Acknowledgment

Ecos Consulting (Aust) Pty Ltd and Queensland Fertilizer Assets Pty Ltd, wish to thank Queensland Nitrates Pty Ltd for their assistance and cooperation in permitting noise measurement data to be gathered from their production facility in Central Queensland.

All diagrams, maps and other figures in this report have been produced in black and white at the request of the Department of State Development. This is to assist government personnel who require to reproduce sections of this report for internal distribution within their Department.

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1 Introduction

1.1 Project Title

Pickanjinnie Nitrogen Facility (Fertiliser and Ammonium Nitrate).

1.2 The Proponent

Queensland Fertilizer Assets Ltd (QFAL)
76 Arthur Street
ROMA QLD 4455

The Proponent, QFAL, is an unlisted Australian public company and its shareholders come from the cotton, cattle, grain growing and regional business community.

1.3 Proposal

Queensland Fertilizer Assets Limited (QFAL) (the Proponent), is proposing to develop a Nitrogen Facility at Pickanjinnie in South East Regional Queensland. The proposed site is approximately 8 km west of Wallumbilla and 34 km east of Roma, within the Shire of Bendemere (Figure 1-1). The Facility will convert coal bed methane and / or natural gas to ammonia, which in turn will be used to manufacture nitric acid, granular urea and fertiliser and technical grade ammonium nitrate (in solid (prill) and liquid (emulsion) form).

QFAL is currently undertaking a feasibility study in respect to the design, construction and operation of the Facility. The Proponent is committed to completing the feasibility study and impact assessment of the proposal with the intent to commence construction of the Facility in July 2002 and operation by July 2004, however, the final decision to proceed will be a commercial one based on product sales. The proposal represents a capital investment of $600 million and will generate up to 500 construction jobs and 150 permanent jobs (37% skilled and 63% semi or unskilled).

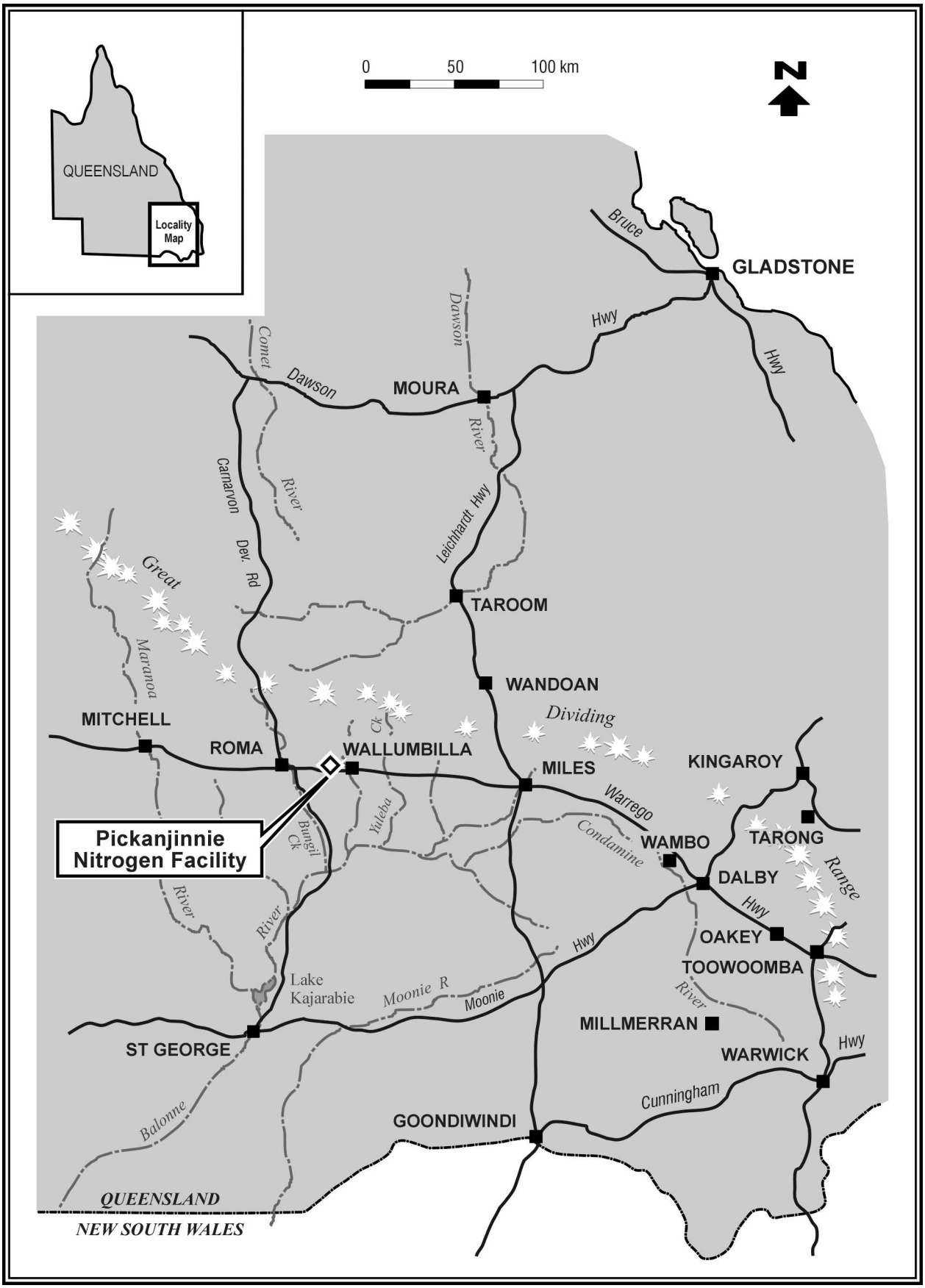
1.4 Objective

The Pickanjinnie Nitrogen Facility involves the planning, design, construction, operation and eventual decommissioning of a world class production plant. The Facility will utilise coal bed methane from the Comet Ridge coal seam methane production area or natural gas from the Surat and South West Queensland gas field to primarily produce urea and ammonium nitrate for the mining and agricultural industries of eastern Australia. The project is predominantly aimed at the import replacement market.

Queensland is a high user of nitrogen based fertilisers and explosives due to its intensive cropping and major open-cut mining. Demand for urea in the market place is high and it is expected that, based on current production, Australia would be importing over 1 million tonnes of granulated urea by 2005. Demand for explosive grade ammonium nitrate in New South Wales and Queensland is forecast to increase

from around 465,000 tonnes per annum (tpa) currently to around 948,000 tpa by 2020, a forecast increase of 3.6% per annum. This compares with a local manufacturing capacity of 860,000 tpa from four existing plants.

Figure 1-1: Locality of Nitrogen Facility, Pickanjinnie, Queensland



2 Project Alternatives

2.1 Technology

A number of processes exist for the production of anhydrous ammonia, nitric acid, urea and ammonium nitrate. The Proponent has had discussions with five highly qualified major engineering-contractors (refer Table 2-1***)*** and has selected Krupp Uhde GmbH of Dortmund, Germany and DSM, Netherlands to design, purchase equipment and build the ammonia, ammonium nitrate, nitric acid and urea Plants.

Table 2-1: Plant Technology

Ammonia Plant	Nitric Acid Plant	Ammonium Nitrate Plant	Urea Plant
M.W. Kellogg	Weatherley	M.W. Kellogg	DSM, Netherlands
Uhde	Uhde	Uhde	Snam Progetti
Pritchard		Pritchard	

The preferred technologies were selected based on:

- Level of energy efficiency;
- Proven track record of performance;
- Commercially proven equipment; and
- Built in safety and environmental protection features.

2.2 Location

The Directors of QFAL, as key community figures, have focussed their energies on locating an industry that, whilst being economically viable, would provide economic benefits to their local region. Market research showed that the eastern states rely heavily on imports of nitrogenous fertilisers and ammonium nitrate emulsions for agriculture and mining. The Bendemere Shire and Roma district were considered ideally located to capitalise on these markets. The production of urea and ammonium nitrate were thus seen as an appropriate development.

Land acquisition opportunities were investigated, taking into consideration the selection criteria set out in Section 2.1.3.2, Volume 1 of the EIS. Available land in reasonable proximity to gas and water supplies, access to transport routes and within the local region were the starting point. Two sites were considered for the project, one at Wallumbilla and one at Pickanjinnie. Community concerns in relation to safety in association with the Wallumbilla site led to the Pickanjinnie site being selected as the preferred option. The Pickanjinnie site is freehold land that has previously been cleared for grazing. Its greater distance from the residential area of Wallumbilla, distance from nearest residence (1km), and proximity to gas feedstock,

transport routes, power and water, make the site well located for the proposed development.

3 Benefits to the State of Queensland

The state of Queensland would benefit by:

- The expenditure of some $391 million in construction payroll and locally purchased materials and services during the 2 year construction phase;
- The state of Queensland would receive direct financial benefits during the construction phase by way of company payroll tax of up to $13 million over the 2 year construction phase; and
- Based on gas consumption alone, the Facility has the potential to provide around $64 to $66 million of royalty revenue to the Queensland Government over a 20 year period. This is based on 12.8 petajoules of coal seam methane / natural gas at a royalty rate of 10% of wellhead value (approximately $2.50 to $2.60 / GJ in Queensland).

Benefits to the Roma region would include:

- Approximately $74 million expenditure in the region during the 2 year construction phase. This is based on capital costs and typical expenditure during construction of a plant of this nature;
- Approximately $10.3 million per year of revenues into the region by way of direct wages for operational staff or wage for indirect labour requirements. This amounts to $206 million (current value) of revenue over a 20 year plant life; and
- Up to 150 permanent jobs and opportunity to increase skills base within local region.

4 Consequences of the Proposal Not Proceeding

Australia currently relies on imported urea to supply the short fall in domestic requirements. There are a limited number of domestic manufactures of urea and therefore the proposed Facility has the potential to reduce Australia's reliance on imported urea and introduce another producer in the eastern states nitrogenous fertiliser manufacturing industry.

Thus if the project does not proceed, Australia would lose an opportunity to reduce its imports of urea and ammonium nitrate emulsion and associated benefits from the development would be lost, including:

- Increased investment and employment directly associated with construction and operation of the Facility;
- Secondary or multiplier effects giving rise to further substantial increases in regional output and employment; and

- Greater regional economic stability through a broadening of the economic base.

5 Project Schedule

Key milestones for the project are:

April 2001	Heads of Agreement with Krupp Uhde and Heads of Agreement with Markets
May 2001	MOU with Tipperary Oil & Gas (Aust) Pty Ltd
September 2001	Finalise gas and marketing contract
November 2001	Complete financing of Facility
December 2001	Board determination of project viability based on feasibility studies
	Order Plant and start engineering of infrastructure
	Submit Development Application to Council
July 2002	Turn soil
November 2002	Construction of Plant commences
April 2004	Commence commissioning
July 2004	Commence operations

The Facility will have a design life of 20 years, but, through preventative maintenance and capital improvement programs, the actual life of the Facility could reach 40 to 50 years before technological obsolescence.

6 Environmental Impact Statement

6.1 Purpose of the Environmental Impact Statement

This Environmental Impact Statement (EIS) aims to assess the potential impacts of the Facility and the required mitigation measures. The environmental assessment has been carried out as part of the feasibility studies to identify any environmental constraints that may impact upon the viability of constructing or operating the proposed Facility, and to optimise the timing of the project. The EIS has been produced to assist both the Advisory Agencies (comprising both State and Local Government Departments) and the public in assessing the appropriateness of the Facility in the proposed location.

The project has been brought about by grass roots support from the cotton, grain, and cattle growing industries of South West Queensland and Northern New South Wales. The Proponent is fully committed to this project and has a number of agreements in place for both the supply of equipment and feedstock, and the sale of product (see Section 12.0). The project is in full feasibility phase and will only progress when market contracts are finalised.

6.2 Environmental Impact Statement Process

The project was declared a significant project under the *State Development and Public Works Organisation Act 1971* (*SDPWO Act*), in May 2001 and the EIS process is being carried out pursuant to Section 29B of the *SDPWO Act*. This process replaces that provided for in the *Integrated Planning Act 1997,* but does not replace the need for a development application to be lodged for consideration and decision by the Bendemere Shire Council. Thus stakeholders will be provided with a single, coordinated, opportunity to review and comment on the development. Appeal rights in relation to Council's decision will apply only to those persons who have made a submission in relation to this EIS. **There will not be any further public review periods**, and the environmental assessment process will be completed upon issue of the Coordinator General's report. The Development Application will be submitted to the Bendemere Shire Council on receipt of the Coordinator Generals Report.

The main steps in the EIS process are given in Table 6-1.

Table 6-1: Environmental Impact Statement Process

Task	Date
Submit Initial Advice Statement to Government	November 1997
Prepare Draft Terms of Reference	December 1997
Advertise Draft Terms of Reference	December 1997
Meetings with key Government Departments, Local Council and community members	November - December 1997
Written advice to key stakeholders and community organisations	December 1997
Public Review of Draft Terms of Reference	December 1997 - January 1998
Finalise Draft Terms of Reference	January – April 1998
Conduct Specialist Studies e.g. Noise, Air Quality, Risk, Cultural Heritage	January – June 1998
Continuing consultation with Government Departments and key stakeholders and community organisations (phone, mail, meetings)	February – December 1998
Preparation of Draft Environmental Impact Statement	January – October 1998
Project "On Hold" October 1998 – March 2001	
Review of Terms of Reference by Advisory Agencies	April 2001
Review and revise Environmental Impact Statement, including specialist studies	March– August 2001
Consultation with Government Departments and Key Stakeholders	March– August 2001
Public Advertisement of Draft Environmental Impact Statement	September 2001
Public Review of Draft Environmental Impact Statement	September – October 2001
Continuing consultation with Government Departments and key stakeholders and community organisations (phone, mail, meetings)	August - October 2001

Task	Date
Response to submissions to Draft Environmental Impact Statement	October - November 2001
Preparation of Final Environmental Impact Statement	November 2001
Decision by Coordinator General	December 2001
Development Application submission under the *Integrated Planning Act*	December 2001

7 Project Description

7.1 Site Location

The Nitrogen Facility will be located on freehold land at Pickanjinnie, in South West Queensland approximately 8 km from Wallumbilla and 34 km from Roma (Figure 1-1). The site, on the Warrego Highway and adjacent to the Main Western Railway Line, provides excellent access to major transport routes north to Emerald and Mackay, south to St George, Goondiwindi and Moree, and east to the Darling Downs (see Section 2.8). All of these areas are major users of nitrogenous fertilisers and / or ammonium nitrate explosives. The site is 12 km from a major gas collection and distribution point in Queensland, adjacent to the Wallumbilla to Gladstone Gas Pipeline and 100 km south of a major coal seam methane development.

7.2 Physical Features of Plant

The project aims to produce four main products for distribution to both agricultural and industrial customers. These products, and the likely maximum annual rates of product sales, include 80,000 tpa of ammonia, 350,000 tpa of urea, 2000 tpa of nitric acid and 150,000 tpa of ammonium nitrate (prill and emulsion).

The Facility will cover an area of approximately 40 hectares in total; 20 hectares for the various Plant and an additional 20 hectares for the water storage dams and evaporation ponds. The Facility will operate 24 hours a day for approximately 365 days per year, over a design life of 20 years, although with maintenance and upgrades this could extend to 50 years. Operations of the Facility will provide up to 150 permanent jobs in South East Regional Queensland

Key features of the plant include:

7.2.1 Process Plant

The project shall utilise coal seam methane and / or natural gas to produce ammonia, nitric acid, ammonium nitrate and urea. Production capacity for the various Plants is given in Table 7-1.

Ammonia shall be used within the process to manufacture urea, nitric acid and ammonium nitrate. Some ammonia shall be stored for direct sale to industrial and agricultural consumers. An average of 605 tpd of ammonia shall be transferred to the Urea Plant, and a total of 200 tpd of ammonia shall be transferred to the Ammonium Nitrate and Nitric Acid Plants combined.

Equipment will include such items as heaters, pumps, compressors, heat exchangers, refrigeration units, absorbers, stripping columns and storage vessels.

Table 7-1: Plant Capacity and Product Sales

Unit	Plant Production Capacity (metric tonnes/day)	Product to Sales tonnes/annum
Ammonia Plant	1,060 x 350 days/year	80,000
Nitric Acid Plant	450 x 330 days/year	2,000
Granular Urea Plant	1,060 x 330 days/year	350,000
Ammonia Nitrate Plant (prill and emulsions)	455 x 330 days/year	150,000

7.2.2 Utilities / Services

It will be necessary to provide services to the process plant such as coal bed methane and / or natural gas feedstock, electricity for Plant start-up, water, roads, telecommunications lines and depending upon product markets, rail.

7.2.3 Storage

The plant will include on-site storage of minimal quantities of raw materials (catalysts, process solvents, water treatment chemicals and water) and storage of intermediate and finished products including anhydrous ammonia, urea, nitric acid and ammonium nitrate (prill and emulsions). The ammonia shall be stored on-site in liquid form in a 20,000 tonne refrigerated tank operating at atmospheric pressure.

7.2.4 Water Treatment

Process water, potable water and boiler feedwater treatment system equipment will be required to treat water from underground aquifers (either from Comet Ridge or from on-site water bores) for use by the Facility. This area will comprise water softening chemical addition facilities, and settling and storage tanks.

The water system will be a closed system with most water consumed or recycled in the process and with minimal wastewater generation. Where effluent is produced this will be treated and evaporated on-site. Domestic effluent will be treated via a package plant or septic system approved by the Shire Council.

7.2.5 Other Facilities

The Facility will also incorporate a laboratory for analysis of product, a workshop and associated spare parts store, and an administrative centre that will provide for training, accounting, administration and other management functions required for the safe and efficient operation of the Facility.

8 Feedstock and Sources

Key inputs and their sources are given in Table 8-1.

A Memorandum of Understanding (MOU) has been reached with Tipperary Oil & Gas (Aust) Pty Ltd and a contract has been signed for gas supply.

Table 8-1: Key Feedstock

Input	Source
Gas (maximum of 12.8 petajoules per year)	Tipperary Oil & Gas (Aust) Pty Ltd
Water (upped 2,000 megalitres per year depending upon source of water)	Two sources are under consideration: (1) Produced formation water from the Comet Ridge coal seam methane production area via dedicated water pipeline; and (2) Gubberamunda Artesian Aquifer from on-site bores (1,000 ML approved allowance)
Power 16.8 Megawatt normal conditions 800 kW of 660 Volt purchased power for start up of Facility	On-site generation utilising waste heat; State electricity grid
Air (nitrogen)	Atmosphere

8.1 Gas Supply

Feedstock gas is to be delivered to site via pipelines from Comet Ridge. The Proponent is considering methods for achieving this, including the construction of a dedicated gas pipeline. Route Planning has not yet been undertaken for a dedicated pipeline, however, based on studies done by others in the region it is anticipated that the pipeline route will be located in already disturbed road easements with some sections traversing a limited number of freehold and leasehold properties. If a dedicated pipeline is required this will be the subject of a separate licensing and assessment process through the Department of Natural Resources and Mines (DNRM). Preliminary discussions have been held with this department and pipeline licensing negotiations, including a land acquisition strategy, are currently under consideration.

8.2 Water Supply

The water requirements for the project are predominantly for cooling purposes, and the design philosophy is aimed at optimising the cooling concept for the complex utilising both water and air cooling. Air cooling however has disadvantages in relation to the potential for off-site noise nuisance due to the noise associated with cooling fans. The Proponent holds licences for a combined allocation of 1,000 ML of industrial use water from two on-site bores and is investigating the option of sourcing water from the Comet Ridge coal seam methane production area. Production of coal seam methane in this field is creating a considerable volume of

excess water that is currently disposed of to ground with no beneficial use. Consideration is therefore being given to the construction of a water pipeline, in conjunction with the gas pipeline, to transport water to the Facility, and this is the preferred option for the water supply. The volume of water available from Comet Ridge would exceed the entire cooling requirements of the proposed Facility, and could provide additional water resources to the region.

8.3 Power Supply

On-site power requirements, to cover peak periods under normal operating conditions will be 16.8 MW and this will be generated on-site. For start up 800 kilowatts (kW) of 600 Volt purchased power from the grid will be required until the boiler, steam turbine and generator come on line. The Facility will be designed to be independent from the public grid, having its own generator driven via a steam turbine utilising excess steam from Plant operations, and the balance being made up by a package boiler.

8.4 Transportation

Materials for construction will be predominantly brought to site by road from Gladstone and Brisbane via the Dawson/Leichhardt Highways and the Warrego Highway. Large, specialised process equipment from overseas will come by sea, entering Australia through with the Port of Brisbane or Gladstone. Multi-axled lowboy trailers, with escort vehicles, will be used to transport construction materials.

The main materials input for the plant are feedstock gas and water (see 7.1 and 7.2), and chemicals for processing. The later will create a minor volume of traffic movements (less than one vehicle per day).

Product output from the Facility would be transported by road and, depending upon market destinations, rail. If all the output from the Facility were sent by road the traffic movements on the major transport routes listed below will be less than 5% of the existing traffic volume for all routes (see Section 0, Table 11-1).

- Warrego Highway (east to Miles and west to Roma);
- Leichhardt Highway;
- Carnarvon Development Road;
- Carnarvon Highway;
- Dawson Highway;
- Gregory Highway;
- Peak Downs Highway; and
- Main Western Railway Line.

9 Workforce & Social Infrastructure Requirements

The project will provide employment for up to 500 construction workers and 150 operational staff. The skill base in the region is expected to be able to supply 22% to 35% of the construction workforce and up to 85% of the operational workforce. The proponent intends to provide training opportunities to increase local workforce participation, and to advertise construction tenders locally to increase opportunities for local firms.

Accommodation requirements for the construction are highly dependent upon the number of people recruited locally, however it has been estimated that around 210 non-local personnel, with up to 65 partners and 150 children could require to be accommodated. With a two year construction period, accompanying families would need to draw upon local medical, dental, educational, commercial and recreational facilities.

With 85% of the operational workforce expected to be recruited locally this phase of the project is not expected to require any special infrastructure or social requirements.

10 Existing Environment

The Proponent has purchased the site at Pickanjinnie. The Deeds of Grant of freehold title for the site were made as follows:

- Lot 208 RP 835683, County of Waldegrave Parish of Wallumbilla, 71.016 hectares, 4 November 1897;
- Lot 209 RP 835683, County of Waldegrave Parish of Wallumbilla, 64.387 hectares, 3 February 1905; and
- Lot 210, WAL 53390, County of Waldegrave Parish of Wallumbilla, 64.75 hectares, 3 September 1897.

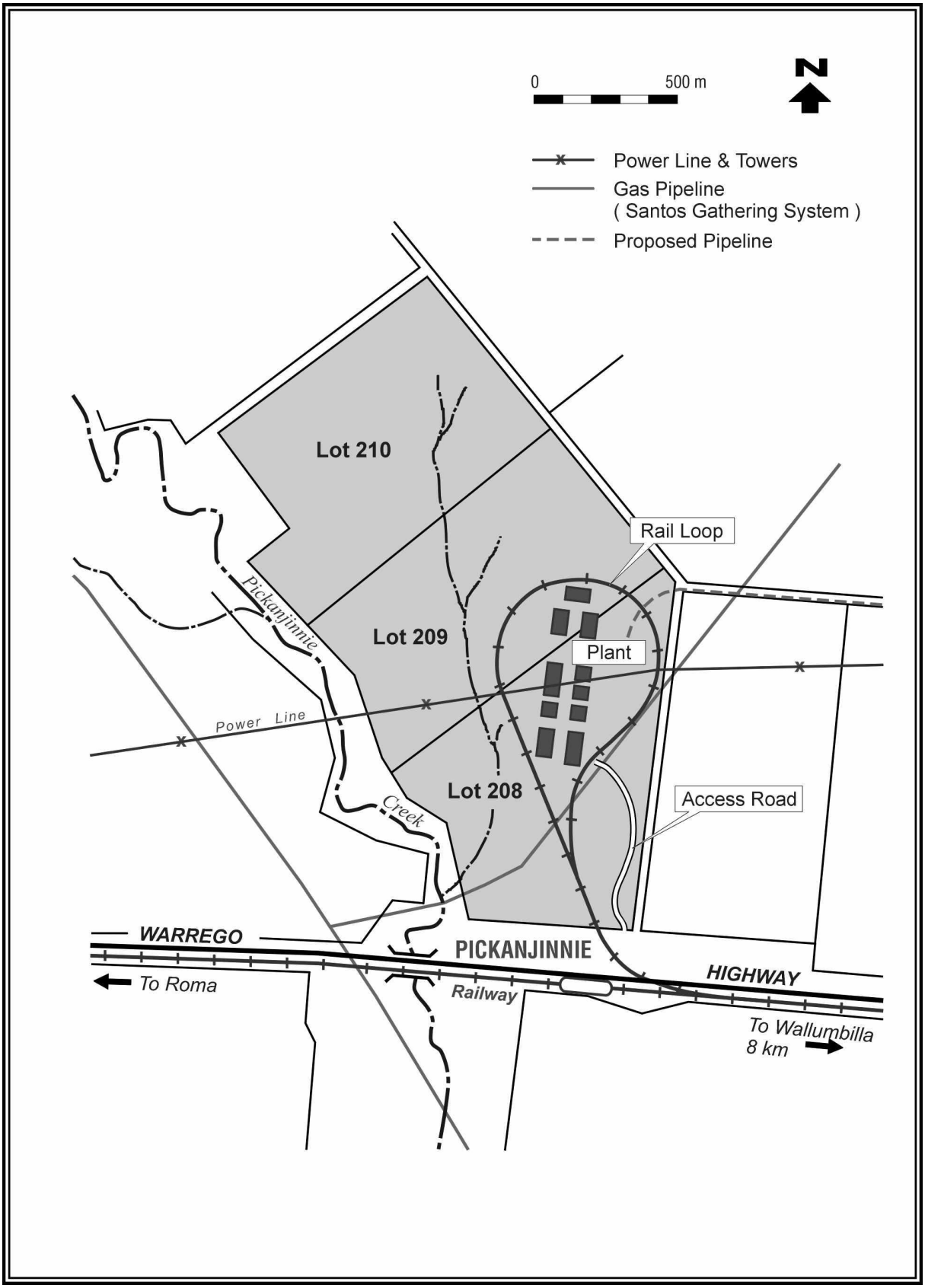
It is proposed that the main Plant, storage areas and evaporation ponds will be situated on Lot 208, with the emulsion Plant being located on lot 209 (Figure 10-1).

The site has a gently undulating to flat topography, sloping in a generally south-westerly direction, and is predominantly cleared for grazing. Three dams are located on the site and a bore is located on the northern part of Lot 210. Two electricity pylons are located on the site and an existing, under ground gas flowline, operated by Santos Limited, traverses the site in a southwest to north-easterly direction through Lot 208 (refer to Figure 10-1).

The land is not part of, or likely to become part of the conservation estate and there are no national parks, conservation parks, wilderness areas or aquatic reserves in the vicinity which would in any way be affected by the proposed Facility. The indigenous vegetation of the site has been subject to extensive clearance, grazing by livestock and weed invasion. Little if any undisturbed vegetation remains and remnant habitats are generally in poor condition. The vegetation consists of native

and introduced grasses and remnant Poplar Box woodland (*Eucalyptus populnea)* with Belah *(Casuarina cristata)*. The site falls within the Southern Downs Province of the Brigalow Belt South Bioregion and predominantly represents regional ecosystem 11.4.7 (page 11/26 of the *Conservation Status of Queensland Bioregional Ecosystems, 1999*). This regional ecosystem has been extensively cleared for pasture and is

Figure 10-1: Nitrogen Facility Site Map (Preferred Layout)



therefore "of concern". Representative species including Poplar Box and Belah occur along the southern boundary of Lot 208.

Soils on the site are poor quality duplex soils with cracking clay in small pockets. The property is underlain by sedimentary shales, siltstones, mudstone and sandstone, which form various geological units of the Surat Basin section of the Great Artesian Basin. Of these strata, sandstone is the predominant waterbearing unit. The Gubberamunda Sandstone is a reliable and well proven high yielding formation. Good water quality with pumping supplies in excess of 20 litres per second can be expected.

The climate in the region is typically characterised by hot wet summer seasons and warm dry winters. Rainfall is highly variable and evaporation rates are very high. The area is subject to prolonged drought and heavy rainfall due to cyclonic activity. During the months January to April dominant winds blow north to north-easterly and south to south-easterly, turning to the south-west during the months May to August, and then predominantly north to north-easterly during the months September to December.

The site of the proposed Facility is located in the central part of the Maranoa-Balonne Catchment draining into the Pickanjinnie and Wallumbilla Creeks, which flow to the Balonne River just east of Surat. Pickanjinnie Creek lies just to the west of the site, however, given the strategic location of the three existing dams on the site, it would be only on rare occasions (1:50 storm event) that water from the site would flow into Pickanjinnie Creek.

The western boundary of the site is of moderate heritage significance containing a background scatter of Aboriginal artefacts, some scarred trees of non-Aboriginal significance, and the remains of early non-Aboriginal settlement. A Draft Environmental Management Plan (EMP) has been prepared for the project that includes cultural heritage management (Appendix G, Volume 2 of the EIS).

Agriculture is the main industry of the Bendemere Shire with cropping, beef cattle, wool and timber being the key areas of activity. Manufacturing and construction in the Shire is limited. Population density in the region is low and has been declining in recent years due, in part, to a decline in global agricultural commodity prices and the lack of employment opportunities.

11 Impact on Socio-Economic and Built Environment

The impact of the Facility is expected to be most evident in Roma and Wallumbilla, however these towns are likely to welcome the employment opportunities that the Facility will provide. Local employment opportunities, both regionally and State wide, could be enhanced by giving opportunities to local manufacturers to supply goods and services for the construction of the Facility.

Community, recreational and educational facilities in Roma are adequate to cope with a percentage population increase of the magnitude being considered. Educational, health, police, emergency services and recreational facilities have been reviewed and there is adequate capacity to cater for the needs of both the construction and operational workforce. However, it is possible that an increase in teaching staff could be required during the construction phase. This would be highly dependent on the number of families accompanying construction workers (see Section 8.6.1 Volume 1 of the EIS).

Temporary accommodation (e.g. hotel, motel, caravan and rental accommodation) in the area is limited and it is anticipated that some additional temporary accommodation may be required to accommodate the construction workforce at its peak. The Roma Town Council has freehold land that it can make available for this purpose and the Proponent will continue to work with both the Bendemere Shire Council and the Roma Town Council to identify accommodation opportunities in the area.

Permanent accommodation (e.g. houses for sale) is plentiful in the area. In addition approximately 85% of the permanent workforce is expected to be recruited locally. Therefore accommodation in the region is adequate to meet the demands of the operational phase of the projects.

Road impacts will be associated with the movement of workers, equipment and product. During the construction phase up to 500 workers (peak) will need to travel to the site each day, predominantly from the Roma direction. The Proponent will investigate the use of buses to minimise impacts of worker movements on the Warrego Highway and the Roma town roads. During the operations phase up to 30 shift workers will need to travel to site each day, plus a further 30 administrative and day workers during the day shift. Since most of the workers are expected to be recruited locally the operational workforce is not expected to significantly increase the vehicle movements on roads in the area.

Equipment for the construction of the Facility will be brought in by road from the coast, and is expected to travel via the Leichhardt and/or Warrego Highways. The maximum number of deliveries to site is expected to occur during the 3rd to 5th months of construction and peak at 7 trucks per day (total of 14 vehicle movements in and out of the site). This is less than 2% of the existing traffic volume on the Warrego Highway.

Distribution of product from site shall be by truck and, depending upon market destinations, rail, however transport options for product distribution have not yet been finalised. The Proponent is negotiating with Queensland Rail for rail freight of ammonium nitrate product e.g. to the Port of Brisbane. In a worst case scenario for road usage where all product is transported by road, a total of 70 truck movements per day (i.e. 35 empty trucks in and 35 loaded trucks out) would be required. Given the anticipated product destination routes product shall predominantly head west along the Warrego Highway to Miles and south along the Leichhardt Highway to service southern Queensland and northern New South Wales.

A comparison of the anticipated movements with existing Average Annual Daily Traffic (AADT) numbers along the main distribution routes (Table 11-1) shows that, in the worst case, predicted operational traffic does not exceed 5% of the existing AADT for any of the anticipated product destination routes. The Department of Main Roads *Guidelines for Assessment of Road Impacts of Development Proposals, 2000,* generally considers traffic impacts of less than 5% to be insignificant.

Table 11-1: Comparison of Existing AADT with QFAL Predicted Truck Movements

Route	Loaded Trucks p/d	Total Trucks p/d (In & Out)	AADT (DMR, 2000)	% of QFAL Trucks to AADT
Primary Destination Route				
Pickanjinnie / Roma	10	20	1121	2%
Pickanjinnie / Miles	25	50	1141	4%
TOTAL	**35**	**70**		
Secondary Destination Route				
Roma / Rolleston (Carnarvon Dev. Rd)	5	10	1174	1%
Roma / St George (Carnarvon Highway)[1]	5	5	222	2%
Miles / Banana (Leichhardt Highway)	2	4	474	1%
Miles / Goondiwindi (Leichhardt Highway) [1]	17	17	512	3%
Miles / Toowoomba (Warrego Highway)	6	12	1634	1%
TOTAL	**35**	**48**		

[1] It should be noted that trucks transporting product to St George via Roma and Goondiwindi via Miles will travel one way only as pickup from the Facility will represent backhaul for trucks carrying product from southern states.

12 Principal Environmental Impact and Mitigation Measures

The principal potential environmental impacts identified with the proposed Facility include the imposition of additional, but highly localised, risks and hazards, impacts

on public amenity, the supply of water for use in the process and the impact on ambient air quality.

12.1 Risks and Hazards

A preliminary Hazard Identification and Quantitative Risk Assessment has been carried out for the proposed Facility. The major sources of off-site risk identified for this development are associated with accidental releases of ammonia or fires involving ammonium nitrate or urea. When ammonium nitrate or urea are heated beyond their melting point they form nitrogen oxides. Both ammonia and nitrogen oxides are toxic materials.

The Facility will feature state of the art containment facilities, control systems, and fire detection and suppression systems to prevent the release of toxic materials. Systems and equipment will also be available for the containment and recovery of accidental releases.

The conclusion of the risk assessment is that the Facility does meet HIPAP 4 criteria in the studied site provided that key recommendations relating to siting of equipment and provision of water curtains are implemented. Changes have already been made to the preliminary layout to take into account the findings of this study. This has included greater separation between the ammonium nitrate storage shed and the ammonia storage tank and relocation of the Plant and storage facilities further north within the site. The Proponent will ensure that through siting of the Facility and incorporation of safety features the 50 in one million risk contour is confined within the site boundary.

12.2 Water

The impact of any discharges of liquids upon the flow and quality of surface waters at or near the proposed Facility would be minimal. The Proponent intends to construct two earthen evaporation ponds on the site sized to permit the effluent produced by the Plant to be managed on-site by evaporation. There would be no effluent discharged from the site into surface waters. Only clean stormwater run-off, from greater than 1:50 rainfall events, would be permitted to leave the site. Thus there should be no impacts on Pickanjinnie Creek as a result of the construction and operation of the Plant.

The preferred option for water supply to the Facility is via a dedicated pipeline from the Comet Ridge coal seam methane production area, thus making beneficial use of currently wasted produced formation water. However, water may be sourced from the Gubberamunda formation of the Great Artesian Basin using two licensed bores on the site.

If only the on-site bores were utilised the rate of extraction would be limited to 1,000 ML per annum. Any additional cooling requirements would be addressed by other options e.g. air cooling. The degree of impact upon the artesian waters of the region resulting from the use of groundwater for the Facility is difficult to predict accurately. The actual impact can only be determined through pump tests conducted

on the bores, which will be undertaken during the design phase of the project, if required.

12.3 Air Quality

Dust emissions due to construction activities are not expected to cause loss of amenity at the nearest residential locations.

Air emissions associated with the operation of the Facility should have a minimal effect on the air quality in the region. Ausplume dispersion modelling (Section 8.2.3) carried out for the project found that relatively small emission rates for combustion gases, particulates, ammonia and odour would result from the Facility. The modelling found that maximum concentrations occurred close to the stacks and only minor levels at nearby residential locations. Assuming typical background levels for a rural area, the relevant air quality guidelines are readily achieved for the regulated pollutants and odour. The air quality impact under anticipated upset conditions is also expected to be within health guidelines for short-term exposures.

12.4 Noise

Given the temporary nature of the works and the distance between source and off-site receptors, noise levels generated by the construction activities are unlikely to be discernible above normal background levels at the nearest sensitive receptors off-site except on infrequent occasions and for a short duration.

To meet the requirements of the *Environmental Protection (Noise) Policy 1997* and protect the well being of individuals (i.e. occupants of the closest residences), noise limits, based on the quietest anticipated background noise levels, have been adopted of. These are:

- Background +5 dB(A) 07:00hours - 22:00hours; and
- Background + 3 dB(A) - 22:00 hours - 07:00 hours

Similar noise limit criteria have been used extensively by consultants, State and Local Governments alike, for a number of years and has been shown to provide a satisfactory level of protection to individual residences and residential communities, for constant continuous noise.

Noise modelling, using the ENM computer model, indicated potential for minor exceedences of the nominated sound pressure level limits at the closest residences for some meteorological conditions between 22:00 hours and 07:00 hours. However, the computer modelling did not take into account any noise attenuation provided by the buildings within the proposed Facility and specialist studies concluded that all the noise sources likely to be associated with the proposed Facility can be controlled to meet the nominated noise guidelines

12.5 Cultural Heritage

The Cultural Heritage Assessment of the proposed site recommended that the proposed development be permitted to proceed but that development should be constrained around those areas described as archaeologically sensitive. The archaeologically sensitive areas are located in the southwest corner of Lot 208 and the north west corner of Lot 210. Both these areas are outside the proposed Facility development area, and their significance shall be taken into consideration during the final plant design phase.

12.6 Public Amenity

There are no obvious land use conflicts involving the proposed Facility. The subject land is currently used for grazing and is typical of the farms in the area. Any reduction in amenity due to noise and dust will be localised around the Facility site and therefore generally restricted to areas that are not accessible by the public.

The surrounding Pickanjinnie area is flat to slightly rolling, providing few elevated viewing points. The most frequently viewed section of the subject land is that area viewed from the Warrego Highway and from the Main Western Railway Line, both of which run parallel to the southern boundary of the site. Impacts from this direction will be mitigated by the existing trees on the southern boundary of the site, augmented by screen planting, use of colours that harmonise with the regional setting, and designing lighting to minimise off-site impacts.

13 Safety and Environmental Protection, Monitoring and Reporting

The Proponent places a very high priority on safety and environmental issues, and aims to maintain a high standard of safety and environmental performance.

13.1 Safety

Facilities for the production of ammonia in quantities greater than 200 tonnes, and ammonium nitrate in quantities greater than 2,500 tonnes, are classified as Major Hazard Facilities under the National Standard *National Occupational Health and Safety Commission (NOHSC) 1014 (1996).* An on-site and off-site emergency plan must be prepared for such sites. A Draft Emergency Response Plan has been provided (Appendix I) and will be finalised in consultation with the relevant emergency services.

Safety at the Facility will focus on the design of the Plant by using proven technologies and ensuring compliance with industry best practice and all applicable industry codes and standards.

The Proponent's safety performance will be monitored and reported regularly to the Board of Directors and senior management.

13.2 Environment

The Facility will require an Environmental Authority (EA) under the *Environmental Protection Act 1994 (Queensland)* covering the Environmentally Relevant Activities (ERA):

- Section 6(c) >100,000 tonnes per annum Chemical Manufacturing;
- Section 7(b) Chemical Storage >1,000m^3;
- Section 11(a) Petroleum Product Storage > 10,000 litres but less than 500,000 litres;
- Section 14(b) Sewage Treatment;
- Section 17 Fuel Burning (package boiler for top up steam for on-site power generation); and
- Section 39(b) Construction Activities (not enforced until July 2002).

Protection of the environment will focus on the design of the plant to minimise the occurrence of any accidental release of product.

Storage areas will be adequately bunded with sealed surfaces to contain any spilled material. Load out areas will be kerbed to divert any spilled material to a fully contained area for product recovery.

The Draft Construction Environmental Management Plan (EMP) (Appendix G, Volume 2 of the EIS) and the Draft Integrated Environmental Management System (IEMS) for operation (Appendix H, Volume 2 of the EIS) aim to control, manage risks associated with and reduce environmental impact during Facility construction and operation.

The Draft Construction EMP and IEMS include:

- Establishment of agreed performance criteria and objectives in relation to environmental and social impacts;
- Detailed prevention, minimisation and mitigation measures for environmental impacts at specific sites;
- Details of the funding and implementation responsibilities for environmental management;
- Timing of environmental management initiatives; and
- Reporting requirements and auditing responsibilities for meeting environmental performance objectives.

13.3 Monitoring and Reporting

Regular performance and emission monitoring will be undertaken to confirm the accuracy of predictions made in this EIS, ensure compliance with statutory and licence requirements and to review the project's success in achieving the targets and objectives specified in the Draft Construction EMP.

If monitoring exposes shortcomings in project environmental management, corrective action will be taken to fine tune or amend procedures as required.

Prior to any monitoring program being implemented, consideration will be given to:

- Location and timing of sampling program;
- Sampling technique;
- Analysis of results; and
- Documentation and reporting requirements.

Reporting of environmental information will be undertaken both internally (from the board of directors to line management) and externally (ie. Government departments and interested stakeholders).

Requirements for reporting to Government will be as per licence conditions and other environmental authorities. The Proponent will strictly adhere to the due date for such reporting. All statutory requirements for reporting information to Government and Stakeholders will be complied with.

14 Conclusion

The Pickanjinnie Nitrogen Facility is an opportunity for Queensland to establish an important value adding industry that will replace currently imported product. The project will provide employment opportunities in South East Regional Queensland during both the construction and operational phases of the project.

The selected site is freehold land, consisting of predominantly poor quality, duplex soils with limited capability for improved pasture.

Specialist studies concluded that the plant would not result in any adverse off-site impacts. Impacts associated with air quality, noise, risk, and water management can be successfully mitigated with the application of appropriate design standards, engineering controls and management measures. No significant adverse impacts are expected and residual impacts can be ameliorated.

A list of commitments undertaken by the Proponent to ensure that the Facility meets the environmental objectives of the EIS is given in Table 14-1

Table 14-1: Table of Commitments

Number	EIS Section	Commitment
1	1.2	In line with the Queensland Government *Local Industry Policy* which aims to "*support local industry and to ensure that local industry is provided with full, fair and reasonable opportunities to tender for work on major projects*", the Proponent will ensure that local industries receive every opportunity to tender for on-site works and supporting infrastructure for the Facility.
2	2.3.4.1	The Proponent is committed to treating environmental management, rehabilitation and abandonment as an integral component of the planning and operation of the Facility.
3	2.3.4.1	The Facility shall be designed in accordance with the principles of cleaner production to reduce waste, increase levels of recycling and limit harmful emissions.
4	2.3.4.1	The Proponent shall ensure that the Facility, after decommissioning, is rehabilitated to sound environmental and safety standards, and consistent with the condition of the surrounding land.
5	2.3.4.1	Plant equipment shall undergo regular maintenance and updating to ensure that the production process continues to meet environmental best practice standards and provide an economically viable product.
6	2.3.4.1	At no time, either during construction or operation of the Facility, shall any solid waste be disposed of on-site by the Proponent.
7	2.3.4.1	Waste tracking systems shall monitor waste generation areas to enable the identification of process areas where improvements could be investigated.
8	2.3.4.1	Top soil removed during construction shall be recovered for reuse in landscaping of the site at the end of the construction period.
9	2.3.4.1	If the Facility is decommissioned, rehabilitation measures shall include treatment of any contaminated land, reinstatement of contouring and drainage controls, ripping of compacted areas and respreading. The evaporation pond site shall be allowed to dry, any contaminated sediment shall be removed off-site to landfill and the clay lining ripped to relieve compaction.

Number	EIS Section	Commitment
10	2.3.4.1	Site rehabilitation shall be facilitated by the installation of measures to prevent land contamination from accidental spills during construction and operation e.g. installing adequate bunds, sumps and drainage systems.
11	2.3.4.1	Throughout the operational period of the project, the integrity of the bunds, drains, ponds and other possible sources of contamination shall be routinely monitored and any spills or contamination identified shall be immediately cleaned up or remediated.
12	2.3.4.1	The philosophy of the Facility shall be to eliminate, reduce, reuse, recycle, treat and dispose of waste generated by the Facility.
13	2.3.4.1	The design philosophy for the Facility is for nil off-site effluent discharges.
14	2.9.1	On-site fire fighting facilities shall be provided consistent with normal practice for such facilities. Fire fighting equipment shall be fitted out in such a manner that the Plant operators are able to fight fires and rapidly provide cooling water to 'at risk' equipment.
15	2.9.1	The fire water system, except for the prill store, shall be designed and built in compliance with the relevant Australian Design Standard, regulatory requirements, and building codes to ensure that fire water flows are adequate to ensure the safety of personnel and Plant.
16	2.9.1	Firewater monitors shall be installed for the ammonium nitrate prill store to ensure that firewater can penetrate into the storage piles. The installation shall comply with relevant Australian Standards, regulatory requirements and building codes.
17	3.3.3	There will be no reticulation of water off-site.
18	3.3.4.2	Site drainage systems shall keep stormwater separate from water contaminated by plant operations and/or process effluent.
19	3.3.4.2	Diversion drains shall be established around the perimeter of the Facility site to ensure that rainfall run-off shall not drain onto the Facility site from adjacent areas.
20	3.3.4.2	Process areas within the complex shall be sealed and kerbed, where required, to ensure containment of possible contaminants.
21	3.3.4.2	Sumps and drains shall be periodically cleaned of debris and blockages.
22	3.4.3	Maintenance and domestic rubbish, which shall include drink cans, scrap metal, damaged gaskets, packaging materials, oils and cleaning cloths, shall be collected in appropriate bins and, wherever practicable, be sent for recycling or reuse.
23	3.4.3	A Chemical Drum Return Area shall be designated, bunded and signed accordingly.
24	3.4.3	Chemical waste shall be appropriately labelled and sealed before being transported off-site and disposed of by a licensed waste treatment and disposal company. Transport shall be in compliance with the *Australian Code for Transport of Dangerous Goods by Road and Rail*.
25	3.5.1	The construction contractor shall set up temporary ablution facilities on-site for the construction phase of work.
26	3.4.2	The Proponent will ensure that construction contractor sets up appropriate recycling areas and liases with council on the methods and disposal.
27	3.5.1	Liquid wastes arising from chemical cleaning of plant and equipment during construction shall be collected and disposed of off-site to an approved trade waste facility located in Roma.

Number	EIS Section	Commitment
28	3.5.2	Regulated wastes generated during operation of the Facility such as detergents and grease from vehicle and equipment washdown facilities shall be properly collected and disposed of off-site to an approved regulated waste facility (e.g. Roma Town).
29	3.5.2	Waste material and oil and grease (Regulated Wastes) collected in the filters and/or sumps shall be disposed of, by a licensed treatment and disposal company, in accordance with the requirements of the Environmental Protection Agency.
30	3.5.2	All sewage shall be treated on-site in either a septic tank/ percolation trench system or an approved 'Package Septic Treatment Plant System', as agreed with Bendemere Shire.
31	3.5.2	Concrete mats will be used to protect bund walls at inlet and discharge pipes.
32	3.5.2	Evaporation pond bund walls shall be keyed into surrounding clay soils to prevent lateral seepage.
33	3.6.1	Transport routes and times for heavy and/or oversized equipment shall be arranged in consultation with Queensland Transport, Department of Main Roads, power companies and Local Shires.
34	3.9.1	The Facility will be designed to be independent from the public power grid.
35	4.2.1.1	The use of buses and mini buses shall be encouraged to reduce traffic on the Warrego Highway and parking congestion on the site (during construction).
36	4.2.1.2	The cartage of any "dangerous goods" shall be in accordance with the requirements of the *Carriage of Dangerous Goods by Road Act 1984 (Queensland).*
37	4.4.1	The Proponent will liaise with Queensland Transport and the Port of Gladstone or Brisbane Authorities to determine the most appropriate transport outcome.
38	5.3.1	The Proponent is committed to using as much local content as practicable during construction and will comply with the Queensland Government *Local Industry Policy.*
39	5.3.2	The Proponent will be seeking to maximise the employment of local people, with or without prior experience in the operation of plant equipment and machinery, for the operational phase of the project.
40	5.3.4	The Proponent will liaise with local Training Services officers, the Southern Queensland Institute of TAFE, Roma College, the Golden West Group Training Scheme Inc. (the Local Group Training Scheme located in Roma) and the appropriate Government Department handling employment to facilitate access to current training opportunities and initiatives in the Roma area.
41	5.4.1	During the recruitment of construction workers, the accommodation situation will be monitored and, in the event of a shortage of accommodation becoming apparent, temporary accommodation (portable huts and ablution facilities) will be provided in a suitable, council approved location. Contingency plans shall be drawn up to cover this event.
42	6.1.3.7	The Proponent will ensure that through siting of the Facility and incorporation of safety features the 50 in one million risk contour is confined within the site boundary.
43	6.1.5	The final layout will incorporate the findings of the Preliminary Risk Assessment and feedback from Advisory Agencies to ensure the optimum layout being taken through to the design stage.

Number	EIS Section	Commitment
44	6.1.6	The Proponent acknowledges it's obligations under various Standards and Codes of Practices and will ensure that the safety standards of the Facility conform to the requirements of the compliance standards and to the principals of best practice.
45	6.2	Safety will be ensured by using proven technologies and designing the Facility in accordance with best practice and the applicable Australian and International codes and standards.
46	6.2	The integrity of the equipment will be assured by such measures as specialised construction specifications for the equipment, quality control, testing and inspection (e.g. components, welds) during construction, specialised specifications for materials, gaskets, seals, valves and other critical components (e.g. measuring nozzles) and equipment.
47	6.2	The ignition risk by hot surfaces will be avoided by means of insulation, if necessary, in accordance with relevant American Petroleum Institute standards, in the absence of suitable Australian Standards.
48	6.2	Segregation of incompatible products and ingredients will be in conformance with the *Dangerous Goods Act, 2001 (Queensland)*.
49	6.2	Any off-specification materials will be reworked or recycled into first grade materials, or sold as fertiliser in the case of off-specification ammonium nitrate. Rework of off-specification materials will be controlled through a Quality Assurance System.
50	6.2.1	The Facility layout will be designed to avoid areas where coal seam methane or natural gas are able to accumulate and areas of congestion in and between process units.
51	6.2.1.3	The potential for a release of a toxic substance will be minimised by quality plant design in accordance with Australian and International codes and standards.
52	6.2.1.4	Storage facilities will conform with Australian Standard AS 4326 – 1995 (Storage and Handling of Oxidising Agents).
53	6.3	The Draft Emergency Response Plan shall be finalised in consultation with the relevant emergency service authorities including the Queensland Department of Emergency Services.
54	6.3	An Off-site Plan and comprehensive emergency procedures shall be developed, in consultation with the Department of Emergency Services, for the site and shall be incorporated into the Emergency Response Plan for the site.
55	6.4	The Proponent shall ensure that the design, construction, commissioning and operation of the proposed Facility conforms with the relevant Compliance Standards under the *Workplace Health and Safety Act 1995 and Regulations 1997 (Queensland).*
56	6.4	The Proponent acknowledges its Workplace Health and Safety obligations under the *Workplace Health and Safety Act and Regulations 1995 (Queensland)* and shall ensure that the safety standards of the Facility conform with the requirements of the Compliance Standards.
57	6.4	The Proponent shall not expose personnel to any workplace health and safety risk prohibited by a Compliance Standard.
58	6.4	The Proponent shall consult with the Division of Workplace Health and Safety to ensure that the Site Specific Safety Plan complies with all aspects of the *Workplace Health and Safety Act 1995 and Regulations 1997 (Queensland).*

Number	EIS Section	Commitment
59	6.4	Specialised training of all personnel concerned with both commissioning and normal plant operations activities shall be carried out on a regular basis to ensure that they are fully conversant with emergency procedures, control of process hazards, environmental protection and personal and general safety
60	6.4.1	The design and equipment selection phases of the project shall ensure that all machinery used on the site conforms to the requirements of the Noise Compliance Standard, under the *Workplace Health and Safety Act 1995 (Queensland).*
61	6.4.1	A noise survey shall be conducted to verify that actual workplace noise conditions are consistent with design concepts and specified standards. Regular noise monitoring of the workplace shall be undertaken to ensure acceptable noise related environmental conditions are maintained.
62	6.4.2	Dust levels will be controlled through dust prevention and suppression measures or ducted exhaust systems to remove dust caused by mechanical handling of the solid product.
63	6.4.2	Dust/vapour monitoring shall be carried out in high-risk areas or as required to ensure personnel health.
64	6.4.4.1	The Proponent is committed to preventing the breeding of mosquitoes on-site.
65	6.4.4.1	A Mosquito Management Plan will be formulated in consultation with Queensland Health and Bendemere Shire Council.
66	6.4.4.1	Approved insecticides and application procedures shall be in accordance with the requirements of Queensland Health and the Bendemere Shire Council's Health Department.
67	7.4.2	The proposed development will provide for the appropriate and environmentally sound utilisation of resources required to manufacture product outputs as detailed in Section 2.3.1.
68	7.5.1.4	The Proponent will continue to liaise with DPI, EPA and Bendemere Shire Council during design to ensure that the Facility does not produce any adverse impacts on the environment as a result of soil characteristics.
69	7.5.2.3	The proposed development will comply with the setback requirement stated in Section 5.5 of the Planning Scheme, and will comply with relevant requirements relating to landscaping and site fencing, and provision of parking.
70	8.2.4.1	There would be no effluent discharged from the site into surface waters. Only clean stormwater run-off, from greater than 1:50 rainfall events, would be permitted to leave the site.
71	8.2.4.1	Monitoring of the evaporation pond walls would be undertaken to detect any potential failure of the pond walls so that preventative maintenance may be carried out to maintain the pond wall integrity.
72	8.2.5.6	A suitable equipment and building design will be adopted to meet the noise criteria at nearest residents of: • background + 5 dB(A) 0700 to 2200 hours • background + 3 dB(A) 2200 to 0700 hours
73	8.2.6	The Proponent would ensure commercial waste collection and treatment companies used for the disposal of waste material from the Facility comply with all relevant state and local regulations and industry standards.

Number	EIS Section	Commitment
74	8.2.6	Solid waste shall not be disposed of on-site during the construction or operation phase of the project.
75	8.2.8	Throughout the operational period of the project, the integrity of bunds, drains, ponds, and other possible sources of contamination would be routinely monitored and any spills or contamination identified and immediately cleaned up or remediated
76	8.2.10	All site personnel would be regularly trained in the use of fire prevention and fire fighting equipment, and regular emergency exercises shall be carried out to maintain a high level of preparedness.
77	8.2.10	Fire breaks will be maintained around the Facility boundary and vegetation fuel will be kept to a minimum within the boundary. An adequate fire water system shall be installed to ensure the safety of personnel and plant.
78	8.3	The Proponent will encourage the prime construction contractor to recruit locally where possible.
79	8.3.3	The Proponent will be carrying out construction and operational activities in such a way as to meet the requirements of the *Workplace Health and Safety Act 1995 and Regulations*.
80	8.3.3	The proposed Facility shall have trained first aid people on its staff and a fully equipped first aid room to assist with on-site medical emergencies.
81	8.3.6	The Proponent will liaise with local Fire Brigade, SES, Bendemere Shire Council and Roma Town Council in developing Emergency Plans for the Facility.
82	9.5.1	To ensure that all community issues are addressed during the environmental impact assessment process, the Proponent will contact local associations and interested parties. Contact shall be maintained by phone calls, letters and meetings as required.
83	11.1	Full details for the EM Plan will be prepared, in consultation with the EPA, as early as possible after management approval to proceed with the project has been given, and as project design progresses into detailed design.
84	11.2	The Proponent is committed to achieving the highest performance in occupational health and safety with the aim of creating and maintaining a safe and healthy work environment.
85	12.1	A dedicated gas pipeline from the Comet Ridge coal seam methane production area to the Facility will be subject to a separate EIS.
86	12.2	It is anticipated that the water pipeline would share the proposed dedicated gas pipeline corridor (refer Section 12.1). In this instance the dedicated water and gas pipelines from the Comet Ridge coal seam methane production area to the Facility will be covered under a joint corridor EIS, but separate to this EIS.