Yarraman Abattoir and Feedlot

SSD Application Supporting Document

FJT Australia Pty Ltd

9 May 2016

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KMH ENVIRONMENTAL

Yarraman Abattoir & Feedlot

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Prepared for:
FJT Australia Pty Ltd

Prepared by:
KMH Environmental
Level 1
81 Hunter Street
Newcastle NSW 2300

Phone: (02) 4910 3600
Fax: (02) 8008 1600

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1. Introduction

This Supporting Document has been prepared by KMH Environmental Pty Ltd (KMH) to accompany a State Significant Development (SSD) application by FJT Australia Pty Ltd (FJT), for the proposed Yarraman Abattoir and Feedlot near Wybong in the Upper Hunter Valley, NSW (referred to hereafter as the "Project"). The Project includes construction of a modern abattoir and feedlot using current world's best practice systems in construction, equipment, animal handling and environmental considerations.

The Project occurs on two separate properties. The proposed abattoir is located at a property known as "Hollydene", on the northern side of the Golden Highway approximately 8km northwest of Denman, in the Upper Hunter Valley region of NSW. The proposed feedlot is located on a nearby property known as "Yarraman Estate", in Wybong.

The abattoir would seek accreditation as an Export Abattoir with (in particular) accreditation to sell product to China as well as other foreign markets. Product would also be sold domestically.

It is proposed that the abattoir would be dual species, processing both cattle and sheep. Target baseline throughput (after a trial period to test system efficiency and reliability) would be as follows:

- Cattle: 1000 per day over two 7.5-8 hour shifts, 6 days per week
- Sheep: 1400 sheep per day over two 7.5-8 hour shifts, 6 days per week.

The ultimate goal would be to process approximately 500,000 head of cattle and 1,000,000 head of sheep per year, subject to supply of livestock and demand for meat products.

The proposed feedlot would be for beef cattle targeted at a 25,000 head capacity with an annual throughput of around 100,000 head.

Although they would be operated on separate properties the proposed abattoir and feedlot represent vertically integrated businesses that are operationally dependent on each other. The feedlot is intended to provide a secure source of livestock to the abattoir. The two enterprises are closely located which will bring significant operational efficiencies in relation to livestock transport. Due to their inter-dependence it is desirable to seek approval of the abattoir and feedlot as a single development application.

Based on the nature and scale of the proposal it is clear that the Project meets the definition of State Significant Development (SSD) and would be subject to determination by the NSW Department of Planning and Environment (DP&E). An Environmental Impact Statement (EIS) will be required to support a future application for SSD.

This Supporting Document describes the Project and has been prepared to accompany a SSD application and inform the preparation of Secretary's Environmental Assessment Requirements (SEARs) for the EIS that will be required for the Project.

1.1. Project Applicant

The applicant for the proposed Yarraman Abattoir and Feedlot is FJT Australia Pty Ltd.

1.2. Project Need and Justification

The Australian red meat industry is presently experiencing unprecedented demand for its products driven by export demand. The deserved "clean and green" reputation of Australian red meat protein will ensure that demand remains very strong in the long term as our "natural market" of Asia experiences an increase in living standards and purchasing power. The red meat industry in particular

and agribusiness in general must be one of the economic drivers for future Australian prosperity given the declining prospects of mining exports as a source of national income.

The Hunter Region where the facilities will operate from is in need of more diversity in terms of economic activity and most particularly employment opportunity given the mature phase that the coal mining industry is now in. The project has the potential to provide at least 600 full time equivalent jobs all for the long term and the majority of which it is hoped can be filled by local people.

The meat processing industry in Australia is also experiencing market concentration through extensive merger & acquisition activities by multi-national corporations in recent times. The addition of a facility such as the Yarraman Feedlot and abattoir will provide a much needed service outlet for producers in the region and elsewhere that has now been denied them by the recent acquisition of the former Primo abattoir at Scone by industry giant JBS of Brazil.

From a business case and logistical viewpoint the Yarraman Feedlot and Abattoir also makes excellent sense. Being closely located to mining company buffer zones means virtually non-existent impact on local residents, roads are either suitable already for large truck movements or can be upgraded where necessary, there is ample industrial power and water available locally and transportation to the nearest port facility Newcastle is less than 140 km away.

The Project is ideally located close to traditionally strong animal populations, has excellent infrastructure with the Hunter Expressway and rail to Newcastle port for an export focussed business. The Project will provide an enormous boost in economic activity in the Muswellbrook Shire and Upper Hunter Region. Much of the money generated will remain “local” and will inject significant economic development to the local region. The project will provide extra employment and training possibilities for the area.

The Project will be a modern facility with a high emphasis on environmental sustainability and sustainable business practices.

1.3. Outline of this Supporting Document

This Supporting Document has been prepared to provide information about the project, to assist in formulating the SEARs. It provides:

- a description of the Site and locality (Section 2)
- a description of the proposed Project (Section 3);
- an overview of the relevant planning legislation and approvals process (Section 4); and
- a preliminary environmental assessment (Section 5) summarising the existing conditions, potential impacts and proposed EIS assessment methodology, for a range of environmental aspects.

2. The Site

2.1. Strategic Location

The Project is strategically located in the heart of the Upper Hunter Valley within the Muswellbrook Local Government Area, with good road access from prime agricultural regions including major grain, feed cropping, and livestock production areas within a 200 km radius to the west and north. The Project is only a short distance from the well serviced and thriving rural township of Denman via the Golden Highway. The larger industrial town of Muswellbrook is approximately 35km to the east, and provides access to larger equipment/material supply outlets, specialised trades and labour hire, and professional engineering, design and support services. **Figure 1** describes the regional context of the Project, indicating the relative location of the two subject properties, nearby towns, major coal mines and other features

The Port of Newcastle is approximately 140km southeast of the Project area and provides shipping container facilities giving excellent access to export markets. The major domestic markets around Sydney are just a short distance further by road or rail. Road access to Newcastle Port and Sydney is via major arterial roads and highways, including the Golden Highway, New England highway, recently completed Hunter Expressway and M1 Pacific Motorway.

The abattoir site is located on the northern side of the Golden Highway at Hollydeen, approximately 10 km by road to the northwest of Denman in the NSW Hunter Valley. The feedlot site is located at Wybong, approximately 8 km north of the Golden Highway and less than 20 km by road from the proposed abattoir (refer **Figure 2**). The two properties are ideally co-located within the Wybong valley.

The Project occurs close to the substantial coal mining operations of Glencore Mangoola Coal, a factor that was prominent in the selection of these sites. The development sites occur within or close to the voluntary acquisition buffers around the Glencore Mangoola Coal operations. Glencore has acquired many of the neighbouring rural properties. This is a significant benefit for the Project as Glencore's consolidation of the much of the surrounding rural properties has removed most of the potentially sensitive rural residential receivers. The Project is expected to be completely compatible with the adjoining mining use.

2.2. Property Details and Ownership

2.2.1. Abattoir Site

The abattoir site occurs on a property known as "Hollydene" and comprises Lots 5, 6, 7 and 8 in DP 1160936. The Hollydene property has a combined land area of approximately 250 hectares and is currently owned by United Pastoral which fully supports the proposed development.

Figure 3 provides a site plan of the abattoir property indicating the approximate position of the proposed abattoir and access road, and approximate locations of the nearest potentially sensitive receivers (pins denoted "R"). The abattoir would be accessed via the Golden Highway at an existing access point, then via a new internal road.

In relation to the abattoir site it is noted that a State Significant Development application (SSD 6519) was recently submitted for a quarry on adjoining Lot 2 in DP1160936 – known as the proposed "Dolwendee Quarry". The proposed Dolwendee Quarry is located on a property known as "Dolwendee" comprising Lots 1-4 in DP1160936. The Hollydene and Dolwendee properties have some common ownership and have been effectively managed as a single landholding for many years. A suitable legal agreement would be implemented between the respective property owners in relation

to any required property access arrangements and to secure support between the closely located proposed abattoir and quarry projects.

2.2.2. Feedlot Site

The feedlot site occurs on the property known as "Yarraman Estate" at Wybong. The property has a combined area of approximately 375 hectares (ha) (refer **Figure 4**) and is owned by the applicant, FJT Australia.

It is noted that the Yarraman property contains an existing winery and vineyards and it is intended to continue winery operations in accordance with existing approvals. The winery and related activities occupy the eastern part of the property, and the proposed feedlot would occupy the western part of the property as indicated in **Figure 4**.

Property details and land ownership for each of the estates is provided in **Table 1**.

Table 1 Property Details

Property	Lots	Ownership
Hollydene	Lots 5, 6, 7 8 in DP 1160936	United Pastoral
Yarraman Estate	Lots 9, 17, 34, 55, 57, 58, 65, 74, 75, 100, 101, 102, and 112 in DP 750969; Lot 1 in DP 342371; and Lot 891 in DP 590976	FJT Australia Pty Limited

The feedlot site is accessed via the main Wybong Road, which provides direct access to the Golden Highway to the west and the New England Highway and the town of Muswellbrook to the East. This main road also services Glencore, Rio Tinto and BHP coal mining operations in the area.

2.3. Project Area

The Project Area is yet to be defined in detail but will include all lands required for the abattoir and feedlot, including the main infrastructure, access roads, pends, yards, waste management areas and ancillary facilities.

At the abattoir site this is expected to comprise Lots 5, 6 7 and 8 in DP 1160936, with a total area of approximately 250 hectares. While a relatively small area would be required for the main abattoir buildings and infrastructure, additional area would be utilised for related activities such as waste management (composting) and irrigation area of treated wastewater.

The feedlot site area for the purposes of the SSD application is likely to comprise the majority of the Yarraman property including Lots 9, 17, 34, 55, 57, 58, 65, 74, 100 and 112 in DP 750969; Lot 1 in DP 34271, and Lot 891 in DP 590976. The main feedlotting activities would be at the northern part of the property focused primarily on Lots 34, 55, 57 and 100. Several additional allotments on Yarraman are zoned E3 Environmental Management and would not be used for feedlotting related activities.

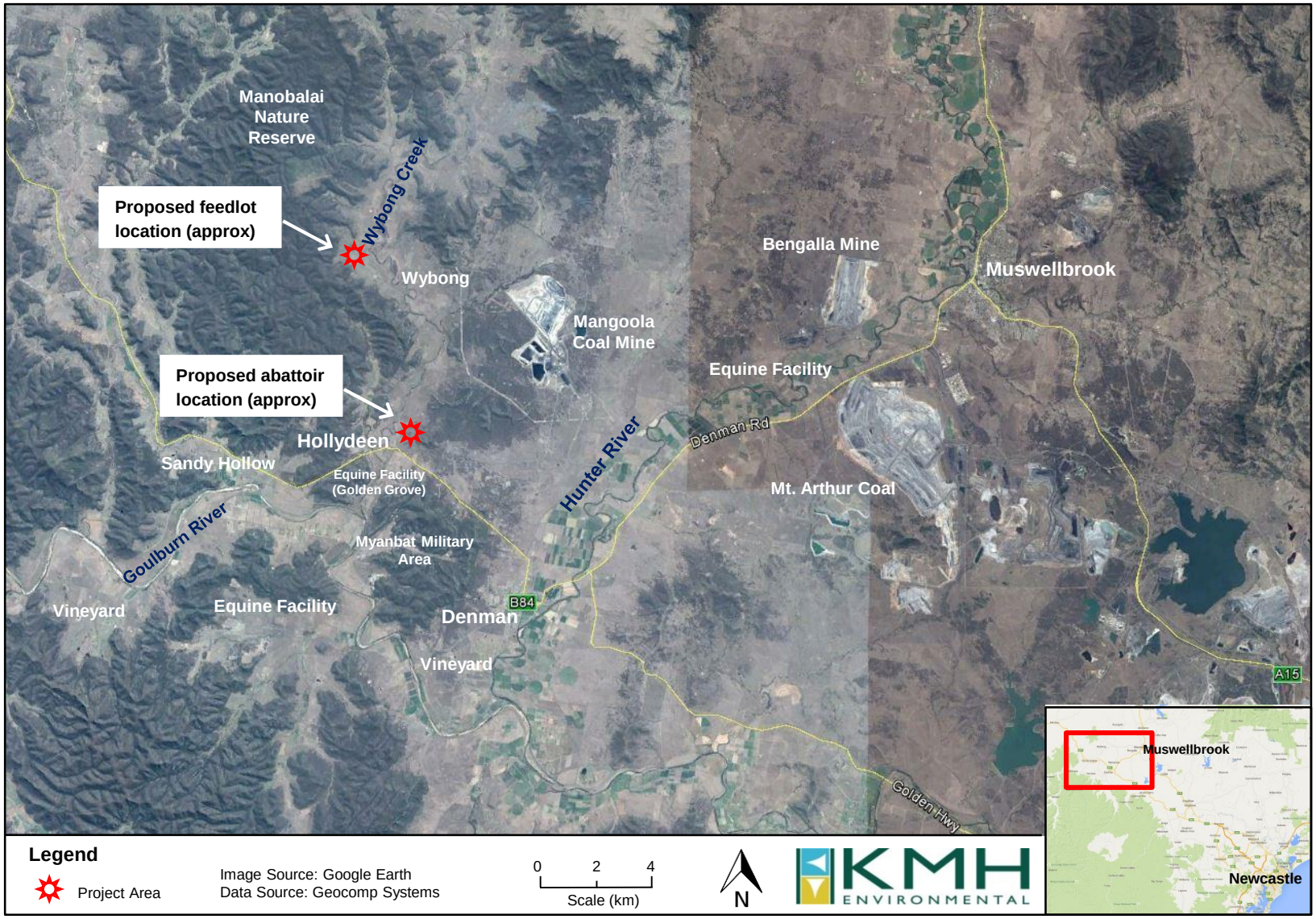
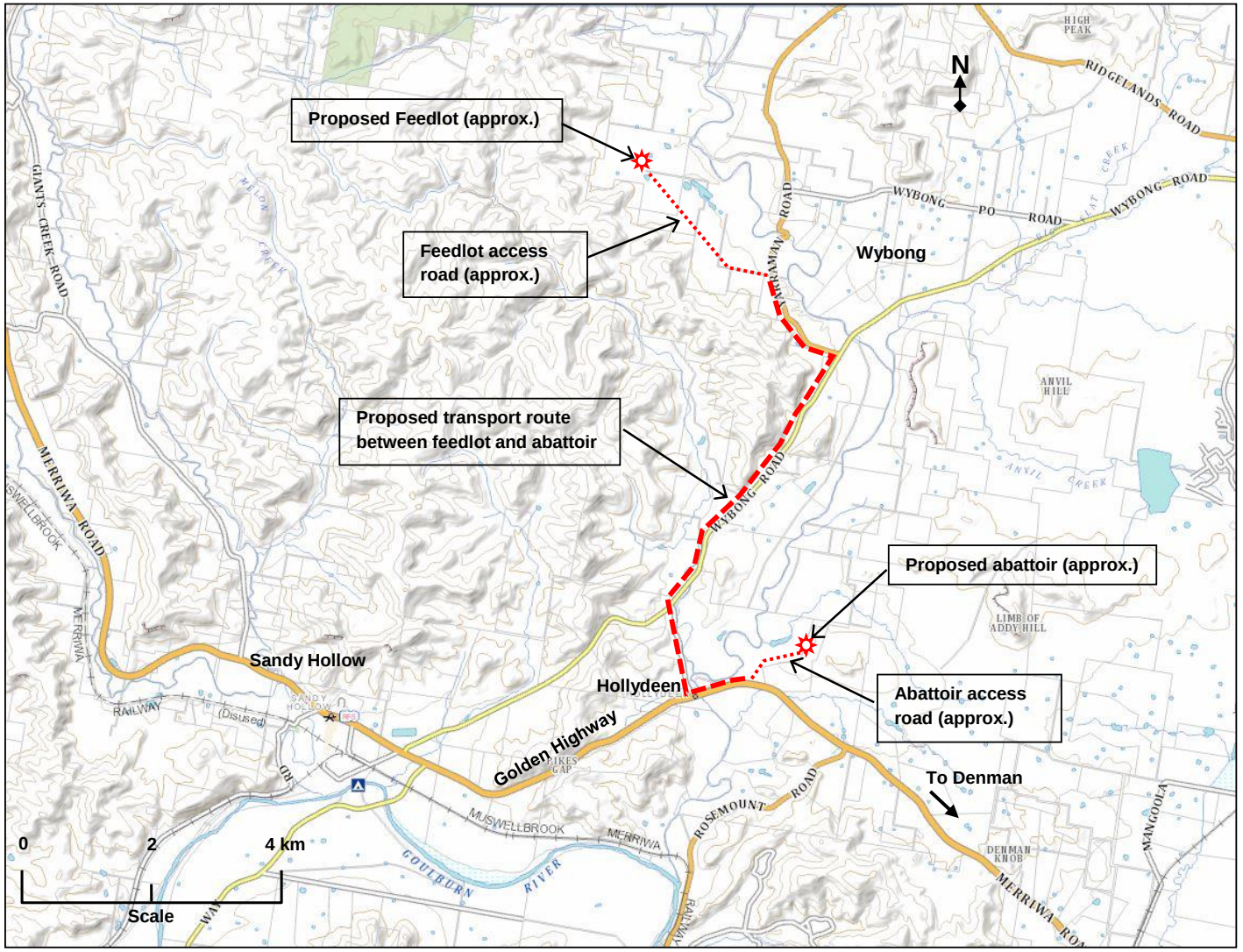
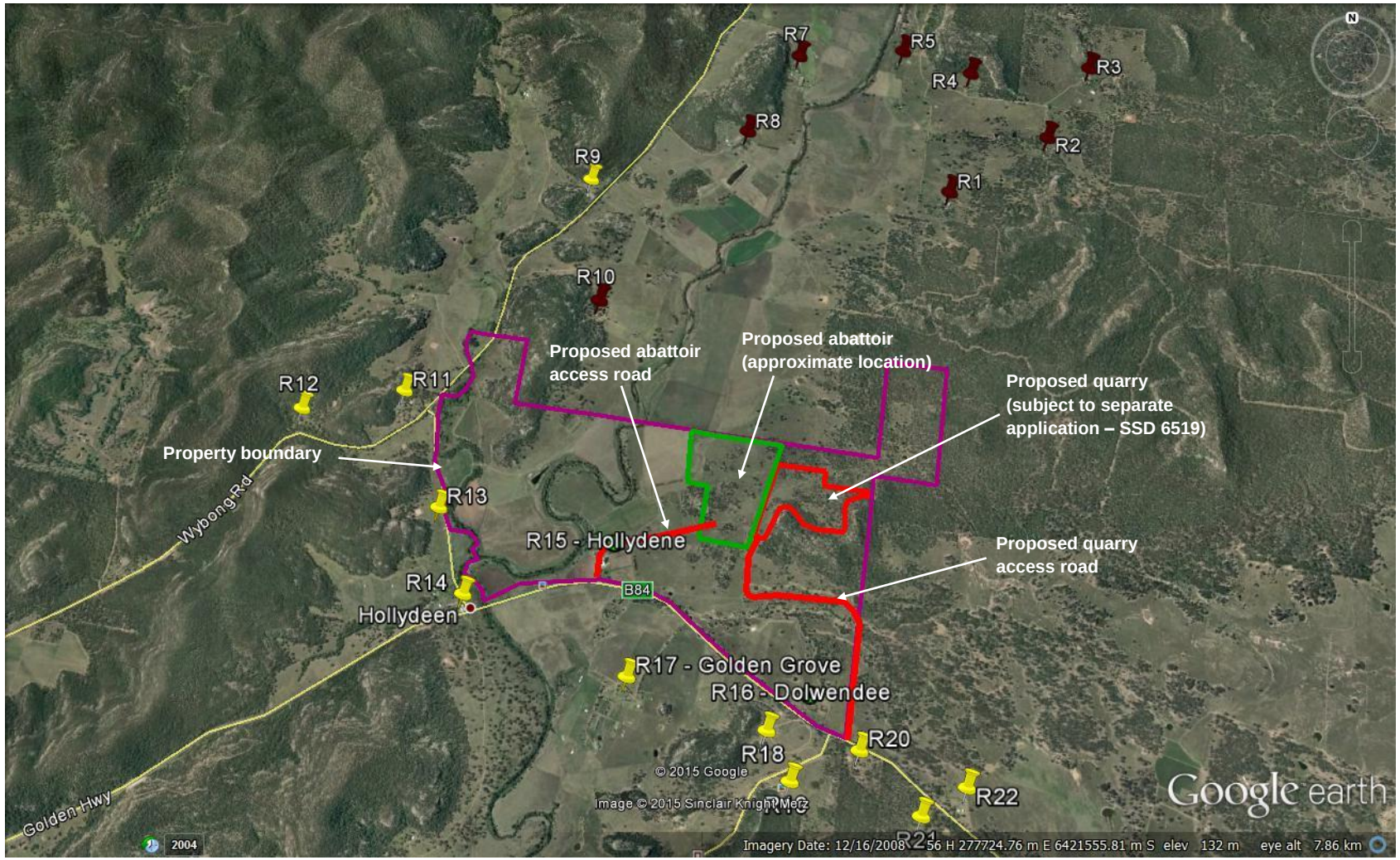


Figure 1 **Regional Context**



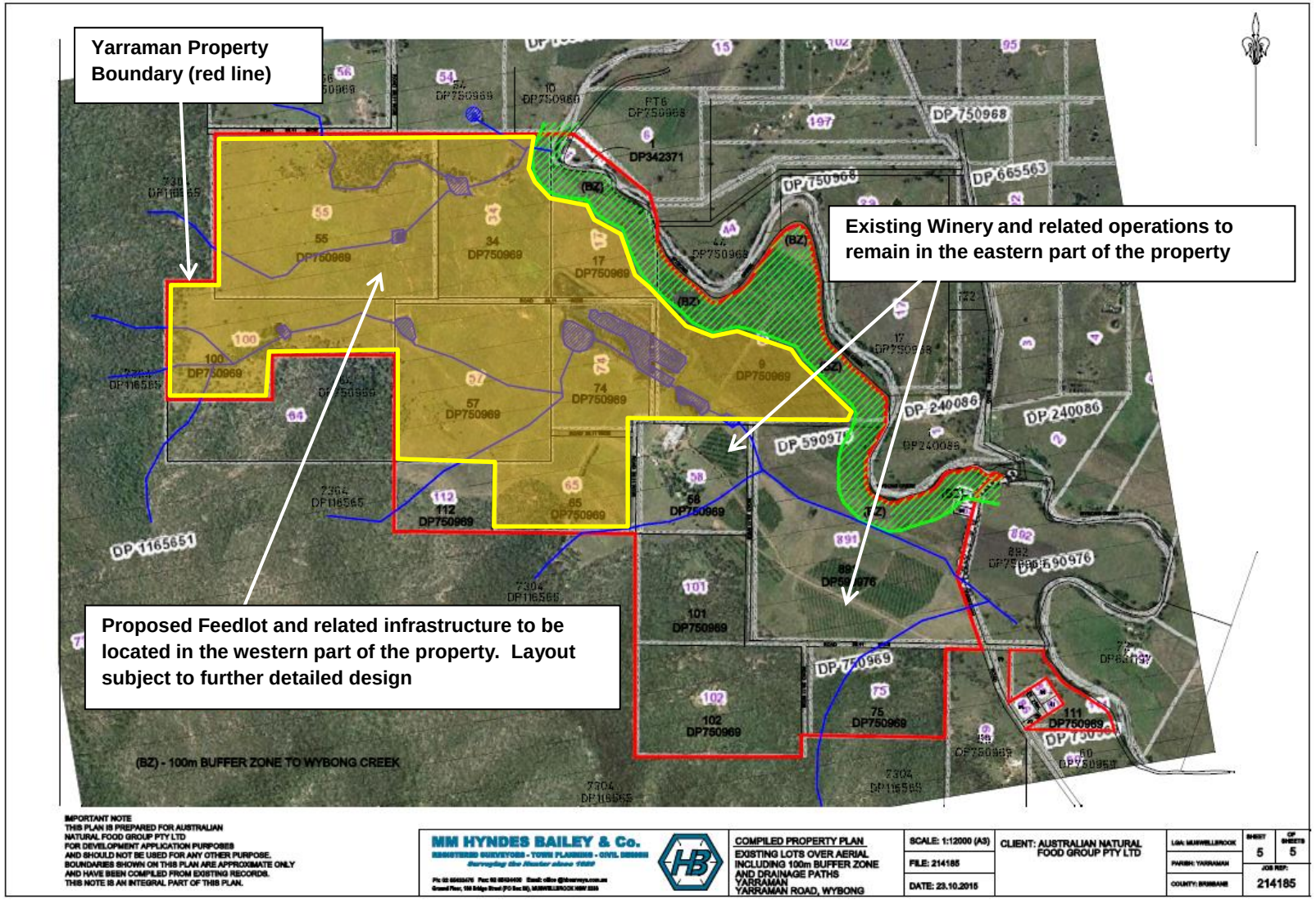
Source: SIX Maps

Figure 2 Locality Map Showing Relationship Between Proposed Facilities



Source: Google Earth

Figure 3 Abattoir Site Plan



Source: Hyndes Bailey

Figure 4 Feedlot Site Plan

2.4. Local Government Area and Zoning

The proposed Project occurs within the Muswellbrook Local Government Area. The Project Area is zoned *Primary Production* (RU1 zone) under the *Muswellbrook Local Environmental Plan 2009* (Muswellbrook LEP) for all of the land area at the abattoir and feedlot sites that would be developed as part of the Project.

Several Lots at Yarraman Estate are zoned as E3 Environmental Management including Lots 75, 101, 102 and 112. These Lots would not be included in any proposed feedlot configuration.

2.5. Environmental Setting

2.5.1. Abattoir Site

The abattoir site comprises mainly cleared agricultural lands comprising a mix of fertile alluvial flats adjacent Wybong Creek and poorer agricultural lands on the adjacent hillslopes and rocky ridges. The property is currently used for cropping and hay production on the more fertile lands as well as beef production. Historically the property has contained extensive vineyards for wine grape production though most have been removed in recent times.

The local topography of the abattoir site is charactered by gentle rises and slopes, though is dominated by a prominent horseshoe-shaped hill and sandstone ridgeline southeast of the proposed abattoir. The proposed abattoir is located on gentle sideslopes. The landscape is relatively stable with only minor localised areas of sheet erosion evident.

The property drains to Wybong Creek (a tributary of Goulburn River) which is located approximately 700 m west of the proposed abattoir. An intermittent watercourse known as Lynch's Gully occurs in the southern part of the property and drains westwards to Wybong Creek. Lynch's Gully displays some gully erosion and has been the subject of soil conservation works in the past.

A report on the agricultural capability of the land was recently prepared by consulting agronomist Ross Watson. This indicates that the property contains Class 2 agricultural land along the alluvial flats adjacent Wybong Creek, and Class 3, 4 and 5 lands elsewhere. The main abattoir buildings and operational areas would be located on Class 4 land with poor agricultural capability. Productive agricultural areas would not be developed or sterilized from agricultural production by the proposed abattoir, however may continue to be used for agricultural production including through effluent irrigation of suitable crops.

2.5.2. Feedlot Site

The feedlot site comprises cleared agricultural lands with a mix of fertile alluvial flats adjacent Wybong Creek and adjacent gently sloping sideslopes on less fertile residual/colluvial soils. The property is on the footslopes of a prominent, forested mountain range to the west, which is part of Manobalai Nature Reserve. The property has been (and is currently) used for wine grape growing and grazing of mainly unimproved pastures.

The alluvial plains and footslopes are flat to gently sloping with gradients typically less than 2%. The sideslopes and footslopes have gradients typically up to 5%,. Gradients exceeding 25% occur in the forested mountains to the west, but these areas would not be utilised for the feedlot.

Rainfall runoff generated from the mountains to the west, drains in an easterly direction through the property via a number of minor first order watercourses and contour drains, thence to Wybong Creek which forms the property's eastern boundary. This landscape is likely to be affected by significant stormwater run-on during heavy or protracted rain events, and new drainage diversions may be required to divert this around the feedlot.

2.6. Surrounding Land Use and Residential Receivers

2.6.1. Abattoir Site

The abattoir site is surrounded by other cleared rural properties to the south and west. Otherwise it is surrounded by the Glencore-operated Mangoola Coal Mine site to the north and east including rural properties purchased as buffer lands by the mine.

The proposed abattoir is well separated from neighbouring rural residences and provides good buffer distances in excess of 1.5 km from all receivers that could be potentially affected by noise or odour impacts. There are a number of rural residential properties and associated residences to the south of Hollydeen on the southern side of the Golden Highway, the closest being approximately 1.5 km from the proposed abattoir.

There are a small number of rural residences approximately 2 km to the west of the proposed abattoir in the vicinity of the Hollydeen shop, on the corner of Reedy Creek Road and Golden Highway. A number of more distant residences occur to the north of the proposed abattoir, further up the Wybong Valley. Virtually all of the rural residential properties in the vicinity of the Project to the north and east have been acquired Glencore Mangoola Coal Mine as buffer lands and biodiversity conservation areas for their coal mining operations.

2.6.2. Feedlot Site

The feedlot site is surrounded by the Manobalai Nature Reserve in the west, associated lands of the Wybong Estate and other rural landholdings to the north, east and south. The majority of the surrounding rural lands have been purchased by the Glencore-operated Mangoola Coal Mine site as buffer lands from their mining operations.

The nearest neighbouring residence is approximately 1km to the east of the preferred feedlot location, with a number of additional residences greater than 1.5km to the east along Wybong Post Office Road. Topography may obscure views of the feedlot from some of these residences. To the north and northeast further up the Wybong Valley are a number of additional residences, the closest approximately 1km away and the others greater than 2km away. These residences are likely to have distant views of the proposed feedlot.

Buffer distances from neighbouring rural residences will depend on the final layout of the proposed feedlot. The layout would be designed, where possible, to maximise buffers to sensitive receivers to reduce amenity impacts.

3. Project Description

3.1. Project Overview

The Project entails construction of a modern, medium sized abattoir and feedlot using current world's best practice systems in construction, equipment, animal handling and environmental considerations whilst still being pragmatic regarding overall project expense. The abattoir and feedlot would be interdependent in that cattle from the feedlot would be transported to the abattoir for processing. Both facilities would meet or exceed regulatory standards and requirements.

The abattoir would comprise supplementary processing facilities including a rendering plant to maximise the efficient processing of all animal materials into value added products. It would be fully accredited as an Export Abattoir with (in particular) accreditation to sell product to China as well as other foreign markets. Product would also be sold domestically.

The feedlot would be based on industry best practice and comply with the industry's quality assurance system, the National Feedlot Accreditation Scheme (NFAS). Under this scheme accredited feedlots are required to adhere to the *National Beef Cattle Feedlot Environmental Code of Practice* (the Code of Practice) published by Meat & Livestock Australia (MLA) in 2000, along with all other relevant environmental, animal welfare and food safety legislation.

Lot feeding is viewed in Australian as an activity of some environmental significance. The site has been selected with this in mind. Due to its many favourable features it is believed that environmental issues can be effectively managed to prevent harm to the environment and neighbouring communities.

3.2. Relationship Between Abattoir and Feedlot

In conducting an exhaustive feasibility analysis for the Project, the applicant has formed the view based on factors related to business case, animal welfare and quality of product, that the two projects are inextricably linked and are impaired if viewed or assessed as separate or stand-alone projects/agribusinesses.

A description of the most relevant points (not necessarily in order of importance) which have produced this conclusion are as follows.

3.2.1. Market factors

The Australian red meat industry is currently in what will prove to be a sustained period of high demand (especially Export Demand) and above historical financial returns for industry participants including producers (graziers and feed lotters) and processors alike.

This high and continuing demand combined with the effects of long term drought in livestock production areas across much of Australia, (which has resulted in record turn-off of stock) has resulted in a substantial reduction in both the national beef cattle and sheep herds.

Along with significant market concentration recently occurring (mergers & acquisitions by the large multi-national and national meat processors), a business model that is not fully vertically integrated (paddock-feedlot-abattoir-sales) cannot gain a foothold in the industry as it presently (and in the future) stands, hence the imperative to fully link the feedlot (as supplier of inputs) to the processing facility.

Operators who cannot source their own stock, feed them to specification and then process them in an integrated manner will simply be unable to access the quantity and quality of animals needed to create a viable long term business. Integration of the two aspects of the Project help achieve security of supply.

3.2.2. Operational efficiency

There are numerous synergies and efficiencies created by fully linking these two aspects of the industry supply chain. Key factors are animal welfare and product safety which lead to better quality for consumers through complete and integrated traceability. Animal welfare is enhanced on two fronts.

Firstly the integration of the business means a much longer period where the animals are under single ownership and responsibility, creating a consistent monitoring environment for both product traceability and general animal health and welfare.

Secondly the closely co-located nature of the two facilities (feedlot & abattoir) greatly reduces animal stress compared with mostly long transportation distances experienced between similar facilities elsewhere in the country.

3.2.3. Environmental Benefits

There will also be an environmental dividend arising from fully linking the two business units. Greatly reduced transportation distances will result in less fuel consumption and greenhouse gas generation, less dust creation, vastly more efficient water and feed usage and a more contained (and captured and used as biofuel) methane gas output from processing animals at the abattoir.

3.2.4. Socio-economic Benefits

Job creation (up to 600 full time equivalent jobs) arising from this integrated project will provide significant economic stimulus for the Hunter Valley region which is experiencing large job losses as the mining industry responds to lower commodity prices.

The social aspects of being able to employ as many “locals” as possible who may have lost jobs in the mining rationalisation should also not be understated. Regional towns such as Muswellbrook, Denman and Singleton are highly dependent on local job opportunities to maintain and grow their local economies and maintain social cohesion. The Project would provide significant employment and economic development potential within the regional context.

3.2.5. Resource, Technology and Labour Sharing

Water Sharing

It has been strategically necessary to acquire the two closely located properties most particularly to obtain an aggregate amount of water access that meets the essential needs of both businesses.

By acquiring both properties there is now a sufficient and certain water supply (in excess of 1,000 ML. per annum Water Access Licenses) to operate both businesses. Water will be shared across the two businesses as demand requires ensuring efficient usage of this essential and finite asset.

Staffing

Staff sharing and staff rotation will also occur as there will be a number of positions that have common skill sets across both businesses. This process (staff sharing/rotation) will enhance the overall capability of the workforces in the respective integrated businesses.

Accommodation

Local accommodation needs will be a factor in creating the necessary workforce of approximately 600 positions across both businesses. Depending on the extent that the businesses can recruit locally (which will be a priority) the project proponents do have a contingency plan for the establishment of suitable worker accommodation which would cater for employees of both businesses where necessary. Such accommodation is not contemplated as being “on-site” and is likely to be in the Denman town precinct.

Technology

There is opportunity to utilise similar technology and systems design for the best treatment and re-use of any wastewater created in the two respective businesses, which potential for learnings and environmental improvements at one site to be applied across the other.

Various other technologies and systems are likely to be shared across the businesses. These would include areas such as animal health and development monitoring systems derived from microchip ID tags on all livestock, and potentially administration, maintenance and other services.

3.3. Source of Livestock

As already stated, a significant source of beef cattle for processing at the abattoir would come from the integrated feedlot. Beef cattle would also be sourced more broadly from throughout NSW or even elsewhere throughout Australia if the market dictates.

The livestock (sheep) required for the abattoir (400,000 per annum in early stages of operation and up to 1 million or greater at a later time) will come from NSW, principally from the Central West, Southern Highlands &Tablelands and the Riverina Regions.

NSW currently holds about 35% (26 million head) of the national sheep herd which is presently of the order of 73 million, a historically low figure. The decline in sheep numbers is attributed mainly to the large contraction in the wool industry (in 1991 NSW had 60 million sheep). Large scale long term drought in many areas of NSW is the other main contributor to the decline in numbers.

The proponents of the Yarraman Abattoir & Feedlot will be establishing relationships with sheep graziers in the above mentioned regions of NSW for the advance purchase via off-take agreements of all the necessary livestock to meet the initial and ongoing needs of the abattoir.

Considerable scope exists to increase the available pool of meat sheep available in NSW through such long term off-take agreements when one examines the current sheep population against historical numbers.

It is also likely that the proponents will enter into several intensive “feedlot style” short term fattening arrangements with suitable grazier partners located within 200 km of the abattoir site. This will promote throughput availability for the abattoir and be of mutual benefit to the grazier partners and the abattoir owners/operators.

3.4. Scale of Operations

It is proposed that the abattoir facility would be dual species, processing both cattle and sheep.

Initial target throughput (after a trial period to test system efficiency and reliability) would be as follows:

- Cattle: 1000 per day over two 7.5-8 hour shifts, 6 days per week (300,000 per annum);
- Sheep: 1400 sheep per day over two 7.5-8 hour shifts, 6 days per week (400,000 per annum).

The ultimate goal would be to process approximately 500,000 head of cattle per year and 1,000,000 head of sheep by scaling the abattoir to two ten-hour shifts during working hours. The supply of livestock and demand would determine whether these numbers are feasible into the future.

The proposed feedlot would be for beef cattle targeted at a 25,000 head capacity at any one time and with an annual throughput of around 100,000 head based on typical holdings times of approximately 90 days.

3.5. Abattoir Description

3.5.1. Process Overview

The Abattoir will be a fully accredited Export Licensed facility and will meet or exceed all standards of operation that are required by Government Regulators and suggested or mandated by Industry Associations. The abattoir will adopt the Halal slaughter method for both species (cattle and sheep) being processed at the facility as the halal method is the most humane and environmentally sound method of slaughter.

Animals for processing will be transported minimum distances to the facility for both operational efficiency reasons and most particularly to mitigate against stress for the incoming livestock. In the case of the cattle the transportation distance for a good percentage of the livestock processed will be less than 20 km from the closely co-located feedlot, and for sheep a somewhat longer but most acceptable distance of under 200 km.

All incoming livestock will be on site for 24 hours prior to processing and will be thoroughly checked for health, watered but not fed prior to processing and be in shaded yards.

The processing facility will operate using chilled carcasses (as opposed to hot boning) which increases both food safety and eating quality. The abattoir will adopt world's best practice in all operational areas and will look to innovate through in house R & D to drive improved methods wherever possible.

Full traceability of all products will be available through sophisticated data collection and analysis from all livestock creating an unbroken "paddock to plate" quality assurance program.

3.5.2. On site Rendering Plant

An on-site rendering plant is proposed and is a highly desirable add-on to the main abattoir business of meat and offal production. All parts of the animals must be processed or disposed of if no viable by-products can be created subsequent to the slaughtering process. Having a rendering plant onsite maximises the processing of materials into viable products and minimises waste generation and disposal.

The rendering plant will be closely located and connect directly with the main abattoir processing line and processing material from the abattoir will not see daylight at any stage. The process would likely be as follows:

1. The blood will be pumped directly from the collection point in the processing lines into the rendering plant blood holding tanks.
2. The other material (heads, feet, bones, fat etc.) will be placed in an air tight hopper and conveyed directly to the rending plant.

This 100% collection of non-edible by product means no "left over" animal material is introduced into the environment via landfill or any other method.

The full capture rendering process will provide environmental safeguards, sustainable uses and value adding products for the enterprise.

3.5.3. Management of Animal Hides

The only animal product that would be sent for offsite processing at the abattoir site are the hides. These would be mechanically "de-fleshed" to remove virtually all the meat and fat, reducing the likelihood of spoiling and therefore eliminating the need to salt the hides before transport offsite.

The hides would also be hung and chilled for storage awaiting collection by the processor. It is estimated there would be one pickup daily of 1,000 to 1,500 hides per day. Transport would be via crates that are fumigated and returned for reuse.

3.5.4. Wastewater Management

All wastewater produced in the above process (processing line to rendering plant) will be pre-treated at source to maximise solids capture, prior to being fed into a suitably designed wastewater treatment plant. It is planned to incorporate covered anaerobic digestors to enable capture of all methane produced, for use as a power source most particularly in the boiling processes of the rendering plant.

Wastewater would be treated by a suitably designed wastewater treatment system to produce an effluent that is of an acceptable quality for irrigation of pasture and fodder crops.

The rendering plant will have in-situ bio-digestors to use up any remaining solid material with no release of same to the environment.

3.6. Land Area

3.6.1. Abattoir Site

The proposed abattoir site incorporates at least 250 hectares of land which is ample for both operational needs and as an extensive buffer zone that still has agricultural uses.

The actual footprint of the abattoir and all ancillary buildings such as rendering plant, stockyards etc. is not likely to exceed 40 hectares. Internal roads will occupy additional land. A concept plan of the abattoir showing the likely location and indicative layout of the main operational area is shown in **Figure 5**.

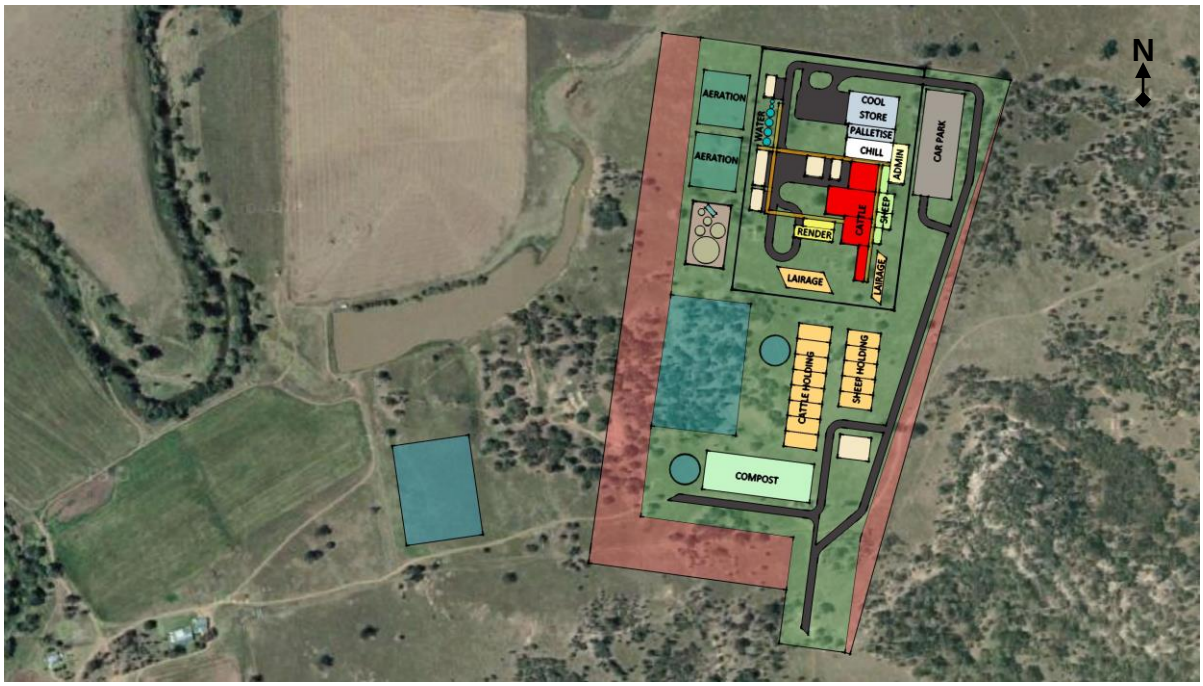


Figure 5 Abattoir Concept Layout Plan

A significant buffer zone of productive land will still remain at the abattoir site, which will provide ample area for provision of wastewater treatment infrastructure and effluent management areas for irrigation. This buffer also provides an effective physical separation from neighbouring residences and other sensitive receivers and will contribute to noise and odour abatement.

3.6.2. Feedlot Site

The feedlot and related uses would be positioned in the optimum location within the 375ha property which should be ample for both operational needs and as an extensive buffer zone that still has agricultural uses.

The actual footprint of the feedlot including pens, handling yards, drains and ponds, stock lanes and feed alleys, manure stockpiling and composting areas, feed mill and storage facilities, may require of the order of 110ha of land. Approximately 50ha this area would comprise pens to contain the animals and 60ha would include ancillary facilities. This does not include any effluent irrigation area. The feedlot layout has not yet been designed, and would need to be informed by a detailed site analysis and assessment of environmental constraints.

A significant buffer zone of productive land would remain at the feedlot site to provide ample area for effluent capture, treatment and irrigation infrastructure, as well as solid waste (manure) management. This buffer also provides an effective physical separation from neighbouring residences and other sensitive receivers and will contribute to noise and odour abatement.

3.7. Animal Welfare and Disease Management

All animals (beef cattle & sheep) that pass through the businesses (feedlot then abattoir) will have a veterinary check done on them at induction to the feedlot/and or arrival at the abattoir holding yards. All animal health details will be recorded and monitored via a computer software system that utilises the unique animal identification data provided by the NLIS tags which all animals will receive at the initial entry point in the supply chain (if the animals are not already appropriately tagged).

A detailed register of all animals in the supply chain will be created and regularly monitored for product traceability, carcass quality and specification purposes and general animal health and welfare.

Animal welfare procedures and systems in both operations (feedlot and abattoir) will be of world's best practice standards. These will include but are not limited to the following:

- Regular replacement and safe disposal/processing of animal bedding and excrement;
- Dust suppression systems to mitigate against airborne particulate matter being circulated;
- Best practice in ventilation systems, including prevention of air recirculation;
- Workers personal clothing stored entirely separately from hygienic employer supplied work clothing and safety equipment;
- Air locks and disinfecting wash stations located in all appropriate areas of operational facilities; and
- Extensive induction program and regular training update programs for all employees focusing on hygiene and animal disease and transmission control.

In regards specifically to Q fever, the following observations are made. Q fever (caused by the bacterium Coxiella burnetii) is endemic in sheep, cattle and goats in all places around the world. At this time a vaccine for the animals is not yet developed but may be in the near future due to the efforts of Victorian dairy goat farmer Mr Sandy Cameron who is funding his own vaccine trial program with technical assistance from a laboratory in Geelong.

The proponents of the Yarraman Abattoir and Feedlot project have a strong desire to use Research & Development (R&D) in all areas of the businesses to the maximum extent possible. They would be therefore looking to build on the work of Mr Cameron for their own requirements and industry wide application in the future as well.

Australia is the only place that has an effective vaccine for humans against Q fever which further emphasises this country's well deserved biosecurity safety reputation. All employees and contractors working in areas of possible exposure to Q fever would be fully immunised.

The project proponents would diligently apply the requirements of the Federal Government's Q fever registry (www.qfever.org) by:

- Testing and vaccinating all employees for Q fever and placing such information on the National Registry;
- Ensuring all visitors and contractors attending sensitive areas of operations for both businesses are also on the National Register as being vaccinated;
- Applying best practice systems in all operational areas of the businesses to minimise the extent of and transmission of Q fever; and
- Providing ongoing training and educational emphasis to all employees and contractors in regards to Q fever thereby minimising the impacts on the business and its employees and visitors.

3.8. Feedlot Site Landscape and Suitability

Landscape is an important consideration when assessing site suitability and design of feedlots. Factors include:

- Aspect: A northerly aspect is most desirable for maximising exposure to winter sun and provides some shelter from cold southerly winds. However, if shade is to be installed, a north-south orientation of the rows will make installing shade structures easier.
- Slope: Historical practices and many current guidelines (eg Cattle Feedlot Guidelines in S.A.) recommended pen slopes of approximately 2-4%, though more recent advice suggests greater slopes, in the order of 4-6%, are desirable to improve drainage.
- Position: Low lying positions that may be flood affected or prone to waterlogging, would generally not be suitable for feedlots. Steep landscapes would not be practical due to the greater erosion risk and extensive earthworks and terracing that would be needed to produce suitable pen floor slopes.

A range of aspects exist across the Hollydeen landscape, with the main area proposed for the feedlot having an open northeasterly aspect which is desirable.

The site has an undulating landscape that is gently to moderately sloping, for the most part, and suitable for creation of a feedlot that meets relevant design guidelines. Some earthworks may be anticipated to construct pen floors and drains with the recommended grades. The proposed feedlot would be located on gentle sideslopes above the floodplain that would be suitable in terms of aspect and drainage.

3.9. Water Requirements

Collectively the Hollydene and Yarraman sites possess in the order of 1,100 ML of licensed water entitlements permitting abstraction from Wybong Creek and associated aquifers. Abattoirs and feedlots are water intensive industries and require secure access to large volumes of water. The existing water entitlements are more than adequate and provide good water security for the Project.

The proposed Project aims to be highly efficient in terms of water demand, water recycling and reuse where appropriate. Both the abattoir and feedlot would use modern management and industry best practice initiatives to minimise the volume of water used in production.

3.9.1. Abattoir

Using existing industry benchmarks water requirements for an abattoir operation of the size may be estimated based on an "all up" water usage allowance of approximately 1000 L per head of cattle throughput and 250 L per head of sheep throughput. This amounts to approximately 1.4 ML per day, or 400 megalitres (ML) per annum. The proposed Project will be designed to achieve water savings and water efficiency in all aspects of the process, and is targeting a substantial reduction in water

consumption relative to the industry benchmark, resulting in an annual water demand of up to 200 ML. As part of the abattoir design process a detailed water balance would be prepared identifying potential and available water sources, water demand for all key stages of operations, and water recycling opportunities. In line with the water efficient design of the operations, the minimum water quality requirements for each stage would be identified, to identify and promote water reuse opportunities where water quality is fit for purpose.

The abattoir site has a large (> 50 ML) storage dam to the west of the proposed abattoir complex as well as several other small dams, all with reasonable catchment areas for collection of rainfall runoff. Rainfall would be captured of all roof areas and used as part of the water supply system.

The large site dam would be used as the main water storage for the operations and is vital in ensuring security of supply. Preliminary advice indicates that it is desirable to maintain at least 6 weeks' water supply at all times. If necessary the main storage dam would be enlarged to meet this requirement.

The existing licensed water rights on the property plus dam catchment and the use of recycled water would appear to be more than adequate for the proposed operation.

It will be necessary to treat dam and river water to ensure water quality is fit for the food processing operations at the abattoir. Water treatment for provision of potable process water will need to meet Australian Drinking Water Guidelines and will be a key element of the abattoir detailed design.

3.9.2. Feedlot

Water consumption in a feed lot is estimated to be 90% drinking water and 10% other uses. On the basis of expert studies (using Queensland feedlots) that indicate cool weather water use is approximately 11 L per head per day and hot weather up to 70 L per head per day, an average value of 30 L per head per day is used for initial predictions. Short-term daily usage far in excess of this average figure can be anticipated, particularly during hot weather when drinking water demand is high, and when watering of pens for dust control is required.

Assuming a 25,000 head capacity and 365 days of operation, this amounts to 273 ML/yr. With a 10% safety factor, the estimated water use is approximately 300 ML/yr.

3.10. Traffic Movements

3.10.1. Abattoir

The type of traffic movements created by the abattoir will be stock trucks for livestock delivery, B-double trucks for container movements out of the facility and from passenger vehicles for workers and visitors. Worker and visitor travel movements in light vehicles will count for the greatest volume of traffic on a day-to-day basis.

Livestock Truck (incoming) movements are estimated to be of the order of 10-12 per day occurring mostly during very early morning and late afternoon. Most will be "short haul" trips from the local region. B-Double container truck (outgoing) movements are estimated to be 12-14 per day. As the facility will operate at least 16 hours per day these movements can be spread out across this time period (16 hours).

3.10.2. Feedlot

The most significant traffic movements created by the proposed feedlot will be stock trucks for livestock delivery and livestock transport offsite to the abattoir and processing facility. The route proposed is via the Reedy Creek Road and the Golden Highway (refer **Figure 2**).

Heavy vehicles will also deliver feed to site. A relatively small number of passenger vehicles will access site daily for workers and visitors. No information on likely traffic volumes is available at present.

Adequacy of the existing driveway and its authorised intersection with Yarraman Road would need to be investigated further and upgraded if required. Viewing distances at the intersection appear to be in excess of several hundred metres in either direction, though would need to be assessed for safety and adequacy considering the changed traffic conditions, in line with requirements of the NSW Roads and Maritime Services. Additionally, Yarraman Road and its intersection with Wybong Road would need to be assessed for potential improvements and safety for the use of B-double trucks. The need for upgrades to the local roads including Reedy Creek Road and Yarraman Road would be considered as part of the EIS.

3.11. Power Supply

Energy requirements have not yet been evaluated in detail for the Project; however, both the abattoir site and the feedlot site possess good access to the electricity grid. High voltage mains cross the front of the abattoir site near the Golden Highway and could be accessed via an onsite transformer to produce 240/415V power supply to the abattoir.

The Project would implement renewable energy technologies aimed at significantly reducing external power requirements (electricity grid or gas) compared to comparable operations. These renewable energy options include:

- Extensive use of Solar panels on the property;
- Implementation of the anaerobic digestion and biogas generation and capture from wastewater lagoons as an energy source that would make the Project about 70% self-sufficient in gas power needs based on successes achieved at other abattoir sites.

At this stage it is thought that the biogas would be ideal for powering the onsite rendering plant which has a relatively continuous energy demand that should be suited to the consistent biogas supply. Additional gas supply would need to be brought to site via road tanker.

These incentives offer major advantages with respect to minimising not just energy costs but also carbon outputs, greenhouse gas production and overall environmental impacts from the Project.

The feedlot site is connected to the power grid with 240V and 415V power supply available at the Yarraman Estate winery facilities located on Lot 58 in DP 750969.

3.12. Hours of Operation

The proposed hours of operation at the abattoir are:

- 7am to 11pm Monday to Friday;
- 7am to 11pm Saturday; and
- No work on Sundays or public holidays.

The abattoir is proposed to run two eight-hour shifts per day, six days per week.

The feedlot would be a relatively continuous operation with most activity occurring during the day and hence employing predominantly day labour.

3.13. Facilities and Employees

The abattoir business of this scale would be staffed by approximately 500 people across areas of farm management, admin/sales, OH&S, quarantine and quality control, abattoir, rendering plant, yarding staff & general hands/drivers. The goal will be to recruit workers from the local and regional area in the first instance, then nationally if required. Foreign workers may be used if it is not possible to recruit in sufficient numbers from the domestic labour market.

Staffing amenities and facilities to be provided include:

- Administration/office building;

- Lunchroom;
- Amenities, toilets, showers;
- Car parking spaces; and
- Caretaker/Manager residence.

The feedlot is expected to employ between 80 and 100 full time equivalent staff.

Additional indirect employment and economic activity would be generated through the considerable construction phase and ongoing during operations through demand for a wide range of support services and products.

4. Statutory and Planning Considerations

The EIS would provide a detailed review of statutory and planning considerations including relevant Commonwealth, State and Local Government legislation and environmental planning instruments. A summary of key statutory considerations is provided in this chapter.

4.1. Commonwealth Legislation

4.1.1. Environment Protection and Biodiversity Act 1999

The *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) states that an action which *has, will have or is likely to have a significant impact on a matter of national environmental significance*, may not be undertaken without prior approval of the Commonwealth Minister for Sustainability, Environment, Water, Population and Communities. The following are identified by the Act as matters of national environmental significance (MNES):

- World Heritage properties and National Heritage places;
- wetlands of international importance (including Ramsar Wetlands);
- listed threatened species, ecological communities and migratory species protected under international agreements;
- commonwealth marine areas;
- nuclear actions; and
- an action by the Commonwealth, or an action on Commonwealth land which is likely to have a significant impact on the environment.

Preliminary investigations have indicated that the Project has the potential to contain listed threatened species and ecological communities. No other MNES have been identified in the vicinity of the proposal. Further studies would be conducted during the preparation of the EIS to determine whether a referral to the Minister is required.

4.1.2. Native Title Act 1993

The *Native Title Act 1993* administers processes relating to the recognition, protection and determination of native title and dealings with native title land. Native title is concerned with the rights and interests of Aboriginal and Torres Strait Islander peoples in relation to land and water in Australia and its territories.

A search of the National Native Title Register, the Register of Native Title Claims, and the Register of Indigenous Land Use Agreements would be undertaken as part of the EIS.

4.2. NSW Planning Legislation and Environmental Planning Instruments

The following NSW legislation and Environmental Planning Instruments may have relevance to the proposal and would be considered during the environmental assessment.

4.2.1. Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act) and the *Environmental Planning and Assessment Regulation 2000* (the EP&A Regulation) provide the framework for assessment and approval of development in NSW.

Under the provisions of Part 4, Section 89C of the EP&A Act the proposed Project is SSD if a State environmental planning policy declares the development to be SSD. The proposed Project is declared

by State Environmental Planning Policy (State and Regional Development) 2011 to be SSD (refer Section 4.2.3).

Section 89J of the EP&A Act outlines a range of approvals that are not required to be obtained for an approved SSD project. These include the following that could be relevant to this Project:

- a permit under section 201, 205 or 219 of the *Fisheries Management Act 1994*;
- an approval under Part 4, or an excavation permit under section 139, of the *Heritage Act 1977*,
- an Aboriginal heritage impact permit under section 90 of the *National Parks and Wildlife Act 1974*,
- an authorisation referred to in section 12 of the *Native Vegetation Act 2003* (or under any Act repealed by that Act) to clear native vegetation or State protected land,
- a bush fire safety authority under section 100B of the *Rural Fires Act 1997*,
- a water use approval under section 89, a water management work approval under section 90 or an activity approval (other than an aquifer interference approval) under section 91 of the *Water Management Act 2000*.

4.2.2. Protection of the Environment Operations Act 1997

The Environment Protection Authority (EPA), which is part of the NSW Office of Environment and Heritage (OEH), issues environment protection licences (EPLs) to the owners or operators of various industrial premises under the *Protection of the Environment Operations Act 1997* (POEO Act). Licence conditions relate to pollution prevention and monitoring, and cleaner production through recycling and reuse and the implementation of best practice.

Schedule 1 of the POEO Act outlines a range of Scheduled Activities for which an EPL is required.

Clause 22 of Schedule 1 describes Livestock Intensive Activities and declares the following operations to be scheduled activities:

- "cattle, sheep or horse accommodation", meaning the accommodation of cattle, sheep or horses in a confinement area for rearing or fattening (wholly or substantially) on prepared or manufactured feed (excluding facilities for drought or similar emergency relief), with a capacity to accommodate more than 1,000 head of cattle, 4,000 sheep or 400 horses at any time.

Clause 23 of Schedule 1 describes Livestock Processing Activities and declares the following operations to be scheduled activities, several of which could be relevant to the Project:

- "general animal products production", with a capacity to produce more than 5,000 tonnes of animal products per year;
- "slaughtering or processing animals", with a capacity to slaughter or process more than 750 tonnes live weight per year;
- "rendering or fat extraction", with a capacity to produce more than 200 tonnes of tallow, fat or their derivatives or proteinaceous matter per year; and
- "tanneries or fellmongeries", with a capacity to process more than 2 tonnes of skins or hides per year.

By virtue of Clause 22 and Clause 23 the proposed abattoir and feedlot would classify as scheduled activities and would require an EPL.

4.2.3. State Environmental Planning Policy (State and Regional Development) 2011

State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP) identifies development that is SSD under Section 89C of the EP&A Act. Schedule 1 of SRD SEPP lists a range of development types and conditions that are defined as SSD and include the following that are relevant to the Project:

Clause 1 Intensive livestock agriculture

Development for the purpose of intensive livestock agriculture that has a capital investment value of more than $30 million

Clause 3 Agricultural produce industries and food and beverage processing

Development that has a capital investment value of more than $30 million for any of the following purposes:

(a) abattoirs or meat packing, boning or products plants, milk or butter factories, fish packing, processing, canning or marketing facilities, animal or pet feed production, gelatine plants, tanneries, wool scouring or topping or rendering plants,

The largest part of the Project, by value, would be the abattoir. The proposed Project meets the definition of "agricultural produce industries and food and beverage processing" under Clause 3, as it includes an abattoir with a capital investment value (CIV) that is expected to well exceed $30 million. The Project classifies as SSD.

The feedlot element of the Project would best fit the definition of "intensive livestock agriculture".

A Quantity Surveyor's report assessing the CIV of the project would be provided in due course once the design of the facilities has been sufficiently progressed.

4.2.4. State Environmental Planning Policy (Infrastructure) 2007

Division 17, Subdivision 2, section 104 of State Environmental Planning Policy (Infrastructure) 2007 (SEPP Infrastructure) requires that development specified in Column 1 of the Table to Schedule 3 of this planning instrument must be referred by the consent authority to the NSW Roads and Maritime Service (RMS) for assessment if the conditions under Column 2 or Column 3 of the Table are met.

As the Proposal is an *'industry'* with an area in excess of 5,000m^2, to be located on land with access to a classified road, the DA will need to be referred to the RMS.

4.2.5. State Environmental Planning Policy No. 33 – Hazardous and Offensive Development

State Environmental Planning Policy No. 33 – Hazardous and Offensive Development (SEPP 33) requires the consent authority to consider whether an industrial proposal is a potentially hazardous or offensive industry that without the implementation of appropriate impact minimisation measures would, or potentially would, pose a significant risk in relation to the locality, to human health, life or property, or to the biophysical environment.

The NSW Department of Planning has released numerous guidelines on the application of SEPP33 for development applications, including *Hazardous and Offensive Development Application Guidelines: Applying SEPP33* (DoP, 2011). These guidelines outline a general risk screening process to determine whether developments are potentially hazardous or offensive, based on criteria including the types and quantities of materials stored onsite, buffer distances to site boundaries, and frequency of transport of hazardous materials to and from site, among other things.

A risk screening of the Project will be performed to determine if the Project constitutes potentially hazardous or offensive development.

4.2.6. State Environmental Planning Policy No 44 – Koala Habitat Protection

State Environment Planning Policy No 44 – Koala Habitat Protection (SEPP 44) aims to encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas.

The Project is located within the Muswellbrook Local Government Area (LGA), to which the SEPP applies. As such, Muswellbrook Council would be consulted in relation to the presence and

management of any Koala habitat. An assessment for the presence of Koala habitat and feed trees would also be undertaken as part of the EIS.

4.2.7. State Environmental Planning Policy No 55 – Remediation of Land

State Environmental Planning Policy No 55 – Remediation of Land provides consistent state wide planning and development controls for the remediation of contaminated land. There are no known contaminated sites within the Project Area, however the EIS would consider the potential for contaminated land to be encountered based on historical land use and appropriate mitigation measures would be identified where appropriate.

4.2.8. Muswellbrook Local Environmental Plan 2009

The *Muswellbrook Local Environmental Plan 2009* (Muswellbrook LEP) provides development standards for the Muswellbrook Local Government Area within which the Project is located. The Project is located on land zoned RU1 Primary Production (RU1 zone). Development that is permitted with consent within the RU1 Zone includes the following types that may be relevant to the abattoir and feedlot:

- Dwelling houses;
- Farm buildings;
- Hazardous industries;
- Intensive livestock agriculture;
- Rural industries (one type being "livestock processing industries");
- Rural worker's dwellings;
- Sewerage systems;
- Signage; and
- Waste disposal facilities.

Abattoir

"livestock processing industry" means a building or place used for the commercial production of products derived from the slaughter of animals (including poultry) or the processing of skins or wool of animals, derived principally from surrounding districts, and includes abattoirs, knackeries, tanneries, woolscours and rendering plants.

Livestock processing industry is a type of "Rural industry" and is permitted in the RU1 zone. The proposed abattoir would meet the definition of a "livestock processing industry" and is therefore permitted with consent in the RU1 zone.

The EIS would consider the permissibility of the Project with respect to Muswellbrook LEP and associated planning controls.

It is noted that the client has held preliminary discussions regarding the proposed Project with the Mayor of Muswellbrook Shire, Mr. Martin Rush, and senior Council staff, who are very supportive of the development and believe the LEP caters for this type of development.

Feedlot

"Intensive livestock agriculture" means the keeping or breeding, for commercial purposes, of cattle, poultry, pigs, goats, horses or other livestock that are fed wholly or substantially on externally-sourced feed, and includes any of the following:

(a) dairies (restricted),

(b) feedlots,

(c) piggeries,

(d) poultry farms,

The proposed feedlot meets the definition of “intensive livestock agriculture” and is permitted with consent in the RU1 zone.

4.2.9. Other Relevant Legislation

While the EP&A Act provides the framework for the planning and development approvals system in NSW, there are a number of other Acts and Regulations of relevance. These would be identified and considered during the preparation of the EIS. A summary of key additional pieces of legislation follows:

Fisheries Management Act 1994

Under the *Fisheries Management Act 1994* (FM Act), approval is required from Department of Primary Industries (Fisheries NSW) for activities involving dredging and reclamation (section 201), blockage of fish passage (section 219) and harming of certain marine vegetation in a protected area (section 205). A licence is required under section 220ZW of the Act for activities likely to harm or damage threatened species, populations or ecological communities.

The Project would not involve dredging or reclamation works, would not result in harm to marine vegetation and would not block fish passage. Minor works within watercourses may be required for installation of culverts associated with access roads and possibly to enable drainage diversion works at the feedlot site. Pursuant to section 89J of the EP&A Act, permits under section 201, 205 and 219 of the FM Act are not required for an approved Project under Part 4 of the EP&A Act.

Given the proposed works, it is considered unlikely that there will be harm or damage to threatened species, populations or ecological communities listed under the FM Act, however, further ecological investigations would be undertaken as part of the EIS to determine the need for a licence under Section 220ZW of the FM Act.

Heritage Act 1977

Consent is required under Part 4 of the *Heritage Act 1977* (Heritage Act) for development which alters, moves or damages any part of a listed heritage item. An excavation permit is required under section 139 of the Heritage Act to ‘damage, despoil, move or alter’ a relic.

Pursuant to section 89J of the EP&A Act, approval under Part 4 or a permit under section 139 of the Heritage Act is not required for a Project approved under Part 4 of the EP&A Act. Notwithstanding this, a search of relevant Heritage registers would be undertaken and if necessary a detailed heritage investigation undertaken to assess the impact on any listed or identified non-indigenous heritage items in the Project Area.

National Parks and Wildlife Act 1974

Under section 90 of the *National Parks and Wildlife Act 1974* (NPW Act), consent is required to destroy, deface or damage an Aboriginal object or Aboriginal place. Pursuant to section 89J of the EP&A Act a permit under section 90 of the NPW Act is not required for a Project approved under Part 4 of the EP&A Act.

No Aboriginal heritage items or places are currently listed on the National, State or Local heritage registers as being present within the abattoir or feedlot sites. A search of the AHIMS register identified that while there are no registered Aboriginal sites within the Project Area, there are a large number of sites within several kilometres of the Project Area. Further detailed Aboriginal heritage investigations would be undertaken as part of the EIS.

Threatened Species Conservation Act 1995

The *Threatened Species Conservation Act 1995* (TSC Act) provides legal status for biota of conservation significance in NSW. A comprehensive flora and fauna survey would be undertaken for

the EIS to identify the presence of any threatened species or endangered ecological communities, assess the potential impact of the Project on the ecological resources, and identify the strategies for management and mitigation of potential impact.

Water Management Act 2000

Under section 56 of the *Water Management Act 2000* (WM Act) an access licence is required for water extraction. Section 89 of the Act relates to water use approvals. Section 91 relates to activity approvals and provides that certain types of development and activities that are carried out in or near a river, lake or estuary are "controlled activities" and require an activity approval. Section 91 also provides that aquifer interference activities require an aquifer interference approval.

Pursuant to section 89J of the EP&A Act a permit under section 89, 90 (with the exception of aquifer interference) and 91 of the WM Act is not required for Projects approved under Part 4 of the EP&A Act.

The EIS would assess the impacts on groundwater and identify whether an aquifer interference approval or groundwater license is required.

The Project is within the area covered by the Water Sharing Plan for the Wybong Creek Water Source. The Water Sharing Plan covers the waters of the Wybong Creek Water Source including all water occurring on the land surface, including any lakes and wetlands in this water source, along with the groundwater within the alluvial sediments associated with the rivers in this water source whilst excluding any groundwater contained in fractured rock aquifers.

5. Preliminary Environmental Assessment

5.1. Introduction

A preliminary review of environmental constraints and opportunities at both the Hollydene abattoir and Yarraman feedlot sites has been undertaken based on site inspections; review of available background information from previous detailed environmental surveys at both sites; and review of key guidelines and references related to key environmental aspects and management at abattoir and feedlot industries.

On the basis of these initial investigations it appears both sites are well suited to the proposed developments. Some key factors promoting the sites for the proposed development are:

- **Water availability** – Collectively the Hollydene and Yarraman sites possess in the order of 1,100 ML of licensed water entitlements. Abattoirs and feedlots are water intensive industries and require secure access to large volumes of water. The existing water entitlements are more than adequate and provide good water security for the Project.
- **Strategic location** – As indicated in Section 2.1, the Project is ideally located within the Upper Hunter Valley with good access to major roads and export shipping facilities in Newcastle. The two developments are co-located within the Wybong Valley in close proximity to one another.
- **Property zoning** – The proposed Project occurs within the Muswellbrook Local Government Area and would occur on land that is zoned Primary Production (RU1 zone) under the Muswellbrook *Local Environmental Plan 2009* (Muswellbrook LEP). The Project is permissible with consent within the RU1 zone.
- **Surrounding Land Use and Buffers** – The project sites contain largely cleared rural land that has supported a range of agricultural activities in the past. Surrounding lands comprise large rural properties, mining buffer lands and nature reserve. There is a very low density of sensitive rural receivers surrounding both sites, and good buffer distances (> 1km) separating the proposed developments from sensitive receivers.
- **Compatibility with Adjoining Mining** – The development sites occur within or close to the voluntary acquisition buffers around the Glencore Mangoola Coal operations. This benefits the Project as Glencore has acquired many of the neighboring rural properties, consolidating these properties and removing most of the potentially sensitive rural residential receivers. The Project represents a significant agribusiness that is completely compatible with the adjoining mining use.
- **Land Area and Suitability** – The Hollydene and Yarraman properties each have large areas suited to development of the abattoir and feedlot, respectively. Preliminary analysis of the land area required to support these developments, including any required wastewater management areas and buffer setbacks from environmentally sensitive features, indicates there is sufficient land available. The abattoir and feedlot development sites are located on previously cleared agricultural land which limits the likelihood of any significant impacts to native flora and fauna.
- **Environmental sensitivity** – Both development sites contain some areas of environmentally sensitive land; however, there is good opportunity to achieve a development that is both functionally efficient while avoiding areas of high sensitivity including the remnant woodland, waterways and heritage sites.

5.2. Previous Studies

Numerous environmental investigations of the subject properties have been completed in recent years associated with different development proposals, that provide baseline information on the existing

environment, constraints and opportunities to development. Just some of these previous investigations include:

Abattoir Site

- Biodiversity assessment of proposed quarry and abattoir area at Hollydeen (Umwelt, in prep; 2015). A detailed survey of the proposed adjoining quarry and abattoir area was undertaken by Umwelt late in 2014;
- Dolwendee Quarry Aboriginal Heritage Impact Assessment (Draft) (McCardle Cultural heritage, March 2015). This assessment was undertaken to assess the Aboriginal cultural heritage values of the quarry on adjoining lands;
- Aboriginal Cultural Heritage Assessment (Victor Perry, July 2008). This report addressed a previous subdivision at Hollydeen and included the area of the proposed abattoir. No Aboriginal objects or areas of Aboriginal cultural significance were identified during site surveys that would be impacted by the proposed abattoir;
- Preliminary Agricultural Appraisal (Ross Watson Agriculture, 2014). This assessment focused on the proposed quarry but did provide an evaluation of the agricultural capability of lands across the broader Hollydene property that would be associated with the abattoir development. This assessment confirms that the proposed abattoir infrastructure would be confined to lands with low agricultural production potential and on this basis the Project is unlikely to impact on prime agricultural lands;
- Air Quality Assessment (Todoroski Air Sciences, 2015) and Noise and Vibration Assessment (Muller Acoustic Consultants, 2015). These assessments were undertaken for the proposed quarry on adjoining lands and establish information on baseline noise and air quality, and location of sensitive receivers.

Feedlot Site

Environmental investigations of the Yarraman property have been completed previously, including in support of a proposed tourist development, Yarraman Rural Retreat. These previous studies provide a good baseline understanding of the existing environment, constraints and opportunities at the feedlot site and include:

- Stormwater Management Strategy (Richard Harils Moretti, November 2004). This report outlined the potential issues associated with stormwater quality and recommended management strategies to mitigate impacts from the proposed development;
- Flora and Fauna Assessment (Harper Somers O'Sullivan, November 2004). This assessment examined the likelihood of the proposal having a significant effect on any threatened species, populations or ecological communities listed within the Threatened Species Conservation Act 1995 (TSC Act);
- Bushfire Threat Assessment (Harper Somers O'Sullivan, November 2004). The assessment considered and assessed the bushfire hazard and associated potential threats relevant to such a proposal, and outlined the minimum mitigation measures which would be required in accordance with the provisions of the Rural Fires and Environmental Assessment Legislation Amendment Act 2002;
- Aboriginal Archaeological Heritage Impact Assessment (Wildthing Environmental Consultants, November 2004). Preliminary Aboriginal Heritage studies were undertaken over approximately 300 acres of land located within the western portion of Yarraman Estate. Consultation was undertaken with the local Aboriginal community;

- Geotechnical Investigation Report (Martens & Associates, December 2004). This report detailed the geotechnical requirements for foundations and pavements including site soils investigations by test-pitting at eight locations.
- Traffic Investigation Assessment Report (Stapes, November 2004). The report provided a traffic investigation assessment of the proposed development.
- Water Supply and Wastewater Strategy (Martens & Associates, December 2004). The report outlined a proposed strategy for water supply and wastewater for the proposed development.

5.3. Key Issues

Feedlots and abattoirs present a number of key environmental risks which must be addressed through the planning, design, construction and operational stages.

The NSW Department of Primary Industries publication *Opportunity Lot feeding of Beef Cattle* (NSW DPI, 2004) indicates that issues of particular concern to be assessed when approving feedlots are:

- Possible impact on the community amenity, especially in relation to odour, dust, noise and insects;
- Protection of surface and groundwater (underground water resources) from possible pollution by feedlot effluent, either by runoff from the feedlot pens and other yards, or by infiltration of water below the pen surface;
- Effluent runoff into neighbouring properties;
- Availability of suitable land areas for using effluent and manure sustainably; and
- Availability of suitable water supplies for stock water and, depending on effluent volume and quality, for dilution of effluent for irrigation.

Abattoirs present many similar risks. Issues such as traffic management, amenity (air, noise and dust), and water and wastewater management, are expected to be key issues to address for the abattoir.

In summary, the following matters are likely to present the key environmental issues for assessment and would be evaluated in detail in the Project EIS.

- Aboriginal cultural heritage;
- Air quality and odour;
- Buffer distances;
- Community amenity;
- Community consultation;
- Energy consumption and greenhouse gas production;
- Flora and fauna (including impacts on threatened species and endangered ecological communities);
- Noise and vibration;
- Stormwater management;
- Socio-economic issues;
- Soils and geology;
- Traffic, transport and access;
- Visual amenity.
- Water supply;
- Water resources (surface water and groundwater management, water supply);
- Waste management;
- Wastewater management.

Additional aspects that may not present as key issues, though would be assessed in the EIS, include:

- Agricultural land capability;
- Built form and compatibility with the landscape;
- Hazard and risk;
- Lighting and light spill;
- Non-Aboriginal heritage;

5.4. Aboriginal Cultural Heritage

5.4.1. Background

Aboriginal people have occupied the NSW landscape for at least 40,000 years. The evidence and important cultural meanings relating to this occupation are present throughout the landscape, as well as in documents and in the memories, stories and associations of Aboriginal people. Therefore, activities that disturb the landscape may impact on Aboriginal cultural heritage (DECCW, 2010). The Hunter Valley contains areas that are highly significant to Aboriginal people. There is a comprehensive record of past occupation and use of the Hunter Valley landscape and its resources by Aboriginal people.

Abattoir Site

A search of the AHIMS register identified that there are no registered Aboriginal sites within the abattoir site; however, there are numerous sites within several kilometres of the abattoir site. The site is close to landscape features that are often associated with the presence of Aboriginal objects, including permanent waterways, ridge lines and cliff faces.

An Aboriginal Cultural Heritage Assessment was undertaken by Victor Perry of Junburra Aboriginal Consultancy Services in 2008, to address a proposed subdivision. The assessment considered the entire proposed subdivision area including the area proposed for the abattoir complex. The assessment included consultation with the local community via direct contact with key Traditional Owner groups as well as more broadly through advertisements in print media seeking registrations of interest in the project. Junburra Aboriginal Consultancy Services subsequently undertook fieldwork over two days to identify the cultural heritage values of the proposed subdivision site, including the presence or otherwise of Aboriginal objects. During the survey no Aboriginal objects were found and it was recommended that there were no constraints to the proposed subdivision.

The recent Dolwendee Quarry Aboriginal Heritage Impact Assessment (Draft) (McCardle Cultural heritage, March 2015) found that the landscape of the property is highly disturbed by past activities (such as tree clearing and animal grazing, and associated soil erosion), which lessens the archaeological potential of the site. Six stone artefacts were found within the proposed quarry survey area. A detailed assessment would need to be undertaken for the abattoir lands.

Feedlot Site

An Aboriginal Archaeological Heritage Impact Assessment (Wildthing Environmental Consultants, November 2004) was undertaken over approximately 300 acres of land located within the western portion of Yarraman Estate and consultation was undertaken with the local Aboriginal community. The survey recorded fifteen sites comprising eighty-four (84) stone artefacts and two scared trees. The majority of these artefacts were located within the northern portion of the site, in close proximity to Wybong Creek and its associated ephemeral drainage lines. The feedlot is to be located over highly disturbed agricultural lands. A significant buffer is expected to be maintained adjacent the sensitive area of Wybong Creek, limiting the potential for disturbance to culturally sensitive areas.

No Aboriginal places are currently listed on the National, State or Local heritage registers as being present within the feedlot site. A basic search of the AHIMS register identified that there are eight registered Aboriginal sites within or near the feedlot site.

5.4.2. Method of Assessment

An Aboriginal Cultural Heritage Assessment would be undertaken to assess whether the proposed Project may harm Aboriginal objects or Aboriginal places. The assessment would be in accordance with relevant NSW Government guidelines and legislation, including the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH, 2011); *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW, 2010); *Aboriginal Cultural Heritage Consultation requirements for proponents* (DECCW, 2010); and *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010).

5.5. Air Quality / Odour

5.5.1. Background

Managing air quality impacts, specifically from dust and odour, is a key environmental issue for the Project.

Abattoir

Abattoirs possess numerous potential odour sources including from rendering plants, waste effluent treatment ponds, waste drying areas, slaughterhouse, animal holding pens and livestock transport vehicles. Greenhouse and ozone-depleting gases are produced in proportion to the types and quantity of chemicals and fuels used, and the degree to which waste to energy recycling is adopted. Dust can be generated from unsealed areas such as yards, unsealed haul roads and stockpiled products.

Objectionable air quality emissions and odours can be reduced through good design and adoption of suitable mitigation strategies. These design and mitigation strategies include (but are not limited to):

- Good facility design, so as to locate odour-generating activities a maximum distance from sensitive receivers;
- Providing good ventilation with abattoir buildings and rendering works contained in enclosed buildings and vented to atmosphere via a discrete stack with odour control equipment (such as scrubbers);
- Appropriate process controls and equipment design in rendering operations;
- Good housekeeping and regular removal of manure from stock holding areas;
- Quick processing of materials and storage of potentially odour-generating materials within enclosed vessels;
- Suitably locating and correctly operating effluent treatment ponds (eg to avoid odours due to anaerobic conditions)
- Covering effluent ponds to jointly reduce odours and capture methane gas for energy production;
- Minimising energy use and greenhouse gas production; and
- Sealing high activity dust generating areas such as holding yards and haul roads.

It is proposed to install a modern abattoir building designed according to current best practice techniques which will reduce air quality impacts. The proposed location of the abattoir buildings is ideal due to the large buffers that are available to potentially affected neighbours.

Long term meteorological monitoring indicates the dominant winds are from the WNW-NW direction (autumn-winter) and E-ESE (spring-summer). This suggests the closest sensitive receivers to the south are not down-wind of the abattoir during the most common seasonal winds, which should significantly reduce odour impacts on these receivers. Areas down-wind of the dominant westerly winds during autumn-winter (ie to the east) are devoid of sensitive offsite receivers for many kilometres.

Feedlot

Potential sources of air quality impacts at feedlots are outlined in **Figure 6**, and include the surface of holding pens, feed storage, run-off collection and treatment (ponds), storage and processing of solids, land application of effluent and solids, and disposal of carcasses. The greatest odour source is generally the pens surface from manure accumulation.

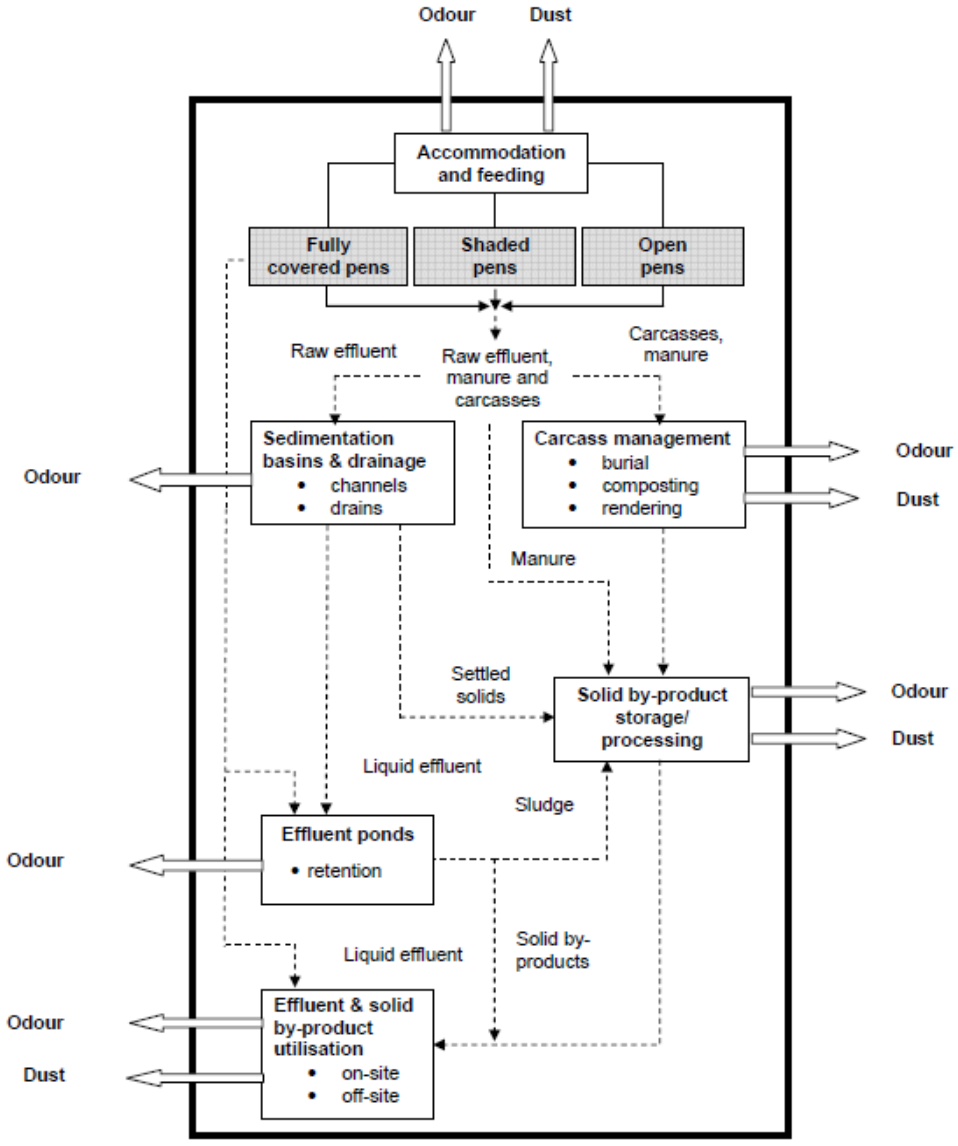
Dust can be generated from movement of cattle within the pens, storage and processing of solids, land application of effluent and solids, disposal of carcasses, and vehicle traffic on unsealed roads.

There are limits to the odour control measures that can be employed at feedlots due to the large odourous surfaces that are exposed, and the anaerobic processes that are involved (eg in wastewater treatment, and solids storage and composting). Nonetheless, objectionable air quality emissions including odours and dust can be reduced through good design, management and adoption of suitable mitigation strategies. These design and mitigation strategies include (but are not limited to):

- Location: Appropriate location of feedlots, ideally remote from rural towns and urban settlement;
- Moisture Control: Controlling moisture within the pen surface through good pen design and management, considering the factors of:
  - good drainage
  - adequate slope
  - location of shade controls structures
  - good management of water and feed troughs, and
  - pen cleaning techniques;
- Feed management: Managing feed storage to control moisture content, aeration and temperature, and avoiding waste;
- Feedlot drains: Good design and maintenance of feedlot drains to prevent ponding water and allow efficient removal of effluent and solids;
- Sediment basins/effluent ponds: Good design to ensure adequate capacity to treat the predicted inflows, access for maintenance/solids removal, and locating the basin/s away from sensitive receivers;
- Effluent application: appropriate sizing and siting of irrigation area, suitable application rate and scheduling of irrigation, minimising aerosols, and ensuring appropriate level of treatment before land application; and
- Solid waste management: treating solids immediately after collection, preventing waterlogging of materials, maintaining adequate oxygen supply through stockpile design, ensuring good drainage around solids handling/composting areas, disturbing solids when odours are least likely to cause impacts (eg during the day with suitable winds to disperse odours).

Long term meteorological monitoring indicates the dominant winds are from the WNW-NW direction (autumn-winter) and E-ESE (spring-summer). This suggests the closest sensitive receivers to the south are not commonly down-wind of the proposed feedlot, which should significantly reduce odour impacts on these receivers. Areas down-wind of the dominant westerly winds during autumn-winter (ie to the east) are devoid of sensitive offsite receivers for many kilometres.

With good design and management of both the abattoir and the feedlot, air quality should be capable of being managed so as to avoid offence to distant neighbours.



Source: NSW Local Government Air Quality Toolkit: Beef Cattle Feedlots

Figure 6 Feedlot Processes and Odour Sources

5.5.2. Method of Assessment

A detailed air quality and odour assessment would be undertaken. This would include a quantitative air quality assessment in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (DEC, 2005). The air quality assessment is expected to include:

- Identification of project specific assessment criteria;
- Description of existing environment including existing air quality, existing and approved air emissions/industries/pollution sources, location of sensitive receptors, and prevailing meteorology;
- Project air emissions inventory describing key air emissions sources and characterising emissions from these sources (eg as TSP, PM_{10}, $PM_{2.5}$, NO_x);
- An assessment of the likely effectiveness of air emissions controls, including pollution control equipment and buffers;

- Dispersion modeling and interpretation – a used to predict ground level concentrations for sensitive receivers;
- Cumulative impacts assessment considering any existing and recently approved developments, in particular the Mangoola Mine; and
- Describe and discuss air emission controls, monitoring methods, response mechanisms and responsibilities.

5.6. Buffer Distances

The proposed abattoir and feedlot appear capable of maintaining buffers in excess of at least 1.0 km from all potentially affected residences on neighbouring allotments. This compares favourably with many other abattoirs in NSW which are located much closer to residential areas. The site is well suited to the Project based on the available buffer distances.

Maintaining suitable and effective buffer distances between potentially offensive development and sensitive receivers is an effective way of minimizing impacts due to aspects such as noise, vibration, odour and lighting. The NSW EPA in its manual for authorized officers, recommends minimum buffer distances of 500 m to the nearest residence or residential area downwind of an abattoir (1000 m for a rendering plant). This depends on the prevailing winds and may need to be increased if effective and reliable odour control equipment is not installed.

There is an opportunity to locate certain odorous elements of the Project so as to maximise buffers from sensitive receivers – for instance, locating solid waste management areas in areas that promote good air dispersion while maximising buffers to sensitive receivers.

It is expected that the air quality, odour and noise assessments would quantitatively assess the effectiveness of buffers in determining the likely impacts on surrounding receivers.

Buffers are also required to protect waterways against contamination from stormwater runoff and effluent irrigation. Suitable buffers would be implemented between sensitive waterways and activities like waste storage/management, and wastewater irrigation.

5.7. Flora and Fauna

5.7.1. Background

Abattoir Site

A Flora and Fauna Assessment of the Hollydene and Dolwendee property was undertaken by the Enviro Factor in 2008 with the aim of assessing potential impacts of a proposed quarry on flora and fauna, especially in regards to critical habitat, threatened species, populations or ecological communities, or their habitats. The survey included part of the areas proposed for the abattoir.

More recently, a biodiversity survey of the proposed abattoir area was undertaken by Umwelt late in 2014 with reporting still in preparation. Preliminary survey results indicate the site of the proposed abattoir contains predominantly low condition derived native grassland, small areas of moderate to good condition woodland, and extensive areas of cleared land. Though these assessments are still being finalised, there appears to be a low likelihood of significant impacts to threatened species or endangered ecological communities (EECs).

Feedlot Site

A Flora and Fauna Assessment was undertaken by Harper Somers O'Sullivan in November 2004 for a previously proposed development at the Yarraman Estate. This was to identify vegetation communities and assess potential impacts of a proposed development on flora and fauna. Three vegetation communities were identified as occurring upon the site including Grassland, Modified Open Eucalypt Forest and Casuarina Woodland. All three communities were recognised as highly disturbed

due to past clearing for agriculture. The Grassland community dominates the site and contains exotic pasture gasses such as dactylon (Couch) and Axonopus affinis (Narrow-leaf Carpet Grass). The Modified Open Eucalypt Forest occurs mainly around the outside edge of the property, connected in parts with the relatively intact vegetation of the surrounding rocky hillsides. The Casuarina Woodland occurred as an isolated remnant within the drainage line running through the northern portion of the proposed development area and extending over land to the north. Little or no understorey was apparent throughout this community consisting of only a few groundcover species representative of those within the Grassland community.

The majority of the feedlot site has limited habitat values. Past and present land-uses including partial to total clearing and under-scrubbing and grazing were all contributing factors.

5.7.2. Method of Assessment

A detailed flora and fauna assessment would be undertaken to assess the potential ecological impacts of the Project. This would include updated surveys as required to supplement the previous assessments. The assessment would include identification of appropriate and specific mitigation and management measures.

The survey would be tailored to address the relevant SEARs and is likely to include: threatened flora survey within areas to be disturbed; baseline fauna surveys to include all fauna groups in areas where previous survey has not occurred (or occurred outside of the preferred survey season); and targeted surveys for threatened species most likely to be impacted by the proposal.

Flora and fauna investigations will be undertaken in accordance with the *draft Guidelines for Threatened Species Assessment* (DEC 2005) and the *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities (Working Draft)* (DEC 2004). Assessments will include significance of all threatened species, populations and ecological communities present or likely to occur onsite.

The proposed Project activities will be assessed also in relation to the Commonwealth EPBC Act, including identification of any Commonwealth referrals required.

5.8. Noise and Vibration

5.8.1. Background

Noise sources at abattoir and feedlot sites include animals (in concentrated groups), processing activities within the slaughterhouse, fixed machinery (including conveyors, air conditioning units, pumps) and mobile plant (haul trucks, forklifts and tractors).

The environment is already influenced by noise from the existing (and expanding) Mangoola coal mining operations. The main existing noise sources are the mining operations of Mangoola Coal, road traffic and noise from agricultural activities. The operations of stock trucks could increase road traffic noise.

This means that background noise levels are already elevated, and should lower the impact of additional noise generated by the proposed feedlot. A detailed noise impact assessment would be required; however, it is expected that noise can be managed so as to avoid impacting on neighbours.

5.8.2. Method of Assessment

A detailed noise and vibration assessment would be undertaken to assess impacts from construction and operation of the Project. This assessment would be undertaken in accordance with relevant NSW noise policies and guidelines, including (as appropriate) the *NSW Industrial Noise Policy* (EPA, 1999); the *NSW Road Noise Policy* (DECCW, 2011); the *Interim Construction Noise Guideline* (DECC, 2009); and *Assessing Vibration: a technical guideline* (DEC, 2006).

The Noise assessment is expected to include:

- Identification of noise-sensitive receivers;
- Monitoring of ambient and background noise levels;
- Determination of project specific noise objectives;
- Review site topography, land use and terrain, sensitive receivers and historical meteorological information;
- Noise inventory for key plant and equipment;
- Prediction of noise emissions and noise modelling to assess the impacts of noise during construction and operation (including road traffic noise) in accordance with relevant guidelines;
- Cumulative noise impact assessment; and
- Identification of mitigation measures to reduce any unacceptable impacts.

A qualitative vibration impact assessment would be undertaken. Given there will be no blasting and the relatively large distance between the proposed abattoir and sensitive receivers, it is anticipated that vibration impacts would not be significant.

5.9. Non-Aboriginal Heritage

5.9.1. Background

Searches of Commonwealth and State heritage registers as well as Muswellbrook Council LEP were conducted. There are no heritage items listed as occurring within the Project area. There is a site of local heritage significance listed on Muswellbrook LEP that is several kilometres from the proposed abattoir – "Hollydeen Shop", located at the corner Reedy Creek Road and Golden Highway. The proposed abattoir would not impact on this heritage site.

The Manobalai Nature Reserve, listed on the Register of the National Estate, is approximately 2km distant to the west of the Yarraman Estate and would not be impacted by the feedlot. The Wybong Cemetery is listed on the Register of National Trust and located along the east side of Yarraman Road 200m south of the Yarraman Estate turnoff. Although Lot 111 in DP750969 of the Project is directly adjacent to the cemetery, the lot is currently being considered for release. The proposed feedlot would be focused in the northwest lots of the Yarraman Estate and would not impact on this heritage site.

5.9.2. Method of Assessment

A historical heritage assessment would be undertaken to confirm the absence of any heritage values within the Project Area. This assessment would rely on relevant heritage registers as well as a site inspection. Specialist historic heritage consultants would not be involved unless a potential heritage item is identified that might be affected by the Project; however this is considered very unlikely.

5.10. Soils and Geology

5.10.1. Background

Soil Landscapes of the Singleton 1:250,000 Sheet (Kovac & Laurie, 1991) indicates that much of the Hollydene and Yarraman properties contain the Sandy Hollow Soil Landscape which occurs on gentle rises and slopes above the Wybong Creek floodplain. This includes the proposed operational areas of the abattoir and feedlot.

The Sandy Hollow Soil Landscape covers undulating rises and slopes within the Goulburn Valley on sandstone, gravel and shale parent material of the Narrabeen Group. The main soils are red and yellow Solodic Soils on the lower slopes. Red Earths occur midslope directly adjacent to sandstone benches with Siliceous Sands. Alluvial soils occur along major drainage lines. Soil salinity, high erodibility and poor drainage are constraints that can occur across this landscape.

The Wollombi Soil Landscape covers the valley flats and undulating rises of the Wollombi Brook and its tributaries south of Singleton. The main soils are alluvial soils and these tend to be very sandy textured. The Wollombi Soil Landscape is mapped along the alluvial flats adjacent to Wybong Creek west of the proposed abattoir site. The rocky escarpment east of the proposed abattoir is described as Lees Pinch Soil Landscape.

The Merriwa Soil Landscape covers terraces and floodplains with basaltic alluvium on the Merriwa plateau and in the Wybong area. The main soils adjacent to the drainage lines are alluvial sands and loams, with clays occurring in areas of poor drainage (eg depressions). The Merriwa Soil Landscape is mapped along the alluvial flats adjacent to Wybong Creek along the northeast boundary of the Yarraman Estate.

5.10.2. Method of Assessment

Soil disturbance would occur as a result of the abattoir and feedlot. This includes disturbance during construction and ongoing disturbance from the activities of dense numbers of livestock.

A description of the existing soils and geology, their susceptibility to degradation, and an assessment of potential impacts would be undertaken as part of the EIS and is expected to include:

- A description of the existing soils and geology, and evaluation of soil constraints such as erodibility, sodicity and salinity;
- Assessment of erosion hazard using the Revised Universal Soil Loss Equation (RUSLE);
- Identification of key activities with the potential to impact on soils; and
- Development of mitigation measures to manage soil-related impacts, including a conceptual soil and water management plan.

An assessment of the suitability of soils for long term irrigation of abattoir wastewater would be undertaken in accordance with the NSW Department of Environment and Conservation document *Environmental Guidelines: Use of Effluent by Irrigation* (DEC, 2007).

5.11. Surface Water Hydrology and Stormwater Management

5.11.1. Background

The dominant surface water drainage feature of the Project is Wybong Creek, a tributary of Goulburn River. Both the abattoir and feedlot sites drain to Wybong Creek, which is located approximately 700 m west of the proposed abattoir and forms part of the northeastern boundary of the Yarraman Estate property.

Abattoir Site

The abattoir property drains to Wybong Creek mainly via sheet flow over gently sloping north, north-west and south-facing slopes. There is one large and several small dams on the property. The proposed abattoir is not located near any existing drainage lines.

“Clean” stormwater runoff from areas upslope of the abattoir complex would be diverted around the buildings, yards and other important infrastructure, so as to prevent mixing of clean runoff with “contaminated” runoff from production areas. This can be readily achieved using an earth contour bank or similar. Other best practice measures that would be considered to help minimise the environmental impacts and management associated with contaminated stormwater include:

- Provide roofing or isolate unloading areas, stockyards and processing plant so that the amount of contaminated stormwater, wastewaters and washwaters can be minimised;
- Contaminated stormwater, wastewaters and washwaters shall be collected in lagoons and aerated and irrigated without any off-site runoff;

- Clean stormwater would be kept away from the contaminated areas of the site and directed to the stormwater drainage system and harvested for use;
- All process areas must have concrete floors graded to wash down drains; and
- All chemical storage areas and chemical-based odour control equipment would be located on impermeable concrete floors with bunding capable of containing 110 per cent of any spillage.

Clean catchment runoff and stormwater runoff from roof areas would be caught separately and reused for non-potable purposes such as landscape irrigation, external equipment washing and toilet flushing. The site of the proposed abattoir infrastructure is not flood affected or susceptible to significant stormwater inundation.

Feedlot Site

As a general rule, the NSW Environment Protection Authority (EPA) recommends that feedlots may need covering if established in areas with average annual rainfall greater than 750 mm. This is because high rainfall and open feedlots can cause problems with the storage and use of feedlot runoff (effluent). Bureau of Meteorology records for the nearby Denman (Palace Street) station indicate the long term mean annual rainfall is approximately 590mm, which is less than the rainfall threshold for which the EPA consider covering is necessary.

In accordance with best practice, "clean" stormwater runoff from upslope areas would be diverted around the feedlot infrastructure, so as to prevent mixing of clean runoff with "contaminated" runoff from feedlot areas. This can be readily achieved using contour banks or similar, though any new drainage will need to be designed with consideration of the catchment characteristics. There is an opportunity to capture clean stormwater runoff and store this for reuse within the feedlot, and for diluting effluent if necessary before irrigation. The site of the proposed feedlot infrastructure is not flood affected or susceptible to significant stormwater inundation.

The catchment above the feedlot site consists of steep mountainous bushland to the west, sloping down to relatively flat grassed slopes and floodplains. A number of small (predominantly first order) gullies cross the site draining runoff from the mountains eastwards to Wybong Creek. Diversion of waters may be required.

There is one large dam located in the centre of the site, adjacent to the winery buildings, and a number of smaller dams located around the site. The large dam supports the irrigation needs of the property through storage of runoff and allocation from Wybong creek, while the remaining ponds are used primarily to water stock.

A number of contour banks and waterways have been constructed on the site to channel overland flow into existing farm dams and also presumably as soil conservation measures, to control erosion. Other stormwater flows presently discharge via informal overland flow to Wybong Creek.

5.11.2. Method of Assessment

An assessment of potential impacts on surface water would be undertaken for the EIS, including evaluation of water quality and quantity impacts, and impacts on existing drainage lines. The assessment would include an estimate of water demand for the abattoir and feedlot sites, and evaluate water supply options. A detailed water balance would be prepared identifying potential and available water sources, water demand for all key stages of operations, and water recycling opportunities. In line with the water efficient design of the operations, the minimum water quality requirements for each stage would be identified, to identify and promote water reuse opportunities where water quality is fit for purpose.

A conceptual soil and water management plan would be prepared as part of the EIS to address the management of surface water around the abattoir and feedlot sites, including erosion and sediment control requirements, management of clean and dirty water, design and location of sediment basins

and water quality control structures. Recommendations for operational surface water monitoring would be provided, as necessary.

5.12. Traffic, Transport and Access

5.12.1. Background

The abbatoir site fronts the Golden Highway which connects Singleton, Jerrys Plains and Denman in the east with Merriwa and Dubbo in the west. In the vicinity of the site the Golden Highway provides a two lane two-way carriageway with sealed shoulders and a 100 kilometre per hour speed limit. The nearest marked intersection is with Rosemount Road on the southern side of the Golden Highway.

Currently there are two entrances to the proposed abattoir development site which will be consolidated by the application to one entrance, which is an existing B-Double approved entrance near the old Hollydeen winery building.

Access to the feedlot site would be via Golden Highway, thence Wybong Road or Reedy Creek Road to Yarraman Road, and to the Yarraman Estate driveway. Adequacy of the existing intersections with the local road network would need to be investigated and intersections upgraded if required. Viewing distances at both site property access points appear to be in excess of several hundred metres in either direction, though would need to be assessed for safety and adequacy considering the changed traffic conditions in line with requirements of the NSW Roads and Maritime Services. Additionally, Yarraman Road and its intersection with Wybong Road would need to be assessed for potential improvements and safety for the use of livestock trucks.

The choice of transport route between the abattoir and feedlot sites would need detailed analysis. At this stage use of Reedy Creek Road is considered preferable due to the shorter travel distance and better grades, though the suitability of the road and its intersections would need to be assessed.

5.12.2. Method of Assessment

A traffic impact assessment would be undertaken to consider the suitability of the existing intersections, any road and intersection upgrade requirements, and overall effect of additional abattoir and feedlot-generated traffic on the local and regional road network. The assessment would be undertaken in accordance with RMS requirements for traffic generating developments.

5.13. Socio-economic Issues

A socio-economic assessment would be undertaken that considers the existing social and economic environments and the effects (positive or negative) that may arise from construction and operation of the proposed Project. This would include considerations of factors such as:

- Generation of employment, investment and use of local products and services;
- Potentially adverse impacts due to, for example, road traffic, dust, noise, odour, vibration and visual impacts;
- Consultation with stakeholders including neighbouring residents, to gauge community support and any concerns for the project.

It is intended to develop and implement a very comprehensive consultation strategy to assist engagement with the local community, given the significance of this major agribusiness development to the region.

5.14. Solid Waste Management

A rendering plant would be provided as part of the abattoir to recycle solid wastes from animal slaughtering into other useful products and minimise waste disposal from the operations.

Composting and land disposal of solid wastes such as manure, paunch and sludge would be undertaken onsite where this can be done in an economically and environmentally sound manner. The location of such facilities would be carefully considered so as to minimise odour impacts.

5.15. Visual Amenity

The existing landscape has a rural character comprising rolling hills which are predominantly cleared, with a backdrop of vegetated rocky ridges and mountainous areas in the distance. The built environment comprises scattered rural residences and farm buildings.

A Visual assessment will be undertaken to assess potential impacts to visual amenity associated with the proposed Project. The visual analysis will include assessing potentially affected surrounding residences and viewing locations, including public roads.

A view point analysis will be conducted from a number of vantage points with an emphasis on residences to the north and northwest that may have visibility of the proposed Project. Potential vantage points from public roads, including Wybong Road and Golden Highway, would also be considered. Photographs will be compiled to describe these vantage points and assist in the visual analysis. The visual assessment will focus on the degree of visual modification likely to be experienced from different vantage points, and the sensitivity of those changes.

Based on the available information, it is anticipated that visual impacts are not likely to be significant for the surrounding vantage points and residential locations due to their relatively large distance from the Project Area, the small number of sensitive viewpoints and the obscuring effects of topography.

5.16. Wastewater Management

5.16.1. Background

Wastewater management for the Project is a key environmental issue.

Abattoir

As abattoirs use large amounts of water this generates large quantities of wastewater that is highly contaminated with BOD, nutrients and salinity. Suitable wastewater treatment infrastructure would be provided to manage all contaminated stormwater, wastewater and washwater from the abattoir, in accordance with relevant best practice guidelines. A key consideration in determining site suitability for abattoirs is identifying land areas suitable for managing the large quantities of treated wastewater, typically through irrigation. In NSW, the key best practice wastewater management document is the NSW Department of Environment and Conservation document *Environmental Guidelines: Use of Effluent by Irrigation* (DEC, 2007).

The property contains large areas that have historically been used for agricultural cropping and are likely to possess the requisite soil and other features required for sustainable long term irrigation of effluent.

A very rough approximation of the irrigation area requirements can be made using a conservative long term effluent application rate of 1mm/day – equivalent to 1L/m^2/day. Using the target water usage estimate provided in Section 3.9, the estimated average daily volume of effluent required to be irrigated is 0.7 ML, or 700,000 L. Using an application rate of 1mm/day, the required irrigation area would be 70 ha. Suitable areas for effluent irrigation would be determined through detailed site and soil investigations. Given the large available areas on the property it is expected that all required wastewater management infrastructure could be accommodated and that sustainable irrigation areas would be available.

Feedlot

Rain that falls over the feedlot generates stormwater runoff that is grossly contaminated by contact with manure and urine, and needs to be collected, held in a settling (sedimentation) system to allow suspended solid material to settle, then stored in holding ponds until it can be reused. This wastewater runoff is high in nutrients, which can pollute surface water or groundwater if not properly managed.

Feedlots are designed with an efficient drainage system to convey the wastewater and solids away from the pens to suitable sediment settling facilities and wastewater treatment ponds. Drains, sedimentation systems and holding ponds may need to be compacted or lined with an impermeable material, such as clay, to prevent infiltration and contamination of groundwater.

Generally recommended practice is for the effluent to be diluted with 'clean' water and used for irrigation. Cropping with subsequent removal of applied nutrients is the preferred use.

The site should have more than adequate space available to install the necessary wastewater collection, treatment and storage facilities. The location of these facilities is a vital component of the feedlot design. It is preferable to locate wastewater ponds downslope of the feedlot where gravity drainage can be achieved. Wastewater ponds should be sited and constructed so as to minimise collection of clean (uncontaminated) runoff, so that adequate hydraulic residence times for effective treatment are maintained.

5.16.2. Method of Assessment

Detailed site and soil surveys would be required to identify suitable areas on the property for effluent reuse by irrigation. Sizing of wastewater treatment and storage ponds and irrigation area requirements requires a thorough understanding of wastewater volumes and characteristics, to inform water and nutrient balance modeling. While this level of design is beyond the scope of this preliminary appraisal, the property contains large areas that have historically been used for agricultural cropping and would likely possess the requisite soil and other features and be of adequate size for sustainable long term irrigation of effluent.

Some important factors to consider in respect of the irrigation area are:

- Steep slopes and poorly drained areas should be avoided, to minimise the risk of effluent runoff and pollution of natural waterways;
- Irrigation areas should contain fertile soils capable of regular cultivation, that are not affected by soil salinity, sodicity, impeded drainage or shallow limiting horizons:
- Not all of the irrigation area would be used at once. This allows paddocks to be periodically rested or left fallow in accordance with best practice;
- Buffer setbacks are required between irrigation areas and environmentally sensitive areas such as protected native vegetation and waterways. Typically a minimum buffer of 40 m buffer is required from waterways. Smaller buffers might be accepted if runoff controls are employed (eg contour banks) to reduce the risk of effluent runoff to waterways;
- Irrigation areas should be cropped to remove salts and nutrients from the area and avoid excessive accumulation in the soils; and
- Wet weather storage dams are required so that irrigation is avoided during wet weather. Wet weather storage dams may be required to store anywhere between 30 and 60 days of effluent generation. These dams must not receive stormwater inputs. Similarly, terminal ponds may be required to collect first flush runoff from irrigation areas.

A detailed investigation of wastewater management requirements and concept design of a suitable wastewater management system would be undertaken for the EIS. An assessment of the suitability of soils for long term irrigation of abattoir wastewater and conceptual design of the wastewater

management system would be undertaken in accordance with the NSW Department of Environment and Conservation document *Environmental Guidelines: Use of Effluent by Irrigation* (DEC, 2007).

This assessment is expected to include:

- an assessment of land capability and suitability for effluent management (irrigation) to ensure that effluent can be supplied sustainably to land without adversely impacting the soils, surface water quality, groundwater and vegetation, both onsite and offsite. This assessment would consider a range of characteristics including landform, soils, climate, vegetation, surface water and groundwater hydrology;
- detailed site and soils assessment, including soil sampling and analysis;
- identification of the different wastewater streams and determination of the likely quantity and quality of wastewater produced by the abattoir;
- determination of the required irrigation area and wet weather storage size through water and nutrient balance modelling;
- description of proposed wastewater treatment infrastructure and predicted effluent quality after treatment;
- an outline of effluent management design and operational requirements and measures to ensure long term sustainability of irrigation, including consideration of:
  - resting and rotation of active irrigation areas;
  - withholding periods for stock grazing on effluent irrigation areas;
  - management of the crop to ensure harvesting and removal of nutrients, salts and other constituents to prevent build-up in soils and leaching to groundwater;
  - buffer setbacks
  - wet weather storage facilities to enable withholding of effluent irrigation during wet weather.

6. Conclusion

This Supporting Document has been prepared to accompany a development application for State Significant Development, for a proposed new abattoir at Hollydeen and feedlot at Wybong. It provides information to assist in compiling the Secretary's Environmental Assessment Requirements for the proposed Project. The proposed Project meets the definition of an "agricultural produce industry" with a capital investment value (CIV) exceeding $30 million as described in *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP), and so meets the definition of State Significant Development.

In summary, the proposed Project includes construction of a modern abattoir and feedlot using current world's best practice systems in construction, equipment, animal handling and environmental considerations. The abattoir facility would include a rendering plant and would seek accreditation as an Export Abattoir with (in particular) accreditation to sell product to China as well as other foreign markets. Product would also be sold domestically.

It is believed that the proposed Project is well situated to take advantage of the available commercial opportunities and promote economic development within the region, while minimising potential adverse impacts on the environment and on the broader community. Key features promoting the Project include:

- The Project is strategically located in the heart of the Upper Hunter Valley, with good road access from prime agricultural regions and good access to the Port of Newcastle for supply of product to export markets;
- The properties chosen for location of the abattoir and feedlot have large land areas that are expected to be adequate for the proposed agribusinesses.
- The Project is located in a relatively remote location that is distant from large population centres, rural towns and individual rural residences;
- The Project area is ideally situated within large land holdings with buffer distances exceeding 1.5 km to neighboring residences. This will significantly reduce the risk of impacts from abattoir and feedlot operations such as noise and odour;
- The Project Area includes substantial areas of productive agricultural land that could be irrigated with treated abattoir and feedlot wastewater to support the production of crops for stock feed;
- The Project has adequate access to water, power and other essential services;
- The Project would deliver substantial employment opportunities to the local and regional area and generate capital investment in the Muswellbrook LGA; and
- From preliminary environmental investigations the Project sites appear capable of supporting a feedlot, abattoir and related facilities.

Key environmental issues that would be assessed in detail as part of the Environmental Impact Statement include, but are not limited to:

- Aboriginal heritage;
- Air quality and odour;
- Buffer distances;
- Community amenity;
- Community consultation;
- Energy consumption and greenhouse gas production;

- Flora and fauna (including impacts on threatened species and endangered ecological communities);
- Noise and vibration;
- Stormwater management;
- Socio-economic issues;
- Traffic, transport and access;
- Visual impacts and amenity
- Water supply;
- Water resources (surface water and groundwater management, water supply);
- Waste management;
- Wastewater management.