



Department of
Infrastructure, Planning and Natural Resources

**Report on the Assessment of
Development Application No. 256-08-2002-i
Pursuant to Section 80 of the Environmental Planning
and Assessment Act, 1979**

**Proposal by ADI Limited to Modernise Parts of the
Existing Munitions Facility at Mulwala, in the Corowa
Local Government Area**

November 2003

TABLE OF CONTENTS

1. INTRODUCTION	1
2. DEVELOPMENT PROPOSAL	2
2.1 Background to the Existing Development	2
2.2 Scope of the Existing Munitions Facility.....	2
2.3 Outline of the Proposal.....	8
3. STATUTORY PLANNING FRAMEWORK.....	10
3.1 Permissibility	10
3.2 Minister's Role	10
3.3 Legislative Context.....	10
3.4 Relevant Environmental Planning Instruments	11
3.5 Commonwealth Approvals	14
3.6 Scope of Development and Deferred Commencement	15
4. ISSUES RAISED IN SUBMISSIONS	18
5. CONSIDERATION OF ENVIRONMENTAL ISSUES	20
5.1 Hazards and Risk Impacts	20
5.2 Socio-Economic Impacts.....	32
5.3 Air Quality Impacts	36
5.4 Noise Impacts.....	44
5.5 Impacts on Heritage Items	50
5.6 Soil and Groundwater Impacts.....	52
5.7 Traffic and Transport Impacts	55
5.8 Impacts of Waste Production and Management	58
5.9 Surface Water Impacts.....	59
5.10 Impacts on Flora and Fauna	60
5.11 Impacts on Visual Amenity.....	62
6. SECTION 79C CONSIDERATION	64
7. RECOMMENDED CONDITIONS OF CONSENT.....	64
8. CONCLUSIONS	65
APPENDIX A - PROVISIONS OF ENVIRONMENTAL PLANNING INSTRUMENTS	66
COROWA LOCAL ENVIRONMENTAL PLAN 1989	70
APPENDIX B - CONSIDERATION UNDER SECTION 79C.....	74

1. INTRODUCTION

On 12 August 2002, the Department received a development application from ADI Ltd (the Applicant) for the upgrade and redevelopment of an existing munitions production facility. The development is proposed for an existing site at Mulwala in the Corowa local government area.

This report represents the Department's assessment of the proposed development, in accordance with the *Environmental Planning and Assessment Act 1979*. The Department recommends deferred commencement approval of the subject development application.

The Applicant operates the existing munitions facility to supply the munitions needs of the Australian Government, through the Department of Defence, and in combination with the manufacturing capabilities of the Benalla facility in Victoria. To ensure the Australian Government's on-going defence needs and to address current concerns in relation to the environmental and safety performance of the existing development, the Australian Government has committed \$220 million to the upgrade. At the time of lodgement of the subject development application, the exact scope and capacity of the munitions facility upgrade had not been determined. As such, the Applicant has lodged a development application for the "environmental envelope" of the greatest scope and capacity expected for the upgrade works. Pending approval from the Minister for Infrastructure and Planning, the Applicant, in consultation with, and to meet the requirements of the Department of Defence, will refine the scope of the proposed development within the scope of the development consent and to meet the requirements that are imposed through that consent.

To provide the Applicant with flexibility in the final design of the development upgrade, and to ensure consistency with the subject development application, the Department recommends that the Minister impose deferred commencement consent, should the proposal be approved. The deferred commencement consent would become active upon the Applicant demonstrating to the satisfaction of the Director-General that the final design of the munitions facility upgrade lies within the scope of the development application as assessed and approved. Further consideration of issues relating to the issue of deferred commencement consent is provided in section 3.6 of this report. The Department's assessment of the proposed development is presented in this report based on the maximum scope and capacity expected by the Applicant for the munitions facility upgrade. In the event that the final design of the upgrade is inconsistent with the development application and consent, if approved, a separate assessment process would need to be initiated, in accordance with the provisions of the *Environmental Planning and Assessment Act 1979*.

The proposed development also requires approval from the Australian Minister for the Environment and Heritage, under the *Environment Protection and Biodiversity Conservation Act 1999*. The State has established agreement with the Australian Government for the environmental impact assessment of the proposal. As such, the State will undertake assessment on behalf of the Australian Government and this report will form part of the documentation supporting any approval made by the Department of the Environment and Heritage to the Minister for the Environment and Heritage in relation to the proposal. This report has been provided to the Department of the Environment and Heritage, and the comments of that agency incorporated into the report. While the Department has consulted with the Department of the Environment and Heritage in relation to the assessment of the proposal, the Department's recommendation that the Minister for Infrastructure and Planning approve the proposal, and the Minister's subsequent determination of the development application does not imply a similar outcome as a result of the Australian Minister for the Environment and Heritage's consideration of the matter.

2. DEVELOPMENT PROPOSAL

2.1 Background to the Existing Development

The Australian Government, through the Department of Defence owns an existing munitions facility at Mulwala, in the Corowa local government area. In 1998, the Australian Government signed the “Mulwala Agreement” with ADI Limited (the Applicant) to reflect the on-going relationship between the parties. The Agreement places an obligation on the Applicant to provide the Australian Government with a strategic, indigenous source of propellants and high explosives at the Mulwala facility. Propellants and high explosives are to be used to manufacture munitions at the existing Benalla munitions manufacturing facility in Victoria.

The Mulwala facility has been in existence since 1942-43, when it was established to produce single base (nitrocellulose) gun propellants for the Australian Defence Force (ADF). The facility originally had a manufacturing capacity of some 6,000 tonnes per annum. During the period 1986 to 1996, a number of other facilities were closed, with the capabilities of these facilities transferred to Mulwala. These capabilities included the production of double base (nitrocellulose and nitroglycerine) and triple base (nitrocellulose, nitroglycerine and nitroguanidine (picrite)) propellants, high explosives and rocket motors.

Due to the age of parts of the existing munitions facility, the Applicant indicates that compliance with current occupational health and safety, and environmental outcomes is difficult. The Applicant argues that there is a clear and urgent need to address this issue to ensure not only the on-going protection of employee safety and the environment, but to also ensure the viability of the munitions facility. A number of investigations have been undertaken to assess various options for the future of the site, including full or partial redevelopment, or closure with full or partial relocation of manufacturing capabilities to the existing Benalla facility. In 2001, the Australian Government announced that it intends to upgrade the Mulwala Facility, and committed up to \$220 million for the upgrade.

2.2 Scope of the Existing Munitions Facility

The existing munitions facility can be generally separated into a number of areas in which particular processes, and groups of related processes are located. These areas can be described as follows:

- Acid, Nitrocellulose and Nitroglycerine Section;
- Propellant Section – including powder, finishing, solvents, double base and gun propellant area;
- High Explosives Section;
- Cast Composites Section; and
- Specialist Services and Support Section.

The location of these areas of the site is illustrated in Figure 1, with each section briefly described below. The interrelation of major process areas is illustrated in Figure 2.

Acid, Nitrocellulose and Nitroglycerine Section

The Acid, nitrocellulose and nitroglycerine section of the munitions facility is responsible for the production of nitrocellulose and nitroglycerine used in the manufacture of single, double and triple base propellants. Acid, particularly nitric acid, is produced and concentration for use in nitrating processes fundamental to the production of nitrocellulose, nitroglycerine, trinitrotoluene (TNT) and RDX (cyclotrimethylene trinitramine). Ether is also produced for use in down stream production processes.

Nitric Acid Plant

The Applicant receives ammonia at the site, which is oxidised over a platinum/ rhodium catalyst to form nitrogen oxide gases. These gases are absorbed into water to generate 60% nitric acid. This acid is concentrated in the Nitric Acid Concentration/ Sulfuric Acid Concentration (NAC/ SAC) plant before used elsewhere on the site. Nitric acid produced is also used for the manufacture of calcium nitrate on-site and sold commercially. The nitric acid plant, which was commissioned in 1989, operates seven days per week, 24-hours per day with a daily output of 35 tonnes (more than 12,000 tonnes per annum).

NAC/ SAC Plant

The Nitric Acid Concentration/ Sulfuric Acid Concentration (NAC/ SAC) plant receives 60% nitric acid from the nitric acid plant, as well as waste acids from nitrocellulose, nitroglycerine and RDX (cyclotrimethylene trinitramine) manufacture. Waste acids produced from the off-site manufacture of pentaerythritol tetranitrate (PETN) are also received for reconcentration. The plant includes three columns (two in operation, and one on standby at any time) to concentration nitric acid, separate nitric and sulfuric acids from the nitrocellulose and nitroglycerine plants, and safely decompose any nitrocellulose and nitroglycerine that may be carried over in waste acids. The plant usually operates two out of every four weeks, but the frequency of operation increases during those periods of operation at the RDX and TNT (trinitrotoluene) plants. The NAC/ SAC plant was commissioned in 1990 and has a daily capacity of 25 tonnes of concentrated nitric acid (as 100% concentration).

The NAC/ SAC plant is the only facility in Australia capable of producing concentrated nitric acid (98%). As such, it is important for the on-going operation of other explosives manufactures in this country.

Calcium Nitrate Plant

Excess nitric acid produced in the nitric acid plant that is not used in the primary production processes on the site, or sold commercially, is used for the manufacture of calcium nitrate. The plant has the capacity to produce some 250 tonnes of calcium nitrate per week for commercial sale (some 13,000 tonnes per annum).

Effluent Treatment Plant

The Effluent Treatment Plant (ETP) receives acid wastewater nitrocellulose and nitroglycerine plants as well as wastewater carrying suspended solids from processes such as the boilerhouse and caustic cleaning tanks. The ETP treats approximately 300 megalitres of water each year through neutralisation (to correct pH), biological treatment (to remove nitrates) and clarification (to remove solids). Treated water is discharge to the environment (Murray River)

The ETP was originally commissioned in 1984, with recent upgrades including new biological treatment units and holding ponds completed in mid 2002.

Nitrocellulose Area

Nitrocellulose is produced on site for use in the manufacture of single, double and triple base gun propellants. Cellulose is brought to the site and pulped, before being nitrated with nitric acid (combined with sulfuric acid), stabilised, mixed and dewatered. As noted above, waste acid from the nitrocellulose plant is reconcentrated in the NAC/ SAC plant.

The nitrocellulose plant was originally built in 1942, with changes being made to the nitration and dewatering processes during the period 1986 to 1996 to ensure employee safety. The plant has the capacity to produce 1,500 tonnes per annum of nitrocellulose (per single shift).

Nitroglycerine Area

Nitroglycerine is produced in a similar manner as nitrocellulose in that the key process step involves nitration of glycerine with nitric acid. Nitroglycerine is mixed with nitrocellulose and dewatered to form paste for the production of double base propellants. The nitroglycerine plant represents the sole nitroglycerine manufacturing capability in Australia. Nitroglycerine from the existing munitions facility is used at other explosives manufacturing plants and is also used in the pharmaceutical industry for the production of cardiac products.

The nitroglycerine plant has a capacity in excess of 300 tonnes per annum (per single shift).

Propellant Section

The propellant section of the munitions facility includes processes for the handling, processing and packaging of single, double and triple base propellants from the materials produced in the acid, nitrocellulose and nitroglycerine section.

Powder Area

The powder area accepts wet nitrocellulose from the nitrocellulose plant. Solvents are added to the nitrocellulose during initial drying and kneading processes. Dried nitrocellulose is passed through a number of mixing processes before being extruded into propellant cords. Cords are cut and solvent removed through an air drying process.

The powder area was established in the early 1940s and has a capacity of some 500 tonnes per annum of propellants (per single shift). This is based on a production year of 220 days, which is dependent on the types of propellants being produced at any particular time.

Finishing Area

The finishing area, as the name suggests, includes processes for finishing extruded and cut propellants from the power area. Propellants are dried to remove residual solvents before being coated (with dinitrotoluene), glazed, sieved and blended. Finished propellants are packed and stored in magazines in the finishing area before shipment off-site.

The capacity of the finishing area is matched with that of the powder area. Finishing processes remain largely unchanged since establishment in the early 1940s.

Solvent Area

The solvent area is used for the manufacture of diethyl ether as well as the separation of ethanol and ether in recovered solvents from nitrocellulose dehydration. The diethyl ether manufacturing process represents the only production capacity in Australia. Ethanol is converted to diethyl ether with sulfuric acid at a rate of some 1,500 tonnes per annum. Ethanol is also separated in this area, at a rate of 7,000 tonnes per annum for return to the nitrocellulose plant or as a feed material in the manufacture of ether. The solvent area also includes capacity for the storage of solvents and the receipt of ethanol. Processes in the solvent area are largely unchanged since establishment in the early 1940s.

Double Base Area

The double base area was established in 1970 for the production of casting powders for rocket motors and high-energy propellants. Production of double base propellants is similar to that for single base propellants in that nitrocellulose and nitroglycerine are mixed, solvent added, propellants extruded and cut. The plant has not fully operated since 1995 because rules governing the safe distance of the operation of this plant from other structures and receptors have changed, effectively making the plant inappropriately located for safe production. Temporary facilities have been established in the double base area to permit on-going production on a small scale.

Gun Propellant Area

The gun propellant area was established in 1992 for the manufacture of triple base propellants. Since it was developed, the requirement for triple base propellants has all but disappeared. There have been some limited trials of the process for the manufacture of single base propellants, with limited success. If used at full capacity, the gun propellant would have the capacity to produce 400 tonnes per annum of propellants.

High Explosives Section

The high explosives (HE) section includes capability to produce trinitrotoluene (TNT), RDX (cyclotrimethylene trinitramine), TNT/ RDX and RDX products. This section of the munitions facility was established during the period 1988 to 1992, as a result of the closure and consolidation of other facilities. High explosives are used in military ammunition, and the existing munitions facility represents the only manufacturing capability for these materials in Australia.

TNT Manufacture

Trinitrotoluene (TNT) is produced through a number of complex steps resulting in the staged nitration of toluene to trinitrotoluene. Manufacture requires the importation of toluene to the site, and the use of 60% and concentration nitric acid produced at the facility. The TNT

manufacturing process has the capacity to produce some 2,750 tonnes of TNT per annum during peak periods of demand, and based on continuous operation.

RDX Manufacture

RDX (cyclotrimethylene trinitramine) is also generated through a number of complex steps, including the receipt of hexamine, nitration, purification and crystallisation. Manufacturing capability includes units relocated to the site from the United Kingdom soon after the Second World War, additional units constructed in the 1970s, and more recently processes established during the period 1988 to 1992 as a result of the relocation and consolidation of other facilities. During periods of five-day continuous operation, the RDX nitration process has a capacity of some 2,000 tonnes per annum. RDX manufacture utilises concentrated nitric acid generated on the site.

RDX/ TNT Manufacture

This plant includes processes for the mixing of TNT with a water slurry of RDX and subsequent drying. The RDX/ TNT plant has a capacity of approximately 1,000 tonnes per annum, based on five days per week continuous operation.

RDX Products

RDX products are produced consisting of coated compositions A3 and TR1 (tetryl replacement), as well as the plastic explosive PE4. Manufacture of these products is undertaken in simple mixing vessels.

High Explosives (HE) Burning Ground

High explosive and nitrocellulose waste are disposed of safely in an open burning ground in the north west of the site.

High Explosives (HE) Magazine Area

High explosives are stored in a number of igloo-style magazines on the site. Fourteen magazines are dedicated to the storage of finished products, and a further six are used to house unfinished high explosive materials.

Cast Composite Section

The cast composite section of the munitions facility represents the only manufacturing capability for cast composite rocket motors in Australia. Equipment in the high explosives section is used to grind ammonium perchlorate, before mixing, casting and assembly in the cast composite section.

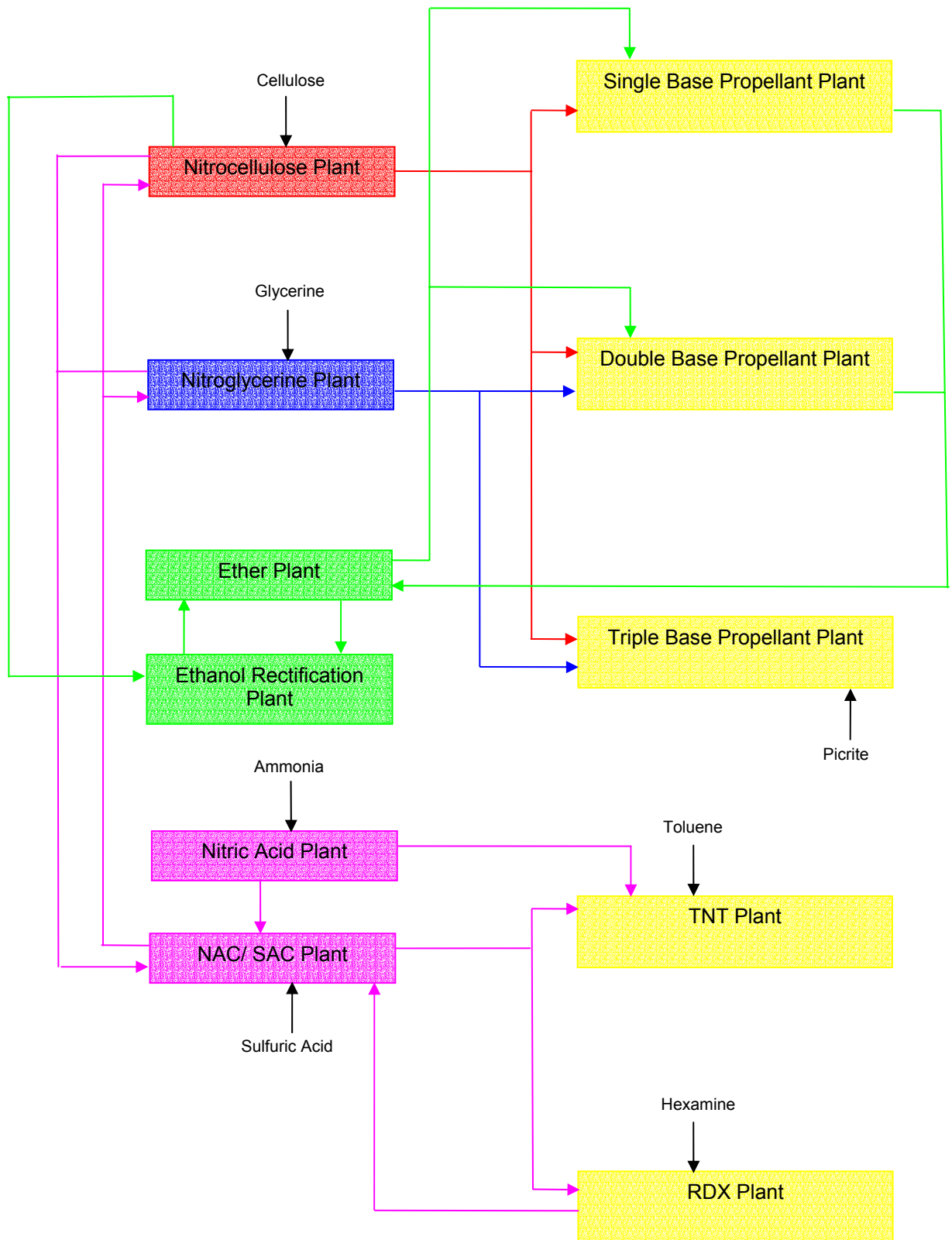
Specialist Services and Support Section

In addition to manufacturing processes on the site, the existing munitions facility includes specialist and support services. These services include administration, laboratory services, engineering and maintenance and general stores.

Figure 1 - Location of Existing Site Process Sections

INSERT FIGURE 3.2 FROM EIS – PAGE 3-12

Figure 2 – Interrelation of Major Processes at the Munitions Facility



2.3 Outline of the Proposal

Following detailed review of options for the site, the Applicant has established, in consultation with the Department of Defence that the existing munitions facility is to be upgraded with the following general scope of works:

- construction and operation of new propellants, nitrocellulose and solvents plants with production capacities of up to 520 tonnes per annum (per shift) of single and multi-base propellants;
- construction and operation of new ancillary services and buildings, including: an administration building; canteen/training facility; stores facility; guard house; fire station; magazines; boilerhouse; an operations office; and new buildings within the engineering section;
- reconfiguration of the site entrance;
- upgrade of the site carpark;
- possible construction and operation of new ballistics range and Hazard Data Test Sheet (HDTs) facility; a low vulnerability ammunition (LOVA) manufacturing plant; plastic bonded explosives (PBX) mixing and filling processes; a confined burning facility (CBF); a product development laboratory; and an NTO (3-nitro-1,2,4-triazol-5-one) manufacturing plant;
- demolition of existing: glazing house; tray drying building; shaker sieve building; shearing shed; maintenance stores; and other buildings as necessary to permit construction of the new manufacturing processes;
- demolition of the existing: guard house, shed, office, administration building, store and fire station; store; development office; slurry tank house and nitrocellulose blending and wringing house; ethanol tank farm; nitrocellulose acid tank farm; and other buildings and infrastructure to permit construction of the new administration and support facilities; and
- possible demolition of the existing: building 228 – ballistics range and magazine 623G; buildings 229 A-J, 299 G-H – magazines; building 501A – boilerhouse; and other buildings and infrastructure as necessary for the munitions facility upgrade.

At the time of lodgement of the subject development application, the Applicant had not finalised the exact scope of the munitions facility upgrade. Rather, the maximum scope of the works had been established based on review of options for the munitions facility upgrade. This maximum scope includes works that will occur, including the construction and operation of new nitrocellulose, propellants and solvents plants. Additional new facilities, such as HDTs, LOVA, NTO, PBX and CBF processes may be established, depending on refinement of the exact scope of detailed design of the proposal. Demolition of existing structures will also depend on the final detailed scope of the proposed development, both in terms of removal of existing facilities replaced as part of the proposal, and to provide cleared areas of the site for redevelopment of certain new processes. General areas of the site earmarked for redevelopment have been identified by the Applicant. The configuration of processes and buildings within each of these areas has yet to be defined in detail, however, the Applicant argues that the scope of the proposed development is sufficiently refined to provide for environmental impact assessment of the “worst-case” redevelopment scenario in which all proposed new and possible processes and buildings are developed. General areas of the site the subject of the munitions facility upgrade are indicated in Figure 3.

The Applicant indicates that following the receipt of relevant planning and environmental approvals, the exact scope of the proposed development will be refined within the broad scope of the development application. This refined scope would include the final capacity of nitrocellulose, solvents and propellants facilities up to a capacity of 530 tonnes per annum of single and multi-base propellants as indicated in the development application. Decisions will also be made in relation to each of the “optional” processes and required demolition activities to permit the munitions facility to proceed. The Applicant is, in effect, seeking approval for the maximum “environmental envelope” likely to be associated with the full scope of works that constitute the munitions facility upgrade. In reality, some of the works the subject of the development application (including full capacity of the new nitrocellulose, propellants and solvents plants) may not proceed, and as such, the environmental impacts posed by the actual redevelopment proposal will lie within the maximum “environmental envelope”, if approved by the Minister.

Figure 3 - Proposed Redevelopment Envelope

INSERT FIGURE 6.1, PAGE 6-31 OF THE EIS

3. STATUTORY PLANNING FRAMEWORK

3.1 Permissibility

The proposed development site lies on land zoned 5(a) – Special Uses Zone (Munitions Factory) under the *Corowa Local Environmental Plan 1989*. The Corowa LEP provides that development of a munitions factory, or any purpose ordinarily incidental or subsidiary to that use is permissible with development consent. As the subject proposal constitutes development for the purpose of a munitions factory (in this case *redevelopment*), the proposal is permissible with consent on the proposed development site.

3.2 Minister's Role

State Environmental Planning Policy No. 34 - Major Employment-Generating Industrial Development (SEPP 34) applies to the proposed development (refer to section 3.4 of this report). In accordance with clause 8 of the Policy, the Minister is the consent authority for the development application.

3.3 Legislative Context

In accordance with the provisions of the *Environmental Planning and Assessment Act 1979* (the Act) and the *Environmental Planning and Assessment Regulation 2000* (the Regulation), the proposed development is designated development, integrated development and State Significant development.

Designated Development

The proposed munitions facility upgrade constitutes designated development, as provided by Schedule 3 of the *Environmental Planning and Assessment Regulation 2000*. Specifically, the proposed development is a:

chemical industry or works for the commercial production of, or research into, chemical substances comprising explosive and pyrotechnic industries that manufacture explosives for purposes including industrial, extractive industries and mining uses, ammunition, fireworks and fuel propellants.

The Applicant has a commercial agreement with the Australian Government to produce propellants and high explosives for the purpose munitions.

As required for designated developments, an Environmental Impact Statement was prepared in accordance with Division 4, Part 6 and Schedule 2 of the Regulation. Specific requirements for the preparation of the EIS provided in the Director-General's Requirements (DGR's), issued on 4 February 2002, were also addressed.

In accordance with section 79(1) of the Act and Division 5, Part 6 of the Regulation (public participation for designated development), the development application and accompanying Environmental Impact Statement were publicly exhibited for at least 30 days. Exhibition of these documents was conducted from Thursday 22 August 2002 until Monday 23 September 2002 at the following locations:

- PlanningNSW Head Office, Sydney;
- PlanningNSW Regional Office, Queanbeyan;
- Corowa Council Chambers, Corowa;
- Mulwala Public Library, Mulwala;
- Department of the Environment and Heritage, Canberra; and
- Nature Conservation Council, Sydney.

From a preliminary assessment of the Environmental Impact Statement for the proposed development, the Department established that the proposed munitions facility upgrade would be unlikely to have a significant environmental impact beyond the boundary on the site in terms of air quality, noise, hazards/ risk etc. However, it was noted that the existing development formed an important employment base for the region, without which there would result significant negative socio-economic implications. As such, the Department considered

that the proposed development would be of general community interest and undertook to notify the entire township of Mulwala. Letters notifying of the development proposal were sent to some 1,100 landowners and occupiers. These letters indicated how interested parties could view the development application and Environmental Impact Statement, and how they could make a submission on the proposal.

Notification of the proposed development was placed in the *Corowa Free Press* and the *Albury Border Mail* on 21 August 2002 and 11 September 2002, as required by the *Environmental Planning and Assessment Act 1979*. The same notification was also placed in *The Australian* as the proposed development constitutes a "Controlled Action" under the *Environment Protection and Biodiversity Conservation Act 1999*. The newspaper notifications provided details of the proposal, exhibition locations and dates, and information on how interested parties could make a submission. A notice providing the same information was also displayed on the proposed development site for the duration of the exhibition.

All requirements of the *Environmental Planning and Assessment Act 1979* have been met or exceeded in relation to exhibition and notification of the subject designated development proposal.

Integrated Development

The development proposal constitutes integrated development, as defined by section 91 of the *Environmental Planning and Assessment Act 1979*. In addition to development consent the munitions facility upgrade proposal requires an Environment Protection Licence (EPL) from the Department of Environment and Conservation (the former Environment Protection Authority) under the *Protection of the Environment Operations Act, 1997*.

The DEC was consulted during the preparation of Director-General's requirements for the Environmental Impact Statement and notified of the lodgement of a development application for the proposal. Following the supply of copies of submissions in response to the exhibition of the development application, the DEC supplied comments and General Terms of Approval to the Department, which have been incorporated into this assessment report and the Department's recommendations, if the Minister determines to approval the proposal. The DEC's provision of General Terms of Approval indicates their satisfaction that an EPL for the proposed munitions facility upgrade may be issued.

State Significant Development

The proposed munitions facility constitutes State Significant development, as defined by section 76A(7) of the *Environmental Planning and Assessment Act, 1979*. The proposal is State Significant Development by virtue of the provisions clause 8 of *State Environmental Planning Policy No. 34 - Major Employment-Generating Industrial Development* (refer to section 3.4). The Minister for Infrastructure and Planning is the consent authority for State Significant Development.

3.4 Relevant Environmental Planning Instruments

The assessment of the proposed development is subject to the following environmental planning instruments:

- *State Environmental Planning Policy No. 34 - Major Employment-Generating Industrial Development*;
- *State Environmental Planning Policy No. 33 - Hazardous and Offensive Development*;
- *State Environmental Planning Policy No. 44 - Koala Habitat Protection*;
- *State Environmental Planning Policy No. 55 - Remediation of Land*;
- *Murray Regional Environmental Plan No. 2 – Riverine Land*; and
- *Corowa Local Environmental Plan 1989*.

Consideration of the proposed development in the context of the objectives and provisions of these environmental planning instruments is provided below.

State Environmental Planning Policy No. 34

The munitions facility upgrade is a development to which *State Environmental Planning Policy No. 34 - Major Employment-Generating Industrial Development* (SEPP 34) applies. SEPP 34 applies to the proposed development because:

- the development will have estimated capital investment value of approximately \$220 million (excluding land), which exceeds the \$20 million threshold specified under paragraph (a)(ii) of Schedule 1 of the Policy; and
- the development is of a type listed under paragraph (b) of Schedule 1 of the Policy (i.e. chemicals processing).

In accordance with Clause 8 of SEPP 34, the consent authority for this development is the Minister for Infrastructure and Planning.

State Environmental Planning Policy No. 33

State Environmental Planning Policy No. 33 - Hazardous and Offensive Development aims to identify proposed developments with the potential for significant off-site impacts, in terms of risk and/or offence (odour, noise etc). A development is defined as potentially hazardous and/or potentially offensive if, without mitigating measures in place, the development would have a significant risk and/or offence impact on off-site receptors.

The proposed munitions facility upgrade is considered "potentially hazardous". In accordance with SEPP 33, the Applicant prepared a Preliminary Hazard Analysis (PHA) for the proposal to demonstrate that proposed risk mitigation measures could adequately reduce off-site risk impacts to an acceptable level (i.e. the munitions facility upgrade would not be "hazardous"). Consideration of hazards and risk impacts is considered in more detail in section 5.1 of this report.

The proposal is also considered "potentially offensive" as it requires an Environment Protection Licence (EPL) from the Department of Environment and Conservation (former Environment Protection Authority). The DEC has issued General Terms of Approval for the proposed development, thereby indicating that it is prepared to issue the EPL. As such, the proposal does not constitute "offensive" development.

State Environmental Planning Policy No. 44

State Environmental Planning Policy No. 44 - Koala Habitat Protection aims to:

- encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas;
- ensure permanent free-living populations of koalas over their present range; and
- reverse the current trend of koala population decline.

To this end, a number of local government areas in which populations of koalas are known to reside are provided in Schedule 1 of SEPP 44. As the Corowa local government area is included in the Schedule, the proposed munitions facility upgrade constitutes a development to which SEPP 44 applies.

The proposed development site is primarily vegetated with Yellow Box (*Eucalyptus melliodora*) Woodland remnants, the species of which are not listed as koala feed trees in Schedule 2 of SEPP 44. Examples of River Red Gum (*Eucalyptus camaldulensis*) are located on the proposed development site, and are listed as koala feed trees in Schedule 2 of SEPP 44. This species will not be impacted by the proposal and constitutes a small proportion of the remnant vegetation on the site. As such, the site neither constitutes "potential koala habitat" nor "core koala habitat". The requirements of SEPP 44 have therefore been met. Consideration of impacts of the proposal on flora and fauna is provided in section 5.10 of this report.

State Environmental Planning Policy No. 55

Clause 7(1) of *State Environmental Planning Policy No. 55 - Remediation of Land* (SEPP 55) requires that a consent authority must not consent to the carrying out of any development on land unless:

- it has considered whether the land is contaminated;
- if the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out; and
- if the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land will be remediated before the land is used for that purpose.

The Applicant has investigated potential contamination on the site, and identified that some areas of the site carry dinitrotoluene (DNT), mercury and polycyclic aromatic hydrocarbon concentrations (PAH) above that considered protective of human health on industrial land uses. The Applicant indicates that investigations into soil contamination are on-going and would be the subject of a separate approval process, where required. Contamination and remediation matters, for the broader site, and where relevant to the construction and demolition activities the subject of this development application would be progressed in accordance with the *Contaminated Land Management Act 1997* and DEC regulations. The Applicant proposes to include specific measures in a construction environmental management plan for the site to identify and address any contaminated soils that may be encountered during demolition and construction works. The Department supports this approach and recommends that the Applicant's commitments be reflected in any development consent, should the Minister determine to approve the proposal.

The Department is satisfied that the issue of soil contamination is being appropriately progressed and would be resolved outside the scope of the subject development application. In accordance with SEPP 55, any remediation work may or may not require development consent (category 1 and category 2 remediation works, respectively).

Murray Regional Environmental Plan No. 2 – Riverine Land

The *Murray Regional Environmental Plan No.2 – Riverine Land* (MREP 2) was gazetted on 31 March 1994 with the following objectives:

- a) to ensure that appropriate consideration is given to development with the potential to adversely affect the riverine environment of the River Murray;
- b) to establish a consistent and co-ordinated approach to environmental planning and assessment along the River Murray; and
- c) to conserve and promote the better management of the natural and cultural heritage values of the riverine environment of the River Murray.

To achieve these objectives, MREP 2 requires that a consent authority, in this case the Minister, consider a number of matters when determining a development application to which MREP 2 applies. These matters include: access; bank disturbance; flooding; land degradation; landscape; river related uses; settlement; water quality; and wetlands. Consideration of the proposed development in the context of each of these matters is provided in Appendix A. The Department is satisfied that the proposal is generally consistent with the relevant aim and objectives of MREP 2, and that the proposal will not have a significant adverse impact on those matters listed in the MREP 2 for consideration when determining development applications.

MREP 2 also requires that a consent authority consult with other parties generally, and for specific land uses. General consultation is required with State Forests where a development is in or may adversely affect a State Forest. The proposed development site lies adjacent to Mulwala State Forest, and as such State Forests was notified of the subject development application by letter of 16 August 2002 and invited to comment on the proposal. The Department did not receive a submission from State Forests.

For potentially hazardous or potentially offensive development, such as the munitions facility upgrade, MREP 2 requires that a consent authority consult with:

- the Department of Conservation and Land Management;
- the Department of Planning;
- the Environment Protection Authority;
- the Department of Water Resources; and

- the Murray-Darling Basin Commission.

At the time of lodgement of the subject development application, the Departments of Conservation and Land Management, and Water Resources, was known as the Department of Land and Water Conservation (now known as the Department of Infrastructure, Planning and Natural Resources). The Department of Land and Water Conservation (DLWC) was notified of the proposal by letter of 16 August 2002. A submission was received from DLWC on 30 September 2002 which indicated that DLWC did not oppose the proposed development, but raised a number of matters, particularly in relation to erosion and sedimentation, to be considered as part of the assessment of the proposal. These matters have been noted and duly addressed as part of the Department's assessment.

The Environment Protection Authority (now known as the Department of Environment and Conservation) was notified of the proposed development, both to address the requirements of MREP 2, and because the DEC is an integrated approval body for the proposal. The DEC has indicated that it would be prepared to issue an Environment Protection Licence for the proposal under the *Protection of the Environment Operations Act 1997*, and has issued General Terms of Approval accordingly. The DEC's General Terms of Approval have been incorporated into the Department's recommendations, to be applied should the Minister determine to approve the proposed development.

The Murray-Darling Basin Commission (MDBC) was notified of the proposal on 16 August 2002, and made a submission to the Department on 28 November 2002. The Commission raised a number of issues in relation to water quality, water treatment and discharges to the River Murray. These matters have been addressed as part of the Department's assessment of the proposal, as outlined in the relevant sections of this report.

The subject development application was lodged with the Department of Planning, now known as the Department of Infrastructure, Planning and Natural Resources. As the Department is undertaking the assessment of the proposal, formal notification is not relevant in this case.

The Department is satisfied that the requirements of the *Murray Regional Environmental Plan No. 2 – Riverine Land* in relation to matters for consideration and consultation have been met. A full consideration of these matters is provided as Appendix A.

Corowa Local Environmental Plan 1989

The proposed development site lies on land zoned 5(a) – Special Uses Zone (Munitions Factory) under the *Corowa Local Environmental Plan 1989* (Corowa LEP). The Corowa LEP provides that developments for the purpose of a "munitions factory" or incidental/ subsidiary to that use are permissible with development consent. The subject development proposal falls within that meaning and therefore requires development consent.

The Corowa LEP provides a number of matters that must be considered for development within the 5(a) – Special Uses Zone. These matters generally relate to agricultural potential, natural resources (timber, soil, water, etc), mineral deposits, environmental and archaeological heritage conservation, public infrastructure/ services, settlement and parking/ access. Each of these matters is considered in detail in Appendix A of this report. The Department is satisfied that the proposed development is generally consistent with the objectives of the 5(a) zone.

In addition to provisions specific to the 5(a) zone, the Corowa LEP provides general matters to be addressed. Provisions relevant to the proposed development include advertising requirements, environmental heritage, tree clearing and the erection of advertising structures. These matters are also considered in detail in Appendix A. The Department is satisfied that the requirements of Corowa LEP have been met in relation to the development proposal.

3.5 Commonwealth Approvals

On 21 November 2001, the delegate for the Australian Minister for the Environment and Heritage determined the proposed development to be a "Controlled Action" under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The controlling

provisions for the proposed development under that Act are sections 26 and 27A (protection of the environment from actions involving Commonwealth land). Because the proposed development is a "Controlled Action" it requires the approval of the Australian Minister for the Environment and Heritage, as well as development consent and other relevant approvals in New South Wales, before the development can commence.

The Australian Minister's delegate has also determined that assessment of the proposed development will be by "accredited process". This means that the Department will undertake the environmental impact assessment of the proposed development to meet the requirements of both the NSW *Environmental Planning and Assessment Act 1979* and the *Environment Protection and Biodiversity Conservation Act 1999*. The Department has entered into an agreement with the Department of the Environment and Heritage in this regard, with specific reference to public participation, assessment and consultation through the assessment process. The Department of the Environment and Heritage has been afforded the opportunity to make a submission on the proposal, consider and comment on all submissions made during the public exhibition of the development application, and to comment on this assessment report and the Department's recommendations prior to determination by the NSW Minister for Infrastructure and Planning. Comments made by the Department of the Environment and Heritage in relation to each of these matters have been considered and addressed as part of this assessment report.

In determining the subject development application, the Minister for Infrastructure must certify, through a Section 130(1B) Notice, that the State has assessed "certain and likely impacts of the proposal to the greatest degree practicable" under the State's assessment process (in this case, Part 4 of the *Environmental Planning and Assessment Act 1979*). Because the controlling provisions of the *Environment Protection and Biodiversity Conservation Act 1999* are all environmental impact matters resulting from actions involving Commonwealth land, the Section 130(1B) Notice will be relevant to all environmental impacts, as detailed in this report.

Following the Minister for Infrastructure and Planning's determination of the development application, a copy of this assessment report and the Section 130(1B) Notice will be forwarded to the Australian Government. Following acceptance of the assessment report, the Department of the Environment and Heritage will make its recommendations to the Australian Minister for the Environment and Heritage who will consider the approval of the proposal and any conditions that may be required. The proposed development may only proceed with approval at both State and Australian Government levels.

3.6 Scope of Development and Deferred Commencement

As noted earlier, the Applicant seeks consent of the maximum scope of works that may be associated with the proposed munitions facility upgrade. This maximum scope includes the worst-case expected capacity requirements for the new nitrocellulose, propellants and solvents plants, as well as a number of additional processes that may be included in the redevelopment. Following receipt of relevant approvals, review of manufacturing capability requirements and detailed design, the Applicant intends to refine the scope of the development, within the scope of the subject development application. Refinement of the scope of the development includes specification of the location of various processes and buildings within the general envelope indicated in the Environmental Impact Statement.

The Applicant is, in effect, seeking development consent for the maximum "environmental envelope" that may be posed by the munitions facility upgrade. Refinement of the scope of works will not result in impacts beyond the "environment envelope", and will either equal the approved envelope, or more likely, pose a reduced environmental impact within the scope of the approved envelope.

The Department's review of the development application and associated Environmental Impact Statement suggests that the Applicant has been conservative and flexible in its approach to definition of the maximum "environmental envelope". While the exact scope of the redevelopment works has not been defined, the Department is satisfied that the scenarios considered in the Environmental Impact Statement present the worst-case environmental impacts that may result from any of the redevelopment options available to the Applicant. Further, the Department is satisfied that any approval of the subject development application

would provide a maximum environmental envelope within which the exact scope of the munitions facility upgrade would lie.

Notwithstanding, the Department considers it important that if the proposed development is approved, the Applicant be required to demonstrate that the exact scope of the munitions facility upgrade lies within the approved “environmental envelope”. This demonstration should include details of the final capacities of processes to be included in the redevelopment, decisions on optional processes that may be included in the final scope of the redevelopment, the exact locations of processes and buildings within the general location envelopes specified in the Environmental Impact Statement and a general demonstration that environmental impacts do not lie outside the approved “environmental envelope”. To facilitate this demonstration, and to provide the Applicant with some level of flexibility in relation to the final scope and design of the proposed development, the Department recommends that the Minister grant deferred commencement consent for the “environmental envelope” presented in the Environmental Impact Statement.

Section 80(3) of the *Environmental Planning and Assessment Act 1979* provides that a consent authority, in this case the Minister, may grant deferred commencement consent in relation to a development application, subject to conditions. Deferred commencement consent represents an “in principle approval” subject to an applicant satisfying the consent authority of certain matters. The development consent is “locked” and cannot be acted upon until the consent authority is satisfied in relation to those specified matters. Once the consent authority is satisfied, the consent is “unlocked” and can be acted upon as with any other development consent.

In relation to the proposed munitions facility upgrade, the Department is satisfied that “in principle”, deferred commencement consent could be issued by the Minister with the Applicant required to satisfy the following matters before it could act on the development consent:

- submission of details of the final scope of processing components of the munitions facility upgrade, consistent with the possible capabilities indicated in the Environmental Impact Statement;
- submission of details of the final layout of munitions facility upgrade, consistent with the conceptual layout indicated in the Environmental Impact Statement;
- an indication of the final production capacity of the munitions facility upgrade, be no greater than 530 tonnes per annum of single and multi-base propellants (per shift), as specified in the development application;
- demonstration that the final location and design of air emissions monitoring/ discharge points are consistent with those modelled and assessed in the Environmental Impact Statement;
- submission of a staging program for all demolition, decommissioning, construction, commissioning and operations activities associated with the munitions facility upgrade;
- submitted details of the major technologies to be employed as part of the munitions facility upgrade, including technology suppliers, and a demonstration that the technologies to be employed constitute “proven technology”;
- submission of the final scope of demolition works to be undertaken as part of the munitions facility upgrade; and
- submission of manufacturer’s performance guarantees for all major plant and equipment, including pollution control equipment, demonstrating that the plant and equipment could be operated within the environmental limits predicted in the Environmental Impact Statement and the relevant requirements of the development consent.

The Department’s recommendations reflect the above requirements. The Applicant must submit each of the above documents to the satisfaction of the Director-General of the Department of Infrastructure, Planning and Natural Resources, and the Department of Environment and Conservation (DEC), where relevant. If approved, the development consent should specify that the development consent does not operate, and the Applicant must not act on the consent, until it has received written confirmation of the Director-General’s satisfaction of these matters (in consultation with the DEC, as relevant). The Department has discussed

this approach with both the Applicant and the DEC, and neither has indicated any objection to the application of deferred commencement consent subject to the provisions outlined above.

4. ISSUES RAISED IN SUBMISSIONS

As noted earlier in this report, the Department received a total of 39 submissions in response to the exhibition of the subject development application and accompanying Environmental Impact Statement. These submissions can be grouped as follows:

- Four submissions from Australian and State Government agencies
 - Department of the Environment and Heritage (Australian Government);
 - NSW Roads and Traffic Authority (RTA);
 - the former NSW Department of Land and Water Conservation (DLWC), now part of the Department of Infrastructure, Planning and Natural Resources; and
 - the Murray-Darling Basin Commission.
- One submission from local government:
 - Moira Shire Council (Victoria).
- Four submissions from groups, including:
 - Mulwala Services Club;
 - Yarrawonga and Border Golf Club;
 - Yarrawonga Lodge of St David; and
 - Yarrawonga Secondary College.
- Twenty-nine submissions from private individuals.
- One submission from the Applicant.

Submissions from private individuals and groups can be analysed by source area, as follows:

- 56% from the Yarrawonga area in Victoria, immediately south of Mulwala, across the Murray River;
- 38% from the Mulwala area and land surrounding the proposed development site;
- 6% from outside the Mulwala-Yarrawonga areas.

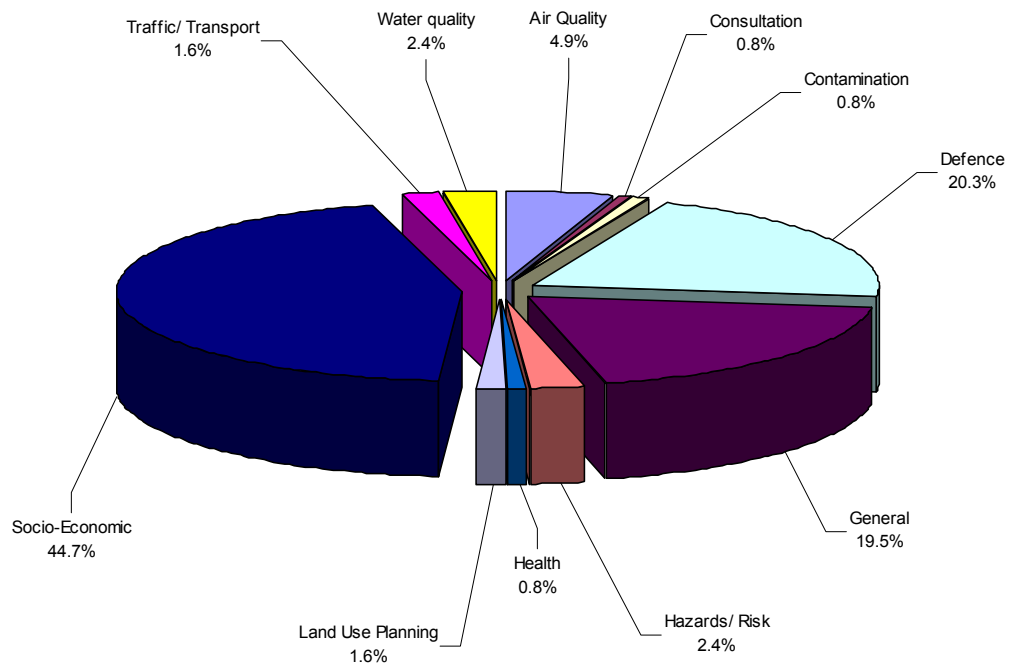
Of the 39 submissions received by the Department in relation to the proposed remediation, 8% objected to the proposed development, 5% stated no position (but raised concerns in relation to various environmental impacts), and 87% supported the proposal. Where submissions indicated opposition to the proposed development, the opposition was generally based on the current poor performance of the existing development and concern that the proposed upgrade would either make the situation worse, or would not leave the existing environmental impacts unchanged. Submissions indicating support for the proposal generally indicated a strong push for the proposed upgrade to ensure the on-going presence of the munitions facility and the employment and national security benefits associated with its operation.

Issues raised in submissions are considered in detailed under the relevant parts of section 5 of this report. The frequency of issues raised in submissions is illustrated in Figure 4. The key issues identified in submissions are:

- socio-economic impacts, particularly the employment and investment benefits afforded by the existing munitions facility, which may be lost if the proposed development does not proceed (44.7%);
- National defence requirements, particularly the fact that the existing and proposed upgraded facility is fundamental to on-going National security without reliance on foreign defence supplies or capabilities (20.3%);
- general environmental impact issues, primarily the need to upgrade the existing facility to address on-going negative impacts associated with the existing development (19.5%); and
- air quality impacts, particularly odour emissions (4.9%).

Copies of all submissions made to the Department during the exhibition of the subject development application and Environmental Impact were forwarded to integrated approval bodies (DEC) as required by the Act, and to the Department of Environment and Heritage as required as part of the accredited assessment agreement for the proposed development.

Figure 4 - Frequency of Issues Raised in Public Submissions



5. CONSIDERATION OF ENVIRONMENTAL ISSUES

The Department has reviewed the Environmental Impact Statement for the proposed development, and duly considered all submissions from the public, government authorities and councils. As a result, the Department has identified the following environmental issues associated with the proposal. The issues have been classified as being of significance, or major significance, depending upon the magnitude and extent of environmental impacts, and the responses of the public, authorities and councils with respect to the impacts. A full consideration of each of the issues listed is provided from section 5.1 to section 5.11 of this report.

Issues identified as being of **major significance** to environmental planning and assessment:

- hazards and risk impacts;
- socio-economic impacts; and
- air quality impacts.

Issues identified as being of **significance** to environmental planning and assessment:

- noise impacts;
- impacts on heritage items; and
- soil and groundwater impacts.

Other important issues associated with the proposed development are:

- traffic and transport impacts;
- impacts of waste production and management;
- surface water impacts;
- impacts on flora and fauna; and
- impacts on visual amenity.

5.1 Hazards and Risk Impacts

As noted in section 3.4 of this report, the proposed development constitutes “potentially hazardous industry”, as defined by *State Environmental Planning Policy No. 33 – Hazardous and Offensive Development* (SEPP 33). That is, in the absence of risk mitigating measures, the proposed development would pose a significant risk impact on surrounding land uses. The Applicant prepared a Preliminary Hazard Analysis (PHA) for the proposal, as required by SEPP 33 for potentially hazardous industry, to demonstrate that the application of risk mitigating measures would reduce risks to an acceptable level and that the proposed development would not be “hazardous industry”.

Applicant's Position

Nature of Operations

The Environmental Impact Statement identifies a number of dangerous goods that would be associated with the munitions facility. These materials are summarised in the table below, with an indication of maximum quantities to be stored and the location of dangerous goods inventories on the site.

Table 1 - Dangerous Goods to Be Stored and Used for the Munitions Facility Upgrade

Material	Dangerous Goods Code	Maximum Inventory	Inventory Location and Use
Nitrocellulose	4.1	103 tonnes	Stored in aboveground tubs and transported on-site with trucks and buggies. Generated in the nitrocellulose plant and used in the propellant plant
Propellants	1.3C	200 tonnes (process) 800 tonnes (storage)	Generated in the propellant plant and stored in process buildings and magazines
NTO	1.1D	20 tonnes (process) 260 tonnes (storage)	Generated in the NTO plant and stored in process buildings and magazines

Insensitive munition/ PBX	1.1D	2 tonnes (process) 254 tonnes (storage)	Generated in the LOVA/ PBX plant and stored in process buildings magazines
Fuel gas	3	Provided from natural gas supply	Used as boiler feed
Fuel (diesel and petrol)	3	13 m ³	Stored in underground tanks for use in vehicles and for emergency generator
Ether	3	77 m ³ (53 tonnes)	Stored in aboveground tanks for use through the propellant and solvents plants
Ethanol	3	133 m ³ (107 tonnes)	Stored in aboveground tanks for use through the propellant and solvents plants
Acetone	3	70 m ³ (57 tonnes)	Stored in aboveground tanks for use through the propellant and solvents plants
Caustic soda	8	1 tonne	Stored as solids in bags, and used as liquid in the solvents plant
Potassium nitrate	5.1	16 tonnes	Stored as solids in bags, and used in propellants plant
Nitric acid (98%)	8	10 m ³ (14 tonnes)	Stored in aboveground tanks for use in the nitrocellulose, propellants and NTO plants
Sulfuric acid (98%)	8	11 m ³ (20 tonnes)	Stored in aboveground tanks for use in the nitrocellulose plant
Nitrating acid mixture	8	380 m ³ (646 tonnes)	Stored in aboveground tanks for use in the nitrocellulose, propellants and NTO plants
Spent and waste acids	8	12 m ³ (20 tonnes)	Stored in aboveground tanks, generated in the nitrocellulose, propellants and NTO plants

The Applicant highlights that dangerous goods with the greatest hazards to be stored and used on the site are explosives (class 1). It is also highlighted that although the proposed munitions facility upgrade would involve significant quantities of dangerous goods, none of these materials are new to the site, having been safely manufactured, stored and handled on the site as part of existing operations. As such, knowledge and expertise of the management principles for these materials is already available on the site.

Hazard Identification

The Applicant undertook a hazard identification process as part of the Preliminary Hazard Analysis. This process included identification of hazardous incidents, incident causes, incident consequences and mitigation measures to be applied. From the hazard identification process, the Applicant established the following credible major hazards that have the potential to impact beyond the boundary of the site:

- explosion during the manufacture of class 1.1 or 1.3 materials at the propellant, NTO, PBX or LOVA plants, due to a loss of control of process parameters or exposure to incompatible materials;
- loss of containment of flammable liquid at the propellant, solvents, solvents recovery, PBX or LOVA plants, or at an emergency generator;
- mishandling of finished product, for example dropping of explosives or exposure of explosives to friction, spark or heat;
- internal fire or explosion during the manufacture of explosives or within plants handling flammable materials, such as at the solvents, solvents recovery or propellant plant;
- loss of containment of explosives onto the floor or into cracks, with subsequent self-ignition of spilt material that has remained hidden in floor drains or other parts of the plant and become unstable;
- exposure of explosives from external sources such as bushfire, lightning strike or hostile event;
- faulty finished explosives stored, becoming unstable in magazines or other storage areas;

- formation of peroxides in the ether recovery plant;
- loss of containment of corrosive liquids in the nitrocellulose or NTO plants;
- faulty nitration at the nitrocellulose plant, causing a run-away reaction, decomposition, formation of NO_x vapours and possibility of fire in the nitrating vessel;
- failure to stabilise nitrocellulose, resulting (in the extreme case) in a fire during storage in magazines;
- loss of containment of wet nitrocellulose onto the floor, which subsequently dries, resulting in potential explosion, projectiles, overpressure effects and heat radiation;
- over-drying of wet nitrocellulose in the dewatering facility;
- loss of containment of nitrous oxide gases due to scrubber failure in the nitrocellulose plant or confined burning facility;
- fire at the boiler involving natural gas;
- a flammable event at one of the stores (dangerous goods store, gas bottle store, drum storage or flammable goods store);
- fire or explosion in the laboratory or in the hazard range data testing building;
- fire or explosion in the PDF building;
- fire or explosion in the ballistics buildings;
- confined explosion in the confined burning facility;
- fire or explosion hazard during transport of corrosive, flammable and explosive materials;
- hazards during demolition and construction, due to such factors as people or vehicle access to on-line plant areas; excavation; incidents in operating plants; construction interference with operating plants at tie-ins; construction use of hazardous materials (typically diesel, paint and oxy-acetylene); and
- commissioning activities causing impacts on existing plants.

The Environmental Impact Statement provides a detailed outline of mitigating measures currently implemented on the site, and to be applied to the proposed munitions facility upgrade to address potential hazards. These measures relate to matters such as general safety, management of material incompatibilities, exposure to external fire sources, control of combustion products, safety in ancillary facilities, emergency response, spill management, control of incident propagation, control of road transport hazards and standards and codes of practice.

Analysis of Potential Incidents

From consideration of potential incidents that may occur in relation to the munitions facility upgrade, the Applicant has identified that incidents may fall into three general categories: incidents associated with explosive materials; incidents that involve the release of toxic gases; and incidents involving flammable materials. The Applicant has analysed the potential consequences generated in each of these categories, as summarised below.

INCIDENTS INVOLVING EXPLOSIVE MATERIALS

The Environmental Impact Statement highlights that the Department of Defence has adopted the NATO Safety Principles approach (based on United Nations recommended changes to procedures for transporting a wide range of dangerous goods) in relation to the location of areas in which explosive materials may be stored or handled. This approach is consequence based, with location requirements for explosive materials specified as a function of the type of material and distance to inhabitable structures.

The Preliminary Hazard Analysis (PHA) focuses on the “yellow safeguarding zone”, specified to meet United Nations criteria. The yellow zone is generally that area around explosives facilities in which public areas, inhabited buildings, general community amenities, public recreation areas or major transport routes must not be sited. The “yellow zone” is bounded by the “yellow line”, which is defined by a specified distance from inventories of explosives in various classes. The Applicant highlights that explosive materials associated with the proposed munitions facility upgrade may be defined as hazards division HD1.1 and HD1.3 (class 1.1D and 1.3C), which have the following requirements for yellow line definition:

- HD1.1 – The Inhabited Building Distances for these materials are based on peak incident overpressures of 5kPa, subject to minimum distance requirements of 400

metres in built-up areas and 270 metres (for light frangible potential explosion site with net explosive quantity less than 1,800 kg) in sparsely populated areas to protect against damage from primary fragments. Major Public Route Distances, set equal to the Inhabited Building Distance with a minimum distance requirement of 400 metres, are used for all roads where the nature of the traffic is such that the reaction of drivers to sudden blast or fireball effects would result in unacceptable damage or injury. For minor traffic routes, the Minor Public Transport Route distance is set at two thirds of the Inhabited Building Distance, or a minimum of 270 metres.

- HD1.3 – The Inhabited Buildings Distances for these materials is based on a target thermal dose of 62.8 kJm^{-2} . The Public Transport Route Distance is set at two thirds of the Inhabited Buildings Distance, or a minimum of 60 metres. For explosives of HD1.3, other than propellants, Public Transport Route Distances are constant distances based on acceptable risk from fragments and lobbed explosives to be expected in the first half hour of an incident. Under these circumstances it is assumed that traffic can be stopped before final fragment saturation. If not, the Public Transport Route Distance is set equal to the Inhabited Building Distance.

Based on the expected maximum inventories of explosive materials to be located on the site, the Applicant has calculated the yellow line, and consequently, the yellow zone, as depicted in Figure 5. As can be seen from this figure, the yellow zone lies generally within the site boundary. Where it does extend beyond the site boundary (marginally onto Mulwala Canal and the Mulwala State Forest), these affected land areas are not inhabited and do not represent public traffic routes. As such, the Applicant concludes that the proposed munitions facility is consistent with locational guidance provided by the United Nations and adopted by NATO. Further, restriction of the yellow zone to within the site boundary, other than for minor excursions onto non-inhabited land, indicates that the proposed munitions facility upgrade would not pose a significant consequence to surrounding land uses in the event of incident involving explosive materials.

The Applicant notes that the approach used to establish the yellow zone is different the approach advocated in land use planning guidelines established in New South Wales. This is because the UN approach is based on incident consequences, whereas the NSW land use safety planning approach employs a risk/ frequency approach. The Preliminary Hazard Analysis provides a comparison of the criteria established under each approach, as summarised below.

Table 2 - Comparison of UN and NSW Criteria

Risk Category	UN Criteria	NSW Criteria
Injury caused by heat radiation	Residential areas must be located outside yellow zone, which corresponds to heat radiation of 4.2 kWm^{-2} for a 15 second fireballs, or 2.1 kWm^{-2} for a 30 second fireball	Heat radiation of 4.7 kWm^{-2} must not be exceeded at residential areas at greater than 50×10^{-6} per year.
Injury caused by overpressure	Residential areas must be located outside yellow zone, which corresponds to 5 kPa . Minimum requirement is 400 metres to a built-up area, or 270 metres in a sparsely populated area.	Overpressure of 7 kPa must not be exceeded at residential areas at greater than 50×10^{-6} per year.
Structural damage from heat radiation	Industrial areas must be located outside yellow zone, which corresponds to heat radiation of 4.2 kWm^{-2} for a 15 second fireballs, or 2.1 kWm^{-2} for a 30 second fireball	Heat radiation of 23 kWm^{-2} must not be exceeded at residential areas at greater than 50×10^{-6} per year.
Structural damage from overpressure	Industrial areas must be located outside yellow zone, which corresponds to 5 kPa . Minimum requirement is 400 metres to a built-up area, or 270 metres in a sparsely populated area.	Overpressure of 14 kPa must not be exceeded at residential areas at greater than 50×10^{-6} per year.

Fatality at sensitive land uses	Sensitive land uses must lie outside yellow zone, which is protective with respect to injury. Therefore, yellow zone is also inherently protective in relation to human fatalities.	Fatality risk must not exceed 0.5×10^{-6} per year
Fatality at residential land uses	Residential land uses must lie outside yellow zone, which is protective with respect to injury. Therefore, yellow zone is also inherently protective in relation to human fatalities.	Fatality risk must not exceed 1×10^{-6} per year
Fatality at commercial land uses	Commercial land uses must lie outside yellow zone, which is protective with respect to injury. Therefore, yellow zone is also inherently protective in relation to human fatalities.	Fatality risk must not exceed 5×10^{-6} per year
Fatality at sporting complexes/ open space land uses	Sporting complexes/ open space land uses must lie outside yellow zone, which is protective with respect to injury. Therefore, yellow zone is also inherently protective in relation to human fatalities.	Fatality risk must not exceed 10×10^{-6} per year
Fatality at industrial land uses	Industrial land uses must lie outside yellow zone, which is protective with respect to injury. Therefore, yellow zone is also inherently protective in relation to human fatalities.	Fatality risk must not exceed 50×10^{-6} per year

From the comparison provided in the table above, the Applicant highlights that although the UN approach is different to that used in NSW, it is not inconsistent with the approach that would be applied in New South Wales for heat and overpressure effects associated with explosives incidents. In fact, the UN approach is more conservative than the NSW criteria. In relation to injury impacts, the UN approach specifies heat radiation and overpressure levels that may not be exceeded. These heat radiation and overpressure levels are below those that would be permitted to be exceeded on occasion if applying the NSW land use safety planning criteria.

Similarly for structural damage effects caused by heat and overpressure, the maximum allowable levels permitted by the UN approach are less than those levels that may be exceeded on occasion under the NSW system. Fatality impacts are addressed through the UN system by requiring compliance with injury criteria. By meeting heat and overpressure levels that would not cause an injury, the UN system also takes into account the potential for fatalities. In contrast, the NSW system specifies a frequency at which exceedance of fatality criteria may be acceptable.

The Preliminary Hazard Analysis also presents a number of representative calculations to demonstrate the affectation areas of a number of explosive heat radiation and overpressure scenarios. In all cases, the modelled affectation areas lie within the yellow zone, and in most cases to a significant degree. The Applicant highlights that from this demonstration, it can be seen that the criteria on which the delineation of the site's yellow zone are conservative.

Figure 5 - Extent of Worst-Case Yellow Zone

INSERT FIGURE 12.1 FROM PAGE 12-7 OF THE EIS

INCIDENTS INVOLVING THE RELEASE OF TOXIC GASES

The Applicant suggests that toxic gases may be released from the proposed development as a result of spills involving nitric or sulfuric acid, or the release of nitrogen oxides during scrubber upsets. In relation to spills of acid, the Applicant argues that these types of incidents are unlikely to cause a significant consequence at the nearest site boundary, in terms of injury, irritation or fatality. In particular, the vapour pressure of sulfuric acid is such that the gaseous concentration of sulfuric acid vapours resulting from an exposed quantity of spilt acid is generally contained to the area of the spill, and is not present in any significant concentration at a distance from the spill. In contrast, the relatively high vapour pressure of nitric acid means that there is significant potential for elevated concentrations of nitric acid vapours to be experienced at considerable distances from a spill. The Applicant refers to an earlier hazard study for the existing development, which demonstrates that a spill of nitric acid covering the entire acid bund area in the nitric acid plant would not generate vapour concentrations causing injury at 290 metres from the point of release. By comparison, the worst-case nitric acid spill scenario for the munitions facility upgrade would involve a spill at the proposed new nitrocellulose plant. A nitric acid spill in this area would be some 350 metres from the nearest site boundary (i.e. further than the 290 metre injury contour predicted in the acid plant hazard analysis). The Applicant highlights that a spill in the nitrocellulose plant would be subject to a number of additional mitigating circumstances. These would include initial dispersion in the nitrocellulose building, absorbent Pleistocene dune sands in the event that the spill progressed outside bunding and building constraints, and the fact that a spill of nitric acid is only likely to occur during the day (i.e. not worst-case dispersion situation experienced at night). These factors would result in any plume generated by a nitric acid spill at the nitrocellulose plant extending generally no further than 150 metres from the spill. This is well within the boundary of the site, and as such does not represent a potential significant off-site consequence.

In addition to toxic gas releases resulting from acid spills, the Applicant highlights that a release of nitrogen oxides may result during a process upset at the nitrocellulose plant scrubber. A release of nitrogen oxides would be associated with a failure of the scrubber, or the inability of the scrubber to cope with loads that may be generated during a run-away reaction in the nitrocellulose plant. The Applicant identified four separate scenarios for consideration:

1. normal operating conditions in the nitrocellulose plant, with failure of the scrubber medium, resulting in a release of nitrogen oxides from the scrubber stack at an elevated concentration;
2. normal operating conditions in the nitrocellulose plant, with failure of the scrubber vent, resulting in a release of nitrogen oxides from the building roof at an elevated concentration;
3. a run-away reaction in the nitrocellulose plant, generating nitrogen oxide concentrations above the design capability of the scrubber, resulting in a release of nitrogen oxides from the scrubber stack at an elevated concentration; and
4. a run-away reaction in the nitrocellulose plant, combined with failure of the scrubber vent, resulting in a release of nitrogen oxides from the building roof at an elevated concentration.

The Applicant considered each of the above scenarios, and modelled a worst-case release and dispersion situation for each. The maximum concentration of nitrogen oxides (assumed to be completely in the NO₂ form) were determined at the southern and eastern site boundaries for comparison to the concentration at which injury is likely to occur (25 ppm) and irritation (5 ppm). Results of the dispersion modelling undertaken by the Applicant are summarised below.

Table 3 - Predicted Boundary Concentrations of NO_x

Scenario	Maximum Concentration (ppm)	
	Southern Boundary	Eastern Boundary
Normal operating conditions, with gases evacuated through the scrubber stack	2	2
Normal operating conditions, with gases evacuated through the roof	4	3
Run-away reaction, with gases evacuated through the scrubber stack	9.5	9.5
Run-away reaction, with gases evacuated through the roof	20	15

From the results of the modelling presented in the table above, the Applicant notes that in the event of a run-away reaction, there is potential for a NO_x concentration of 5 ppm to be exceeded at the site boundary. This represents potential for irritation impacts, and a potential significant consequence at the site boundary that must be considered further (i.e. assessment of potential frequency).

The Preliminary Hazard Analysis presents an assessment of the potential frequency of exceedance of 5 ppm of nitrogen oxides at the site boundary. The Applicant highlights that exceedance of this concentration is dependent on wind direction, meteorological stability and the probability of process upset (including a run-away reaction by itself or with failure of the scrubber event). Land use safety criteria in New South Wales stipulate that irritation criteria of 10×10^{-6} and 50×10^{-6} per year must not be exceeded at sensitive and residential land uses, respectively. As such, the product of frequencies for wind direction, meteorological stability and process upsets must not exceed these frequencies. Considering measured frequencies of winds towards southern and eastern site boundaries, and frequencies of stable weather conditions (Pasquill stability class F), the Applicant has worked back to determine the maximum allowable process upset frequencies before land use safety criteria would be exceeded. The results of this consideration are summarised below.

Table 4 - Maximum Allowable Failure Frequencies and Required System Reliability

Scenario	Maximum Failure Frequency	Required Reliability of Protective System
Scenario 3 or 4 (as defined above)	2.6×10^{-3} per year	> 0.997
Massive NO _x release due to a run away reaction and failure of the scrubber	0.5×10^{-3} per year	> 0.9995

Because the final design of the proposed development has yet to be established, the Applicant argues that it is not possible to demonstrate that the required reliabilities of protective systems can be demonstrated based on available information. However, the Applicant highlights that the required levels of reliability are commonly achieved in other industrial designs. To ensure that the required reliabilities are achieved, the Applicant suggests that a Hazard and Operability (HAZOP) study for the proposed development specifically demonstrate that relevant processes have been designed with the required protective system reliabilities. Features that may be considered during detailed design to address this issue include:

- highly reliable monitoring and control of process parameters preventing a run-away reaction;
- automatic detection and response system, such as deluges or dumping of water (or other appropriate medium) in case of a run-away reaction;
- possible use of hardwired protective systems for critical trips and alarms;
- back-up power supply (for example automatic start-up on emergency power in case of loss of normal power) for all critical components (pumps, fans etc);
- back-up critical components;
- alarm(s) alerting to a failure of a critical component;

- reliable supply of scrubber medium, including prevention of loss of scrubber medium (eg through low level in scrubber medium tank supply); and/ or
- ensuring that even in case of failure of scrubber, the NO_x would be released at height (of the stack, or at least at the height of the building roof).

INCIDENTS INVOLVING FLAMMABLE MATERIALS

The Preliminary Hazard Analysis (PHA) considers four general scenarios that may involve flammable materials on the site:

- torch or jet fires;
- flash fires and vapour cloud explosions;
- pool fires; and
- dangerous goods store fires.

The Applicant highlights that torch, or jet fires, may occur when pressurised flammable gases are released and ignited to form a long, stable flame. The natural gas supply to the site, being a flammable gas under pressure, represents potential for a torch or jet flame if the gas supply pipeline is breached. Based on the expected operating parameters of the gas supply (temperature, pressure, pipe size), the Applicant established that heat radiation from a worst-case torch fire event would drop to 4.7 kWm⁻² at 27 metres from a vertical torch fire. At this heat radiation, pain would be caused, but no serious injury would be expected for less than thirty seconds exposure. Given that the nearest site boundary is more than 300 metres from potential natural gas torch fires, the Applicant concludes that these types of incidents do not pose a significant risk to surrounding land uses, in terms of fatality, injury or irritation.

An incident at the proposed new solvents plant has the potential for the release of flammable gases, which if ignited, may produce a flash fire or vapour cloud explosion. Because the proposed solvents plant has not been designed in detail, it was not possible for the Applicant to assume a realistic release event, and as such, the overly conservative assumption that all vapours in the plant at any time are released has been applied. Based on this assumption, the Applicant established that the worst-case effect distance for flash fires would be 64 metres from the incident. In the case of vapour cloud explosions, an overpressure of 7kPa (considered the threshold of human injury effects) would be reached at 340 metres from the incident. Even if the solvents plant were located at the edge of the proposed development envelope, significant fatality or injury effects from flash fires and vapour cloud explosions would not occur beyond the site boundary.

In relation to pool fires, the Applicant identifies that there is potential for loss of containment of flammable liquids, with possible resultant pool fires, in the following areas of the proposed munitions facility upgrade:

- propellants plant;
- solvents recovery plant; and
- solvents storage area.

The Preliminary Hazard Analysis (PHA) presents the outcomes of head radiation modelling from pool fires at each of the above locations. The Applicant has established effect distances to 23 kWm⁻² (structural damage), 12.6 kWm⁻² (human fatality) and 4.7 kWm⁻² (human injury). The results of this modelling are summarised below.

Table 5 - Predicted Effect Distances for Possible Pool Fire Events

Scenario	Pool Area (m ²)	Pool Radius (m)	Effect Distance (m)		
			23 kWm ⁻²	12.6 kWm ⁻²	4.7 kWm ⁻²
Propellants plant	225	16	32	43	70
Solvents recovery plant	160	14	27	36	59
Solvents storage area	200	15	30	41	66

Based on the above predicted effect distances, the Applicant highlights that a pool fire event would not generate a significant off-site risk impact, given that the nearest site boundary would be more than 300 metres away.

The Applicant did not specifically quantify the likely consequence of a dangerous goods fire on the site. It is argued, however, that dangerous goods would be stored on the site in accordance with relevant Australian Standards, including segregation of non-compatible materials. Given that storage areas will meet relevant design standards, and materials will be stored in small quantities, the Applicant argues that incidents involving stored inventories pose a minimal offsite risk.

TRANSPORT INCIDENTS

The Applicant has assessed the consequences of incidents involving the transport of explosives/ propellants and flammable materials.

In relation to explosives and propellants, the Applicant modelled the overpressure effects (to 7kPa, causing human injury, and 14 kPa, causing structural damage) and heat radiation effects (as fireball affectation area and duration) for “major” and “massive” transport incidents, as summarised below.

Table 6 - Overpressure Consequences for Transport Incidents

Scenario	Distance to Overpressure (m)	
	7 kPa	14 kPa
Major incident involving 2,000 kg NEQ of HD1.1	310	180
Massive incident involving 12,000 kg NEQ of HD1.1	415	245

Table 7 - Thermal Consequences for Transport Incidents

Scenario	Consequence Distance (m)	Fireball Duration (s)
Major incident involving 2,000 kg NEQ of HD1.3	44	4
Massive incident involving 12,000 kg NEQ of HD1.3	80	7

The Applicant suggests that any irritating combustion products that may be generated as a result of an explosives/ propellants traffic incident (such as nitrogen oxides) would be affected by thermal buoyancy and would disperse at altitude. Ground-level concentrations of toxic gases are therefore likely to be below levels causing injury or irritation.

In relation to the transport of flammable materials, the Preliminary Hazard Analysis presents calculations for “small”, “medium” and “large” incidents and resulting consequence distances for 4.7 kWm⁻², 12.5 kWm⁻² and 23 kWm⁻². The results of these calculations are reproduced below.

Table 8 - Distance to Heat Radiation Levels from Transport Incidents

Scenario	Affectation Distance from Centre of Pool Fire (m)		
	4.7 kWm ⁻²	12.5 kWm ⁻²	23 kWm ⁻²
Small fire	95	45	28
Medium fire	105	50	30
Large fire	145	75	50

The Applicant argues that there is potential for toxic gas impacts at ground level resulting from a spill of material during transport (for example, nitric acid). However, these impacts would be contained through appropriate spill management and emergency response measures.

Issues Raised in Submissions

Hazards and risk impacts were raised 2.4% of the time in submissions received from the public. Key issues raised include:

- concern that a high risk facility such as the existing and proposed upgrade munitions facility should not be located near a populated and growing area like Mulwala/ Yarrawonga; and
- reference to an explosion that occurred in the past that resulted in the death of one person and injury of several others, as well damage to houses.

The DEC's General Terms of Approval include provisions in relation to hazards and risk management and minimisation, including:

- the requirement to appropriately bund all fuel, oil and chemical storage areas; and
- the development of an Emergency Management Plan, including contingency planning in the event of an incident on the site.

Department's Position

The Department is generally satisfied that the Applicant has applied appropriate assumptions and methodologies to the preparation of the Preliminary Hazard Analysis for the proposed munitions upgrade.

Impacts from Explosive Materials

The Department recognises that the UN approach, as applied by the Applicant in relation to consideration of consequences in the event of an incident involving explosive materials does not strictly follow guidance provided in the Department's Hazardous Industry Planning Advisory Papers. However, from the consideration presented by the Applicant in the Preliminary Hazard Analysis, the Department is satisfied that the approach is not inconsistent with relevant safety outcomes. In fact, the approach applied by the Applicant is more conservative than would generally be required for industrial development in New South Wales.

The conservatism applied in the consideration of explosive materials impacts is a result of the consequence-based approach underpinning the UN methodology. This methodology specifies a consequence associated with incidents that must not be exceeded. The approach applied in New South Wales, however, recognises that an incident with elevated consequences is not necessarily inappropriate, provided the probability of an initiating incident (i.e. incident frequency) is sufficiently low such that the resultant risk (product of consequence and frequency) lies within appropriate land use safety criteria. The UN approach, by its nature, specifies that regardless of frequency, incidents must be restricted to ensure that through consequence considerations alone, appropriate safety outcomes are achieved. The Department is satisfied that through the inherent nature of the approach applied by the Applicant, an additional level of comfort is provided that the off-site impacts that may result from an incident involving explosive materials do not exceed appropriate levels.

It is noted that the "yellow zone" resulting from the location of explosive materials associated with the munitions facility upgrade is generally contained within the boundaries of the site. A marginal extension beyond the site boundary is predicted for Mulwala Canal, as is a slightly greater extension over Mulwala State Forest. The Department recognises that the basis for the yellow zone relates to injury impacts, and as a result, fatality consequences at the yellow zone boundary and beyond are negligible. Given that the injury criteria on which the yellow zone is based lie below land use planning criteria for injuries on land various land uses, and noting that the UN approach does not include the flexibility afforded by frequency considerations, the Department is satisfied that off-site injury and fatality impacts that may result from explosive materials incidents lie within acceptable limits.

To reduce potential explosives-related impacts to as low as reasonably possible, the Department highlights that effective and appropriate management of the potential for incidents is important. In this regard, the Department considers that the Applicant must be required to prepare a Final Hazard Analysis after completion of detailed design of the munitions facility upgrade. The Final Hazard Analysis would need to demonstrate that based on the final design of the proposal, all reasonable and feasible risk mitigating measures had been applied. Further, requirements to prepare a Hazard and Operability (HAZOP) study and Fire Safety Study would ensure that the design of manufacturing processes, and fire safety systems were completed to minimise the potential for incidents involving explosive materials to occur. The Department recommends that these requirements be imposed on the development, should the Minister determine to approve the subject development application.

Impacts from the Release of Toxic Gases

The Department concurs with the Applicant's assessment of potential toxic gas release scenarios. In particular, the Department recognises that process failures in the proposed new nitrocellulose plant represent the most significant potential for off-site consequences. Spills of nitric acid, while representing potential for the liberation of toxic gases, are considered to be manageable through the application of appropriate materials handling procedures and installation of bunding. The Department specifically recommends that bunding meet the most stringent of Australian Standards, 110% of the volume of the single largest volume stored within a bund, and the DEC's guidelines in relation to bunding and spill management.

For most industrial development applications relating to potentially hazardous industry, Preliminary Hazard Analyses are required to consider consequences of credible incidents on site, and the frequency of these incidents if significant consequences are identified at the site boundary. Because the Applicant has yet to finalise the detailed design of the proposed munitions facility upgrade, it is not possible to quantify incident frequencies in order to assess potential off-site risks. In this circumstance the Department accepts the Applicant's approach of "working back" from relevant land use safety criteria to establish the required reliability of protective systems. Further, the Department is satisfied that the required reliabilities presented in the Preliminary Hazard Analysis are achievable in practice. However, it is of fundamental importance that these reliabilities are taken into full account during the detailed design of the nitrocellulose plant and associated pollution control systems. At the very least, the final design of these processes must achieve the required reliabilities, and preferably exceed them. As noted above, the Department recommends that the Applicant undertake a Hazard and Operability (HAZOP) study and prepare a Final Hazard Analysis. The Department has drafted the condition require a HAZOP study such that it is clear that the HAZOP must specifically highlight how the design of the development has been progressed to address potential releases of NO_x and/ or failure of the nitrocellulose plant scrubber, and that an appropriate level of redundancy has been incorporated. Further, the Final Hazard Analysis is required to demonstrate that the reliability of preventative and protective systems against a massive NO_x release through the nitrocellulose plant exceeds 0.997, and that the reliability of the preventative and protective system against a NO_x release coinciding with a failure in the nitrocellulose plant scrubber exceeds 0.9995. Provided the Applicant can demonstrate that the munitions facility upgrade (particularly the nitrocellulose plant and associated systems) has been designed to meet these criteria, the Department is satisfied that the proposal will not exert an unacceptable fatality, injury or irritation impact beyond the site boundary as the result of a release of toxic gases.

Impacts from Flammable Materials

The Department notes that the predicted consequences resulting from flammable materials incidents on the site have limited areas of affectation and do not generate a significant consequence at the site boundary. As such, the Department is satisfied that incidents involving flammable materials do not represent a significant off-site fatality or injury impact.

Notwithstanding, and as noted above, the Department considers it important to ensure that appropriate fire safety measures are installed on the site. To this end, the Applicant should prepare a Fire Safety Study to demonstrate that fire safety measures have been designed to minimise the potential for flammable materials incidents. The Fire Safety Study must be approved by both the Director-General and the Commissioner of the New South Wales Fire Brigades. The Study would also outline measures to manage potential fire hazards that may be associated with the storage of dangerous goods, including the containment of contaminated fire fighting water.

Impacts from Transport Incidents

The Department is satisfied with the technical methodology and modelling results presented in the Preliminary Hazard Analysis in relation to traffic incident consequences. It is recognised that the consequences of a traffic incident alone may be significant in magnitude.

However, and as the Preliminary Hazard Analysis fails to highlight, the frequency of traffic incidents involving explosive or flammable materials is relatively low. The Department is satisfied that when considering both the consequences and frequencies of potential traffic

incidents, the resultant risk to land uses adjacent to transport routes is manageable. In addition to the design and operation of dangerous goods transport vehicles, the Department highlights that the transport of dangerous goods is strictly regulated. The Department is satisfied that dangerous goods transport regulations provide an adequate and appropriate means to address and mitigate transport-related risks.

Concluding Position

The Department recognises that the most significant potential environmental and safety impacts associated with the proposed development are related to potential hazardous incidents on the site. While the Applicant has generally demonstrated that impacts in this regard can be managed to ensure that off-site safety can be assured, the Department highlights the importance of hazards and risk management as fundamental to achieving this outcome. As such, if the Minister determines to approve the proposal, the Department recommends that the consent contains a suite of hazards and risk related measures that the Applicant must implement, including:

- bunding of all dangerous goods;
- preparation of a Fire Safety Study to demonstrate that adequate and appropriate safety measures have been included in the detailed design of the proposal, including provision for the containment of contaminated fire fighting water;
- a comprehensive Hazard and Operability (HAZOP) and Control Hazard and Operability (CHAZOP) study to ensure that the detailed design of the proposal has considered potential process hazards and that appropriate design features have been included in the design to identify and address process hazards that may arise;
- a Final Hazard Analysis to refine the predictions made in the Preliminary Hazard Analysis in light of detailed design, and to ensure that the risk outcomes associated with the final design of the proposed development lie within acceptable limits. The Final Hazard Analysis must specifically demonstrate that reliability requirements for the nitrocellulose plant and associated NO_x scrubber exceed those requirements specified in the Preliminary Hazard Analysis;
- a Construction Safety Study to ensure that construction works on the site are undertaken in a manner that minimises hazards, including hazardous interactions with existing operating plant;
- a Demolition Safety Study to ensure that demolition works are undertaken in a safe manner and that appropriate measures are in place to manage potential hazards that may be associated with the removal of materials such as asbestos;
- a comprehensive Emergency Plan to outline procedures to be implemented in the event that a hazardous incident occurs on the site. It is also recommended that the Applicant successfully rehearse the response to an emergency situation on the site prior to the operation of the proposed munitions facility upgrade;
- a Safety Management System to provide an overarching management framework for the on-going management of hazards associated with the proposed development; and
- regular Hazard Auditing of the munitions facility upgrade to ensure on-going and effective hazards and risk management.

5.2 Socio-Economic Impacts

Applicant's Position

This section of the Department's assessment report focuses on the socio-economic impacts of the proposal, through employment and investment, as well as social issues of concern such as security/ crime and community information, consultation and participation. Socio-economic issues that may arise as a result of real or perceived environmental impacts are considered in the relevant sections of this report (eg air quality, noise, visual amenity etc).

Employment and Investment

The Environmental Impact Statement highlights that the existing development provides a significant regional employment base, both through direct and indirect job creation. Some 340 employment positions are supported by the site, with an additional 14 places comprising contracted labour. Indirectly, the site supports employment in associated industries,

particularly transport. Products generated on the site are transported to the Benalla facility, which employs a further 210 people.

The Applicant suggests that closure of the site is highly likely if the proposed upgrade does not proceed. It is suggested that without the upgrade, the age of the development, as well as its current environmental and occupational health and safety performance at a reduced level would see the site close. The net result would be the loss of current direct employment and associated indirect jobs particularly transport. There is also a strong likelihood that the downstream Benalla facility would also be affected, and may also be closed if import of necessary munitions were commercially preferred over the import of munitions constituents.

As a flow-on effect of the possible closure of the development, it is likely that the towns of Mulwala and Yarrowonga would experience a significant negative socio-economic effect, given that these populations enjoy employment at the development at through many of the associated industries.

The munitions facility upgrade itself will not generate significant levels of employment during the operation of the upgrade. In fact, it is possible that if the upgrade were to proceed, there would be some limited reduction in employment requirements given improved processes and automation. However, the key employment benefit of the upgrade would be the maintenance of existing employment.

In terms of investment, the Applicant highlights that the Australian Government has committed \$220 million to the proposed munitions facility upgrade. Much of this investment will be spent in the region and the State, particularly for materials that can be sourced locally and for the provision of construction labour costs.

Site Security

The Applicant highlights that the nature of existing and proposed upgrade munitions facility necessitates stringent and comprehensive security and surveillance measures. At present the site is patrolled by on-site security patrols, with a 24-hour guardhouse at the site entrance and well-lit site environs. As part of the munitions facility upgrade, the Applicant intends to design new facilities to incorporate motion detectors, reed switches on doors, closed-circuit television on critical processes etc into the design of the proposed munitions facility, where appropriate. Electronic measures would be connected to a central security management system to be located in the guardhouse. Access to the site would be restricted to authorised parties and enforced with physical exclusion measures around the perimeter of the site.

Community Consultation

The Environmental Impact Statement outlines a series of community consultation and information activities undertaken by the Applicant during the development of the proposal and preparation of the Environmental Impact Statement. Community consultation and information activities applied by the Applicant include:

- community information forums – these forums were held during the preparation of the Environmental Impact Statement (6 December 2001, 7 May 2002 and 11 June 2002), and at the time of lodgement of the subject development application, the Applicant intended to hold an additional information forum during the public exhibition of the proposal. The Applicant indicates that each forum was attended by some 30 to 50 interested and concerned community members. Each forum involved question and answer sessions at which community questions could be answered and community concerns could be taken onboard to be addressed in the Environmental Impact Statement.
- employee briefing sessions – during December 2001 and May 2002 employee information sessions, similar to community information forums, were held to ensure that employee questions and concerns were addressed.
- project newsletters – two rounds of newsletters (3 May 2002 and June 2002) were posted to some 400 households located around the existing development. The newsletters provided information in relation to the environmental impacts of the proposed munitions facility upgrade, and included an update on the progress of proposal development and Environmental Impact Statement preparation.

- advertisements – information was placed in the *Yarrawonga Chronicle* to coincide with the release of project newsletters. These advertisements include general information in relation to the proposed development, and included details of community information forums.
- telephone information line – a toll-free, dedicated telephone was established to receive questions and to provide information in relation to the proposal. The Applicant indicates that the telephone line received 37 calls prior to the finalisation of the Environmental Impact Statement.
- written submissions – the Applicant indicates that it encourage interested and concerned members of the public to make written submissions to be addressed in the Environmental Impact Statement.
- website and email – details of the proposal, including information on environmental impacts and the status of the Environmental Impact Statement preparation was provided on the internet. An email address was established to receive electronic submissions.
- correspondence with Government and elected representatives – throughout the preparation of the Environmental Impact Statement, the Applicant corresponded with relevant Government bodies and elected representatives to ensure that those parties were informed of the status of the proposal, and to ensure the transparency of the environmental impact assessment process.
- media – the Applicant indicates that a number of feature articles were run in the *Yarrawonga Chronicle*, providing information on the proposed development.

Issues Raised in Submissions

Some 65% of issues raised in public submissions generally related to socio-economic impacts. Of this, 44.7% related to socio-economic impacts in the context of the locality and the region. A further 20.3% of issues related to national socio-economic impacts, particularly defence. In relation to the local and regional socio-economic impacts, the following broad issues were raised in submissions:

- the existing munitions facility represents a significant direct and indirect generator of employment and investment in the region. If the proposal were not to proceed, local and regional employment and investment would suffer, including a possible complete loss of these benefits if the existing facility were to close.
- loss of the munitions facility would result in a loss of confidence in the local economy;
- the Applicant supports the local school, staff and students, and helps the college to address youth issues and education;
- the Applicant supports local businesses and volunteer organisations;
- closure of the munitions facility would negatively impact land values in Mulwala and Yarrawonga;
- there will be a disastrous impact on social infrastructure if the proposed development does not proceed;
- if the proposal does not go ahead, there will be a mass exodus, with youth and businesses disappearing from the area;
- upgrade of the site is vital for the on-going viability of the region;
- construction of the proposal will bring with it significant economic benefits;

In relation to national impacts, and defence, public submissions highlighted the following matters:

- the munitions facility is a terrorist target;
- Australia should be independent and strong, with its own indigenous defence industry;
- Australia should not become dependent on imported propellants and high explosives, as we would be left vulnerable with unreliable supplies;
- maintaining munitions manufacturing capabilities is of strategic importance;
- supply of munitions from Australian sources would increase the confidence of our service personnel.

Department's Position

Employment and Investment

The existing munitions facility represents a significant local and regional employment base. As noted in a number of public submissions, if the munitions facility were to close, not only would several hundred direct employment positions be lost, the townships of Mulwala and Yarrowonga would suffer significant negative flow-on social and economic impacts. Even broader than this is the unique position the existing facility represents for other industry sectors. In particular, the Department highlights that the existing and proposed upgraded development represent the only Australian source of concentrated nitric acid (important in the manufacture of explosives, including those for the mining industry) and the only source of nitroglycerine (important in the manufacture of cardiac medicines). The facility also supports employment in industry sectors including transport. Loss or disruption of the munitions facility would therefore have a flow-on effect to these industries.

While the proposed munitions facility upgrade will not generate new employment in itself, it is important in relation to both maintaining existing employment benefits, and positive economic impacts through the investment of new capital and the support of on-going local and regional expenditure. Public submissions have also highlighted that the Applicant provides support for local education and charity activities. In this regards, the facility affords the local and regional community significant positive socio-economic benefits, which are dependent on the on-going viability of the site.

Site Security

A number of submissions have indicated support for the proposal based on the need for Australia to maintain its own defence capabilities. Equally, other submissions have highlighted concern in relation to terrorism and site security.

The issue of national security rests with the Australian Government, and has not been specifically considered in this assessment report. However, the Department recognises from public submissions that the local community has recognised a real or perceived need for indigenous munitions manufacturing capability. Recognition of this need has been reflected by the Australian Government with the indication that it intends to upgrade the existing munitions facility.

The Department is, however, responsible for assessing security-related matters where these matters may directly affect local, regional or State socio-economics or land use safety. Submissions have highlighted that given the nature of the munitions facility, there is potential for unauthorised access to initiate an incident with undesirable off-site impacts. Further, site security should be maintained to ensure to prevent general public access and protect public safety. To address this issue, the Department recommends that the Applicant be required to demonstrate that it has appropriate site security measures in place prior to the commencement of operation of the munitions facility upgrade. Specific measures that may be included in the design of the proposed development include fencing, video surveillance, lighting and management measures, including attendance of the site guardhouse.

Community Consultation

The Department considers the community consultation activities undertaken by the Applicant during the preparation of the Environmental Impact Statement for the proposal, and prior to the lodgement of the subject development application are reasonable. The scope of the consultation activities are such that the Department considers that Applicant has identified relevant interested parties, and received and addressed the concerns of those parties as part of the Environmental Impact Statement. Further, the notification process conducted by the Department saw some 1,100 properties notified of the development proposal, essentially representing the entire town of Mulwala. The Department considers that the Applicant's consultation activities, combined with notification above the requirements of the *Environmental Planning and Assessment Act 1979* have seen all potentially affected community members informed in relation to the proposal, and provided the opportunity to express concerns or support for the redevelopment.

While the Department appreciates that there is significant community support for the existing and proposed munitions facility and upgrade, as evidenced in submissions received, there are also community members opposed to the development and concerned about impacts the munitions facility upgrade may pose. To ensure that there are on-going mechanisms to receive and address concerns that may be raised by the community, the Applicant should establish a complaints receipt and handling system. This system includes toll free telephone numbers, a postal address and an email address through which to receive complaints and comments. The Applicant is also required to maintain a register of complaints, detailing how complaints have been addressed.

The Applicant has indicated that it currently runs a community consultation group for the munitions facility, and intends to continue operating this group during and after the munitions facility upgrade. The Department supports this approach, and the open and transparent involvement of the community through information, consultation and participation. The Department recommends that specific provision be made in any development consent that may be granted for the Applicant to make all environmental and safety monitoring and management data available to the public.

5.3 Air Quality Impacts

Applicant's Position

Construction

The Environmental Impact Statement suggests that the majority of construction and demolitions works associated with the proposed development would be undertaken significant distances from the site boundary and residential areas. Works associated with the new nitrocellulose plant, propellants plant and solvents plant would be located some 350 metres from the site boundary. The proposed confined burning facility (CBF) and LOVA plant would be even more remote from the boundary. Given the significant distances of these works from residential areas, the Applicant argues that dust impacts generated by these construction and demolition works would be minimal.

Some components of the proposed development would, however, be located relatively close to the site boundary. These works include the construction of the new access road and administration building, the location of which is currently occupied by the existing nitrocellulose plant. Demolition of the existing coal-fired boiler house may involve the disturbance of soils contaminated with polycyclic aromatic hydrocarbons (PAHs), which, if not appropriately managed have the potential to impact on human health.

The Applicant intends to include specific provisions in a construction and demolition environmental management plan for the site. Dust mitigation measures would be tailored to the construction and demolition works to be undertaken, the location of the works, and the types of soils that may be disturbed (including potential contamination issues). The management plan and include measures would provide for dust mitigation to ensure that dust impacts are minimise to as low as reasonably possible and to protect human health and amenity, where relevant.

The Environmental Impact Statement provides the outline of a construction and demolition environmental plan and details of mitigation measures to be implemented. Specific measures proposed by the Applicant to address dust generation and impacts include:

- minimisation of areas of disturbed soil;
- stabilisation of stockpiles to minimise wind erosion (eg water sprays, covering, revegetation);
- watering of roads and exposed soils;
- speed limits for vehicles;
- minimum drop heights for unloading and loading of materials; and
- monitoring as relevant for suspended particulates, deposited dust, asbestos, volatile organic compounds (VOC), heavy metals, polycyclic aromatic hydrocarbons (PAHs) and meteorology.

Operation

To assess the potential air quality impacts posed by the proposed development, the Applicant undertook air quality modelling using the AUSPLUME model. The existing environment was characterised in the model with meteorological data derived from the Rutherglen and Wagga Wagga airport meteorological monitoring stations and measured emissions from existing processes. Proposed new processes were based on design criteria for process components, and emissions points assumed to be consistent with the overall conceptual plan of the redeveloped site layout. In the case of ethanol, ethyl ether and acetone (odorous compounds), modelling was completed for two scenarios (20-metre and 25-metre stacks) to illustrate the effect of alterations that may be required to the final design of the air emissions discharge points. Modelling results presented in the Environmental Impact Statement are summarised below in Table 9. The table provides existing and predicted air quality impacts, with relevant ambient air quality criteria for comparison. All ambient air quality criteria are those established by the former EPA (now DEC) in the document *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in New South Wales*, except in relation to ethyl ether. Because there are no established criteria in NSW for this compound, the Applicant has applied Canadian criteria (Ontario Ministry for the Environment (MoE)) as a guide. The MoE has introduced interim values, with the goal of eventually moving to more stringent (proposed) criteria in future.

Table 9 - Existing and Predicted Air Quality Impacts

Pollutant	Existing Development (μgm^{-3})	Upgraded Development (μgm^{-3})	Assessment Criteria (μgm^{-3})
NO _x (1-hour)	167	122	246
NO _x (annual)	7.2	4.3	62
HNO ₃ (3-minute, all sources))	278	286	170
HNO ₃ (3-minute, excluding DP30(2))	96	110	170
SO ₂ (10-minute)	119	119	715
SO ₂ (1-hour)	95	95	572
SO ₂ (24-hour)	12	12	228
SO ₂ (annual)	2.1	2.1	57
PM ₁₀ (24-hour)	7.9	0.2	50
PM ₁₀ (annual)	0.57	0.05	30
CO (15-minute)	42	42	100,000
CO (1-hour)	41	44	30,000
CO (8-hour)	18	26	10,000
Ethanol (3-minute, 20 metre stacks)	2,640	1,362	3,800 (health) 345,000 (odour)
Ethanol (3-minute, 25 metre stacks)	2,640	1,034	3,800 (health) 345,000 (odour)
Ethyl Ether (10-minute, 20 metre stacks)	39,260	1,292 (1,051 at discrete receptors)	950 (odour)
Ethyl Ether (10-minute, 25 metre stacks)	39,260	1,009 (735 at discrete receptors)	950 (odour)
Ethyl Ether (30-minute, 20 metre stacks)	33,130	1,186 (879 at discrete receptors)	700 (proposed) 7,000 (interim)
Ethyl Ether (30-minute, 25 metre stacks)	33,130	977 (601 at discrete receptors)	700 (proposed) 7,000 (interim)
Ethyl Ether (24-hour, 20 metre stacks)	4,210	156	8,000 (health)
Ethyl Ether (24-hour, 25 metre stacks)	4,210	120	8,000 (health)
Acetone (3-minute, 20 metre stacks)	-	1,082	48,000
Acetone (3-minute, 25 metre stacks)	-	742	48,000

The Applicant provides the following comments in relation to predicted air quality impacts for each of the compounds listed in the table above, in light of the results of air dispersion modelling:

- Nitrogen oxides (NO_x) – outcomes of the air emissions modelling indicated that concentrations of NO_x will not exceed relevant ambient air quality criteria. It is noted that ambient air quality criteria are only specified for NO_2 , and in reality, not all of the NO_x emitted from the proposed development would be in NO_2 form. As such, there is an additional level of conservatism inherent in the comparison of NO_x emissions with NO_2 criteria. The Applicant also highlights that the munitions facility upgrade will reduce the ambient NO_x impacts posed by the development from the existing situation.
- Nitric acid (HNO_3) – for three-minute averages, modelling predicts that ambient air quality criteria for nitric acid will be exceeded with the operation of existing (retained) and proposed new process components. Exceedance of the criteria is also predicted to be occurring for the existing development. The Applicant highlights, however, that nitric acid emissions are dominated by discharge point DP 30(2) (associated with RDX nitration). RDX nitration is only undertaken during 545 hours per year, with emissions from this source representing an intermittent contributor to ambient pollution levels. The Applicant highlights that emissions from DP30(2) are outside the scope of the subject development application, and would not impact emissions from the proposed upgrade. The Applicant recognises, however, that emissions from DP30(2) should be investigated and addressed, but as a separate consideration to the subject munitions facility upgrade. If emissions from DP30(2) are excluded from modelling, the resultant ambient nitric acid concentrations for both the existing and proposed upgraded munitions facility lie below the nitric acid criterion.
- Sulfur dioxide (SO_2) – the Applicant highlights that sulfur dioxide emissions for both the existing and upgraded munitions facility lie below both the 10-minute and 1-hour ambient air quality criteria. Sulfur dioxide emissions from the site are dominated by discharges from the high explosives area, which will not change as part of the proposed development, and as such, predicted air quality impacts in relation sulfur dioxide will not change with the upgrade.
- Particulates (PM_{10}) – particulate impacts associated with the operation of the development will decrease significantly and will lie well below relevant criteria should the munitions facility upgrade proceed. The Environmental Impact Statement indicates that a major source of particulates from the existing development is the coal-fired boiler, which will be replaced with a gas-fire boiler as part of the upgrade.
- Carbon monoxide (CO) – carbon monoxide impacts are predicted to lie well below established criteria for all averaging periods, and predicted to increase by a marginal degree as a result of the proposed upgrade.
- Ethanol – as indicated in the table above, emissions of ethanol from both the existing and proposed upgraded munitions facility do not generate a significant ambient air quality impact. However, the Applicant highlights that the existing scenario for ethanol may underestimate peak concentration maxima off-site, given the batch nature of the existing propellants plant and the potential for sporadic fugitive emissions. Potential for fugitive emissions will be eliminated with the decommissioning of the existing propellants plant.
- Ethyl Ether – the Applicant highlights that air quality modelling predicts that with assumed 20 metre stacks, 10-minute average criteria for ethyl ether (odour impacts) would be exceeded, even though the munitions facility upgrade would be a significant improvement over the existing situation. In the same situation, the maximum concentration at the most affected receptor (as opposed to the maximum concentration at any point) also exceeds the odour criterion ($1,051 \mu\text{gm}^{-3}$, compared with the $950 \mu\text{gm}^{-3}$ criterion). However, if stack heights are increased to 25 metres, ethyl ether concentrations at discrete receptors would drop below the 10-minute odour criterion. A similar situation is predicted for 30-minute averages, with predicted impacts posed by the munitions facility upgrade meeting interim requirements with 20 metre stacks, but not meeting future “proposed” criteria, as established in Canada (in the absence of specific NSW criteria). However, with an increase of stack heights to 25 metres, the “proposed” criterion can be met at discrete receptors. Longer-term impacts (24-hour averaging period) that may affect human health, are well below relevant criteria for both the existing and proposed upgraded development.

- Acetone – acetone impacts predicted through air dispersion modelling would not exceed established ambient air quality criteria for the protection of health and amenity (odour).

Greenhouse Gases

The Environmental Impact Statement highlights that greenhouse gas emissions from the existing development are largely the result of fuel in coal and gas boilers, the nitration of calcium carbonate and emissions from waste combustion at the burning grounds. The proposed munitions facility upgrade will see the existing coal-fired boilers replaced with a gas-fired boiler, and a confined burning facility to replace the existing open burning grounds. The net result of these upgrades will be a 26% reduction in greenhouse gas emissions from the site. Details of this reduction are reproduced below.

Table 10 - Existing and Proposed Greenhouse Gas Emissions

Emission Source	Carbon Dioxide Equivalent Emissions (tonnes per annum)	
	Existing Development	Upgraded Development
Existing coal boilers	31,409	0
Existing calcium nitrate plant	880	880
Existing nitration plant	No data	0
Existing gas boiler	18,046	18,046
Proposed gas boiler	0	18,046
Existing burning grounds	320	0
Proposed confined burning facility	0	259
TOTAL	50,655	37,231

The Applicant argues that the predicted 26% decrease in greenhouse gas emissions is consistent with the targets outlined in the Kyoto Protocol.

Issues Raised in Submissions

Air quality concerns represent 4.9% of all issues raised in public submissions. These issues can be summarised as follows:

- emissions from the site are currently unacceptable and there is no guarantee that the upgrade will address this situation. There is no guarantee that by meeting current air quality standards that the development can meet requirements in future.
- odours, particularly those associated with ether, are currently unbearable and emission of further odorous compounds should not be permitted;
- the air quality modelling is flawed as it suggests that air emissions will disperse. In reality emissions descend on Mulwala at night; and
- upgrades to the development are likely to bring about improvements in air quality.

The former Environment Protection Authority issued a number of General Terms of Approval that relate to air quality:

- activities on the site must be undertaken so as not to deposit dust off-site;
- the thermal disposal unit must be designed and constructed to meet specified air emissions discharge criteria;
- the equipment decontamination facility must be designed and constructed to prevent the emission of smoke;
- air pollutant concentrations are specified for the new gas boiler, the new nitrating house scrubber stack and the confined burn facility;
- volume and mass limits are specified for the stacks associated with kneading/graphitising, solvent drying, , solvent production/ recovery and the acetone adsorb recovery system;
- minimum stack heights and discharge velocities are specified for the new gas boiler and new nitrating house scrubber, and all stacks are required to be designed in accordance with good engineering practice;
- within two months of the commissioning of each relevant component of the proposed development, the Applicant must undertake an air quality assessment of the operating

- component to confirm predicted air quality performance and compliance with air emissions limits;
- the Applicant must provide manufacturers' performance guarantees certifying that the air emissions performance of relevant equipment will meet specified air emissions limits;
- all plant and equipment must be designed and operated to prevent the emission of offensive odours from the site; and
- air emissions discharges points must be monitored periodically and continuously to confirm that specified air emissions limits are being met.

Department's Position

Construction

The Department is satisfied that given the distance from the site boundary, the majority of construction activities associated with the proposal will not generate a significant off-site air quality impact. There is however, works closer to the site boundary, including those relating to the new administration building(s), carpark and site entrance configuration, that have the potential to generate elevated dust impacts off-site, if not appropriately managed. There is also potential for dust that may be disturbed during construction to carry contaminant loads, given historical operations on the site.

Management and mitigation of dust impacts during construction works is relatively well known and commonly applied, and the Department is generally satisfied with the measures proposed to be applied by the Applicant in this regard. To reflect the Applicant's commitments, the Department recommends that if the Minister determines to approve the proposal, the consent requires a Construction and Demolition Plan to be developed and implemented on the site. The Plan specifically requires the Applicant to detail measures to mitigate and manage dust emissions during construction and demolition, and includes provision for the identification and management of potentially contaminated soils, where relevant. The Applicant should be expressly prohibited from emitting visible dust from the site, and required to take all practicable measures to prevent vehicle-related dust generation. The Department concludes that with the rigorous application of the measures outlined above, construction and demolition works associated with the munitions facility upgrade could be constrained to lie within acceptable environmental limits.

Operation

In order to contextualise air quality impacts associated with the proposed munitions facility relative to ambient air quality criteria, the Department has calculated the fraction of acceptable air quality limits "consumed" by the proposal. In effect, predicted ambient concentrations of pollutants from the existing and proposed upgraded development (including background, where relevant) have been compared with criteria and quantified as a percentage of the specified respective limits. This approach illustrates the "safety margin" available for operation of the upgraded facility relative to criteria, and acts to quantify the net increase or decrease in air quality impacts that may result from the proposal. Consideration of impacts in this light is provided below for all compounds other than nitric acid (HNO₃) and ethyl ether (which are assessed later in this section of the Department's report).

Table 11 - Calculated Air Quality Impacts as a Fraction of Criteria

Pollutant	Existing (µgm ⁻³)	Fraction of Criterion (%)	Upgraded (µgm ⁻³)	Fraction of Criterion (%)
NO _x (1-hour)	167	67.9	122	49.6
NO _x (annual)	7.2	11.6	4.3	6.9
SO ₂ (10-minute)	119	16.6	119	16.6
SO ₂ (1-hour)	95	16.6	95	16.6
SO ₂ (24-hour)	12	5.3	12	5.3
SO ₂ (annual)	2.1	3.7	2.1	3.7
PM ₁₀ (24-hour)	7.9	15.8	0.2	0.4
PM ₁₀ (annual)	0.57	1.9	0.05	0.2
CO (15-minute)	42	0.04	42	0.04
CO (1-hour)	41	0.1	44	0.1

CO (8-hour)	18	0.2	26	0.3
Ethanol (3-minute, 20 metre stacks)	2,640	69.5 (health)	1,362	35.8 (health)
		0.8 (odour)		0.4 (odour)
Ethanol (3-minute, 25 metre stacks)	2,640	69.5 (health)	1,034	27.2 (health)
		0.8 (odour)		0.3 (odour)
		473.3 (interim)		14.0 (interim)
Acetone (3-minute, 20 metre stacks)	-		1,082	2.3
Acetone (3-minute, 25 metre stacks)	-		742	1.5

For all air pollutants listed in the table above, air quality impacts lie below relevant ambient air quality criteria. In all cases, impacts lie below 50% of criteria accepted as protective of human health and amenity (odour-related impacts). Criteria pollutants, including SO₂, particulates and CO, are significantly less than criteria, with all pollutants less than 20% of criteria. A similar situation is predicted for NO_x over the long term, although shorter-term averages (1-hour) approach 50% under worst-case considerations. Compounds with potential health and odour impacts (ethanol and acetone) pose minimal potential for significant odour generation, being substantially lower than odour criteria for those compounds (less than 1%). While information in the above table suggests that health impacts from these compounds are likely to be the limiting factor, predicted maximum ambient concentrations of these compounds are not expected to exceed 40% of the concentrations at which human health impacts would be experienced. For all of these compounds, the Department is satisfied that the upgraded munitions facility would not pose an unacceptable environmental, safety (human health) or amenity (odour) impact. The Department also highlights that from a comparison of the impacts posed by the existing and proposed upgrade facility, the munitions facility upgrade would improve air quality with respect to the compounds listed in the above table.

A key issue associated with the compounds listed in the table above is the Applicant's compliance with human health and odour outcomes. In this regard, it is important to ensure that ambient air quality criteria for acetone and ethanol are met (a similar consideration applies to ethyl ether, which is outlined later in this section of the Department's assessment report). The DEC's General Terms of Approval require the Applicant to demonstrate the final design of the munitions facility is such that ambient air quality criteria for these compounds will be met. This requirement is reflected in the Department's recommendations, which would require this demonstration as part of a broader air quality performance confirmation (based on detailed design) prior to the construction of the upgraded components of the facility.

In relation to nitric acid emissions, the Environmental Impact Statement identifies an existing issue with emissions of this compound from the facility, dominated by the RDX nitration process and discharges from DP30(2). The situation relative to air quality criteria is illustrated in Table 12.

Table 12 - Calculated Air Quality Impacts as a Fraction of Criteria (Nitric Acid)

Pollutant	Existing (µgm ⁻³)	Fraction of Criterion (%)	Upgraded (µgm ⁻³)	Fraction of Criterion (%)
HNO ₃ (1-hour, all sources))	278	163.5	286	168.2
HNO ₃ (1-hour, excluding DP30(2))	96	56.5	110	64.7

The munitions facility upgrade is expected to result in a small net increase in nitric acid emissions from the site (less than 10%). In comparison, emissions of nitric acid from DP30(2) alone would exceed the 1-hour ambient air quality criterion.

The Department accepts the Applicant's argument that emissions from the RDX nitration process, through the DP30(2) lie outside the scope of the subject development application and are being addressed separately. It is clear, however, that this discharge point represents

a significant contributor to total air quality impacts from the munitions facility (existing and upgraded) and must be addressed by the Applicant, in consultation with the DEC. The Department notes that the RDX nitration only occurs during some 545 hours (less than a total of 23 days) per year. To add to context to this issue, it should be highlighted that predicted air quality impacts presented in the Environmental Impact Statement have been based on a worst-case scenario, including worst-case weather conditions. In reality, operation of the RDX nitration process and worst-case weather conditions would not occur concurrently, 100% of the time. As such, the predicted air quality impact, dominated by emissions from DP30(2) would not reach the predicted elevated levels all of the time. Further, the Department highlights that the munitions facility upgrade would increase nitric acid emissions to a minor degree, relative to total nitric acid emissions from the existing development. If the proposed development were not approved, or did not proceed for any reason, the existing issue with nitric acid emissions from DP30(2) would not be affected. The Department is satisfied that the munitions facility upgrade would not generate a significant impact with respect to nitric acid emissions, however it is recognised that other emissions sources associated with existing components of the facility must be, and are currently being, addressed.

As for each of the air emissions assessed above, the Department has directly compared predicted ambient concentrations of ethyl ether from the existing and proposed upgraded munitions facility with relevant criteria. Comparisons have been made for each of the relevant scenarios presented in the Environmental Impact Statement (including average periods, stack heights and maximum concentrations at any point and at discrete receptors). The results of these calculations are summarised below.

Table 13 - Calculated Air Quality Impacts as a Fraction of Criteria (Ethyl Ether)

Pollutant	Existing (μgm^{-3})	Fraction of Criterion (%)	Upgraded (μgm^{-3})	Fraction of Criterion (%)
Ethyl Ether (10-minute, 20 metre stacks)	39,260	4,132.6 (odour)	1,292	136.0 (odour)
			1,051 (discrete receptors)	110.6 (odour)
Ethyl Ether (10-minute, 25 metre stacks)	39,260	4,132.6 (odour)	1,009	106.2 (odour)
			735 (discrete receptors)	77.4 (odour)
Ethyl Ether (30-minute, 20 metre stacks)	33,130	4,732.9 (proposed) 473.3 (interim)	1,186	169.4 (proposed)
				16.9 (interim)
			879 (discrete receptors)	125.6 (proposed)
				12.6 (interim)
Ethyl Ether (30-minute, 25 metre stacks)	33,130	4,732.9 (proposed) 473.3 (interim)	977	139.6 (proposed)
				14.0 (interim)
			601 (discrete receptors)	85.9 (proposed)
				8.6 (interim)
Ethyl Ether (24-hour, 20 metre stacks)	4,210	52.6 (health)	156	2.0 (health)
Ethyl Ether (24-hour, 25 metre stacks)	4,210	52.6 (health)	120	1.5 (health)

Emissions of ethyl ether from the facility and associated impacts, particularly odour impacts, are a key issue in relation to the munitions facility upgrade, as evidenced in public submissions. The local community currently experiences ethyl ether odour impacts, with submissions highlighting that this impact is of particular concern. On a longer-term basis (24-hour), the Applicant has demonstrated that ethyl ether emissions lie within acceptable criteria for the protection of human health (2% or less than criteria, depending on stack height above 20 metres). The Department is satisfied that this does not represent a significant impact.

On a shorter-term basis, however, the Applicant has predicted elevated concentrations of ethyl ether attributable to the munitions facility. The Department recognises the proposed upgrade will reduce ethyl ether impacts, but does not accept ambient concentrations above the specified criteria for 10-minute or 30-minute periods. With increased stack height, the Applicant has demonstrated that it is possible to meet criteria for a 10-minute period when

considering discrete receptors, and generally for a 30-minute period if assessed against interim criteria specified by the Ontario Ministry of Environment (MoE). However, the position established through the DEC's General Terms of Approval, and reflected in the results of the Department's assessment of the proposal, is that the most stringent criteria (proposed MoE criteria) must be met at all locations beyond the site boundary. This position reflects best practice air quality management and prevents the munitions facility from "sterilising" surrounding land for possible future development.

The Applicant has demonstrated that it is possible to reduce ambient ethyl ether impacts by increasing stack height. In practice, air quality criteria could be met by discharging air emissions through a sufficiently high stack. The Department notes that reductions in ethyl ether impacts could also be achieved through increased discharge velocities/ temperatures, or the application of additional pollution control equipment.

Considering the information provided in the table above, it can be seen that the fundamental parameter will be compliance with the 30-minute "proposed" air quality criterion. Predicted impacts are sufficiently close to the 10-minute criterion such that compliance with the 30-minute specification would also achieve compliance within a 10-minute interval. The DEC's General Terms of Approval, and the Department's recommendations have therefore specified that the Applicant must achieve no greater than $700 \mu\text{gm}^{-3}$ of ethyl ether at ground level, in ambient air (the MoE 30-minute proposed ethyl ether criterion). Specifically, and in a similar fashion to acetone and ethanol, the Applicant must demonstrate that the proposed munitions facility upgrade has been designed to meet this criterion prior to the commencement of construction. By achieving this specification, the proposed development will not exert ethyl ether impacts (as health or odour impacts) above what is considered environmentally acceptable.

Confined Burning Facility

The scope of the subject development application includes a number of development components that will form part of the upgraded munitions facility, and some components that are "optional", pending final design and determination of exact capability requirements. One of the "optional" components the subject of the development application is the confined burning facility (CBF). The CBF is intended to replace the current practice for disposal of explosive materials through burning in an open area.

The DEC and the Department have indicated to the Applicant that burning explosive waste from the munitions facility upgrade is not environmentally acceptable, and not consistent with best practice waste and air quality management. If the proposed development proceeds, the Applicant would be required to construct and operate the CBF for management of waste from the upgraded facility, rather than the CBF component of the development application being "optional". If the Minister determines to approve the proposal, the Applicant should be required to demonstrate that the CBF has been designed to meet air quality outcomes, and that it will be constructed as such.

Greenhouse Gases

The Department is satisfied that the Applicant has adequately considered impacts of the proposed munitions facility upgrade in relation to greenhouse gas emissions. Should the proposal proceed, greenhouse gas emissions from the facility will decrease by some 26%. A key factor in the reduction of greenhouse gas emissions from the site is the replacement of the site's coal-fired boiler with a boiler fired on natural gas. The Department notes that in relation to these emissions, the proposed upgrade will have a net positive environmental benefit. Given the likely significant reduction in CO₂-equivalent emissions, the Department considers that further measures to address greenhouse gas issues are required.

Concluding Position

With hazards and risk impacts, air quality issues represent important environmental impacts associated with the proposed munitions facility upgrade that must be appropriately and adequately mitigated, managed and monitored. The Department's recommendations include a comprehensive suite of measures aimed at ensuring that environmental outcomes for air quality are achieved. These measures include:

- prohibition on the emission of any offensive odours from the site;
- prohibition on the emission of visible dust from the site, and a requirement that all vehicles carrying a load that may generated dust must be covered;
- stringent discharge limits for pollutants including NO_x, nitric acid, particulates, carbon monoxide, hydrogen chloride, fluorine compounds, sulfur dioxide, metals, dioxins and furans, volatile organic compounds, ethyl ether, acetone and ethanol;
- minimum stack design requirements to ensure air quality outcomes are met;
- a requirement that the Applicant must prepare and submit for approval prior to construction, an air quality assessment based on detailed design to demonstrate compliance with relevant air quality criteria and the general outcomes predicted in the Environmental Impact Statement. This assessment must make specific reference to the air quality performance of the CBF (which must be constructed), and compliance with ambient air quality criteria for ethanol, acetone and ethyl ether (specified as the MoE 30-minute "proposed criterion");
- comprehensive air quality monitoring requirements, on a continuous and periodic basis, for pollutants including NO_x, nitric acid, particulates, carbon monoxide, hydrogen chloride, fluorine compounds, sulfur dioxide, metals, dioxins and furans, volatile organic compounds, ethyl ether, acetone and ethanol;
- assessment of the air quality performance of the development within 90 days of the commencement of operation, to demonstrate that air quality criteria are being met;
- where the above assessment indicates that criteria are not being met, the Applicant must develop remedial measures to be applied to the munitions facility to ensure full compliance with air quality criteria;
- a Construction and Demolition Environmental Plan must be developed and implemented, including measures to minimise dust generation during construction and demolition, and identify and address any contaminated soils that may lead to contaminated dust impacts; and
- an Air Quality Management Plan, for inclusion in an Operation Environmental Management Plan, to detail specific measures to mitigate, monitor and manage air quality impacts throughout the life of the munitions facility upgrade.

If the Minister determines to approve the proposed development, the Department considers that the imposition of these conditions will constrain the development, both through construction, demolition and operation, to within acceptable environmental limits.

5.4 Noise Impacts

Applicant's Position

Background Noise

As a basis for the prediction and consideration of noise impacts associated with the proposed development, the Applicant undertook noise monitoring to characterise the existing acoustic environment. Noise monitoring was used to established background noise levels for operation of the proposal during the day, evening and night (on any day of the week). For construction noise impacts, background noise levels were derived considering monitoring data for the period Monday to Saturday, noting that construction activities are not usually undertaken on Sundays. The Applicant did, however, derive a background noise level typical of Sundays in the event that construction was required on those days. The following background noise levels were presented in the Environmental Impact Statement for location 1 (rural land use on Wanini Road) and location 2 (residential land use on Payne Road).

Table 14 – Rating Background Noise Levels (10th Percentile, L₉₀(15 minute))

Receptor	Operation Background (dB(A))			Construction Background (dB(A))	
	Day	Evening	Night	Weekdays	Sunday
Location 1	33	32	32	33	32
Location 2	35	35	32	35	35

Construction

The Applicant proposes to construct components of the munitions facility upgrade over the course of a number of years, with each construction campaign occurring over varying periods of time and at different locations on the site. Given that the existing munitions facility will be operated during construction, and components of the munitions facility upgrade will be operated while other components are being constructed, it is difficult to conclusively and quantitatively establish noise impacts, or even specific noise criteria against which to assess the impacts (given that the DEC's construction noise criteria are based on the period of construction).

In light of this, the Applicant predicted the likely sound pressure level contributions from the construction of the munitions facility upgrade at sensitive receiver locations and compared the predicted contribution with existing background noise levels. This consideration is reproduced in Table 15 below.

Table 15 - Comparison of Predicted Noise Impacts and Background Noise Levels

Location	Distance to Nearest Construction (m)	Predicted Noise Contribution (dB(A))	Background Noise (dB(A))
Bayly St/ Wanini Rd	350	57	33
Bayly St/ Lucan St	250	60	
Romney St/ Inglis St	900	49	35
Romney St/ Slattery St	1,000	47	

The Applicant notes that the predicted worst-case construction noise impact would be some 27 dB(A) above existing background noise levels (at Bayly Street/ Lucan Street). The predicted noise impacts are relevant for outdoor receptors, and the Applicant argues that for receptors inside buildings, the actual impact would be some 10dB(A) lower with windows open, and 15dB(A) lower with windows closed. The Applicant expects that most residents would close windows that face construction areas, so the worst-case construction noise impact would in fact be in the order of 45 dB(A). This noise impact does not exceed the typical indoor household noise level of 55 dB(A). The Applicant anticipates that despite predicted construction noise impacts, construction will generally be undertaken during the day, when most residents would be absent from their homes.

Construction noise mitigation measures proposed to be implemented by the Applicant include:

- construction plant and equipment would be maintained and operated in a proper and efficient manner;
- construction activities would not occur during the night, or on Sundays, or on public holidays, unless inaudible at residential premises outside the facility;
- construction activities would not occur during the evening unless noise levels as a result would not exceed 40 dB(A) (being background noise plus 5 dB(A)) at residential premises outside the facility; and
- residences potentially affected by noise as a result of any construction activities would be notified of planned activities, timing and durations, one month prior to the commencement of construction.

Operation

Based on measured background noise levels and the criteria specified in the former EPA's *Industrial Noise Policy*, the Applicant determined protect specific noise levels for the proposed munitions facility upgrade, at location 1 (rural land use on Wanini Road) and location 2 (residential land use on Payne Road). Noise criteria derived and presented in the Environmental Impact Statement are reproduced below.

Table 16 - Project-Specific Noise Criteria

Receptor	Day (dB(A))	Evening (dB(A))	Night (dB(A))
Location 1	38	37	32
Location 2	40	37	32

The Applicant highlights that the existing development, and the proposed munitions facility upgrade could be operated at any time, and as such, the most stringent noise criterion would be the limiting factor. In this case, the night time noise criterion of 32 dB(A) represents the most stringent noise criterion of the operation of the munitions facility upgrade. Compliance with this criterion would ensure compliance with the criteria for day and evening operation.

The Environmental Impact Statement provides predictions of the likely noise contributions attributable to each of the major components of the munitions facility upgrade. As there will be an interim period in which some existing components of the munitions facility are operated concurrently with new processes before being decommissioned, noise impacts have been presented for existing, future and transitional situations, as reproduced below.

Table 17 - Noise Impacts from Existing, Future and Transitional Process Arrangements

Plant Component	Predicted Sound Power Level at Receptor (dB(A))					
	Bayly/ Binda	Bayly/ Wanini	Bayly/ Wanini	Romney/ Inglis	Romney/ Slattery	Bayly/ Waratah
Existing nitrocellulose plant	18	39	31	21	14	21
Existing and proposed nitrocellulose plants	27	40	32	23	17	30
Proposed nitrocellulose plant	26	32	24	18	14	29
Existing propellant plant	13	28	31	35	31	-
Existing and proposed propellant plant	24	29	32	35	31	-
Proposed propellant plant	23	23	19	21	15	-
Proposed PBX plant	13	16	11	9	9	17
Existing solvent plant	6	17	27	30	16	8
Existing and proposed solvent plants	15	29	28	30	17	18
Proposed solvent plant	15	29	21	15	10	18
Proposed LOVA plant	26	24	20	16	18	28
Proposed NTO plant	28	25	20	20	18	24
Proposed CBF plant	13	2	0	0	0	12
Existing boiler	30	55	33	27	23	37
Existing and proposed gas-fired boilers	30	55	33	28	24	38
Proposed gas-fired boiler	21	34	17	20	17	27

From the information provided in the table above, the Applicant makes the following key observations in the context of the 32 dB(A) project specific noise criterion and noise impacts associated with the proposed munitions facility upgrade:

- Noise impacts associated with existing and proposed nitrocellulose plants are generally below the 32 dB(A) criterion. One exception is in the vicinity of Bayly and Wanini Roads, where this criterion is currently exceeded and would be exceeded during the transition from the existing to the new nitrocellulose plant. The Applicant highlights that noise impacts from the nitrocellulose plant are currently unlikely to be audible at Bayly/Wanini, given the existing noise impact of the current boiler of some 51-55 dB(A) at this point. Once the boiler has been decommissioned and replaced with a new boiler, noise from existing, future or transitional nitrocellulose plant arrangements is equally unlikely to be significant, given the on-going operation of the existing acid plant and the domination of noise contributions from this process (approximately 45 dB(A)). The operation of the proposed new nitrocellulose plant will generally decrease noise impacts from this part of the munitions facility, and in all cases meet the most stringent (night-time) project specific noise criterion of 35 dB(A).
- The operation of the new propellants plant will generally decrease noise impacts at the receptors considered (other than for an increase at Bayly/ Binda), and once the new plant is operational and the existing plant decommissioned, will meet the 32 dB(A) noise criterion.

- There is currently no PBX plant on the site, and as such there will be no transitional noise scenario. The operation of the PBX plant will generate off-site noise well below the 32 dB(A) criterion at each of the receptors assessed.
- The existing, future and transitional noise scenarios for the solvent plant all lie below the 32 dB(A) noise criterion.
- As with the proposed PBX plant, there is currently no LOVA plant on the site. The operation of the new LOVA plant will not generate noise above the 32 dB(A) noise criterion.
- There is also no existing NTO plant on the site. Operation of the NTO plant is predicted to generate noise impacts of no greater than 4 dB(A) below the 32 dB(A) criterion at the receptors considered.
- The confined burning facility will replace the current practice of open burning. The operation of the new facility will generate noise impacts significantly below the 32dB(A) criterion.
- The existing boiler on the site represents a significant contributor to off-site noise impacts, as evidenced by sound pressure levels at the Bayly/ Wanini receptor. Operation of the proposed new boiler will result in a minor exceedence of the 32 dB(A) noise criterion (some 2 dB(A)). As noted above, the existing acid plant will dominate the noise profile of the site once the munitions facility upgrade is implemented, and as such, a minor exceedence of the 32 dB(A) criterion attributable to the new gas-fire boiler will be imperceptible above the dominant noise impacts from the on-going operation of the acid plant. The Applicant also highlights that from the existing to the proposed noise situation at Bayly/ Wanini, that receptor will experience a significant reduction in boiler-related noise (some 21 dB(A)).

To demonstrate the noise impacts generated by the proposed upgrade, once operational and during the transition period when existing and new components of the munitions facility are operated concurrently, the Applicant modelled off-site noise impacts for existing, transitional and proposed scenarios. Modelling was performed for the worst-case situations of temperature inversions (night time) and low wind speeds. The results of this modelling are reproduced in Table 18 and Table 19 below.

Table 18 - Predicted Noise Impacts (Night Time, Temperature Inversion)

Receptor Location	Predicted Sound Power Levels (dB(A))		
	Existing	Transition	Proposed
Bayly/ Binda	32	37	36
Bayly/ Wanini	55	55	48
Bayly/ Wanini	39	40	35
Romney/ Inglis	37	38	32
Romney/ Slattery	33	35	31
Bayly/ Waratah	39	41	40

Table 19 - Predicted Noise Impacts (Low Wind Speed)

Receptor Location	Predicted Sound Power Levels (dB(A))		
	Existing	Transition	Proposed
Bayly/ Binda	31	38	38
Bayly/ Wanini	56	56	50
Bayly/ Wanini	44	45	39
Romney/ Inglis	40	42	38
Romney/ Slattery	36	39	36
Bayly/ Waratah	39	42	41

From these modelling results, the Applicant highlights that for the existing situation, noise impacts during temperature inversions meet the night-time project specific noise level of 32 dB(A) at only one location. Further, under low wind speed conditions, the night time noise level (32 dB(A)) is currently only met at one location, the evening noise level (37 dB(A)) at two of six locations, and the day time noise level (40 dB(A)) at all but two locations.

Overall, the proposed munitions facility upgrade is not predicted to alter noise impacts from the existing situation to any significant degree (no more than 3 dB(A)) at any location other than Bayly Street/ Binda Street, where it would increase by some 4 dB(A) under temperature inversion conditions (night-time), and 7 dB(A) under a low wind speed scenario. When considering the “future case” (retained and new facility components), the night-time project specific noise level (32 dB(A)) would only be met at two locations with temperature inversions, and nowhere with low wind speeds. Evening noise levels would be met at only one location, and day time noise levels at four of six locations with low wind speeds. Further analysis of noise sources outlined in the Environmental Impact Statement suggests that the major contributor to noise levels after redevelopment is the existing acid plant, which will not be affected as part of the subject development proposal.

While project specific noise levels are predicted to be exceeded under various scenarios, the Applicant argues that noise impacts could be managed. In particular, noise issues could be addressed by:

- specifying sound power levels for new process equipment to minimise noise emissions;
- scheduling operation of plant items to avoid concurrent operation of the noisiest processes;
- taking advantage of site topography when determining the final location of the noisiest processes on the site

Vibration

The Environmental Impact Statement provides a summary of typical vibration impacts that may be associated with various construction equipment, as reproduced below. The Applicant highlights that no proposed plant or equipment associated with the operation of the munitions facility would give rise to vibration levels above that likely to be associated with construction.

Table 20 - Typical Vibration Levels from Construction Equipment

Plant Item	Vibration Level (mms ⁻¹)		
	5 metres	20 metres	40 metres
Large rock breaker	5	0.5	0.3
Small rock breaker	2	0.09	0.06
Jackhammer	2	0.09	0.06
Truck	1	0.05	0.02

Noting that off-site receptors would be some 250 metres away from construction activities (as a minimum), the Applicant highlights that the follow acceptable vibration levels would not be exceeded, and as such, the proposed development does not pose a significant vibration issue:

- a vibration level of 5 mms⁻¹, considered protective of the structural integrity of dwellings;
- a vibration level of 20 mms⁻¹, considered protective of industrial and commercial structural integrity;
- a vibration level of 0.2 mms⁻¹, considered protective of residential amenity; and
- a vibration level of 0.6 mms⁻¹, considered protection of commercial amenity.

Traffic Noise

The Applicant highlights that the proposed development will not introduce additional traffic movements, over and above that already associated with the existing development. Therefore, the Environmental Impact Statement does not provide a specific assessment of operational traffic noise.

During the construction period, the Applicant suggests that construction noise would be minimised through restriction of construction activities to daylight hours and prohibition of noisy construction activities on Sundays and public holidays.

Issues Raised in Submissions

Concerns in relation to noise generation and impacts were not raised in public submissions received by the Department during the exhibition of the subject development application and associated documentation.

The DEC has provided a number of General Terms of Approval related to noise impacts associated with the proposed development. These General Terms may be summarised as follows:

- construction activities may only be carried out between 7:00 am and 6:00, Mondays to Fridays, 7:00 am to 1:00 pm on Saturdays and at no time on Sunday or public holidays
- the munitions facility upgrade must not exceed 40dB(A) during the day, 37 dB(A) during the evening or 32 dB(A) at night (as $L_{Aeq}(15 \text{ minute})$);
- the Applicant must monitor operation noise within three months of conclusion of commissioning to confirm that noise limits are not being exceeded.

Department's Position

Construction

While the Department appreciates that construction activities on the site may generate elevated noise impacts, it highlights that construction will be limited in duration. Further, the Department recommends that construction hours be restricted to ensure that any noise impacts in this regard are limited to daylight hours, and not on Sundays or public holidays. The Applicant should also be required to implement to manage and monitor construction noise impacts. The Department considers that this is an appropriate approach to the issue of construction noise impacts, and would act to mitigate construction noise impacts to as low as reasonable and feasible.

Operation

From information provided in the Environmental Impact Statement, it is apparent that each of the components forming the munitions facility upgrade could generally meet project specific noise levels developed in accordance with the former EPA's *Industrial Noise Policy*. The Department is satisfied that with appropriate specification of sound power levels for new equipment, and management of operation noise, the upgrade components of the munitions facility could be operated within appropriate noise limits.

However, when combined with existing parts of the munitions facility, either during transition or future, redeveloped phases, noise modelling results presented in the Environmental Impact Statement suggests elevated noise impacts. These impacts are predicted to be significantly above those noise criteria that would ordinarily be applied to the munitions facility upgrade if it were considered as a stand-alone development. To contextualise the assessment of operation noise impacts in this situation, the Department highlights that the existing Environment Protection Licence for the site includes noise levels that must not be exceeded by the existing munitions facility. These noise limits are 55 dB(A) during the day, 45 dB(A) during the evening and 40 dB(A) at night. In comparison, project specific noise levels stipulated by the *Industrial Noise Policy* for the development proposal are 40 dB(A) during the day, 37 dB(A) during the evening and 32 dB(A) at night.

Noting the logarithmic nature of the decibel scale, the Department highlights that application of the project specific noise levels to upgraded components of the munitions facility would yield significantly lower noise impacts than permitted from the facility in its existing state. The Department considers an appropriate environmental outcome is for the facility not to increase noise impacts as a result of the proposed upgrade. In this light, there would be some flexibility for the Applicant in operation of upgraded components of the plant without exceeding existing, permitted noise levels. This matter has been discussed in detail with the Applicant and the DEC. Rather than applying project specific noise criteria to the munitions facility upgrade, it is considered appropriate to restrict the facility, after the proposed upgrade, to operation at or below current criteria. As such, the Department recommends that any approval that may be granted by the Minister be worded to reflect that the munitions facility upgrade must not contribute to total noise levels from the site exceeding 55, 45 and 40 dB(A) during the day, evening and night. This provides two key outcomes. Firstly, it restricts noise impacts to no greater than existing levels. Further, it provides the Applicant with the flexibility to reduce noise emissions from anywhere on the site (whether through existing or upgraded plant) to achieve the noise criteria. There may be greater potential to reduce noise from existing, older equipment than applying overly stringent criteria to new plant items that are expected to operate at best practice levels.

To ensure that the specified noise outcomes are being met, the Applicant is required to monitor noise from the site within the first 90 days of operation of the munitions facility upgrade. If exceedances of the specified noise criteria are identified, the Department recommends that the Applicant be required to develop and implement additional noise mitigation measures to ensure compliance with the noise limits.

The Department is satisfied that if the Minister determines to approve the proposed development, the recommended measures to address noise impacts would ensure that operation noise impacts are appropriately and adequately mitigated, monitored and managed. The DEC has indicated that it is satisfied with this approach.

Vibration

The Department concurs with the Applicant's conclusion that the construction and operation of the proposed munitions facility upgrade will not generate a significant off-site vibration impact. Therefore, no specific measures to address vibration impacts are recommended to be included in any development consent that may be granted by the Minister.

Traffic Noise

Although not explicitly assessed in the Environmental Impact Statement, the Department recognises that heavy vehicle movements associated with the construction of the proposed development have the potential to negatively impact acoustic amenity, if not properly managed. To address construction traffic noise, the Department recommends that the Minister:

- limits the hours of construction, which would consequently limit the hours of traffic movements, mitigating potential construction traffic noise impacts;
- requires the Applicant to develop and implement a transport management plan as part of the Construction and Demolition Environmental Management plan for the development. This would include specific measures to limit routes and transport times, thereby further mitigating and managing potential construction traffic noise.

The Department notes that operational traffic will not change as a result of the proposed development, and consequently operational traffic noise (dominated by heavy vehicle movements) will not change either. As such, operational traffic noise impacts lie within acceptable environmental limits and the Department has not recommended further measures to address this issue.

Concluding Position

The Department is satisfied that the proposed development could be constructed and operated within acceptable environmental limits. For construction noise, the Department highlights the importance of pro-active noise management, particularly through restrictions on construction hours, scheduling of construction activities and effective response to any noise complaints. In relation to operation noise, the measures recommended by the Department for inclusion in any development consent would ensure that there will be no net increase in noise from the site above existing permitted levels.

5.5 Impacts on Heritage Items

Applicant's Position

The Applicant undertook a review of heritage registers, including the NSW National Parks and Wildlife Register of Aboriginal Sites and the Register of the National Estate, to identify any known and registered items of heritage significance on the site. The review resulted in no registered aboriginal heritage items being identified on the site. However, the Applicant did identify the Mulwala Homestead as a registered item of non-indigenous heritage significance.

Although not registered, previous surveys of the site have identified three aboriginal heritage items. Two of these items lie west of the areas of the site the subject of the proposed munitions facility upgrade, and would therefore not be impacted by the proposal. The third, a scarred tree identified as "Anutech Site #3" lies in the south west corner of the site. As part of

the environmental impact assessment of the proposal, the Applicant re-inspected Anutech Site #3. The scarred tree was recognised as being in poor condition when first identified in 1986. Since its identification, the trunk of Anutech Site #3 has been lopped to approximately two metres above ground level, and is currently held together with metal bands and concrete place around the base of the trunk in an attempt to stabilise the item. Inspection of the item suggests that it is weathered, decayed and there is evidence of active termite activity. Some 40% of the un-occluded original scar is missing. The Applicant suggests that this aboriginal heritage item is in very poor condition and collapse of the tree trunk appears imminent. Survey work undertaken as part of the consideration of the proposed development did not identify any other items of aboriginal heritage significance.

While no additional aboriginal heritage items have been identified through recent surveys of the site, the Applicant recognises that the proximity of the site to the Murray River means that there may be buried artefacts or human skeletal remains. In the event that an artefact is uncovered, the Applicant suggests that the requirements of the National Parks and Wildlife Service would be met in relation to the management and preservation of the item(s). The Applicant also intends to develop a human skeletal remains protocol to be followed during site preparation and construction works. The protocol would specify procedures to identify any skeletal remains and to manage the remains in an appropriate manner, in consultation with the National Parks and Wildlife Authority.

In relation to non-indigenous heritage, the Applicant suggests that the proposed munitions facility upgrade will not impact on the Mulwala Homestead. Further, the Applicant recognises that structures comprising the existing munitions facility that may be demolished as part of the upgrade may carry heritage significance. As such, the Applicant intends to undertake a heritage assessment of all structures to be demolished (once these are finalised through the detailed design of the upgrade). The assessment would identify whether, and how, the relevant structures should be recorded.

Issues Raised in Submissions

None of the public submissions received by the Department raised concern in relation to heritage items.

The Department of the Environment and Heritage notes that an independent report into impacts on indigenous heritage items was commissioned by the Yota Yota Clans Council, and recommends that the relevant comments from this report be incorporated into the assessment and management framework for the proposal. In relation to non-indigenous heritage, The Department of Environment and Heritage noted that the EIS recommended a full heritage assessment of structures on the site to be demolished or otherwise impacted, as part of the detailed design process.

Department's Position

The Yota Yota Clans Council were provided with a copy of the indigenous heritage report prepared for the EIS and gave verbal advice to the heritage consultant that they did not have any concerns regarding the assessment. They indicated that written advice to that effect would not be issued. The Department is satisfied that the Applicant has undertaken an appropriate level of heritage assessment for the proposed development, given that the exact scope of the proposal has yet to be established within the constraints of the scope of the development application.

Although Anutech Site #3 is currently in very poor condition, the Department considers it important to ensure that the proposed upgrade, particularly site preparation and construction works, does not further degrade this item. To facilitate this outcome, the Department recommends that the Applicant be prohibited from undertaking construction works within 50 metres of the indigenous heritage item. This separation distance has been established to prevent vibration impacts from construction works impacted on the item.

The Department also supports the Applicant's proposal to prepare and implement a skeletal remains protocol to ensure that any remains that may be uncovered are identified and appropriately managed. The Applicant's commitment in this regard has been reflected in the requirements of a Construction and Demolition Environmental Plan for the development, if

approved. The protocol should be based on the outline provided in the Environmental Impact Statement and be developed in consultation with the National Parks and Wildlife Service and the Yota Yota Local Aboriginal Clans Council.

In relation to non-indigenous heritage items, the Department concurs with the Applicant that works associated with the construction and operation of the proposed munitions facility are sufficiently distance Mulwala Homestead to prevent impacts on that item. It is also recognised that given the age and uniqueness of a number of processes and buildings on the site, these items may carry with them significant heritage value. As such, the Applicant is required to undertake a heritage assessment of all items to be demolished/ removed from the site prior to demolition. The heritage assessment is to be completed in consultation with the NSW Heritage Office. The Applicant should be required to develop specific measures to preserve the heritage value of any item identified as being significance. These measures may include preserve of the item, without demolition.

The Department is satisfied that the proposed munitions facility does not pose a significant impact in relation to existing, known items of heritage significance. If the Minister determines to approve the proposal, the scope of the Department's recommendations would ensure that impacts on any heritage item that may be uncovered or identified during construction of the proposal would be appropriately managed.

5.6 Soil and Groundwater Impacts

Applicant's Position

Soil Erosion

During site preparation and construction works, the Applicant recognises there is potential for soil erosion. To prevent significant impacts through soil erosion, the Applicant intends to install "best practice" soil erosion mitigation measures, including diversionary drains and silt fences.

Soil Contamination

Investigations in relation to soil contamination undertaken in 2001 indicate that dinitrotoluene (DNT) concentrations in soil on the site exceed human health risk thresholds in the powder area and the finishing area. Mercury concentrations also exceed levels protective of human health around the oleum area and laboratory. In the vicinity of the boilerhouse, concentrations of polycyclic aromatic hydrocarbons (PAHs) also exceed human health risk criteria. All other areas of the site are not characterised as being contaminated to a significant degree.

The Applicant suggests that any required remediation of contaminated soil would be undertaken by the Department of Defence, where necessary. The scope of any necessary remediation works have yet to be scoped, and would be the subject of separate approvals, outside the subject development application.

Groundwater

The Environmental Impact Statement outlines the results of investigations into the quality of groundwater beneath the munitions facility. These investigations have identified that elevated ammonia concentrations exist around the former ammonia storage and handling areas, but are below ecological and drinking water criteria elsewhere. A plume of groundwater with high sulfate and nitrate concentrations was identified under the site in 1987. This plume has been identified as affecting off-site bores, and is recognised as migrating towards the Murray River. To address groundwater contamination and prevent further impacts, identified potential sources of contamination have been removed. The Department of Defence is currently investigation options to address groundwater contamination. Options that may be identified lie outside the scope of the munitions facility upgrade and would be the subject of separate approvals, if required.

The Applicant suggests that disturbance of soils may provide short-term exposure of soils, with exposed areas providing for greater aquifer recharge. Increased aquifer recharge can have a beneficial impact on aquifer “storativity” and quality.

Issues Raised in Submissions

Some 0.8% of issues raised in public submissions relate to soil and groundwater impacts, particularly the potential for soil contamination. Concern was raised that land uses surrounding the proposed development site and outlet drains from the site may become contaminated with heavy metals and ammonia.

The DEC’s General Terms of Approval did not include any specific provisions in relation to soil and groundwater issues, other than the requirement to adequately and appropriately bund fuel, oil and chemical storage areas.

The Department of the Environment and Heritage notes that remediation of groundwater contamination does not form part of the subject development application, but is pleased that relevant parties are considering options to progress the matter of remediation. It suggests that monitoring of groundwater hydrology and water quality should occur.

Department's Position

Soil Erosion

If not properly managed, site preparation and construction works have the potential to generate significant levels of soil erosion. To address this issue, the Applicant should develop and implement specific soil erosion and sedimentation measures, through a Construction and Demolition Environmental Management Plan. The Department is satisfied that erosion mitigation measures for construction are well known and commonly applied. As such, the Department considers that potential erosion impacts that may be generated during site preparation and construction can be managed within appropriate environmental limits.

Soil Contamination

The Department appreciates that investigations into soil contamination and potential remediation works are on-going and do not form part of the subject development application. Notwithstanding, the Department considers it important that potential soil contamination be recognised and appropriately addressed during construction of the proposed development. To this end, the Construction and Demolition Plan should include specific procedures to identify and manage contaminated soils that may be uncovered during site preparation, construction and demolition works.

To minimise the potential for future soil contamination as a result of the operation of the munitions facility upgrade, the Department recommends that the Applicant fully bund stores of dangerous goods, in accordance with Australian Standards and the DEC’s guidelines relating to bunding and spill management.

Groundwater

As with soil contamination, the Department recognises that groundwater contamination is an existing issue associated with the site and the Department of Defence is currently investigating options to address the matter. Any works to address groundwater contamination lie outside the scope of the subject development application and would be progressed separately.

While the Department recognises that soil disturbance may permit increased aquifer recharge in some cases, as noted by the Applicant, it does not consider the proposed site preparation and construction works for the upgrade of sufficient scale to illicit a significant positive impact in this regard. Equally, the loss of permeable surfaces for the construction of proposed new process area is not considered of a sufficient scale to negatively impact on aquifer recharge areas.

The proposed development does pose potential for groundwater contamination if materials such as dangerous goods are not appropriately stored and handled. As noted above in relation to potential soil contamination, the Applicant should fully bund stores of these

materials, thereby mitigating the potential for groundwater contamination from any potential spills.

5.7 Traffic and Transport Impacts

Applicant's Position

The Environmental Impact Statement provides an outline of major traffic routes to and from the existing munitions facility. The site is connected by Bayly Street to Melbourne Street/ Corowa Road, which is the main road through Mulwala. Corowa Road provides a link to Corowa in the east, with connection to Albury via the Riverina Highway. To the south, Melbourne Street connects Mulwala to Yarrawonga in Victoria, and to the Benalla facility via the Murray Valley Highway and Yarrawonga/ Benalla Road. A map indicating the road network in the vicinity of the Munitions facility is provided as Figure 6.

Construction

In order to estimate likely construction traffic, and to assess the potential impacts of that traffic, the Applicant has applied a number of assumptions in relation to the scheduling of construction works, including:

- construction of the munitions facility upgrade would be phased, both in terms of the timing of construction of new facility components, and phasing to provide a transition period in which the facility can continue to operating during construction;
- construction works would be undertaken six days a week, between 7:00 am and 6:00 pm from Mondays to Fridays, and between 8:00 am and 1:00 pm on Saturdays. Construction works are not proposed on Sundays or public holidays;
- the maximum sustained work force required would be 40 to 70 people during the initial six months of construction and 100 to 180 for the balance of the construction period;
- between 50% and 60% of workers arrive at the start of scheduled working hours. The remainder would be associated with deliveries etc throughout the day;
- some 50 to 150 employees would be required during the installation/ commissioning phases of the munitions facility upgrade, after the conclusion of construction works, but before the munitions facility upgrade progresses to full operation mode; and
- there would be some 30 trucks accessing the site each day to deliver general construction materials; and
- twenty deliveries of large equipment would be expected during the construction period.

The Applicant has assumed a worst-case scenario in which all of the above traffic is generated at the same time. In reality, maximum construction and maximum installation/ commissioning employee numbers would not overlap for the full duration of construction and commissioning works, and deliveries of large equipment would only occur once at the commencement of the construction period.

Table 21 - Predicted Worst-Case Construction Traffic Movements

Activity	Traffic Movements
Employees – construction	250 – 450
Employees – installation	120 – 350
Construction materials deliveries	60
Heavy equipment deliveries	40
TOTAL	470 - 900

The Applicant suggests that the total contribution from combined construction (470 to 900 movements) and on-going operations (658 movements) would constitute between 19.8 and 27.2% of the traffic using Mulwala Bridge (based on traffic counts completed by VicRoads). This represents a conservative assessment, given that not all traffic will travel to the south of the site, across Mulwala Bridge. It does, however, represent an extreme worst case.

In relation to routes to be followed by heavy vehicles carrying oversize loads to the site during construction, the Environmental Impact Statement indicates that necessary approvals will be obtained, and routes agreed with local councils prior to transport of these loads.

Figure 6 - Road Network Surrounding the Munitions Facility

Operation

The Applicant suggests that the proposed development will not generate additional traffic during operation, over and above that associated with the existing development. In reality, the Applicant indicates that if the munitions facility upgrade proceeds, there will be a slight reduction in employee-related traffic over the longer term due to improved process efficiencies and automation. This slight reduction would not be immediate, and would be directly attributable to normal attrition of employee numbers over time. Current traffic movements generated during operation of the existing munitions facility (considering worst-case contributions from each source), are summarised below.

Table 22 – Existing Worst-Case Operation Traffic Movements

Activity	Traffic Movements
Employees	580
Product delivery – light vehicles	58
Product delivery – heavy vehicles	6
Raw materials delivery – non-dangerous goods	6
Dangerous goods delivery	8
TOTAL	658

Given that operational traffic impacts generated by the facility are not expected to change as a result of the proposed development, the Applicant suggests that the proposal will not have a significant impact in relation to traffic and transport.

Issues Raised in Submissions

Traffic and transport concerns represent 1.6% of all issues raised in public submissions. These submissions suggest that the proposed development will generate additional traffic movements across Mulwala Bridge, which is unable to cope with existing traffic flows. Further, public submissions indicate concern that additional traffic generated by the proposal will negatively impact on road safety.

The Roads and Traffic Authority (RTA) raised no objection to the proposed development.

Department's Position

Construction

The Department recognises that traffic generated during the construction of the proposed development has the potential to generate significant impacts, if not appropriately managed. As noted earlier in this report restrictions should be placed on construction hours to address noise impacts. These restrictions will also limit the hours in which construction traffic movements may take place. Further, the Applicant should develop and implement specific traffic management measures, through a Transport Management Plan. The Plan must include consideration of issues such as movement of oversize loads, scheduling of heavy vehicle movements and the transport of hazardous materials (asbestos). The Department is satisfied that with this approach, construction traffic impacts could be managed within acceptable limits.

Operation

The Department concurs with the Applicant's position that the proposed munitions facility upgrade, by itself, will not generate any additional traffic on the surrounding road network. The traffic impacts associated with the subject development application therefore lie within acceptable limits, and no specific additional operational traffic mitigation or management requirements are recommended.

5.8 Impacts of Waste Production and Management

Applicant's Position

Construction and Demolition

The Environmental Impact Statement suggests that there is little scope for the salvage of demolition materials from structures to be removed from the site as a result of the decontamination process to be employed. However, the Applicant has committed to salvage and on-sell materials wherever economically feasible. Equipment and structures that cannot be salvaged and on-sold in their existing forms would be separated and sold as ferrous recyclable materials and non-ferrous scrap. Rubble and spoil generated through demolition and removal works would be crushed and spread across the site. In the event that excess rubble and spoil cannot be spread on the site, it would be transported to, and disposed at, an appropriately licensed landfill.

During demolition, contaminated and hazardous materials, including asbestos, are likely to be encountered. The Applicant indicates that asbestos would be removed and stored in plastic-lined bins on-site, prior to removal to an appropriately licensed landfill. Handling and storage of asbestos would be undertaken in strict accordance with protocols and procedures to be detailed in a construction environmental plan for the subject development.

The Applicant intends to minimise the quantities of construction waste generated by accurately calculating construction materials and limiting materials packaging. Any excess construction materials brought to the site would be sold back to the supplier, and construction-packaging waste that cannot be recycled would be disposed of to an appropriate landfill site. Excavated materials generated during site preparation and construction works would be disposed of to an emplacement area on-site and capped in accordance with DEC criteria. In the event that emplacement is not appropriate or available for these excavated materials, they would be transported off-site for disposal at an appropriately licensed facility.

Operation

The Applicant highlights that wastes currently generated on the site through the nitrocellulose, propellant and high explosives areas are destroyed on-site at a burning ground. Explosives-contaminated wastes are burnt in an open, isolated area of the site, and resulting ash waste (some 10 tonnes per annum) is removed for disposal off-site. The subject development application includes provision for the possible development of a confined burning facility (CBF). The Applicant suggests that until the CBF is developed, it intends to continue the current practice of open burning for explosives waste disposal. If the CBF were to be developed, it would be designed to accommodate the following waste streams:

- nitrocellulose – 10.6 tonnes per annum, wet in 200 litre drums;
- powder and finishing wastes – 40 tonnes per annum, wet in 18 and 25 kilogram bags;
- high explosives and nitroglycerine – 10 tonnes per annum, wet in 25 kilogram bags; and
- laboratory wastes – 0.5 tonnes per annum, as solvents in 20 litre tins.

Issues Raised in Submissions

None of the public submissions received by the Department during the exhibition of the subject development application and accompanying documents raised concern in relation to waste generation and management.

The former DEC's General Terms of Approval requires that the Applicant provide appropriate facilities for equipment decontamination and to eliminate the uncontrolled burning of explosives-contaminated materials. The General Terms of Approval include specific environmental outcomes that must be met for these facilities.

Department's Position

Construction and Demolition

The Department is generally satisfied with the Applicant's approach to the management of waste that may be generated during construction and demolition works the subject of the development application for the munitions facility upgrade.

In relation to asbestos waste that may be generated during demolition activities, the Demolition Safety Study recommended by the Department to address hazards and risk issues should also require the Applicant to specifically address asbestos waste management as part of the Study.

Operation

As noted as part of the Department's assessment of air quality impacts generated by the proposed development, the Department and the DEC do not consider open burning of explosives wastes to be consistent with best practice air quality or waste management. It is not considered appropriate for any waste generated at the munitions facility upgrade to be disposed of by burning in an unconfined/ uncontrolled manner. While the Applicant has put forward the possibility of a confined burning facility (CBF), this process unit is only an "optional" component of the proposal, as described in the subject development application. This issue has been discussed with the Applicant, with the Department indicating that any approval that may be granted by the Minister would include the requirement that the CBF must be constructed and operated if the proposal proceeds. A similar position is provided in the DEC's General Terms of Approval. The Applicant has accepted this approach and would proceed with the CBF as part of the proposed munitions facility, if approved.

To ensure on-going appropriate management of waste on the site, the Applicant should develop and implement a Waste Management Plan. The Plan should detail specific procedures and measures to achieve the aim of maximising the reduction, reuse and recycling of waste on site wherever possible. The Plan should specifically be required to consider the management of explosives-contaminated waste.

5.9 Surface Water Impacts

Applicant's Position

This section of the Department's assessment report relates to surface water quality impacts that may be generated through the operation of the munitions facility upgrade. Impacts that may arise during site preparation and construction include erosion, sedimentation and contaminated soil issues, which have been assessed in section 5.6 of this report.

Operation

The Applicant highlights that it currently operates an effluent treatment plant (ETP) for the treatment of wastewater generated during the operation of the munitions facility. Treated water from the ETP is discharge to the Murray River. The existing Environment Protection Licence for the site, issued by the DEC, recognises the ETP and includes discharge limits to protect water quality in the River. It is suggested in the Environmental Impact Statement that the munitions facility upgrade would not require any alteration to the water discharge limits currently imposed on the site, and the requirement for the ETP to achieve these limits.

The Applicant also indicates that there is no stormwater drainage route on the site that would direct stormwater to the Murray River or billabongs to the west and south west of the site.

Issues Raised in Submissions

Of all issues raised in public submissions received by the Department in response to the exhibition of the subject development application and Environmental Impact Statement, 2.4% related to surface water impacts. In particular, submitters raised the following concerns:

- release of contaminated water is unacceptable, and water should be treated on site, rather than being discharged to the river;
- discharges of polluted water have already turned Mulwala Canal yellow; and

- the proposed munitions facility upgrade will improve water quality discharged from the site.

The DEC's General Terms of Approval contain the following provisions in relation to surface water:

- plant and equipment must be designed to maximise the reuse of wastewater, with any wastewater that cannot be reused restricted to discharge to a sewer in accordance with trade waste agreement, or to the environment in accordance with the Environment Protection Licence for the site; and
- wastewater discharges from the site must not exceed specified limits for conductivity, lead, oil and grease, pH, sulfate, total nitrogen, nitrate/ nitrite, ethanol or suspended solids.

The submission received by the Department from the Murray-Darling Basin Commission (MDBC) indicated that the Commission considers the redevelopment proposal provides an opportunity for the Applicant to adopt, and work towards, a target of zero water discharges from the site to the Murray River. The Commission is concerned that the following matters were not considered in the EIS:

- demonstration that the effluent management systems are designed, constructed and equipped to meet current licence conditions;
- that any additional treatment projects proposed by the facility be included as part of the subject development application; and
- consideration of adopting (possibly on a staged basis) an objective of improving water quality of discharges from the redeveloped facility to meet the most sensitive use within the receiving waterbody.

The submission received from the Department of the Environment and Heritage suggested that water quality monitoring would assist in the assessment of the proposed development.

Department's Position

The Department supports the Applicant's intention to maximise reuse of water within the munitions facility. This commitment has been reflected in the DEC's General Terms of Approval. The Department accepts that it is not possible for the Applicant to prevent all discharges of water from the site at this stage. Further, this goal is not achievable through the proposed upgrade itself. However, continued maximisation of internal reuse and minimisation of water consumption is consistent with the MDBC recommended goal of zero discharge from the site to the Murray River in future.

Current restrictions on discharges from the site to the Murray River, as outlined in the Environment Protection Licence (EPL) for the site, are recognised and supported. The DEC's General Terms of Approval include discharge quality criteria consistent with those in the EPL. The Department recommends that any development consent be specifically worded to require that the munitions facility upgrade be undertaken in such a manner that these criteria, applicable to the site as a whole, are not exceeded. Water quality improvements that may be achievable through modifications to parts of the facility not included in the upgrade works lie outside the scope of the development application and have not been assessed in this report. While the Department recognises that further improvements to discharge water quality from the site may carry environmental benefits for the Murray River, these matters do not fall within the subject development application and there is no mechanism to require any works to other parts of the facility as part of any development consent that may be granted.

5.10 Impacts on Flora and Fauna

Applicant's Position

The Environmental Impact Statement indicates that the land on which the munitions facility lies, and on which the proposed development would be constructed and operated, is largely cleared and highly disturbed. The site is characterised by scattered stands and isolated remnants of mature vegetation. Examples of mature endemic and non-endemic trees are also scattered across the site.

In order to identify species that may be potentially impacted by the proposal, the Applicant undertook a search of the National Parks and Wildlife Atlas of NSW Wildlife, within a ten-kilometre radius of the site. Past survey results were also reviewed, and a new survey of the site conducted.

The Environmental Impact Statement suggests that no ecological communities of significance under the NSW *Threatened Species Conservation Act 1995* (TSC Act) or *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) were identified on or in the vicinity of the site. However, isolated Buloke and Cypress Pine individuals were located. As Buloke grassy woodland communities are regarded as significant under the EPBC Act, the Department required the Applicant to supply further consideration of potential impacts on this community. The Applicant highlighted that the extent of Buloke on the site is limited to a few isolated individuals. The status of these individuals on the site is as outlying individual species within the broader Yellow Box Community in the region, rather than as part of Buloke Woodland or remnants of such. The Applicant highlights that the Bulokes on the site do not constitute a discrete vegetation community and as such do not represent significant ecological value in the context of the EPBC Act.

No flora species of significance under the TSC or EPBC Acts were identified on or in the vicinity of the site. However, the Applicant recognised that the Yellow Box *Eucalyptus melliodora* Woodland was a vegetation community present on the site. As the Yellow Box – White Box – Blakely's Red Gum Woodland is an endangered ecological community listed under the TSC Act, the Department required the Applicant to undertake a precautionary "8 Part Test" on the community. The 8 Part Test concluded that the proposed development would not have a significant impact on the community.

The Applicant identified nine significant fauna species with moderate to high likelihood of occurrence on the site. In accordance with Part 5A of the *Environmental Planning and Assessment Act 1979*, the Applicant conducted "8 Part Tests" for these species, being:

- Black-chinned honeyeater (*Melithreotus gularis*);
- Regent Honeyeater (*Xanthomyza phrygia*);
- Speckled warbler (*Sericornis sagittatus*);
- Diamond firetail (*Stagonopleura guttata*);
- Grey-crowned babbler (*Pomatostomus temporalis*);
- Swift parrot (*Lathamus discolor*);
- Turquoise parrot (*Neophema pulchella*);
- Superb parrot (*Polytelis swainsonii*); and
- Squirrel glider (*Petaurus norfolcensis*).

Each of the 8 Part Tests concluded that the proposed munitions facility upgrade would not have a significant impact on the species, its population, ecological community or habitat. As such, Species Impact Statements for these species were not required.

The Applicant notes that the Great Egret (*Ardea alba*) has been recorded in the vicinity of the munitions facility site. This species is listed under both the JAMBA and CAMBA treaties and is considered significant under the EPBC Act. As this species utilises specific wetland habitats, which do not occur on the site, the Applicant concludes that there is low likelihood of the species occurring on the site, or being affected by the proposed munitions facility upgrade.

Issues Raised in Submissions

The Department did not receive any submissions that specifically raised concern in relation to potential impacts on flora and fauna.

Department's Position

The Department is generally satisfied with the methodology applied by the Applicant in relation to assessment of impacts on flora and fauna. The Department concurs with the Applicant's conclusion that the proposed munitions facility would not have a significant impact on threatened flora or fauna species, or ecological communities.

The *Corowa Local Environmental Plan 1985* includes a list of flora species that must not be destroyed without development consent. The Department considers it important that if any examples of these species are removed as part of the proposed development, that they be replaced. As such, the Applicant shall identify all examples of these species to be removed from the site, and requires replacement of those trees removed. If the Minister determines to approve the proposed development, the Department also recommends that the Applicant be required to develop and implement a Landscape Management Plan, to ensure that the site is appropriately landscaped, with maximum use of endemic species.

5.11 Impacts on Visual Amenity

Applicant's Position

The Environmental Impact Statement presents an assessment of the potential visual amenity impacts that may be experienced at various receptors surrounding the site as a result of the proposed munitions facility upgrade. Consideration of the potential for visual amenity impacts at these receptors is summarised in the table below.

Table 23 - Consideration of Visual Impacts at Various Receptors

Receptor	Number of Viewers	Level of Visibility	Visibility Rating
Lucan Street, south of Beams Street	Low	Largely obstructed views	Low
Beams Street opposite Mulwala concrete plant	Low	Slightly obstructed views across site	Medium
Corner of Beams and Romney Streets	Low	Unobstructed views across site	High
Corner of Beams and Leigh Streets	Low	Views across site largely obstructed by vegetation	Low
Leigh Street, north of Inglis Street	Low	Partially obstructed view of site – view obscured by vegetation and mounding on the site	Medium
Bayly Street, west of Wanini Road	Medium	Unobstructed views to boilerhouse to the east, the former ammonium sulfate store to the west and ancillary buildings on site	High
Corner of Bayly Street and Waratah Road	Low	Obstructed views across the site	Low
Bayly Street (Albion Road access)	Low	Largely unobstructed views across the site	Medium
Corner of Bayly Street and Binda Road	Low	Obstructed views across site	Low
Bayly Street, west of Binda Road	Low	Trees obscure site from passing motorists	Low

Construction works are proposed to be undertaken in a staged manner, with changes to the visual character occurring gradually over time. Views to most of the areas of the site on which construction and demolition works will occur would be obstructed by existing structures and stands of trees. The most significant construction and demolition works, in the context of visual amenity impacts, will be those occurring within the existing administration/nitrocellulose area. These works would be clearly visible from Bayly Street. The Applicant argues, however, that only a few residents at this location would have direct views across the site. It is concluded that the construction works in this area would not detract from the overall visual amenity of the locality to any great extent.

Once constructed, the Applicant highlights that the munitions facility upgrade would consist of a number of modern buildings and structures of an industrial appearance. Buildings would generally range in height up to 16 metres. Air emissions stacks are expected to be up to 25 metres in height. Given the central location of much of the upgrade works on the site, the Applicant considers that there would be limited scope for visual amenity impacts. Those components of the proposed development that would be visible external to the site would be located around the site entrance and administration buildings. These components would be

replacements of existing structures, and as such, would represent potential for a positive visual amenity impact through replacement of older buildings with more modern designs.

Issues Raised in Submissions

The Department did not receive any submissions that raised impacts on visual amenity as an issue of concern.

Department's Position

The Department is satisfied that the proposed development would not have a significant impact on visual amenity. This position is based on the fact that the site is currently used for the purpose of a munitions facility, and the majority of works the subject of the facility upgrade would be located towards the centre of the site, away from direct lines of sight. To ensure that visual amenity is protected in relation to works along the boundaries of the site, the Applicant should be required to develop and implement a Landscape Management Plan. The Plan must include specific measures for the revegetation of the site to replace trees removed as part of the upgrade.

To minimise the potential impacts of lighting installed as part of the proposed development, the Department recommends the Minister require (if the proposal is approved) the Applicant to ensure all external lighting complies with Australian Standard *AS4282(INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting*.

The subject development application does not include in its scope any provision for the erect of advertising structures. To reflect this, the Department recommends that any development consent that may be granted by the Minister expressly prohibit the erection of these types of structures as part of the munitions facility upgrade and note that further consent would be required from Corowa Shire Council under the *Corowa Local Environmental Plan 1989* if advertising structures were required.

6. SECTION 79C CONSIDERATION

Section 79C of the *Environmental Planning and Assessment Act 1979* sets out matters that a consent authority must take into consideration when it determines a development application. The Department has assessed the development application in the context of Section 79C of the Act, having regard to the identified heads of consideration. This consideration is provided in Appendix B. The Department is satisfied that the merits of the proposed development warrant approval subject to the recommended measures outline in this report.

7. RECOMMENDED CONDITIONS OF CONSENT

The Department is generally satisfied that the proposed munitions facility upgrade could be constructed and operated within appropriate environmental and safety limits. Notwithstanding, while the environmental and safety impacts would lie within appropriate limits, there is a need to address residual impacts to ensure that the proposed development is constructed and operated with not only an acceptable impact, but a minimal impact. To this end, the Department considers that the Applicant should be required to implement additional measures to reduce environmental impacts to as low as reasonably possible, and in-line with environmental best practice. If the Minister determines to approve the proposed development, the Department would recommend that these measures be imposed through conditions of the development consent. Key issues covered by the conditions include:

- deferred commencement – the Applicant has lodged a development application that seeks consent for the broad scope of the maximum environmental envelope that may be associated with the proposed munitions facility upgrade. The Department recommends that should the proposal be approved, that the consent is subject to deferred commencement provisions. These provisions should require the Applicant to demonstrate to the satisfaction of the Director-General that the final design scope of the upgrade lies within the approved environmental envelope. This demonstration is required prior to the consent becoming operative (i.e. before any works the subject of the consent may commence);
- hazards and risk impacts – the Department recommends a comprehensive suite of conditions to address potential hazards and risk impacts. These include measures in relation to construction and demolition safety, fire safety study and a requirement to undertake a full Hazard and Operability (HAZOP) and Control Hazard and Operability (CHAZOP) of the development. The Applicant must also develop a comprehensive Emergency Plan, which must be successfully rehearsed prior to operation. To ensure on-going hazard management, an over-arching safety management system must be developed and implemented, and the site subjected to an independent hazard audit on a regular basis;
- air quality impacts – the Department recommends that if the proposal is improved, stringent and comprehensive air quality mitigation, monitoring and management measures conditions are imposed. The Department's recommendations include prohibitions on the generation of unacceptable odours and dust, includes discharge limits for air pollutants (including toxic and odorous compounds), details specific design criteria for stacks, requires on-going monitoring of air emissions and requires the Applicant to confirm air impact predicts with the first few months of operation. The Department also recommends that the Applicant be required to construct and operate the confined burning facility as part of the upgrade, rather than leaving this component as an "optional" extra;
- noise impacts – noise limits for the existing munitions facility are included in the DEC's General Terms of Approval, and have been reproduced in Departments' recommendations, including the requirement that the upgrade must not cause noise from the upgrade must not cause noise from the total upgraded development to exceed specified criteria. This provision limits the proposed development such that there will be no net increase in noise impacts from the site, and provides the Applicant with flexibility in the application of any necessary additional noise mitigation to either existing or upgraded process components. The Department also recommends that the Applicant monitor operation noise, and confirm through practical assessment that the upgraded facility is meeting specified criteria;

- auditing – it is recommended that the Applicant be required to undertake environmental and hazard auditing of the upgraded facility on a regular basis. This auditing must be carried out by an independent person(s) approved by the Director-General; and
- environmental management – if the proposal is approved, the Applicant would be required to develop and implement environmental management plans for construction and operation phases, cover issues including hazards/ risk, erosion and sedimentation, traffic and transport, heritage, air quality and water quality.

8. CONCLUSIONS

The Department considers that the proposed development is consistent with State and regional planning objectives. The development application accords with the objectives and provisions of regional and local planning instruments.

The Department is satisfied that all key environmental concerns have now been adequately addressed. It is recommended that the development application be approved subject to the Department's recommended conditions which have been formulated to manage, monitor and mitigate potential environmental impacts.

Scott Jeffries
Senior Environmental Planning Officer
Major Development Assessment

ENDORSED:

Sam Haddad
Executive Director
Sustainable Development

APPENDIX A - PROVISIONS OF ENVIRONMENTAL PLANNING INSTRUMENTS

Follow are considerations of the proposed munitions facility upgrade in the context of the objectives and provisions of relevant environmental planning instruments.

MURRAY REGIONAL ENVIRONMENTAL PLAN No. 2 – RIVERINE LAND

The *Murray Regional Environmental Plan No. 2 – Riverine Land* provides objectives and general principles applicable to the proposed development application, and requires the consent authority to consult with specific parties in relation to particular development types.

Objectives of the Plan

The objectives of the *Murray Regional Environmental Plan No.2 – Riverine Land* are:

- a) ***to ensure that appropriate consideration is given to development with the potential to adversely affect the riverine environment of the River Murray; and***
- b) ***to establish a consistent and co-ordinated approach to environmental planning and assessment along the River Murray; and***
- c) ***to conserve and promote the better management of the natural and cultural heritage values of the riverine environment of the River Murray.***

The Department's assessment of the proposed development considers impacts posed by the munitions facility on the Murray River, particularly in relation to water quality. The Department is satisfied that discharge quality criteria, as existing in the Environment Protection Licence for the site, and reproduced in the Department's recommendations, are protective of the riverine environment of the Murray River.

General Principles

The following general principles must be considered by a consent authority in determining a development application to which the *Murray Regional Environmental Plan No.2 – Riverine Land* applies:

- a) ***the aims, objectives and planning principles of this plan;***
- b) ***any relevant River Management Plan;***
- c) ***any likely effect of the proposed plan or development on adjacent and downstream local government areas;***
- d) ***the cumulative impact of the proposed development on the River Murray.***

The Department has considered the potential impacts of the proposed development on the Murray River and on adjacent/ downstream local government areas. The Department is satisfied that the impacts posed by the munitions facility upgrade lie within acceptable environmental limits.

Specific Principles

The following specific principles must be considered by a consent authority in determining a development application to which the *Murray Regional Environmental Plan No.2 – Riverine Land* applies:

Access

- ***The waterway and much of the foreshore of the River Murray is a public resource. Alienation or obstruction of this resource by or for private purposes should not be supported.***
- ***Development along the main channel of the River Murray should be for public purposes. Moorings in the main channel should be for the purposes of short stay occupation only.***
- ***Human and stock access to the River Murray should be managed to minimise the adverse impacts of uncontrolled access on the stability of the bank and vegetation growth.***

The proposed development site does not lie adjacent to the Murray River and does not restrict access to the River. The munitions facility is an existing development, within the bounds of which the subject development proposal will be undertaken. No additional land outside the boundary of the existing facility would be required for the munitions facility upgrade.

Bank disturbance

- ***Disturbance to the shape of the bank and riparian vegetation should be kept to a minimum in any development of riverfront land.***

The proposed development does not involve any works that would affect the bank of the Murray River or riparian vegetation.

Flooding

- ***Where land is subject to inundation by floodwater:***
 - a) ***the benefits to riverine ecosystems of periodic flooding;***
 - b) ***the hazard risks involved in developing that land;***
 - c) ***the redistributive effect of the proposed development on floodwater;***
 - d) ***the availability of other suitable land in the locality not liable to flooding;***
 - e) ***the availability of flood free access for essential facilities and services;***
 - f) ***the pollution threat represented by any development in the event of a flood;***
 - g) ***the cumulative effect of the proposed development on the behaviour of floodwater; and***
 - h) ***the cost of providing emergency services and replacing infrastructure in the event of a flood.***
- ***Flood mitigation works constructed to protect new urban development should be designed and maintained to meet the technical specifications of the Department of Water Resources.***

Works associated with the proposed development do not lie on flood-labile land, and would be located above the 1 in 100 year flood level.

Land degradation

- ***Development should seek to avoid land degradation processes such as erosion, native vegetation decline, pollution of ground or surface water, groundwater accession, salination and soil acidity, and adverse effects on the quality of terrestrial and aquatic habitats.***

Each of these issues has been considered in detail in the relevant sections of this report. The Department's recommendations provide specific measures to address potential impacts on soil (erosion and sedimentation control), pollution of ground/ surface water (bundling and discharge quality criteria) and terrestrial habitats (revegetation of the site). The Department is satisfied that the proposed development would not generate an unacceptable impact on the matters listed above.

Landscape

- ***Measures should be taken to protect and enhance the riverine landscape by maintaining native vegetation along the riverbank and adjacent land, rehabilitating degraded sites and stabilising and revegetating riverbanks with appropriate species.***

The proposed development would not be undertaken on the bank of the Murray River or within the riparian zone.

River related uses

- ***Only development which has a demonstrated, essential relationship with the river Murray should be located in or on land adjacent to the River Murray. Other development should be set well back from the bank of the River Murray.***
- ***Development which would intensify the use of riverside land should provide public access to the foreshore.***

The munitions facility upgrade would not be located on land adjacent to the Murray River. Equally, construction and operation of the upgrade would not generate need to intensify the use of land along the Murray River.

Settlement

- ***New or expanding settlements (including rural-residential subdivision, tourism and recreational development) should be located:***
 - a) ***on flood free land;***
 - b) ***close to existing services and facilities; and***

- c) on land that does not compromise the potential of prime crop and pasture land to produce food or fibre.**

The proposed development would not extend beyond the boundaries of land currently used for the purpose of a munitions facility.

Water quality

- **All decisions affecting the use or management of riverine land should seek to reduce pollution caused by salts and nutrients entering the River Murray and otherwise improve the quality of water in the River Murray.**

The Department recommends that any approval include water discharge criteria developed with the specific aim of minimising release of salts and nutrients into the Murray River to a level protective of water quality in the River.

Wetlands

- **Wetlands are a natural resource which have ecological, recreational, economic, flood storage and nutrient and pollutant filtering values. Land use and management decisions affecting wetlands should:**
 - a) **provide for a hydrological regime appropriate for the maintenance or restoration of the productive capacity of the wetland;**
 - b) **consider the potential impact of surrounding land uses and incorporate measures such as a vegetated buffer which mitigate against any adverse effects;**
 - c) **control human and animal access; and**
 - d) **conserve native plants and animals.**

The proposed development would not involve land use or management decisions affecting wetlands. The proposal would not be constructed or operated within a wetland or its catchment.

General provisions for consultation

The Murray REP No. 2 generally requires that the consent authority consult with relevant agencies whose areas of interest or operation may be impacted by a development proposal as follows:

- a) **Where development is contrary to the aims, objectives or principles of this plan and may have a significant environmental effect along the Murray River—the P&D (Vic), C&NR (Vic) and the adjacent local Council in Victoria must be consulted.**
- b) **Where development is within or may adversely affect land dedicated or reserved under the National Parks and Wildlife Act 1974—the NPWS must be consulted.**
- c) **Where development may adversely affect endangered fauna within the meaning of the National Parks and Wildlife Act 1974—the NPWS must be consulted.**
- d) **Where development may affect an Aboriginal site or any other place that is generally recognised as a place of cultural significance to the Aboriginal community—the NPWS must be consulted.**
- e) **Where development is within or may adversely affect a State Forest—the Forestry Commission must be consulted.**
- f) **Where development may affect boating safety—the MSB must be consulted.**

The Department considers that the only relevant consultation in relation to the proposed development would be with NSW State Forests (the Forestry Commission). State Forests was notified of the subject development application (given the site is adjacent to Mulwala State Forest) and invited to comment on the proposal. The Department did not receive a submission from State Forests on the proposal.

Consultation for Specific Development Types

The Murray REP No. 2 provides the following restrictions and consultation requirements for hazardous and offensive (and potentially hazardous and offensive) development

Definition:

Use of land for a hazardous or offensive (or a potentially hazardous or offensive) industry.

Planning control:

- ***Prohibited on flood liable land.***
- ***Council consent elsewhere.***
- ***Advertised.***

Consultation:

CaLM, DoP, DWR, EPA and MDBC.

The Department consulted with the NSW Department of Land and Water Conservation (Departments of Conservation and Land Management, and Water Resources), now part of the Department of Infrastructure, Planning and Natural Resources. The Murray-Darling Basin Commission (MDBC) was also consulted, as was the Environment Protection Authority (now the Department of Environment and Conservation) was consulted as an integrity approval body. General Terms of Approval have been received from the former EPA. Comments from the MDBC have been duly considered as part of the Department's assessment of the proposal.

COROWA LOCAL ENVIRONMENTAL PLAN 1989

Aims of the Plan

The *Corowa Local Environmental Plan 1989* provides the following general aims and objectives:

The general aims of this plan are as follows:

- a) ***to encourage the proper management, development and conservation of natural and man-made resources within the Shire of Corowa by protecting, enhancing or conserving:***

- i) ***prime crop and pasture land;***
- ii) ***timber, mineral, soil, water and other natural resources;***
- iii) ***areas of significance for natural conservation;***
- iv) ***areas of high scenic or recreational value;***
- v) ***places and buildings of archaeological or heritage significance, including aboriginal relics and places; and***
- vi) ***the bed and banks of the Murray River, its streams and tributaries;***

The Department has considered the impacts of the proposed development on places and buildings of archaeological or heritage significance, including aboriginal relics and places (refer to section 5.5 of this report). Specific measures should impose on the development, if approved, to protect aboriginal heritage items and to preserve the non-indigenous heritage of structures and equipment associated with the existing munitions facility. All other items listed above consideration are not relevant to the subject development site.

- b) ***to promote a variety of urban development and forms in existing towns and villages in a manner which:***

- i) ***is compatible with their existing urban and tourist function;***
- ii) ***retains and enhances their historical attributes; and***
- iii) ***enables development to occur in accordance with a development control plan where appropriate;***

The proposed development does not include any component that may be considered “urban development”. Equally, the Department is satisfied that the proposal would not prevent or restrict urban development on other land within the local government area.

- c) ***to replace the existing planning controls with a single local environmental plan in order to facilitate growth and development of the Shire of Corowa in a manner which is consistent with the objectives specified in paragraph (a) and (b), and which:***

- i) ***minimises the cost to the community of fragmented and isolated development of rural and urban land;***
- ii) ***facilitates the efficient and effective provision or delivery of amenities and services;***
- iii) ***facilitates a range of residential and employment opportunities in accordance with demand;***
- iv) ***facilitates farm adjustments; and***
- v) ***ensures that the efficiency of arterial roads is not adversely affected by development on adjacent land.***

The Department considers that the proposed development would not be contrary to the attainment of these goals.

Objectives of the Zone

The 5(a) Special Uses Zone carries a single objective, being:

The objective of this zone is to make provision for particular specialised uses.

The proposed munitions facility is consistent with the special use designation of the development site, being for “munitions facility”.

General Considerations for Development

The Corowa LEP provides the following matters that must be considered for development:

The Council [consent authority] shall not consent to an application to carry out development on any land unless it has made an assessment, where relevant, of the effect of the carrying out of development on:

- a) **the present use of the land, the potential use of the land for the purposes of agriculture and the potential of any land which is prime crop and pasture land for sustained agriculture production;**

The proposed development site does not represent potential for agriculture, given that it is currently utilised for industry. The site does not constitute prime crop or pasture land.

- b) **vegetation, timber production, land capability (including soil resources and soil stability) and water resources (including the quality and stability of water courses and ground water storage and riparian rights);**

The Department considers that the proposed development site does not represent a significant resource in relation to any of these matters.

- c) **the future recovery of known or prospective areas of valuable deposits of minerals, coal, petroleum, sand, gravel or other extractive materials;**

There are no known mineral reserves underlying the proposed development site.

- d) **the protection of area of significance for nature conservation or of high scenic or recreational value, and of places and buildings of heritage or archaeological significance including aboriginal relics and places;**

The proposed development does not constitute an area of significance for nature conservation or of high scenic/ recreational value. Existing buildings and equipment on the site may carry significant heritage value, and specific measures have been included in the Department's recommendations to protect this heritage. Similarly, with the measures proposed by the Applicant, and the additional mitigation provided by the Department's recommended measures, the Department is satisfied that the proposal will not have a significant impact on the heritage value of Mulwala Homestead or Anutech Site #3.

- e) **the practicality, adequacy and cost of providing, extending and maintaining public amenities for and services to the development;**

The proposed development provides no scope to address these matters.

- f) **future expansion of settlements in the Shire of Corowa;**

The proposal would occur on land currently used for a munitions facility, and would therefore not utilise other land that may be required for the expansion of settlements in the Shire of Corowa.

- g) **development on adjoining land or other land in the locality; and**

The Department is satisfied that the proposed development could be constructed and operated within acceptable environmental limits. Impacts posed by the proposal would not significantly affect or restrict the use of adjacent land or other land in the locality.

- h) **the means of access and availability of parking and whether these are adequate for the development including the likely traffic effects of the development.**

The proposed development site includes an existing munitions facility, for which the Department is satisfied that there is sufficient parking. Operation traffic will not change as a result of the proposed development. Specific provisions should be included in any development consent to ensure appropriate management of construction traffic.

Advertised Development

The Corowa LEP details the following provisions in relation to advertised development:

Development for the purposes specified in Schedule 2 is identified as advertised development.

[Schedule 2]

1 Boarding-houses; hotels and motels; residential flat buildings.

2 Industries (other than rural industries) on land not within Zone 4(a).

3 Animal boarding or training establishments; intensive livestock keeping establishments; junk yards; liquid fuel depots; saw mills; stock and sales yards.

The proposal (industry on land not within zone 4(a)) was advertised as designated, State significant development. The advertising requirements for this type of proposal exceed those for advertised development, as specified in the *Environmental Planning and Assessment Act 1979*.

Items of Environmental Heritage

The Corowa LEP details the following provisions in relation to environmental heritage:

A person shall not, in respect of a building, work, relic, tree or place that is an item of environmental heritage:

- a) demolish or alter the building or work;***
- b) damage or move the relic, including excavation for the purpose of exposing the relic;***
- c) damage or despoil the place or tree;***
- d) erect a building on or subdivide land on which the building, work or relic is situated or that comprises the place; or***
- e) damage any tree on land on which the building, work or relic is situated or on the land which comprises the place;***

except with the consent of Council [consent authority].

The proposed development would not impact on any item of environmental heritage.

Tree Clearing

The Corowa LEP details the following provisions in relation to tree clearing:

A person shall not, except with the consent of the Council [consent authority], cause the destruction of trees listed in Schedule 4 on the land to which this plan applies.

The Council [consent authority] shall not consent to an application made in accordance with subclause (1) [above] unless, in the opinion of the Council [consent authority], the destruction of trees on the land will be carried out in a manner which, in respect of that land and adjacent land, minimises:

- a) the risk of soil erosion or other environmental degradation;***
- b) the loss of scenic amenity; and***
- c) the loss of important vegetation systems and natural wildlife habitats.***

The Applicant should be required to appropriately landscape the site, including replacement of all trees removed that are listed under the LEP.

Advertisements

The Corowa LEP details the following provisions in relation to advertisements:

Except as provided by this clause, an advertising structure shall not be erected and an advertisement shall not be displayed on any land.

Nothing in this clause shall operate to prohibit the Council or another person, with the consent of the Council [consent authority], from erecting advertising structures on land for the purpose of directing the travelling public to tourist areas, or displaying on such structures private advertisements of tourist facilities.

Commercial signs may be erected or displayed on any land with the consent of the Council [consent authority].

A single advertising structure which is larger than a commercial sign may be erected on land within Zone No 3(a) or 4(a), with the consent of the Council [consent authority], if the structure is for the purpose only of displaying a notice relating to the purpose for which the land is used.

Nothing in this clause prevents the displaying on any land of an advertisement, which, in the opinion of the Council [consent authority], is a temporary advertisement.

The Applicant does not seek consent for any advertising structure as part of the subject development application. This is reflected in measures recommended by the Department to be imposed on the development, which would exclude all advertising structures from the consent, if granted by the Minister.

APPENDIX B - CONSIDERATION UNDER SECTION 79C

Section 79C requires that the consent authority, when determining a development application, takes into consideration the following matters.

(a) The provisions of:

(i) any environmental planning instrument;

In relation to the proposed munitions facility upgrade, the following environmental planning instruments apply.

- *State Environmental Planning Policy No. 34 - Major Employment-Generating Industrial Development;*
- *State Environmental Planning Policy No. 33 - Hazardous and Offensive Development;*
- *State Environmental Planning Policy No. 44 - Koala Habitat Protection;*
- *State Environmental Planning Policy No. 55 - Remediation of Land;*
- *Murray Regional Environmental Plan No. 2 – Riverine Land;* and
- *Corowa Local Environmental Plan 1989.*

Consideration of the provisions of these instruments, in the context of the proposed development is outlined in section 3.4 and considered in full in Appendix A of this report.

(ii) any draft environmental planning instrument that is or has been placed on public exhibition and details of which have been notified to the consent authority;

There are no draft environmental planning instruments that are, or have been, placed on public exhibition.

(iii) any development control plan;

There are no development control plans that relate to the proposed development.

(iv) any matters prescribed by the regulations that apply to the land to which the development application relates;

Clause 92 of the *Environmental Planning and Assessment Regulation 2000* requires the following matters to be taken into consideration by a consent authority in determining an application:

- *The Government Coastal Policy (where relevant);*
The Government Coastal Policy does not apply to the proposed development site.
- *In the case of a DA for the demolition of a building, the provisions of Australian Standard AS 2601-1991: The demolition of structures, as in force 1 July 1993;*
The Department recommends that the Applicant be required to undertake all demolition works in accordance with AS 2601-1991.

(b) the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality;

Section 5 of this report considers the environmental impacts of the proposed development in detail. The Department is satisfied that all environmental impacts can be appropriately managed and mitigated.

(c) the suitability of the site for the development;

The proposed development site is currently used for the purpose of a munitions facility. The proposal will not alter this use.

(d) any submissions made in accordance with this Act or the regulations;

A total of 39 submissions were made in response to the exhibition of the development application for the proposed munitions facility upgrade. All matters raised in these

submissions have been given due consideration, as outlined in sections 4 and 5 of this report.

(e) *the public interest.*

The Department considers that the public, particularly those residents in the Mulwala/Yarrawonga area will see the on-going benefits of employment generation and investment associated with munitions facility, should the proposed upgrade proceed. The Department's recommendations include a suite of controls, which the Department considers will mitigate any negative environmental impacts of the proposal so as not to outweigh its benefits. All issues raised by members of the public have been duly considered during the assessment of the proposed development.