Development Application and Environmental Impact Statement

Expansion of Beef Cattle Feedlot from 999 head to 3,200 head

Traffic Impact Assessment

"High Claire" 58 Broughans Road Pine Lodge NSW 2714



AGRICULTURAL

ENVIRONMENTAL

PROJECT MANAGEMENT

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Executive summary

AJ & NA Varley own and operate a mixed farming operation across several properties at Pine Lodge including "High Claire", "Arkoona", "Sunnyside", "Killara Rise", Langunyah" and "Glen Cluan" some 17 km by road west of Finley and 49 km by road east-southeast of Deniliquin in Riverina region of NSW.

AJ & NA Varley primarily engage in dryland and irrigated cropping, beef, sheep and wool production. AJ & NA Varley produce wheat, barley in winter and sorghum and maize in summer under irrigation and dryland farming systems.

Central to the beef production enterprise is the breeding, growing and lot feeding of cattle for the domestic market. Currently the beef supply chain includes breeding and growing of beef cattle and lot feeding of cattle within a feedlot on the property "High Claire".

"High Claire" comprises some 195.19 ha (~482.12 acres) and currently, a dryland and irrigated cropping business is undertaken on a large proportion of the property with lot feeding of beef cattle and sheep.

There has been a beef cattle feedlot on "High Claire" for over twenty years after approval was granted for a 999 head feedlot by the former Conargo Shire (now Edward River Council) in 2004 (DA 293). Under Schedule 3, Item 21 of the Environmental Planning and Assessment Regulation 2000, as the capacity of the existing beef cattle development does not exceed 1000 head it is not a designated development and an environmental licence from NSW EPA is not required.

Co-located with the beef cattle feedlot is a 4,000 head sheep feedlot which was granted approval in 2006 by the former Conargo Shire (now Edward River Council) in 2004 (DA 352). Under Schedule 3, Item 21 of the Environmental Planning and Assessment Regulation 2000, as the capacity of the existing sheep development does not exceed 4000 head it is not a designated development and an environmental licence from NSW EPA is not required.

The beef cattle Feedlot is accredited under the National Feedlot Accreditation Scheme (NFAS) with audits conducted annually.

The beef cattle feedlot currently operates for 12 months of the year and employs approximately 2 full time staff. Casual staff and contractors are engaged as required during busy periods such as planting and harvesting of silage and fodder and to supply various associated services such as plant maintenance and veterinary requirements.

AJ & NA Varley wish to expand the existing beef cattle feedlot from the current approved capacity of 999 head by gaining development approval for intensive livestock agriculture to operate as a 3,200 head beef cattle feedlot on the site. The proposal also involves the ceasation of the sheep feedlot with the existing infrastructure repurposed for the lot feeding of cattle. The proposed development is not proposed to be staged.



The proposed development shall utilise the existing approved and constructed development complex infrastructure on the subject land. The proposed development does not propose to reconfigure existing built infrastructure.

The increase in the number of head in the development shall be gained by reducing the cattle stocking density and utilising the pens currently used for the sheep feedlot as cattle pens. Existing infrastructure such as the grain storage and processing and cattle handling facilities have sufficient capacity to cater for the demands of the proposed development.

The proposed development shall utilise the existing approved manure and effluent utilisation areas on the property. The proposed development does not propose to reconfigure the existing waste utilisation areas.

The property "High Claire" is within the Edward River Council local government area and relevant environmental planning instrument is the Conargo Local Environmental Plan 2013 (CLEP).

Beef cattle feedlots which exceed 1,000 head capacity are defined as designated development under Schedule 3 (Part 1 section 21a) of the Environmental Planning and Assessment Regulation 2000 and therefore require a full Environmental Impact Statement (EIS) to accompany the development application.

This Traffic Impact Assessment has been prepared as part of an EIS to support the Development Application to the Edward River Council for the proposed development and assesses the impact and mitigation treatments (if any) required for the external road network.

The traffic impact assessment determined that no upgrades are recommended within the sealed and unsealed sections of Broughans Road and James Road as these roads meet the minimum standard and existing road order classification commensurate with existing and proposed traffic volumes.

No intersection upgrades to the local road network would be warranted due to the low additional volume of additional traffic generated by the proposed development and intersection geometry is able to accommodate the largest vehicle proposed to access the site.

The following mitigation measures are proposed or maintained:

- Access for light vehicles and heavy vehicles be maintained via the existing approved subject land entrances off Broughans Road approximately 405 m and 525 m east of the intersection with James Road to provide sufficient sight distances to and from the intersection.
- Advisory signage (Truck crossing or entering) be implemented on each approach to 58 Broughans Road in accordance with AS1742.2 to advise motorists of truck turning movements.
- A Traffic Management Plan and Driver Code of Conduct shall be implemented to ensure heavy vehicles utilise either Haulage Route A, Haulage Route B or Haulage Route C.

In conclusion, the proposed development will not adversely impact on the operational performance of the surrounding road network and the proposed road access arrangements are considered adequate and suitable for the proposed use.

1 Background

1.1 Introduction

AJ & NA Varley own and operate a mixed farming operation across several properties at Pine Lodge including "High Claire", "Arkoona", "Sunnyside", "Killara Rise", "Langunyah" and "Glen Cluan" some 17 km by road west of Finley and 49 km by road east-southeast of Deniliquin in Riverina region of NSW.

AJ & NA Varley primarily engage in dryland and irrigated cropping, beef, sheep and wool production. AJ & NA Varley produce wheat, barley in winter and sorghum and maize in summer under irrigation and dryland farming systems.

Central to the beef production enterprise is the breeding, growing and lot feeding of cattle for the domestic market. Currently the beef supply chain includes breeding and growing of beef cattle and lot feeding of cattle within a feedlot on the property "High Claire".

"High Claire" comprises some 195.19 ha (~482.12 acres) and currently, a dryland and irrigated cropping business is undertaken on a large proportion of the property with lot feeding of beef cattle and sheep.

There has been a beef cattle feedlot on "High Claire" for over twenty years after approval was granted for a 999 head feedlot by the former Conargo Shire (now Edward River Council) in 2004 (DA 293). Under Schedule 3, Item 21 of the Environmental Planning and Assessment Regulation 2000, as the capacity of the existing beef cattle development does not exceed 1000 head it is not a designated development and an environmental licence from NSW EPA is not required.

Co-located with the beef cattle feedlot is a 4,000 head sheep feedlot which was granted approval in 2006 by the former Conargo Shire (now Edward River Council) in 2004 (DA 352). Under Schedule 3, Item 21 of the Environmental Planning and Assessment Regulation 2000, as the capacity of the existing sheep development does not exceed 4000 head it is not a designated development and an environmental licence from NSW EPA is not required.

The existing beef cattle feedlot is known as High Claire. High Claire is used to finish AJ & NA Varley's own cattle for the domestic and export market along with custom feeding. The beef cattle feedlot is accredited under the National Feedlot Accreditation Scheme (NFAS) with audits conducted annually.

The beef cattle feedlot currently operates for 12 months of the year and employs approximately 2 full time staff. Casual staff and contractors are engaged as required during busy periods such as planting and harvesting of silage and fodder and to supply various associated services such as plant maintenance and veterinary requirements.

AJ & NA Varley wish to expand the existing beef cattle feedlot from the current approved capacity of 999 head by gaining development approval for intensive livestock agriculture to operate as a 3,200 head beef cattle feedlot on the site. The proposal also involves the



ceasation of the sheep feedlot with the existing infrastructure repurposed for the lot feeding of cattle. The proposed development is not proposed to be staged.

The proposed development shall utilise the existing approved and constructed development complex infrastructure on the subject land. The proposed development does not propose to reconfigure existing built infrastructure.

The increase in the number of head in the development shall be gained by reducing the cattle stocking density and utilising the pens currently used for the sheep feedlot as cattle pens.

The proposed development shall comprise one controlled drainage area with associated production pens and drainage system which includes catch drains, sedimentation basin and holding pond. Existing infrastructure such as the grain storage and processing and cattle handling facilities have sufficient capacity to cater for the demands of the proposed development.

The proposed development shall utilise the existing approved manure and effluent utilisation areas on the property. The proposed development does not propose to reconfigure the existing waste utilisation areas.

The property "High Claire" is within the Edward River Council local government area and relevant environmental planning instrument is the Conargo Local Environmental Plan 2013 (CLEP).

Beef cattle feedlots which exceed 1,000 head capacity are defined as designated development under Schedule 3 (Part 1 section 21a) of the Environmental Planning and Assessment Regulation 2000 and therefore require a full Environmental Impact Statement (EIS) to accompany the development application.

This Traffic Impact Assessment forms part of an EIS prepared to support the Development Application to the Edward River Shire for the proposed development and assesses the impact and mitigation treatments (if any) required for the external road network.

1.1.1 Scope

The objective of this report is to identify the traffic and transport impacts associated with the proposed expansion of High Claire Feedlot from 999 head to 3,200 head and the proposed onsite and off-site measures proposed to mitigate the impacts of the development on any road or rail related infrastructure. The report will form part of the Environmental Impact Statement (EIS) for the proposed development and provides the Edward River Council and the TfNSW the opportunity to adequately consider any traffic or transport related impacts.



The assessment is based on the following general scope for matters to consider in a TIA which is defined by the NSW Roads and Maritime Services (RMS) Guide to Traffic Generating Developments (RTA 2002):

- The existing locality and surrounding land uses;
- Review the existing road network to understand the current road connections and conditions.
- Estimation of the traffic generation of the proposed development based on the proposed activities and car parking requirements;
- Estimate the traffic distribution onto the surrounding road network;
- Provide engineering advice on access arrangements into the development site and geometric requirements including upgrade requirements (if any) to adjacent roads and intersections.
- Assessment of the impact of the additional trips generated from the proposed development on the local road network and any traffic management measures; and
- Analysis of the impact of the existing and proposed development on the road network with consideration for a 10 year horizon.

1.1.2 References and guidelines

In preparing this report, references are made to the following traffic engineering and council sources:

- Austroads Guide to Traffic Management Part 3 Traffic Studies and Analysis (Austroads, 2017);
- Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections, (Austroads, 2021);
- Guide to Road Design Part 3: Geometric Design (Austroads, 2021);
- Conargo Local Environment Plan 2013 (Edward Shire Council, 2013);
- Edward River Council Road classification;
- Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings Management, (Austroads, 2020);
- Guide to Traffic Engineering Practice Part 5 Intersections at Grade (Austroads, 2009);
- Guide to Traffic Management Part 12: Integrated Transport Assessments for Developments (Austroads, 2020); and
- Austroads Supplement for Guide to Traffic Management Roads and Maritime Services (Roads and Maritime Services, 2013); and
- Roads and Traffic Authority, 2002, Guide to Traffic Generating Developments, Version 2.2 (RTA, 2002).

This report has been prepared by Rod Davis (FIEAust, CPEng, RPEQ#20256, CPESC).

2 Site and locality

2.1 Subject land

The proposed development is to be located on one land parcel which forms the property known as "High Claire". The subject land is located on Broughans Road approximately some 17 km by road west of Finley, 49 km by road east-southeast of Deniliquin and 20 km west-northwest of Tocumwal.

The subject land has primary frontage to Broughans Road (unsealed) of approximately 1.2 km in length and secondary frontage to James Road on the western boundary. Broughans Road intersects with the Newell Highway some 11 km east of the subject land. The subject land is about 4.0 km south of the Riverina Highway via James Road.

The proposed development site is bounded on the north by Broughans Road; to the west by James Road; to the south by Bowlers Road and east by other predominantly irrigated and dryland cropping mixed farming landholdings. Road access to the proposed development is from Broughans Road, a council-controlled road.

Figure 1 is a locality plan highlighting the subject land to roads and the nearby townships of Deniliquin and Finley and the main watercourses and drainage lines in the region.

2.1.1 Real property description

The real property description for the subject land is provided in Table 1. The subject land comprises of one (1) cadastral portion. The total area of the subject land is about 195.2 ha (\sim 482.23 acres). The subject land is in the Edward River Shire.

Figure 2 is a cadastral plan highlighting the cadastral parcel that comprises the subject land.

		-	-		•
Property name	Lot no.	Plan no.	Easements	Area Ha	Local government area
"High Claire"	130	DP756353	-	~195.19	Edward River Shire

Table 1 – Subject land – Real property description

2.1.1.1 Limitations/Interests/Encumbrances

The subject land does not contain any easements.

2.1.1.2 Road reserve

The subject land does not contain a road reserve under the *Roads Act 1993* as shown in Figure 2.

2.1.1.3 Travelling Stock Reserve

There are no Travelling Stock Reserves (TSR) declared on or adjoining the subject land or along or adjoining Broughans Road, James Road or the Riverina Highway on parcels of Crown land reserved under the Crown Land Management Act 2016.

2.1.1.4 Tenure

The subject land is owned by Andrew James Jessop Varley and Nichole Andrea Varley (ABN 88 390 323 468) as joint tenants in freehold land tenure.

2.1.1.5 Landuse and zoning

The proposed development site falls within the RU1 Primary Production zone of the *Conargo Local Environment Plan 2013* (Edward River Council, 2024). The anticipated traffic growth rate of the surrounding area is considered to be relatively low.

2.1.1.6 Road network

The subject land is accessed directly from Broughans Road. The Edward River Council is the roads authority for Broughans Road from the intersection with James Road to the local government boundary east of the subject land.

The existing development is accessed via the existing subject land entrance off Broughans Road. All light (staff and support services) and heavy vehicles (livestock and commodity delivery) enter the development complex site via the Broughans Road entrance.







3 Proposed development

3.1 Overview

AJ & NA Varley wish to expand the existing beef cattle feedlot on the subject land from 999 head up to a maximum capacity of 3,200 head. The proposed development shall be accommodated within the existing development built infrastructure by reducing the approved stocking density. The proposed development will allow flexibility of use with the ability to increase or decrease the number of animals within the development in line with market and economic factors.

The proposed development complex would occupy a footprint of approximately 12 ha and includes the following components in a functional configuration:

- Water reticulation infrastructure A reliable and uninterrupted supply of clean water of the required volume to sustain operations is provided;
- Pens Fenced areas are constructed for accommodating beef cattle (production pens), cattle arriving to or being dispatched from the proposed development (induction/dispatch pens), and sick beef cattle (hospital pens);
- Internal road An internal road network is constructed to provide al-weather access to the proposed development complex;
- Controlled drainage area Rainfall runoff from areas such as pens that has a high organic matter and therefore a high pollution potential is controlled within a system that collects and conveys this runoff to a sedimentation system and holding pond prior to environmentally sustainable utilisation;
- Drainage system The controlled drainage area contains a system including catch drains, sedimentation system and holding pond for conveying stormwater, allow entrained sediment to 'settle out' and capture and storage of the stormwater from the controlled drainage area until it can be sustainably utilised; and
- Solid waste and effluent management areas Solids wastes such as manure and mortalities shall be temporarily stockpiled and processed within the solid waste stockpile and carcass composting area prior to utilisation on-site. Effluent is stored in the holding pond pending application to the effluent utilisation area.

The proposed development also includes an associated 148 ha of cropping and pasture land for solid waste and effluent utilisation. Solid wastes generated are applied to an on-site utilisation area. Any solid wastes not utilised on-site are removed off-site to adjoining properties owned by the proponent. When available, effluent is applied to land via irrigation within a dedicated effluent utilisation area.

3.2 Access

Access to the existing development complex on the subject land is directly off Broughans Road a local controlled road. There are two vehicle entrances off Broughans Road. Access for livestock heavy vehicles and light vehicles is located some 405 m east of the intersection with James Road with commodity heavy vehicles and light vehicle entering the site a further 120 m to the east. The entrance to the subject land homestead and outbuildings for light and heavy vehicles is located some 585 m east of the intersection with James Road as shown in Figure 3.

A purpose built all weather internal road has been constructed to connect the entrances to the infrastructure of the existing development. No new entrance off Broughans Road shall be constructed.

The existing subject land entrance shall be maintained for light and heavy vehicles servicing the subject land homestead and agricultural commodities produced on the subject land and not destined for the proposed development.

All livestock and commodity delivery vehicles associated with the proposed development shall be required to enter the site via the existing development entrances. The existing development entrances have been designed to provide an efficient, functional and safe all weather access to the proposed development site for the type of traffic generated by the proposed development. All vehicles can enter and exit the development complex in a forward direction.

The sight distances for traffic approaching the entrances along Broughans Road are very good, as Broughans Road is straight and level in both directions and drivers can clearly see for at least 350 m both east and west of each entrance.

3.3 Parking

A vehicle parking area is located at the south-eastern corner of the existing development complex site adjacent to the grain storage and processing facility, with at least 5 parking spaces provided for operational and maintenance staff.

3.4 Staging

The proposed development is not proposed to be staged.

3.5 Construction

The proposed development shall utilise the existing approved and constructed development complex infrastructure on the subject land. The proposed development does not propose to reconfigure existing built infrastructure. Consequently, there is construction phase per se and no construction traffic generated by the proposed development.



3.6 Decommissioning

There is no proposed operational lifespan of the existing development. The existing development shall continue to operate based on demand for lot-fed beef and economic viability. Consequently, the development complex site and all above ground infrastructure is not proposed to be decommissioned.





4 Traffic Impact Assessment

4.1 Existing road network

This section describes the existing road network including traffic conditions, volumes, intersection performance, road accesses, relevant intersection type and operation, as well as public and active transport provisions.

The locality of the proposed development is shown in Figure 1 and Figure 2.

The principal haulage route to the proposed development by light and heavy vehicles is via the Riverina Highway to James Road to Broughans Road.

Local access to the proposed development from the south is provided via Bowlers Road onto James Road to Broughans Road or Broughans Road from the east.

Local roads such as Lower Finley Road, Tuppal Road and Woodyards Road are used periodically by heavy vehicles to deliver commodities to the existing development from local properties. This use would continue with the proposed development.

The existing road network surrounding the subject land is shown in Figure 4 and includes the roads outlined in the following sections. The haulage routes are shown on Figure 4.





4.1.1 Local roads

All livestock and commodity delivery vehicles shall enter the proposed development complex site via the existing entrances off Broughans Road some 405 m and 525 m east of the intersection with James Road respectively. All heavy vehicles enter the site from the west.

Local roads such as James Road south of the intersection with Broughans Road, Bowlers Road, Fullers Road, Woodyards Road, Lower Finley Road, Broughans Road east of the subject land entrance for example will not be used by development generated traffic in particular heavy vehicles. These roads may be used to transport commodities (grain/straw) to the proposed development however these commodities would be transported off these properties to market even if there was no development. On this basis, the existing local road network that may be impacted by the proposed development is limited to Broughans Road west to James Road and James Road north to the Riverina Highway.

4.1.1.1 Broughans Road

Broughans Road is a local road. The Edward River Council and Berrigan Shire Council are the roads authority for Broughans Road in accordance with Section 7 of the Roads Act 1993.

Broughans Road is designated as a Local Road – Unsealed - Low Volume under the Edward River Council road classification as outlined in correspondence from Edward River Council presented in Appendix A.

Broughans Road is two-lane, two-way undivided local road about 11.6 km long. Broughans Road provides connection from James Road (CH0 km) to the Newell Highway (CH11.6 km) some 2 km south of Finley. Broughans Road is unsealed from James Road (CH 0 km) to the northern abutment to the culvert crossing over Ulupna Channel (CH 3.9 km) and is bitumen sealed from the southern abutment to the Newell Highway (CH11.6 km). Broughans Road terminates at the intersection with the Newell Highway and runs generally in an east west direction from James Road to the Newell Highway. Broughans Road has no posted speed limit.

The unsealed section of Broughans Road is generally 7-8 m pavement on a 9-10 m formation as shown in Photograph 1 and Photograph 2. The sealed section of Broughans Road is a 3.8 m seal on 7.5 m formation to the western edge of the Finley Solar Farm then 6.7 m seal on 9.7 m formation to the Newell Highway as shown in Photograph 4 and Photograph 4. Broughans Road has no line markings (centreline or edge lines) on the sealed section.

The pavement is in very good condition along the entire length reviewed as shown in Photograph 1, Photograph 2, Photograph 4 and Photograph 4.

Development traffic comprising predominantly heavy vehicles is expected to travel to/from the proposed development along Broughans Road from the intersection with James Road.



The principal haulage route is along Broughans Road from the development site entrances west to the intersection with James Road.

Broughans Road from the intersection of the Newell Highway to the boundary of Berrigan Shire (Mulwala No 17 Channel) is approved for up to B-double (25/26m). However, within the Edward River Council area Broughans Road west to the intersection with James Road is the use of B-Doubles is only allowed under permit. Broughans Road is located in an approved 4.6 m high vehicle route area.

Tube count data is not available for Broughans Road. The majority of vehicles currently using Broughans Road would be associated with agricultural operations on surrounding properties and the existing development.

Road width design standards for low volume (generally rural) roads are defined by the Austroads Guide to Road Design (Austroads 2021a) and are based on daily traffic volumes. Austroads (Austroads, 2021a) nominates one 3.7 m traffic lane on 8.7 m carriageway for roads servicing 1-150vpd with more than 15% heavy vehicles. Single lane sealed, however unsealed dual lane is also generally acceptable. No upgrades are recommended under existing or proposed traffic conditions within the sealed section based on the gravel pavement width of 5 m. The formation width does not meet Austroads requirements for shoulder and carriageway width.



Photograph 1 – Broughans Road – Formation CH0.1 m





Photograph 2 – Broughans Road – Formation CH0.6 km ("High Claire")



Photograph 3 – Broughans Road – Formation CH6.0 km





Photograph 4 – Broughans Road – Formation CH11.6 km (Newell Highway intersection)



4.1.1.2 James Road

James Road is a local road. The Edward River Council is the roads authority for James Road in accordance with Section 7 of the Roads Act 1993.

James Road is designated as a Local Road – Sealed – Medium Volume under the Edward River Council road classification as outlined in correspondence from Edward River Council presented in Appendix A.

James Road is two-lane, two-way undivided local road about 5.9 km long. James Road provides connection from the Riverina Highway (CH0 km) to Bowlers Road (CH5.9 km). James Road is sealed for its entire length. Broughans Road intersects with James Road at CH3.9 km. James Road terminates at the intersection with Bowlers Road and runs generally in a north south direction from the Riverina Highway. James Road has no posted speed limit.

James Road is generally 3.7 m pavement on a 7-7.5 m formation as shown in Photograph 5, Photograph 6, Photograph 7 and Photograph 8. James Road has no line markings (centreline or edge lines).

James Road has two bridge crossings, one over the Mulwala Canal adjacent to the Riverina Highway and one over the Box Creek escape channel and a culvert crossing on the Tuppal No 1 channel.

The pavement is in good condition along the entire length reviewed as shown in Photograph 5, Photograph 6, Photograph 7 and Photograph 8. However there is edge drop off which if not repaired will lead to pavement edge wear.

Development traffic comprising predominantly heavy vehicles is expected to travel to/from the proposed development along James Road from the intersection with the Riverina Highway to Broughans Road. The principal haulage route is along James Road from the intersection with the Riverina Highway to Broughans Road.

The use of B-doubles on James Road is only permitted under permit with conditions. James Road is located in an approved 4.6 m high vehicle route area.

Tube count data is not available for James Road. The majority of vehicles currently using James Road would be associated with agricultural operations on surrounding properties and the existing development.

Road width design standards for low volume (generally rural) roads are defined by the Austroads Guide to Road Design (Austroads 2021a) and are based on daily traffic volumes. Austroads (Austroads, 2021a) nominates one 3.7 m traffic lane on 8.7 m carriageway for roads servicing 1-150vpd with more than 15% heavy vehicles. Single lane sealed however unsealed dual lane is also generally acceptable. No upgrades are recommended under existing or proposed traffic conditions within the sealed section based on the pavement width of



3.7 m. The formation width does not meet Austroads requirements for shoulder and carriageway width, however.

An AADT of James Road of 50 vpd has been assumed based on the following:

- James Road provides connection from a state controlled road to service access to predominantly rural type properties;
- James Road does not provide connectivity between two major roads and terminates at Bowlers Road; and
- There are several roads intersection with James Road Broughans Road/Lower Finley Road which provide access to rural properties and seasonal commercial access.



Photograph 5 – James Road – Formation CH0 km (Riverina Highway intersection)





Photograph 6 – James Road – Formation CH0.1 km



Photograph 7 – James Road – Formation CH3.9 km (Broughans Road intersection)





Photograph 8 – James Road – Formation CH5.9 km (Bowlers Road intersection)



4.1.2 Regional roads

There are no regional roads in the Pine Lodge area.

4.1.3 State Road

4.1.3.1 Riverina Highway

The Riverina Highway (Road Number 0000020) is a classified (State) road. The TfNSW is the roads authority for the Riverina Highway in accordance with Section 7 of the Roads Act 1993.

The Riverina Highway designated Route B58 is a 220 km state highway in the Riverina of New South Wales. The Riverina Highway traverses the Riverina Region following the course of the River Murray west by northwest between Albury and Deniliquin. The Riverina Highway links the townships of Albury to Howlong, Corowa, Berrigan and Finley where it has a short concurrency with Newell Highway. From Finley the highway follows the Mulwala Canal westward until it reaches Deniliquin. The western termination of the highway is at the junction with the Cobb Highway at Deniliquin.

The Riverina Highway has the following characteristics between Finley and Deniliquin:

- two-lane, two-way undivided road with a posted speed limit of 100 km/hr (Finley to Deniliquin);
- sealed, generally approximately 9 m wide, with 3.5 m wide lanes and 0.7-1.0 m wide sealed shoulders, centre line marking and edge line marking;
- The road is currently in good condition, with no significant signs of pavement breakup within the vicinity of the James Road intersection due to heavy vehicle turning movements.

The Riverina Highway is generally 9.2 m pavement seal width with two 3.5m lane width on a 11 m formation. However there is widening at the James Road intersection to 14 m as shown in Photograph 9. Photograph 9, Photograph 10 and Photograph 11 illustrate the Riverina Highway between the James Road intersection and Finley. The Riverina Highway has centreline or edge line marking.

The Riverina Highway is an approved 4.6 m high vehicle route and approved route for Type 1 road train route (Road train 36.5 m network), AB-triple, B-triple and modular B-triple.





Photograph 9 – Riverina highway / James Road intersection

Traffic count data is available for Riverina Highway at Station Id 97024 110m West of Hamilton Street, Finley 2713) for 2011. The AADT recorded was 1,482 vpd with 307 vpd (\sim 21%) being heavy vehicles (Class 3 to 10) during this period. The TfNSW has advised that a daily vehicle count of 1,611 was recorded in 2019 at this location. The tube count data for the Riverina Highway at this station is provided in Appendix B.





Photograph 10 – Riverina Highway formation (James Road - Finley)



Photograph 11 – Riverina Highway formation (James Road)



4.1.3.2 Newell Highway

The Newell Highway (Road Number 0000017) is a classified (State) road. The TfNSW is the roads authority for the Newell Highway in accordance with Section 7 of the Roads Act 1993.

The Newell Highway designated Route A9 is a national highway some 1,058 km in length traversing the entire state from north to south in the centrewest of New South Wales. The northern terminus of the Newell Highway is the Queensland town of Goondiwindi and the southern terminus is the Murray River at Tocumwal. The Newell Highway is a vital freight route between Queensland and Victoria and links the NSW townships of Moree, Narrabri, Coonabarabran, Gilgandra, Dubbo, Parkes, Forbes, West Wyalong, Narrandera, Jerilderie, Finley and Tocumwal.

The Newell Highway has the following characteristics between Finley and Tocumwal:

- two-lane, two-way undivided road with a posted speed limit of 100 km/hr (Finley to Tocumwal);
- sealed, generally approximately 9 m wide, with 3.5 m wide lanes and 0.7-1.0 m wide sealed shoulders, centre line marking and edge line marking;
- The road is currently in good condition, with no significant signs of pavement breakup within the vicinity of the Broughans Road intersection due to heavy vehicle turning movements.

The Newell Highway is generally 9.0 m pavement seal width with two 3.5 m lane width on a 11 m formation. Photograph 12 and Photograph 13 illustrate the Newell Highway at the Broughans Road intersection south of Finley. The Newell Highway has centreline or edge line marking.

The Newell Highway is an approved 4.6 m high vehicle route and approved route for Type 1 road train route (Road train 36.5 m network), AB-triple, B-triple and modular B-triple.




Photograph 12 – Newell Highway (Looking north at Broughans Road intersection)



Photograph 13 – Newell Highway (Looking south at Broughans Road intersection)



Tube count data is available for Newell Highway at Station Id 97029 60m North of Old Adcocks Road, Tocumwal 2714) for 2010. The AADT recorded was 2,324 vpd with 589 vpd (~25%) being heavy vehicles (Class 3 to 10) during this period. The tube count data for the Newell Highway at this station is provided in Appendix B.

4.1.4 Crash History

4.1.4.1 Crash history

A review of the crash data for the past five (5) years for the road network around the proposed development site has been undertaken and is summarised in Table 2. Table 2 shows there has been 6 reported road traffic crashes on the Riverina Highway along the segment reviewed. There have been no reported road traffic crashes on the James Road or Broughans Road in the 5 year reporting period up to 2022.



Shire	Location	Year (Crash ID)	RUM – code and (description)	Casualty
Edward River	Riverina Highway*	2021 (1261485)	86 (Off left/left bend)	Non-casualty (towaway)
Edward River	Riverina Highway*	2021 (1263411)	67 (Struck animal)	Minor/other injury
Edward River	Riverina Highway*	2021 (1266498)	20 (Head on)	Moderate injury
Edward River	Riverina Highway*	2018 (1178487)	21 (Right through – T-junction)	Serious injury
Berrigan	Riverina Highway**	2017 (1179610)	70 (Off road to left)	Non-casualty (towaway)
Berrigan	Riverina Highway**	2020 (1248525)	88 (Out of control on bend)T-junction	Non-casualty (towaway)

Table 2 – Road Network – Crash history (2018-2022)

*Segment of Riverina Highway between James Road / Riverina Way intersection and Deniliquin.

**Segment of Riverina Highway between James Road / Riverina Way intersection and Finley.



4.1.5 Key intersections

There are several intersections within the local and state road network. These include Tintersections from the Riverina Highway onto James Road and James Road onto Broughans Road as discussed in previous sections. There are intersections with state and local roads further afield such as the Riverina Highway / Newell Highway, Newell Highway / Riverina Highway and Newell Highway / Broughans Road, James Road / Bowlers Road Tintersections.

From a traffic route perspective the key intersections have been determined as the Riverina Highway / James Road and James Road / Broughans Road T-intersections. These intersections have been assessed in section 4.4.3.

4.1.6 Public transport

The proposed development is not expected to have any significant impact on public transport infrastructure. There are no public passenger bus services along James Road and Broughans Road. There is a passenger bus service operating between Finley and Deniliquin and Finley and Tocumwal operated by NSWTrainLink. There is at least one bus per day from Finley to Deniliquin and at least one bus per day from Finley to Tocumwal.

A school bus service operates on the Riverina Highway, James Road and Broughans Road. The school bus operating on James Road and Broughans Road caters for both primary and high school. The travel route for this bus service morning pickup is from Tocumwal via the Newell Highway to Pine Lodge Road to Woodyards Road to Bowlers Road to Tuppal Road to Lower Finley Road turning right onto James Road, turning left into Broughans Road and continuing west to the Newell Highway to Finley. The travel route for this bus service afternoon dropoff is the reverse of the morning pickup. This bus service travels past the existing development site at about 8:20 am in the morning and 3:30pm in the afternoon.

4.2 Existing rail network

The closest rail network is the disused The Rock Oaklands railway line at Berrigan. The former Rock Oaklands railway line commenced at the township of The Rock, on the Main South Line, and extended west and south to Berrigan and south to Tocumwal. The line is no longer is existence and infrastructure has been removed.

Consequently, the proposed development shall not have any adverse impacts on the rail network.



4.3 Traffic generation and distribution

To establish the impact of the development on the adjacent road network and assess the need for improvements to accommodate traffic generated by the proposed development, traffic generation and trip distribution have been determined.

4.3.1 Generation

The subject land is currently used for lot feeding of cattle and dryland and irrigated cropping. The existing traffic generation for the subject land site comprises the following:

- Several residential dwellings;
- Beef cattle feedlot (999 head);
- Sheep feedlot (4,000 head); and
- Cropping operations irrigated and dryland winter and summer cropping (grain / hay / silage).

The type and configuration of vehicles currently utilising the existing development comprise light and heavy vehicles as outlined in Table 3. James Road and Broughans Road are not approved as a Type 1 Road Train or B-double route. Heavy vehicles in B-double configuration regularly access the existing development under permit.

Light vehicles	The light vehicle movements are comprised of employees, support services and other visitors to the existing development. There is 1 dwelling on the subject land
	dwenning on the subject land.
	Support services include livestock buyers, veterinarians, nutritionists
	etc. These are estimated to generate 1 light vehicle per day.
Heavy vehicles	The heavy vehicle movements are comprised of cattle/sheep
-	movements, as well as movements for grain, protein, roughage,
	liquids and supplements. Solid waste in the form of manure stays on-
	site and is applied to cropping land on the subject land. The traffic
	generation was based on semi-trailers as-of-right access.
	0

Table 3 – Existing development – Vehicle configuration

The traffic generation for the existing development comprises light and heavy vehicles as outlined in Table 4.

Development capacity		Head		999	999	999
Activity	Vehicle Type & (Configuration)	GVM	Capacity	Movements	Movements	Movements
		t		per day	per week	per year
Incoming cattle	Semi-trailer (2 deck)	42.5	65 head	~0.19	1.37	71
Outgoing cattle	Semi-trailer (2 deck)	42.5	45 head	~0.29	2.04	106
Grain^	Semi-trailer	42.5	24 t	0.00	0.00	0
Protein	Semi-trailer	42.5	24 t	~0.13	0.93	48
Roughages*	Semi-trailer	42.5	24 t	~0.01	0.04	2
Supplements (Dry)	Semi-trailer	42.5	24 t	~0.04	0.29	15
Outgoing solid waste**	Semi-trailer	42.5	24 t	0.00	0.00	0
Employees#	Light vehicles	<4.5	-	~1.42	10.00	520
Support services	Light vehicles	<4.5	-	~0.14	1.00	52
Total	Total heavy vehicles		-	~0.67	5	243
Total	Total light and heavy vehicles		-	~2.23	15.7	815

Table 4 – Existing beef cattle development – Estimated traffic generation (999 head)

^ 100% of grain is produced on subject land and neighbouring properties owned by the applicant and heavy vehicles do not use the state-controlled road network

*100% of roughages (silage/hay/straw) are produced on subject land and neighbouring properties owned by the applicant and heavy vehicles do not use the state-controlled road network.

** 100% of the solid waste is utilised on the subject land.

[#] 100% of staff originate from neighbouring properties owned by the applicant and light vehicles do not use the state-controlled road network.

Stage				Existing	Existing	Existing
Development capacity		Head		4,000	4,000	4,000
Activity	Vehicle Type & (Configuration)	GVM	Capacity	Movements	Movements	Movements
		t		per day	per week	per year
Incoming lambs	Semi-trailer (4-deck)	42.5	505 head	~0.25	~1.79	~93
Outgoing lambs	Semi-trailer (4-deck)	42.5	405 head	~0.32	~2.22	~115
Grain^	Semi-trailer	42.5	24 t	-	-	-
Protein	Semi-trailer	42.5	24 t	-	-	-
Roughages*	Semi-trailer	42.5	24 t	-	-	-
Supplements (Dry)	Semi-trailer	42.5	24 t	-	-	-
Outgoing solid waste**	Semi-trailer	42.5	24 t	~0	~0	~0
Employees	Light vehicles	<4.5	-	~0	~0	~0
Support services	Light vehicles	<4.5	-	~0.07	~0.50	~26
Total	Total heavy vehicles		-	~0.57	~4	~208
Total	Total light and heavy vehicles		-	~0.64	~4.5	~234

lable 5 – Existing sneep reculot development – Estimated traffic generation (4000 nea	able 5 – Existing sheep feedle	ot development – Estimated traffic	generation (4000 head
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^ 100% of grain is produced on subject land and neighbouring properties owned by the applicant and heavy vehicles do not use the state-controlled road network

*100% of roughages (hay/straw) are produced on subject land and neighbouring properties owned by the applicant and heavy vehicles do not use the state-controlled road network.

** 100% of the solid waste is utilised on the subject land.

[#] 100% of staff originate from neighbouring properties owned by the applicant and light vehicles do not use the state-controlled road network.



The type and configuration of vehicles accessing the proposed development shall be identical to the type and configuration accessing the existing development and comprise light and heavy vehicles as outlined in Table 6. Heavy vehicles up to B-double configuration shall access the proposed development under permit.

Table 6 – Proposed development – Vehicle configuration

Light vehicles	The light vehicle movements are comprised of employees, support services and other visitors to the proposed development. There is dwelling on the subject land. It is estimated that some 4 full time equivalent employees will be required when the development is fully developed to 3,200 head. About 25% of the staff shall not reside onsite. There will be staff on-site 7 days a week, with less staff on the weekends. Typically hours of work vary, with staff working between 6:30am to 6:00pm in the summer and 7:00am and 5:00pm in the winter.
Light vehicles	Support services: These include livestock buyers, veterinarians, nutritionists etc. These are estimated to be 2 light vehicle per week on average.
Heavy vehicles	The heavy vehicle movements are comprised of cattle movements, as well as movements for grain, protein, roughage, liquids and supplements. Solid waste in the form of manure will stay on-site. The heavy vehicle traffic generation was based on vehicles in semi- trailer as-of-right access.

The estimated staffing levels for the proposed development are provided in Table 7. Not all staff work every day of the year, thus the yearly volume for staff living off-site is less than 365 multiplied by two movements per staff per day.

Stage	Development capacity	No of staff during weekdays	No of staff living on-site	No of staff on weekend	
	Head	FTE	FTE	FTE	
Existing	999	2	1	1	
2	3,200	4	1	2	

Table 7 – Proposed development – Estimated staffing levels

The heavy vehicle traffic generation is summarised in Table 10. for the proposed development when fully developed to 3,200 head.

The table includes all inbound and outbound loaded and unloaded vehicles. A vehicle entering and exiting the development site is two movements. The heavy vehicle movements have been modelled on semi-trailers as-of-right access. However, it is noted that B-doubles would be used under permit for transport of commodities.



The proposed development shall operate 12 hours per day between 6.30 am and 6.00 pm in summer and 10 hours per day between 7:00am to 5pm in winter, 7 days per week including public holidays for general activities such as cattle feeding, waste management and cropping operations. Transport activities such as feed commodity delivery would typically occur between 7:30 am and 4:00 pm on a weekday. Incoming livestock transport would typically occur on a Tuesday, Wednesday and Thursday between 10:30 am and 3:00 pm.

Outgoing livestock are typically transported on a Sunday between 12:00pm and 4:00pm), Tuesday in the morning around 6:30am and Wednesday in the afternoon around 4:00pm. Operating hours will be applied with any noise limitations and traffic requirements taken into consideration. Staff shall be on-site 24 hours a day, 7 days a week.

Periodically, heavy vehicle movements do occur outside of normal operating hours (e.g. in summer), as it is desirable to transport cattle either at night or in the early hours of the morning for animal welfare reasons.

The peak vehicle movements were based on 3 times average weekly movements spread across five days. The volumes are triple the average to represent a reasonable amount of peaking throughout the year.

The principal haulage route is currently not approved as a designated B-double route, however B-doubles regularly access the existing development under permit.

As shown in Table 8, the AADT for the proposed development is estimated to be in the order of 6.7 vpd with 3.6 vpd heavy vehicles when operating at a capacity of 3,200 head-on-feed.

Stage	Development capacity	AADT		Peak daily		Peak hourly	
	.	Total	Heavy vehicles	Total	Heavy vehicles	Total	Heavy vehicles
	Head	vpd	vpd	vpd	vpd	vph	vph
Existing*	999	~2.9	~1.24	~12.1	~5.2	~2.4	~1.0
Proposed**	3,200	~6.7	~3.6	~28.3	~15.1	~5.7	~3.0

Table 8 – Proposed development – Estimated AADT

*These data include allowance for a 4000 head sheep feedlot operating on the site

**Note these data include the existing development traffic

As shown in Table 9, the additional AADT movements for the proposed development when compared with the existing development is estimated to be up to 3.8 vpd with 2.3 vpd heavy vehicles when operating at a capacity of 3,200 head-on-feed.

As shown in Table 9, the additional peak hourly movements for the proposed development when compared with the existing development is estimated to be up to 3.2 vph with 2.0 vph heavy vehicles when operating at a capacity of 3,200 head-on-feed.



Stage	Development capacity	AADT		Peak daily		Peak hourly	
		Total	Heavy vehicles	Total	Heavy vehicles	Total	Heavy vehicles
	Head	vpd	vpd	vpd	vpd	vph	vph
Existing*	999	~2.9	~1.3	~1.15	~0.49	~0.23	~0.10
Proposed	3,200	~3.8	~2.3	~16.2	~9.9	~3.2	~2.0

Table 9 – Proposed development – Additional estimated AADT

*These data include a 4000 head sheep feedlot operating on the site.

Development capacity		Head		3,200	3,200	3,200
Activity	Vehicle Type & (Configuration)	GVM	Capacity	Movements	Movements	Movements
		t		per day	per week	per year
Incoming cattle	Semi-trailer (2 deck)	42.5	65 head	~0.2	~1.2	~64
Outgoing cattle	Semi-trailer (2 deck)	42.5	45 head	~0.33	~2.3	~119
Grain^	Semi-trailer	42.5	24 t	~1.2	~8.2	~427
Protein	Semi-trailer	42.5	24 t	~0.3	~2.2	~112
Roughages*	Semi-trailer	42.5	24 t	~0.3	~1.9	~100
Supplements (Dry)	Semi-trailer	42.5	24 t	~0.1	~0.6	~34
Outgoing solid waste**	Semi-trailer	42.5	24 t	~0	~0	~0
Employees#	Light vehicles	<4.5	-	~1.4	~10.0	~520
Support services	Light vehicles	<4.5	-	~0.1	~0.5	~26
Total	Total heavy vehicles		-	~2.3	~16.4	~855
Total	Total light and heavy vehicles		-	~3.8	~26.9	~1,401

Table 10 – Proposed development –Estimated additional traffic generation (3,200 head)



4.3.2 Traffic growth rates

Traffic growth applied to the background traffic volumes represents the increase in traffic associated with the surrounding area.

Baseline daily traffic volumes for the affected state controlled roads (Riverina Highway / Newell Highway) have primarily been determined from published RMS daily traffic surveys, for the years between 2006 and 2011. NSW RMS have not carried out counts at this location since 2011. To establish a baseline for year 2024, the 2011 average annual daily traffic volume was increased by an annual linear growth factor of +1.5% for each year up to 2024. The 1.5% growth factor was determined by assessing the actual growth between the TfNSW Traffic Volume viewer counts in 2011 and TfNSW advised classified counts in 2019.

4.3.3 Haulage routes

The proposed development shall have several heavy vehicle haulage routes to/from the proposed development site as outlined below.

Haulage Route A will be used by regional heavy vehicles travelling from/to the proposed development site. Heavy vehicles shall travel via the Riverina Highway to James Road to Broughans Road with vehicles entering the development site using the existing entrance onto Broughans Road. Haulage Route A is used by light vehicles, and heavy vehicles in semi-trailer and B-double (under permit) configuration primarily transporting livestock and commodities such as protein (whole cottonseed), roughage (almond hulls), and supplements to the proposed development.

Haulage Route B will be used by regional heavy vehicles travelling from/to the proposed development site from the southeast. Heavy vehicles shall travel via the Newell Highway to Broughans Road with vehicles entering the development site using the existing entrance onto Broughans Road. Haulage Route B is used by light vehicles, and heavy vehicles in semi-trailer and B-double (under permit) configuration primarily transporting livestock and commodities such as grain, protein (canola)), and supplements to the proposed development.

Haulage Route C will be used by heavy vehicles travelling from local properties owned by the applicant to/from the proposed development site. Vehicles travelling from/to these areas shall use the local roads such as Bowlers Road, James Road, Broughans Road (east) using the proposed entrance onto Broughans Road. Route C is used by light vehicles, and heavy vehicles in semi-trailer configuration primarily transporting commodities such as grain and straw to the proposed development.

A heavy vehicle code of conduct shall be implemented to ensure heavy vehicles utilise Haulage Route A and B when travelling from regional areas.



4.3.4 Distribution

Figure 5 shows the local and state controlled road network potentially impacted by the traffic generated by the proposed development.

Local roads being Broughans Road (Segment A & B), James Road (Segment C; D), Bowlers Road (Segment F) will be periodically used by heavy vehicles to gain access to the proposed development site during harvest times. Other local controlled roads may be intermittently used by heavy vehicles generated by the proposed development.

All of the employees shall reside on the subject land or adjoining properties owned by the applicant (e.g. "Sunnyside"/"Arkoona").

Table 11 to Table 14 show the estimated distribution of heavy vehicle traffic to and from the proposed development site with reference to Figure 5.

The haulage route for incoming grains and roughages shall be from the Pinelodge region originating from the properties "Arkoona", "Glen Cluan", "Sunnyside", "Killara Rise", "Langunyah" which are owned by the applicant via Bowlers Road, James Road, Broughans Road, Kelly's Road.

The haulage route for incoming cattle from the east and west shall be from the Riverina Highway to James Road to Broughans Road; from the south shall be from the Newell Highway to Broughans Road.

The haulage route for outgoing livestock vehicles will be Broughans Road west to James Road and the Riverina Highway Road then west to Deniliquin to processing facilities located at Geelong (Vic) or east to Finley for processing facilities located at Wagga Wagga (Teys).

The haulage route for incoming supplements shall be from Deniliquin via the Riverina Highway to James Road to Broughans Road.

The haulage route for incoming proteins (whole cottonseed/canola meal) shall be from Hillston (NSW) via the Newell Highway to James Road and Numurkah (Vic) to Broughans Road via the Newell Highway.



	Broughans Road (Segment A, B, C)							
	To west James Road %	From west James Road %	To east Newell Highway %	From east Newell Highway %				
Cattle								
Incoming	0	25	0	75				
Outgoing	75	0	0	25				
Commodities								
Grains	0	50	0	50				
Proteins	0	50	0	50				
Roughages	0	80	0	20				
Supplements	0	50	0	50				

Table 11 – Proposed development – Traffic generation distribution – Broughans Road (Loaded vehicles)

Table 12 – Proposed development – Traffic generation distribution – James Road (Loaded vehicles)

	James Road (Segment D,E, F)							
	To south Bowlers Road %	From south Bowlers Road %	To north Lower Finley Road	From north Lower Finley Road	To north Riverina Highway %	From north Riverina Highway %		
Cattle								
Incoming	0	0	0	0	0	25		
Outgoing	0	0	0	0	75	0		
Commodities								
Grains	0	10	0	20	0	20		
Proteins	0	0	0	0	0	50		
Roughages	0	10	0	20	0	20		
Supplements	0	0	0	0	0	100		



		Riverina Highwa	y (Segment G & H)	
	From west	To west	From east	To east
	Deniliquin	Deniliquin	Finley	Finley
	%	%	%	%
Cattle				
Incoming	25	0	0	0
Outgoing	0	50	0	0
Commodities				
Grains	20	0	0	0
Proteins	50	0	0	0
Roughages	20	0	25	0
Supplements	100	0	0	0

Table 13 – Proposed development – Traffic generation distribution – Riverina Highway (Loaded vehicles)

Table 14 – Proposed development – Traffic generation distribution – Newell Highway (Loaded vehicles)

	Newell Highway (Segment I & J)			
	From north	To north	From south	To south
	Finley	Finley	Tocumwal	Tocumwal
	%	%	%	%
Cattle				
Incoming	37.5	0	37.5	0
Outgoing	0	50	0	0
Commodities				
Grains	25	0	25	0
Proteins	25	0	25	0
Roughages	25	0	25	0
Supplements	0	0	0	0





Table 15 – Proposed Development – Additional traffic generation on local road
network (All vehicles)

Road	Classification	Development trips	
vpd		AADT	Peak
			Hour
Broughans Road (west of entrance)	Unsealed – Low Volume	~1.78	~1.07
Broughans Road (east of entrance)	Unsealed – Low Volume	~1.74	~1.05
James Road (north of Broughans Road)	Sealed – Medium Volume	~1.57	~0.94
James Road (south of Broughans Road)	Sealed – Medium Volume	~0.22	~0.13
Bowlers Road (east of James Road)	Unsealed – Low Volume	~0.22	~0.13

Table 16 – Proposed development – Additional traffic generation on local road network (Heavy vehicles)

Road	Classification	Developmen	Development trips	
	vpd	AADT	Peak Hour	
Broughans Road (west of entrance)	Unsealed – Low Volume	~1.02	~0.61	
Broughans Road (east of entrance)	Unsealed – Low Volume	~1.01	~0.61	
James Road (north of Broughans Road)	Sealed – Medium Volume	~0.87	~0.52	
James Road (south of Broughans Road)	Sealed – Medium Volume	~0.14	~0.09	
Bowlers Road (east of James Road)	Unsealed – Low Volume	~0.14	~0.09	

Table 17 – Proposed Development – Additional traffic generation on state road network (All vehicles)

Road	Classification	Development trips	
		AADT	Peak Hour
Riverina Highway (west of James Road)	State	~0.61	~0.37
Riverina Highway (east of James Road)	State	~0.03	~0.02
Newell Highway (north of Broughans Road)	State	~0.94	~0.57
Newell Highway (south of Broughans Road)	State	~0.80	~0.48

Table 18 – Proposed development – Additional traffic generation on state road network (Heavy vehicles)

Road	Classification	Development trips	
		AADT	Peak Hour
Riverina Highway (west of James Road)	State	~0.59	~0.35
Riverina Highway (east of James Road)	State	~0.00	~ 0.00
Newell Highway (north of Broughans Road)	State	~0.59	~0.35
Newell Highway (south of Broughans Road)	State	~0.42	~0.25



4.4 Traffic impacts

The traffic impact analysis is focused on the impacts of the traffic generated by proposed development on two key intersections close to the development site access. The impacts of the proposed development on public transport, active transport, parking and traffic safety have also been assessed.

4.4.1 Assessment scenarios

It is standard practice when analysing future year traffic operations to adopt a ten-year design horizon from the year of full operation. The proposed development shall be developed in one stage.

Traffic conditions have been assessed for operation at the expected year of opening of the first stage (2024) through to 10 years to 2034, which represents the 10-year design horizon.

Traffic associated with construction activities of the proposed development have not been assessed as the proposed development shall be accommodated within the existing development built infrastructure by reducing the approved stocking density. Consequently, there are no construction generated movements.

4.4.2 Road network performance

The traffic generation and distribution from the site has been assessed and the impacts of the proposed development on the local road network and state controlled road network, namely the James Road / Riverina Highway Intersection and the Broughans Road / Newell Highway Intersection have been reviewed.

The impact on performance of the existing road network by the proposed development has been assessed in terms of the Levels of Service (LOS) of the roads and key intersections.

4.4.2.1 LOS criteria

The LOS criteria for roads have been based on peak hour flows per direction for rural roads as defined in RTA's Guide to Traffic Generating Developments (RTA, 2002) and detailed in Table 19 for a design speed of 100 km/hr and heavy vehicle percentage of 15.



Terrain	Level of service	Percent of heavy vehicles	Performance standard
	(LOS)	15	
Flat	В	530	
	С	870	Weekday peak hour flows
	D	1,410	Recreational peak hours (weekends)
	E	2,290	

Table 19 – Peak hour flow on two-lane rural roads

The performance standards recommended by RTA (2002), reflect the fact that recreational peak hour periods (weekend peaks, or peaks associated with particular tourist or recreational activity), occur less frequently than weekday commuter peak hour periods.

4.4.2.2 James Road

The traffic generation and distribution from the site has been assessed and the impacts of the proposed development on the local controlled road network, namely James Road have been reviewed.

Traffic count data is not available for existing traffic on James Road. The peak hour flow capacity has been assumed to be in the order of 11% of AADT. With a capacity of up to 150 vpd, the peak hour flow is in the order of 16.5 vehicles per hour (vph) as a worst case scenario. The development generated traffic would increase the peak hour two-way traffic volume on James Road by about 1.07 vph.

This is well below the performance standard of LOS C recommended by RTA (2002).

Given the rural nature of the area and the seasonality of the rural / agricultural activities in the area it could be expected that the traffic movements will reflect the grain planting and harvest windows which occur between September to January and April to June and December to February and October to November for summer and winter cropping programs respectively. There is through several dairies in the area that will receive milk pickup on a daily basis.

The rural nature of the area and the seasonality of the rural / agricultural uses may result in a degree of unevenness in the traffic distribution across the year due to planting and harvesting periods, however.

4.4.2.3 Broughans Road

The peak hour flow capacity has been assumed to be in the order of 11% of AADT. With a capacity of up to 50 vpd, the peak hour flow is in the order of 8.25 vph. The development generated traffic would increase the peak hour two-way traffic volume on Broughans Road by about 1.07 vph to the westbound and about 1.05 vph to the eastbound.

This is well below the performance standard of LOS C recommended by RTA (2002).



The rural nature of the area and the seasonality of the rural / agricultural uses may result in a degree of unevenness in the traffic distribution across the year due to planting and harvesting periods).

4.4.2.4 Riverina Highway

The traffic generation and distribution from the site has been assessed and the impacts of the proposed development on the state controlled road network, namely Riverina Highway have been reviewed.

The annual average daily traffic volume (AADT) for 2011 for the Riverina Highway has been obtained from TfNSW and indicates traffic flows of 1,482 vehicles per day in the vicinity of Finley (1,175 light vehicles; 307 heavy vehicles). The TfNSW has advised that a daily vehicle count of 1,611 was recorded in 2019 at this location which equates to an annual linear growth rate of 1.5% per annum. The average hourly traffic data for the Riverina Highway (Station Id 97024) were adjusted with a 1.5% linear growth rate for each year to arrive at the 2024 hourly data. Table 20 presents the measured 2011 volumes and estimated 2024 volumes. Table 20 shows that the peak hourly flow eastbound (75 vph) occurs between 10 am and 11 am and the peak hourly flow (68 vph) westbound occurs between 2pm and 3pm.



	7 Day Average				
	2011	2011	2024	2024	
	Eastbound	Westbound	Eastbound	Westbound	
	vph	vph	vph	vph	
Midnight – 1am	6	4	7.2	4.8	
1am – 2am	4	4	5	5	
2am – 3am	3	2	4	2	
3am - 4am	3	3	4	4	
4am – 5am	3	5	4	6	
5am – 6am	5	7	6	8	
6am – 7am	16	18	19	22	
7am – 8am	27	39	32	47	
8am – 9am	55	44	66	53	
9am – 10am	61	49	73	59	
10am – 11am	63	47	75	56	
11am – 12 noon	59	48	71	57	
12 noon – 1pm	55	54	66	65	
1pm – 2pm	50	49	60	59	
2pm – 3pm	54	57	65	68	
3pm - 4pm	48	56	57	67	
4pm – 5pm	50	53	60	63	
5pm – 6pm	54	51	65	61	
6pm – 7pm	47	41	56	49	
7pm – 8pm	34	31	41	37	
8pm – 9pm	18	24	22	29	
9pm – 10pm	14	24	17	29	
10pm – 11pm	11	16	13	19	
11pm - Midnight	9	7	11	8	
Total	749	733	895	876	

Table 20 – Traffic generation – Hourly traffic volumes 2011 and 2024 (Station ID 97024)

At the Riverina Highway / James Road intersection the proposed development generates an additional 0.38 vehicle movements per hour [light vehicles (0.03) + heavy vehicles (0.35)] based on the additional development traffic using the intersection. The Riverina Highway would continue to operate at a LOS A as defined in RTA (2002).

4.4.2.5 Newell Highway

The traffic generation and distribution from the site has been assessed and the impacts of the proposed development on the state controlled road network, namely the Newell Highway have been reviewed.

The annual average daily traffic volume (AADT) for 2010 for the Newell Highway has been obtained from TfNSW and indicates traffic flows of 2,324 vehicles per day north of Tocumwal (1,735 light vehicles; 589 heavy vehicles). The average hourly traffic data for the Newell Highway (Station Id 97029) were adjusted with a 1.5% linear growth rate for each year to arrive at the 2024 hourly data. Table 21 presents the measured 2011 volumes and estimated 2024 volumes. Table 21 shows that the peak hourly flow northbound (90 vph)



occurs between 11 am and 12 am and the peak hourly flow westbound (102 vph) occurs between 2pm and 3pm in 2011.

	7 Dav Average				
	2011	2011	2024	2024	
	Northbound	Southbound	Northbound	Southbound	
	vph	vph	vph	vph	
Midnight – 1am	9	12	10.9	14.5	
1am - 2am	8	10	10	12	
2am - 3am	7	8	8	10	
3am - 4am	5	7	6	8	
4am – 5am	9	9	11	11	
5am – 6am	13	13	16	16	
6am – 7am	19	26	23	31	
7am – 8am	43	50	52	61	
8am – 9am	64	73	77	88	
9am – 10am	80	83	97	100	
10am – 11am	87	89	105	108	
11am – 12 noon	90	89	109	108	
12 noon – 1pm	84	90	102	109	
1pm – 2pm	82	100	99	121	
2pm – 3pm	82	102	99	123	
3pm – 4pm	90	88	109	106	
4pm – 5pm	81	82	98	99	
5pm – 6pm	75	76	91	92	
6pm – 7pm	50	55	61	67	
7pm – 8pm	43	38	52	46	
8pm – 9pm	37	31	45	38	
9pm – 10pm	29	30	35	36	
10pm – 11pm	18	25	22	30	
11pm - Midnight	16	17	19	21	
Total	1,121	1,203	1,356	1,456	

Table 21 – Traffic generation – Hourly traffic volumes 2011 and 2024 (Station ID97029)

At the Newell Highway / Broughans Road intersection the proposed development generates an additional 1.05 vehicle movements per hour [light vehicles (0.44) + heavy vehicles (0.61)] based on the additional development traffic using the intersection. The Newell Highway would continue to operate at a LOS A as defined in RTA (2002).



4.4.3 Assessed intersections

4.4.3.1 Broughans Road / James Road intersection

Broughans Road forms a T-intersection with James Road with Broughans Road the terminating leg. The Broughans Road / James Road intersection is an uncontrolled T-intersection and is shown in Photograph 14. The intersection has the following properties:

- Give way signage on the Broughans Road approach as shown on Photograph 14;
- The intersection has no posted speed limit on Broughans Road approach;
- The intersection has adequate visibility (>300m) to the north and south to meet Austroads requirements for a 100 km/h design speed as shown in Photograph 15.
- There is a simple right turn treatment (SR) northbound off Broughans Road and simple left turn treatment (SL) southbound off Broughans Road; and
- Photograph 15 and Photograph 16 show that the Broughans Road / James Road Tintersection has no signs of pavement breakup on the edge of the pavement due to vehicle turning movements and no shoulder edge drop off.



Photograph 14 – Broughans Road / James Road Intersection (Looking west)





Photograph 15 – Broughans Road / James Road Intersection (Looking south)



Photograph 16 – Broughans Road / James Road Intersection (Looking north)



Figure 6 – Broughans Road / James Road Intersection – Aerial image (QLD Globe)



4.4.3.2 James Road / Riverina Highway intersection

The James Road / Riverina Highway intersection is a priority sign-controlled T-intersection with James Road the terminating leg as shown in Photograph 17. The intersection has the following properties:

- Give way signage on the James Road approach (has been knocked down);
- Advanced warning signage on all approaches;
- The intersection has no posted speed limit;
- There is a simple left turn treatment (SL) westbound onto the Riverina Highway and simple right turn treatment (SR) eastbound onto the Riverina Highway.
- Photograph 17, Photograph 18 and Photograph 19 show that the James Road / Riverina Highway T-intersection has no signs of pavement breakup in the throat of the intersection due to vehicle turning movements.



Photograph 17 – James Road / Riverina Highway Intersection (Looking south)

Photograph 17, Photograph 18 and Photograph 19 show that the James Road / Riverina Highway 'T' intersection is in good condition with no signs of pavement breakup in the throat of the intersection due to heavy vehicle turning movements.





Photograph 18 – James Road / Riverina Highway Intersection (Looking east)



Photograph 19 – James Road / Riverina Highway Intersection (Looking west) Figure 7 illustrates an aerial view of the James Road / Riverina Highway T intersection.





Figure 7 – James Road / Riverina Highway Intersection – Aerial image (QLD Globe)



4.4.3.3 Geometric layout

A swept path analysis for the design vehicles that shall access the proposed development from the Riverina Highway / James Road intersection was undertaken and is provided in Figure 8 and Figure 9. A B-double has been selected as the design vehicle as this is the largest vehicle that shall access the proposed development site.

In general, the swept path analysis shows the design vehicle (B-double) manoeuvring acceptably through the Riverina Highway / James Road intersection.







4.4.4 Rail safety

As there are no railway lines in the local region and on the principal haulage route evaluation of the safety performance of railway crossings warrants no further assessment.

4.4.5 Road safety

There is likely to be no significant impacts on road safety as the proposed development does not make any changes to the local roads, access is from a local road and traffic volumes are not significant. The analysis for the crash data during the past five years shows that the crash rates at the local intersections are very low.

4.4.5.1 Warrants

4.4.5.1.1 Broughans Road / James Road

With reference to section 4.4.2.2 and 4.4.2.3 and Figure 10, evaluation of the safety performance of the Broughans Road / James Road intersection is not deemed warranted as the hourly volumes on the major road (James Road) and minor road (Broughans Road) are low.

Considering the low hourly volumes on Broughans Road the existing simple left turn treatment (SL) and simple right turn (SR) are acceptable treatments for the relevant traffic volumes from a safety perspective. No upgrades are recommended to the existing intersection from a safety perspective.

4.4.5.1.2 James Road / Riverina Highway

The James Road / Riverina Highway has been historically constructed with no widening and hence does not meet the current Austroads (2021b) standard for a BAR / BAL. This intersection layout is referred to as simple intersection treatment (SR / SL) and has no pavement widening, or a level of widening less than that described for a BAR / BAL treatment. The minimum treatment for a new intersection is a BAR / BAL treatment.

Traffic count data is not available for existing traffic on James Road. The peak hour flow capacity has been assumed to be in the order of 11% of AADT with 15% of the AADT heavy vehicles. With an AADT of up 50 vpd, the peak hour flow is in the order of 5.5 vehicles per hour (vph) as a worst case scenario. However, it is a reasonable assumption that the actual road use is much lower and that not all of the traffic would use the intersection. Assuming 75% of the traffic is local and does not use the intersection with the Riverina Highway, the peak hourly flow is assumed to be 4.15 vph.

The turn volumes $(Q_R \text{ or } Q_L)$ off the Riverina Highway into James Road for the proposed development traffic were determined from the traffic directional splits as outlined in section



4.3.4 multiplied by the peak-hour volumes for James Road. As the peak hour volumes for James Road are not available it has been assumed that the design peak hour volume is equivalent to 3 times average weekly movements. The existing AADT and peak hour volumes for the James Road / Riverina Highway intersection are provided in Table 22.

Configuration	AADT vpd	Peak hourly vph
Heavy vehicles	7.60	0.04
Light vehicles	43.0	1.6
Total vehicles	50.64	8.9

Table 22 – James Road / Riverina Highway intersection – Estimated traffic generation

The through volumes were calculated from the Cunninham Highway traffic volumes and the turn volumes into Queen Street North. The peak hour turn and through volumes for the Cunningham Highway / Queen Street North intersection are provided in Table 23.

Table 23 – James Road / Riverina Highway intersection - Peak hour turn and through volumes

Road	Direction	Q _{T1} vph	Q _{T2} vph	Q _R vph	Q _L vph
Riverina Highway	Eastbound Westbound	78 -	- 71	0.5	- 0.06

Once the peak hour turn and through volumes for the intersection were calculated, the values for Q_M were then determined from Figure 2.27 of Austroads (2020). Table 24 provides the peak hour traffic volumes (Q_M) for the Riverina Highway. Vehicles per hour (vph) is the same as the vehicle per hour (Veh/h) notation used in Austroads (2020).

Road Type	Turn Type	Q _М vph	Qм vph
Two-lane two-way	Right, no splitter island Left	$= Q_{T1} + Q_{T2} + Q_L$ $= Q_{T2}$	149.1 71

Table 24 – Riverina Highway peak hour traffic volumes

The value of Q_R and Q_L (Table 23) at each corresponding value of Q_M (Table 24) were plotted on Figure 10 and Figure 11. The minimum turn treatment for a greenfield site is BAL and BAR.

The traffic volumes at this intersection are very low with a peak hourly flow on the Riverina Highway typically less than 75 vehicles per hour with less than 1 turning vehicle per hour. At this intersection there is no pre-existing safety issues, over 750 m sight distance in each direction which is greater than required distance for NDD (Table 25) and EDD criteria (Table



26) and the conflict between through and turning vehicles is considered rare enough not to warrant the cost of upgrade to the intersection.

For this design speed, additional left or right turn traffic lanes are not generally required, as long as the peak hourly traffic volume remains below approximately 120 vehicles per hour on the major road.

Consequently, it is recommended that TfNSW not enforce the requirement for an upgrade to a BAL/BAR as it is not reasonable due of the low number of turning movements imposed by the proposed development.

		Normal Design Domain (NDD) design crite Westbound Eastbound			gn criteria ound
Parameter	Units	Light Vehicle Car	Heavy Vehicle Trucks	Light Vehicle Car	Heavy Vehicle Trucks
Design operating speed, V	km/hr	100	100	100	100
Reaction time, R_T	S	2.5	2.5	2.5	2.5
Observation time, O_T	S	3	3	3	3
Decision time, D_T	S	5.5	5.5	5.5	5.5
Coefficient of deceleration, D		0.46	0.29	0.46	0.29
Driver height	m	1.1	2.4	1.1	2.4
Object height	m	1.25	1.25	1.25	1.25
Longitudinal grade, a	%	0	0	0	0
SISD	m	238	247	238	247

Table 25 – James Road / Riverina highway intersection – SISD NDD design criteria



		Extended Design Domain (EDD)					
	Units	Westbound		Eastbound			
Parameter		Light	Heavy	Light	Heavy		
		Vehicle	Vehicle	Vehicle	Vehicle		
		Car	Trucks	Car	Trucks		
Design speed, V	km/hr	100	100	100	100		
Reaction time, R_T	S	2.5	2.5	2.5	2.5		
Observation time, O_T	S	1	1	1	1		
Decision time, D_T	S	3.5	3.5	3.5	3.5		
Coefficient of deceleration, D		0.46	0.29	0.46	0.29		
Driver height	m	1.1	2.4	1.1	2.4		
Object height	m	1.25	1.25	1.25	1.25		
Longitudinal grade, a	%	0	0	0	0		
SISD	m	183	233	183	233		

Table 26 – James Road / Riverina Highway intersection – SISD EDD design criteria

4.4.5.1.3 Broughans Road / Newell Highway

With reference to section 4.4.2.3 and 4.4.2.5 and Figure 10, evaluation of the safety performance of the Broughans Road / Newell Highway intersection is not deemed warranted as the existing turning treatments include a BAL and BAR and the hourly peak turning volumes on the major road (Newell Highway) and minor road (Broughans Road) are very low and would not trigger an upgrade to a CHR/AUL treatment.



Figure 10 – Warrants for turn treatments on high speed rural roads at unsignalised intersections (Austroads, 2020a)





Figure 11 – Warrants for turn treatments on lower speed rural roads at unsignalised intersections (Austroads, 2020a)

4.4.5.2 Signage

To further improve road safety, additional safety measures are proposed due to the additional volume of heavy vehicles imposed on the road network. These include:

• It is recommended that advanced warning signage (Truck crossing or entering) as shown in Figure 12 be implemented on each approach to the development site entrance on Broughans Road in accordance with AS1742.2 Clause 4.11.2.5 to warn motorists and improve road safety.



W5-22

Figure 12 – Truck crossing or entering sign (AS1742.2 Clause 4.11.2.5


4.4.5.3 Traffic Management Plan

A traffic management plan has been prepared and presented in Appendix D.

4.4.6 Access arrangements

4.4.6.1 Location

Access to the proposed development shall be from the existing development entrances off Broughans Road. There are two existing entrances located some 405 m and 525 m east of the intersection with James Road and west of the existing subject land entrance as shown in Figure 3.

The existing subject land entrance shall be maintained for light and heavy vehicles servicing the subject land homestead and agricultural commodities produced on the subject land and not destined for the proposed development.

The proposed development entrances shall be the principal light and heavy vehicle access to and from the proposed development. All livestock and commodity delivery vehicles associated with the proposed development shall be required to enter the site via the existing development entrances. The proposed development heavy vehicle entrances have been designed to provide an efficient, functional and safe access to the proposed development site for the type of traffic generated by the proposed development. The largest heavy vehicle configuration proposed to access the site is a B-double. This access shall also be used by light vehicles such as staff and service vehicles. These entrances are directly off Broughans Road a local controlled road.

The existing heavy vehicle entrance is shown on Photograph 22. The existing entrance is located on a straight flat section of Broughans Road and is not located on a bend with a radius of less than 450 m.

The existing entrances are maintained for all-weather access.

The existing entrances are of sufficient width (8 m) to allow for two vehicles to pass on the road to ensure that heavy vehicles will not be required to queue when turning off Broughans Road to wait for a vehicle to exit the site.

Further, the entrances off Broughans Road is not located within 15 m of a signalised road intersection, 10 m from an un-signalised road intersection, within 2 m of any adjoining property access or within 1 m of any street signage, power pole, street light or other council infrastructure.





Photograph 20 – Proposed development site – Existing entrance (looking east)



Photograph 21 – Proposed development site – Existing entrance (looking west)





Photograph 22 – Proposed development site – Existing entrance (looking south)

The road access safety assessment shall be undertaken in accordance with clause 3.4 of Austroads Guide to Road Design Part4A: Unsignalised and Signalised Intersections August 2017 (Austroads, 2017), with consideration of the proposed entrance as an intersection. The following sections outline the assessment.

4.4.6.2 Safety assessment

The road safety assessment shall determine the following types of sight distance required for the existing entrance:

- approach sight distance (ASD); and
- safe intersection sight distance (SISD);

4.4.6.2.1 Angle of approach

The proposed entrance onto Broughans Road for northbound vehicles is at 45 degrees as shown in Figure 3. This is not the most desirable angle of egress as this will usually not produce the best sight distance for road vehicles. However, given all heavy vehicles turn left into Broughans Road, this alignment does result in improved sight distance to vehicles travelling westbound along Broughans Road.

4.4.6.2.2 Vertical geometry

The flat near level topography of the area results in a level profile of Broughans Road in the vicinity of the proposed entrance as shown in Photograph 20 and Photograph 21. There are no vertical curves such as floodway dips or crests in the sight distance section.



4.4.6.2.3 Horizontal geometry

Broughans Road has a straight horizontal approach to the east and west in the vicinity of the existing entrance as shown in Photograph 20 and Photograph 21.

4.4.6.2.4 Approach Sight Distance (ASD)

4.4.6.2.4.1 Cars

The minimum level of sight distance available on the minor road approaches to all intersections to ensure that drivers are aware of the presence of an intersection is defined as the Approach Sight Distance (ASD). The ASD has been calculated as it assumed that not all light vehicles using Broughans Road would be aware of the access. The ASD has been calculated in accordance with Austroads (2021b) and Equation 1.

$$ASD = \frac{R_{\tau} \times V}{3.6} + \frac{V^2}{254 \times (d + 0.01 \times a)}$$
 Equation 1

Where:-

ASD = approach sight distance (m) R_T = reaction time (sec);V= operating (85th percentile) speed (km/h);D= coefficient of deceleration;

a = a longitudinal grade in % (in direction of travel: positive for uphill grade, negative for downhill grade) (Austroads, 2021b)

The desirable speed environment for an Local Road – Unsealed - Low Volume is 80 km/hr. However, as Broughans Road is not speed limit signposted then vehicles could legally operate up to 100 km/hr.



		Approach site distance (ASD) design						
		criteria						
		West	bound	ound Easth				
Parameter	Unite	Light	Heavy	Light	Heavy			
	Units	Vehicle	Vehicle	Vehicle	Vehicle			
		Car	Trucks	Car	Trucks			
Design operating speed, V	km/hr	100	90	100	90			
Reaction time, \mathbf{R}_T	S	2.5	2.5	2.5	2.5			
Coefficient of deceleration, D		0.46	0.29	0.46	0.29			
Longitudinal grade, a	%	0	0	0	0			
ASD	m	155	172	155	172			

Table 27 – Existing development – Broughans Road entrance – Approach sight distance – Design criteria

4.4.6.2.4.2 Trucks

Obtaining an Approach Sight Distance (ASD) is not deemed necessary for heavy vehicles as the users are familiar with the access location to the proposed development.

4.4.6.2.5 Safe Intersection Sight Distance (SISD)

SISD is the minimum sight distance which should be provided on Broughans Road at the existing development site entrance. An analysis of the existing geometry for SISD (both directions) was undertaken on-site. The SISD was calculated for Normal Design Domain (NDD) and Extended Design Domain (EDD) for both cars and trucks (semi-trailer/B-double) using the following equation and design factors as shown in Table 28 and Table 29 respectively. Tables 3 and 4 detail the finding of the SISD assessment. An object height for the application of SISD of 1.25 m has been used. The SISD has been calculated in accordance with Austroads (2021b) and Equation 2.

$$SISD = \frac{D_T \times V}{3.6} + \frac{V^2}{254 \times (d + 0.01 \times a)}$$
 Equation 2

Where:-

SISD	= safe intersection sight distance (m);
D_T	= decision time (sec) = observation time O_T (3 sec) + reaction time R_T (sec);
V	= operating (85th percentile) speed (km/h)
D	= coefficient of deceleration
а	= a longitudinal grade in % (in direction of travel: positive for uphill grade,

negative for downhill grade) (Austroads, 2021b).



An operating (85_{th} percentile) speed of Broughans Road of 80 km/hr has been used. This represents a representative scenario for this section of the road as the road is unsealed and is not sign posted.

		Normal Design Domain (NDD) design criteria							
		West	bound	Eastbound					
Parameter	Unita	Light	Heavy	Light	Heavy				
	Units	Vehicle	Vehicle	Vehicle	Vehicle				
		Car	Trucks	Car	Trucks				
Design operating speed, V	km/hr	100	90	100	90				
Reaction time, R_T	S	2.5	2.5	2.5	2.5				
Observation time, O_T	S	3	3	3	3				
Decision time, D_T	S	5.5	5.5	5.5	5.5				
Coefficient of deceleration, D		0.46	0.29	0.46	0.29				
Driver height	m	1.1	2.4	1.1	2.4				
Object height	m	1.25	1.25	1.25	1.25				
Longitudinal grade, a	%	0	0	0	0				
SISD	m	238	247	238	247				

Table 28 – Existing development – Broughans Road entrance – SISD NDD design criteria

Table 29 – Proposed development – Broughans Road entrance – SISD EDD design criteria

		Extended Design Domain (EDD)					
		West	bound	Eastbound			
Parameter	Units	Light	Heavy	Light	Heavy		
		Vehicle	Vehicle	Vehicle	Vehicle		
		Car	Trucks	Car	Trucks		
Design speed, V	km/hr	100	90	100	90		
Reaction time, R_T	S	2.5	2.5	2.5	2.5		
Observation time, O _T	S	1	1	1	1		
Decision time, D_T	S	3.5	3.5	3.5	3.5		
Coefficient of deceleration, D		0.46	0.29	0.46	0.29		
Driver height	m	1.1	2.4	1.1	2.4		
Object height	m	1.25	1.25	1.25	1.25		
Longitudinal grade, a	%	0	0	0	0		
SISD	m	183	197	183	197		

[#] EDD SISD – an observation time (O_T) of 0.5 sec less than the values given in Appendix A.3 (Austroads, 2021b) has been used.

4.4.6.2.6 Queue assessment

Heavy vehicles shall have no requirement to queue across Broughans Road. As shown on Figure 3, there is sufficient queuing distance for northbound vehicles on the subject land prior to the crossover.



4.4.6.2.7 Summary

A summary of the sight distance assessment results for the proposed development site entrance off Broughans Road are provided in Table 30.

Table 30 – Proposed development – Broughans Road entrance – Sight distance summary

	Existing entrance							
		East	bound	West l	bound			
Parameter	Unite	Light	Heavy	Light	Heavy			
	Units	Vehicle	Vehicle	Vehicle	Vehicle			
		Car	Trucks	Car	Trucks			
ASD	m	155	172	155	172			
SISD NDD required	m	238	247	238	247			
SISD EDD required	m	183	197	183	197			
Available sight distance	m	+250	+250	+250	+250			

The analysis of the westbound and eastbound approaches demonstrates that for the adopted design speed of 100 km/hr that the SISD is achieved as shown in Table 30.

The available sight distance at the entrance is good due to the straight alignment of Broughans Road and the flat topography at this location as shown in Photograph 20 and Photograph 21. A sight distance in excess of 250 m safe intersection sight distance (SISD) has been measured in both directions. Consequently, no upgrades are recommended.

4.4.6.2.8 Geometric layout

The existing entrances off Broughans Road to the proposed development site is all weather and designed and constructed generally in accordance with a standard rural property access as shown in the standard DTMR drawing 1807 which is presented in Appendix C

4.4.7 Parking

4.4.7.1 Parking arrangements

There is no supporting Development Control Plan to compliment the requirements contained within the Conargo Local Environmental Plan 2013 (CLEP).

The required number of parking spaces (or facilities for service vehicles) will be based on the following objectives:

- Ensure that adequate parking is provided on site for visitors and staff.
- Ensure that car parking facilities do not detract from the amenity of the area.



- Ensure that adequate provision is made for safe and convenient loading and unloading on site.
- Promote road safety by limiting new access points to arterial roads.

To ensure the provision for parking adequately services the proposed development, the parking demand has been estimated at 4 full time equivalent staff members plus the provision of parking for support services and the loading and unloading of goods including livestock and commodities within the site. A conservative assumption has been adopted as each staff member will require an individual parking space.

The proposed development has a large site area which is sufficient to provide for at least 5 informal carparking areas located across the development complex site. Further, the site area provides sufficient area for light and heavy vehicles up to a B-double to manoeuvre and turn around on-site and enter / exit the proposed development site in a forward direction.

4.4.7.2 Adequacy of car parking

Figure 3 indicates several informal gravel car parking areas of which dimensions are able to accommodate a total of over 5 staff parking spaces, plus heavy vehicle spaces. Due to the nature of the proposed development and its location in a rural area this provision is considered to be appropriate in accordance with the requirements of staff and the expected delivery of commodities and livestock.

Provision of parking for persons with disability and general access shall be made in accordance with the requirements of Australian Standards AS1428 – Design for access and mobility and AS2890.6 – Parking facilities as far as they are relevant to the proposed development.

There is no requirement to have a formal pedestrian connection to buildings from parking areas.

There is no requirement for allocation of specific service areas for waste collection, deliveries and loading and unloading of other goods.

4.4.8 Public transport

Due to the rural location of the subject land there is no scheduled public transport operations such as passenger bus or train services along local road haulage routes comprising Broughans Road and James Road. There are passenger bus services operating on the Riverina Highway between Finley and Deniliquin. These services only operate twice per day, once in the morning departing Deniliquin at 8:45am and in the early evening departing Finley at 6:00 pm outside of the typical commodity transport times.

There is a school bus operating on the principal haulage route between James Road from Lower Finley Road to Broughans Road and Broughans Road east to the Newell Highway. The school bus passes the proposed development twice on school days around 8:20 am and



3:30 pm. Livestock and commodity movements are scheduled to occur around the bus school times as far as practical.

Broughans Road and James Road are not proposed as a future public transport route. Due to the nature of the proposed development provision for public transport infrastructure is not deemed warranted.

Consequently, the proposed development shall have no impact on public transport services.

4.4.9 Cyclists and pedestrians

Due to the rural location of the subject land there are no pedestrian paths, bicycle lanes or bicycle awareness zones provided on Broughans Road, James Road or the Riverina Highway for the segment reviewed.

Due to the nature of the proposed development provision for pedestrian paths or bicycle infrastructure is not deemed warranted.

Consequently, the proposed development shall have no impact on cyclist or pedestrian infrastructure.

4.4.10 Conclusion

The impact of traffic generated by the proposed development on the external transport network has been assessed. Consideration has been given to operational performance, road safety and access arrangements.

The assessment was carried out of the trips likely to be generated by the proposed development and the estimated distribution of trips on the existing road network. The impact of the proposed development on the road network has been analysed using procedures set out in Austroads guidelines.

Results of the assessment indicate that the road network continues to operate with capacity as the additional traffic generated is low (<2 vpd) and the additional traffic on the local and state road network is within the standard of the existing road design. Consequently, the impact of development traffic on the operational performance of the road network is not significant.

No intersection upgrades to the local or state controlled road network would be warranted due to the low additional peak hour volume of development traffic.

The following mitigation measures are proposed or maintained:

• Access for light vehicles and heavy vehicles be maintained via the existing approved subject land entrances off Broughans Road approximately 405 m and 525 m east of the intersection with James Road to provide sufficient sight distances to and from the intersection.



- Advisory signage (Truck crossing or entering) be implemented on each approach to 58 Broughans Road in accordance with AS1742.2 to advise motorists of truck turning movements.
- A Traffic Management Plan and Driver Code of Conduct shall be implemented to ensure heavy vehicles utilise either Haulage Route A, Haulage Route B or Haulage Route C.

In conclusion, the proposed development will not adversely impact on the operational performance of the surrounding road network and the proposed road access arrangements are considered adequate and suitable for the proposed use and estimated traffic generated.



5 References

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Austroads, 2020a, Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings Management, Austroads, Sydney, NSW.

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Austroads 2021b, Guide to traffic management: part 4A: Unsignalised and Signalised Intersections, AGTM04A-17, Austroads, Sydney, NSW.

Austroads, 2023b, Guide to Road Design Part 4: Intersections and Crossings – General, edn 2.2 2023, AGRD04-23, Austroads, Sydney, NSW.

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Roads and Traffic Authority, 2002, Guide to Traffic Generating Developments, Version 2.2, Transport Planning Section, Sydney Client Services, Roads and Traffic Authority, Sydney NSW.

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Roads and Traffic Authority, 2011, RTA Supplement to the Austroads Guide to Road Transport Planning, Roads and Traffic Authority, Sydney NSW.



Appendix A – ERC Road Classification

Rod Davis

From:	Fred Heinze <fred.heinze@edwardriver.nsw.gov.au></fred.heinze@edwardriver.nsw.gov.au>
Sent:	Friday, 3 November 2023 10:19 AM
То:	Rod Davis
Subject:	FW: Heirarchy of Roads

Sorry Rod - didn't fully read your email properly

Low – 8 metre formation 5 metre 100mm gravel pavement

Medium – 10 metre formation – 7.5 metre 250mm* FCR sealed pavement.

High-14 metre formation – 2metre 100mm FCR shoulders – 10 M 300mm* FCR sealed pavement

• Subject to Geotech testing for CBR 15.

Thanks

Fred Heinze Manager Transport & Facilities

180 Cressy Street, PO Box 270 Deniliquin, NSW, 2710 T: 03 5898 3000 M: +61 472 751 974 E: fred.heinze@edwardriver.nsw.gov.au W: www.edwardriver.nsw.gov.au



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Received, thank you. Got it, thanks! Thanks for that.

From: Rod Davis <rod.davis@rdcengineers.com.au>
Sent: Friday, 3 November 2023 10:40 AM
To: Fred Heinze <fred.heinze@edwardriver.nsw.gov.au>
Subject: RE: Heirarchy of Roads

Thankyou Fred,

Do you have any criteria around – Low, Medium High volume and design standards for each classification.

Regards,

Rod Davis Director

0427629203 rod.davis@rdcengineers.com.au



From: Fred Heinze <<u>fred.heinze@edwardriver.nsw.gov.au</u>> Sent: Friday, November 3, 2023 9:37 AM To: Rod Davis <<u>rod.davis@rdcengineers.com.au</u>> Subject: RE: Heirarchy of Roads

Hi Rod,

Sorry for the delay – the person I thought was returning to work on 1 November is not returning till the 8th.

Nevertheless trust the following information assists your cause:

ROAD	CLASSIFICATION	B-DOUBLE ACCESS	ROAD TRAIN ACCESS
Broughans Road	Local Road – Unsealed – Low Volume	No	No
James Road	Local Road – Sealed – Medium Volume	No	No
Lower Finley Road	Local Road – Unsealed – Medium Volume	No	No
Bowlers Road	Local Road – Unsealed – Low Volume	No	No
Tuppal Road	Local Road – Sealed – High Volume	Yes	Most southern section only
Riverina Highway	State Highway	Yes	Yes
Newell Highway	State Highway	Yes	Yes

Thanks

Fred Heinze Manager Transport & Facilities

180 Cressy Street, PO Box 270 Deniliquin, NSW, 2710 T: 03 5898 3000 M: +61 472 751 974 E: fred.heinze@edwardriver.nsw.gov.au W: www.edwardriver.nsw.gov.au



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Received, thank you. Got it, thanks! Thanks for that.

From: Fred Heinze Sent: Wednesday, 1 November 2023 9:16 AM To: Rod Davis <<u>rod.davis@rdcengineers.com.au</u>> Subject: RE: Heirarchy of Roads

Hi Rod,

Should have your results today - it is currently sitting with an employee who returns from a fortnight off today.

Sorry for the delay

Fred Heinze Manager Transport & Facilities

180 Cressy Street, PO Box 270 Deniliquin, NSW, 2710 T: 03 5898 3000 M: +61 472 751 974 E: fred.heinze@edwardriver.nsw.gov.au W: www.edwardriver.nsw.gov.au



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Received, thank you. Got it, thanks! Thanks for that. From: Rod Davis <<u>rod.davis@rdcengineers.com.au</u>>
Sent: Wednesday, 1 November 2023 8:50 AM
To: Fred Heinze <<u>fred.heinze@edwardriver.nsw.gov.au</u>>
Subject: FW: Heirarchy of Roads

Hello Fred,

Any progress on the categorisation of the roads below.

Regards,

Rod Davis Director

_

0427629203 rod.davis@rdcengineers.com.au



From: Rod Davis <rod.davis@rdcengineers.com.au>
Sent: Friday, October 27, 2023 9:55 AM
To: 'Fred Heinze' <fred.heinze@edwardriver.nsw.gov.au>
Subject: RE: Heirarchy of Roads

Hello Fred,

The particular roads I am interested in are

Broughans Road James Road Lower Finley Road Bowlers Road Tuppal Road Riverina Highway Newell Highway

If you could also advise what heavy vehicle configuration these roads are currently approved for.

Thankyou Rod

Regards,

Rod Davis

Director

0427629203 rod.davis@rdcengineers.com.au



From: Fred Heinze <<u>fred.heinze@edwardriver.nsw.gov.au</u>> Sent: Friday, October 27, 2023 9:25 AM To: <u>rod.davis@rdcengineers.com.au</u> Subject: Heirarchy of Roads

Hi Rod,

You've requested information about the ERC hierarchy of roads.

As we have approx. 1200 km of roads across the shire , most of them rural and unclassified, sealed and unsealed, some regional, some state highways can you advise please what categories of our roads holds your interest.

Thanks

Fred Heinze Manager Transport & Facilities

180 Cressy Street, PO Box 270 Deniliquin, NSW, 2710 T: 03 5898 3000 M: +61 472 751 974 E: <u>fred.heinze@edwardriver.nsw.gov.au</u> W: <u>www.edwardriver.nsw.gov.au</u>



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Received, thank you. Got it, thanks! Thanks for that.



Appendix B – TfNSW AADT reports





97024 - Riverina Highway Average Daily Traffic for All Days

Exported on Fri May 03 2024 at 16:35:18. © Roads and Maritime Services 2015.





97029 - Newell Highway Average Daily Traffic for All Days

Exported on Fri May 03 2024 at 11:13:41. © Roads and Maritime Services 2015.



Appendix C – Standard drawing - Rural Property Access



• Type 3.1 or 4.3 or match existing is permissible if Type 2.2/2.4 is unable to be used.

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Pavement Type 2 - Gravel, unbound pavement. Refer to Table 2 of Drawing 1 for depths. Access may be required to be sealed for up to 10m width from edge line (to minimize gravel on through road)

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Appendix D – Traffic Management Plan