - 30m Bushfire Buffer Clearance Area

Source: Umwelt 2009

FIGURE 1.3

Existing Operations,
Proposed ANE Production Facility
and Access Road



Figure 2
Aerial photo showing proposed site layout and access

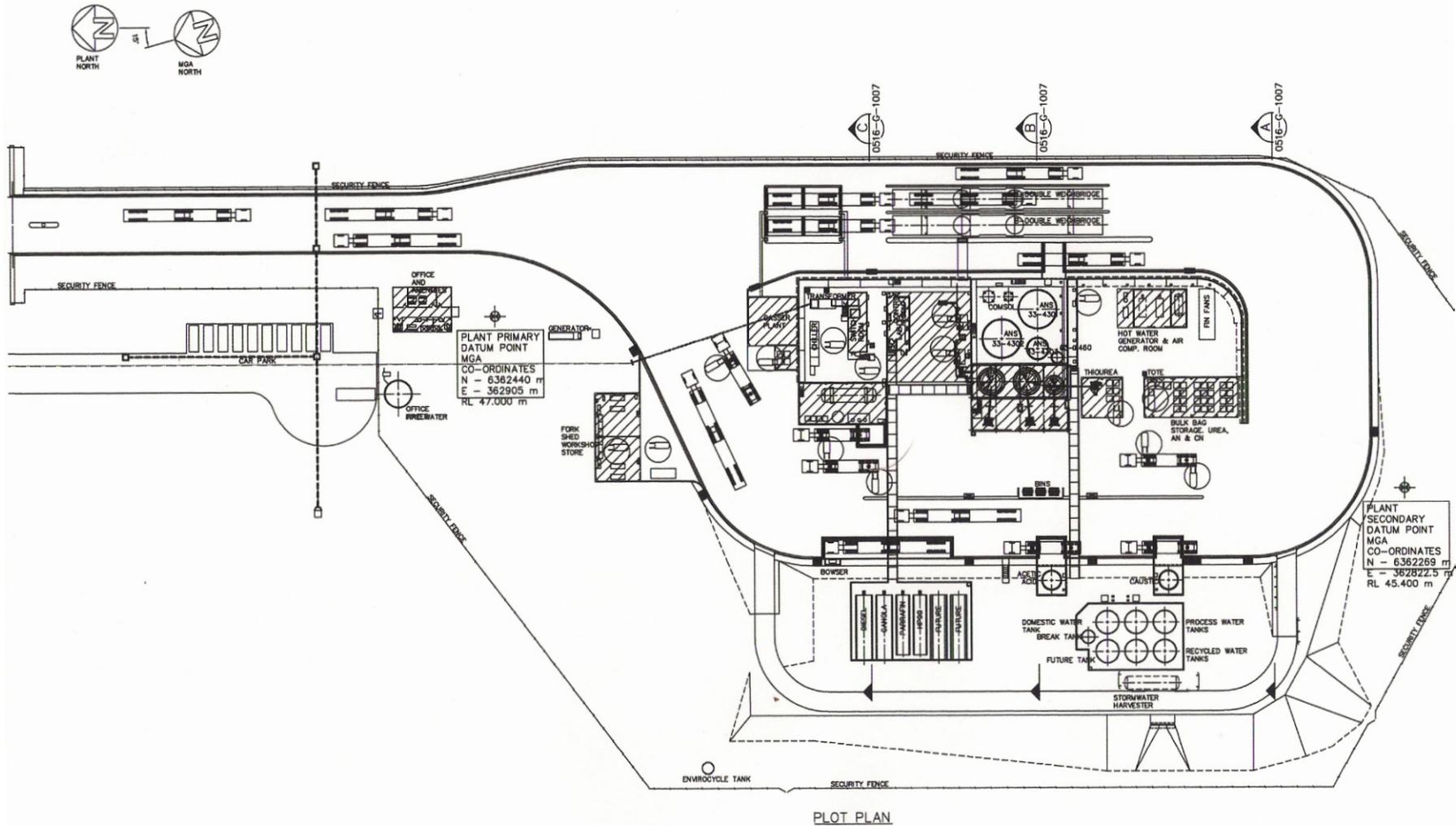


Figure 3
Detailed Site Plan



2 BUSHFIRE THREAT ASSESSMENT

2.1 METHODOLOGY

The bushfire threat assessment was undertaken in accordance with Chapter 4 and Appendix 2 of *Planning for Bushfire Protection* (RFS, 2006). The assessment involved a site visit to assess the physical attributes of the site and surrounding environs, such as vegetation structure and slope.

Chapter 4 of PBP outlines a number of acceptable solutions that must be considered. Whether the Project complies with the acceptable solutions has been assessed throughout this report.

Appendix 2 of the guideline outlines the bushfire protection assessment method used to determine the asset protection zones (APZ's) or separation required based on the slope, fire danger index (FDI) rating and the structure of surrounding vegetation. The slope is determined over 100 metres from the proposed building envelope (BE) in the direction of the bushfire threat and the dominant vegetation type over a distance of 140 metres.

2.2 SURROUNDING VEGETATION

Open forest vegetation is supported across the site and presents a significant bushfire threat to the proposed ANE Production Facility.

Lower Hunter Spotted Gum – Ironbark Forest occurs in the location of the proposed ANE Production Facility and would require removal for construction of the facility. This forest is listed as an endangered ecological community under the Threatened Species Conservation Act.

Preliminary investigations indicate the proposed ANE Production Facility would not have a significant impact on the spotted gum community (Umwelt, 2009). Detailed environmental assessments are being prepared as part of the assessment process.

2.3 SLOPE ASSESSMENT

The land north and south of the proposed building envelope is generally across slope (refer to *Figure 1*).

The slope to the east is approximately 7 degrees upslope.

The land to the west is approximately 4 degrees downslope. The land to the west grades downslope toward Palmers Creek, a tributary of Surveyors Creek.

2.4 FIRE WEATHER

Fire weather assessment assumes a credible worst case scenario and an absence of any other mitigating factors relating to aspect or prevailing winds (RFS, 2006). The site is located within the Cessnock LGA. The 1:50 year fire weather scenario for the Cessnock LGA is an FDI rating of 100 (RFS, 2006).

3 BUSHFIRE PROTECTION MEASURES

3.1 ASSET PROTECTION ZONES

Where a bushfire hazard exists on or adjacent to the development site, an asset protection zone (APZ) is required between the hazard and the development. The APZ serves as a buffer zone between the development and the hazard.

A wide road would be constructed around the perimeter of the proposed ANE Production Facility (refer to *Figure 3*). A smaller perimeter access road for the water tank farm and the fuel storage area would be constructed on the west side around the perimeter of these areas. These roads would separate the proposed facility from the hazard, being the surrounding vegetation, and would provide a fuel free area that could be used as a defensible space should a bushfire threaten the proposed Facility. Both of these roads would form part of the APZ around the proposed Facility where possible.

An APZ is also required around the proposed office / amenities building and workshop / storage areas. The access road would form part of the APZ east of these structures with the office access road forming the part of APZ west of these structures.

3.1.1 Minimum APZ Requirements

Based on the slope of the land and FDI a minimum 20m APZ should be provided on the northern, southern and eastern sides of the proposed ANE Production Facility and associated structures. A minimum 25m APZ should be provided west of the proposed Facility.

The width of the APZ has been calculated using Table A2.4 in Appendix 2 of PBP '*Minimum Specifications for Asset Protection Zones for Residential and Rural Residential Subdivision Purposes (for Class 1 and 2 buildings) in FDI 100 Fire Areas (<29kW/m²)*'.

3.1.2 Future Maintenance of the APZ

Land within the APZ should be maintained in accordance with the requirements of an inner protection area (IPA). Minimal fuels should be supported and regular mowing / slashing should be undertaken in grassed areas. Refer to the RFS Web Page www.rfs.nsw.gov.au for details on the maintenance of IPA's.

Vegetation in the APZ should not form a direct path to the Facility. The presence of some shrubs or trees is acceptable provided they are discontinuous, do not retain dead material or produce excessive quantities of fuel. They should be located so that they will not ignite the

Facility by direct flame contact or radiant heat. Where possible no large trees or shrubs should be located within 10m of the building envelope.

3.2 ACCESS

Access to the site is from George Booth Drive (refer to *Figure 1*). George Booth Drive is two-way and capable of supporting a fully laden fire-fighting vehicle.

The existing Orica access road off George Booth Drive, Echidna Drive, would be utilised for access to the Project. A new round-about would be constructed to allow traffic to divert into the proposed ANE Production Facility (refer to *Figure 2*). The road into the proposed ANE Production Facility has been designed to allow two fully laden trucks to pass safely. The road capacity would be sufficient to carry a fully laden fire – fighting vehicle.

A wide access road would be established within the APZ around the perimeter of the proposed ANE Production Facility. The perimeter road would range between 12 and 20m wide (refer to *Figure 3*). This more than satisfies the minimum requirements of PBP in relation to access.

3.2.1 Minimum Requirements

The access road into the proposed ANE Production Facility must be a minimum of 8m in width kerb to kerb with shoulders on either side to satisfy PBP guidelines.

The access road should have a minimum 4m vertical clearance to any overhanging obstructions including tree branches.

The proposed road into the proposed ANE Production Facility is approximately 13 metres wide and satisfies the minimum requirements for public access in accordance with Section 4.1.3 and 4.2.7 of PBP.

3.3 SERVICES

3.3.1 Water

Rainwater is captured from the roofs of the existing Technology Park office amenities and stored for re-use on-site. Water storage facilities currently on the site allow for the storage of 360 kilolitres of water. A dedicated bushfire water supply of 160,000 L is provided on the existing Technology Park site as part of the Fire Management Plan for the site (Umwelt, 2009).

A 10,000L rainwater tank dedicated to bushfire fighting purposes is required for the proposed ANE Production Facility in accordance with PBP guidelines. The tank must be fitted with a suitable connection for Rural Fire Service (RFS) tankers to refill, such as a 65mm storz outlet with a gate ball or valve. The tank must be made from non-combustible material such as concrete.

3.3.2 Electricity

A transformer and generator would be installed on the northern side of the ANE facility (refer to *Figure 3*). An APZ as outlined in *Section 3.1.1* of this report would be maintained around the proposed transformer and generator.

PBP recommends underground electrical power lines where practicable. Where overhead lines are proposed, lines should be installed with short pole spacings and no part of a tree should be closer to a power line than the distance set out in accordance with “Vegetation Safety Clearances” issued by Energy Australia.

3.4 EVACUATION PROCEDURES

A number of emergency plans have been developed by Orica based on various ‘fire risk scenarios’ covering the existing facilities. Bushfires are considered in these emergency plans as well as other fire threat scenarios.

In the event a bushfire threatens the proposed facility, Orica have a policy of complete evacuation. Clearly marked personnel evacuation routes will be demarked and alarms installed to alert personnel when evacuation is required. Muster points, personnel evacuation routes, and evacuation procedures are included in the site induction procedure and will be exhibited in high traffic areas to allow personnel to become familiar with these plans.

3.5 CONSTRUCTION MATERIALS

The buildings associated with the proposed ANE Production Facility will be constructed on concrete slabs and would be covered with non-combustible materials, such as steel colorbond.

AS 3959 – 1999 Construction of buildings in bushfire-prone areas applies to Class 1, 2, 3 or 4 buildings under the Building Code of Australia (BCA). As none of the buildings associated with the proposed ANE Production Facility are Class 1, 2, 3 or 4 buildings under the BCA, the requirements of AS 3959 – 1999 do not apply.

Chapter 1 in PBP 2006 refers to developments other than those of Class 1, 2, 3 or 4 under the BCA as 'other development'. In regard to construction materials for 'other developments', the PBP states; "the provisions of the BCA for the fire safety will be accepted for bush fire purposes where the aims and objectives of PBP can be met". As the Project meets the aims and objectives of PBP (refer to *Section 1.4.2* of this report) the fire safety provisions of the BCA are acceptable.

3.6 CONSTRUCTION OF STORAGE AREAS

All fuel and other combustible material storage areas would be constructed in accordance with *AS 1940 – 2004 'The storage and handling of flammable and combustible materials'*.

All Class 5 oxidiser materials such as ANS storage areas would be constructed in accordance with *AS4326 (2008) "The storage and handling of oxidising agents"*.

Products such as ANE are not classed as explosive precursors and do not fall within the scope of the *AS2187.1-1998; Explosives – Storage, Transport and Use*. However a code of good practice (the AEMSC Precursor Code) covering explosives precursors has been accepted by the majority of Australian jurisdictions, including NSW. Under the AEMSC Code, storages of ANE must be designed to adopt the same quantity distances as explosives as per *AS2187.1*.

4 RECOMMENDATIONS AND CONCLUSION

4.1 RECOMMENDATIONS

To ensure the Project satisfies *Planning for Bushfire Protection* a number of recommendations have been provided throughout this report. These include:

- (1)** Provide an APZ around the proposed ANE Production Facility;
 - (a) the APZ should be a minimum 20m wide north, south and east of the proposed Facility; and
 - (b) the APZ should be a minimum 25m wide west of the proposed Facility; and
 - (c) roads are acceptable inclusions within the APZ and are encouraged to be included as part of the APZ where possible.
- (2)** Maintain the APZ in accordance with the requirements of an inner protection area (IPA) as outlined in Appendix 5 of PBP;
- (3)** The access road into the proposed facility would need to be a minimum of 8m in width kerb to kerb with shoulders on either side;
- (4)** The access road should have a minimum 4m vertical clearance to any overhanging obstructions including tree branches; and
- (5)** Provide a 10 000L water tank dedicated to fire-fighting purposes and fitted with a suitable connection for Rural Fire Service (RFS) tankers to refill, such as a 65mm storz outlet with a gate ball or valve. The tank should be made from a suitable non-combustible material such as concrete.

4.2 CONCLUSION

The proposed ANE Production Facility would be surrounded by open forest vegetation. To increase the level of bushfire protection afforded to the proposed development an asset protection zone in accordance with Appendix 2 of *Planning for Bushfire Protection* would be maintained around the proposed ANE Production Facility.

The proposed access roads and perimeter road would form part of the recommended asset protection zone around the proposed ANE facility and other structures where possible. Where the described access and perimeter roads do not form the APZ, the land would be maintained as an inner protection area.

Provided the recommendations provided throughout this report are followed, the proposed development is able to satisfy the requirements of *Planning for Bushfire Protection*.

REFERENCES

Australian Standard 3959 (1999). **Construction of buildings in bushfire-prone areas.** Standards Australia.

NSW Rural Bushfire Service (2006). **Planning for Bushfire Protection.** NSW Rural Fire Service.

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

Disclaimer: the recommendations provided throughout this report have been suggested in accordance with guidelines outlined in *Planning for Bushfire Protection* and *AS 3959 - 1999*. The implementation of these measures contributes to the amelioration of the potential threat from bushfires in the area. They do not guarantee that the site or proposed development will not be affected by bushfires in the area at some time in the future. BCS takes no responsibility for any damage or loss of property that may be experienced from bushfires in the future.