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## Traffic Impact Assessment

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### Glencairn Quarry

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Glencairn Quarry Supplies Pty Ltd  
746 Melburra Road, Narrabri, NSW 2390

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August 2020

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## 1 Introduction

The following provides a Traffic Impact Assessment for the operation of Glencairn Quarry. This assessment has been prepared in accordance with requirements of Austroads design standards and the NSW Guide to Traffic Generating Developments (RTA 2002).

### 1.1 Purpose

The purpose of this assessment is to assess the haul routes to be used by a development application for a 29,000-tonne gravel quarry on the property of “Glencairn” located at 746 Melburra Road in the Narrabri Shire local government area.

### 1.2 Aims and Objectives

This assessment aims to identify the likely impact of the proposed development upon the wider road network of the region. Impacts considered include impacts to the road network itself (road condition), the functionality of the road network (road safety and traffic volumes) and amenity impacts of changes to the road network (traffic noise). The assessment also outlines traffic considerations with regard to the design of the quarry (adequacy of on-site parking provision, internal traffic circulation and site access to the public road network).

The proposed objectives for Glencairn Quarry are to:

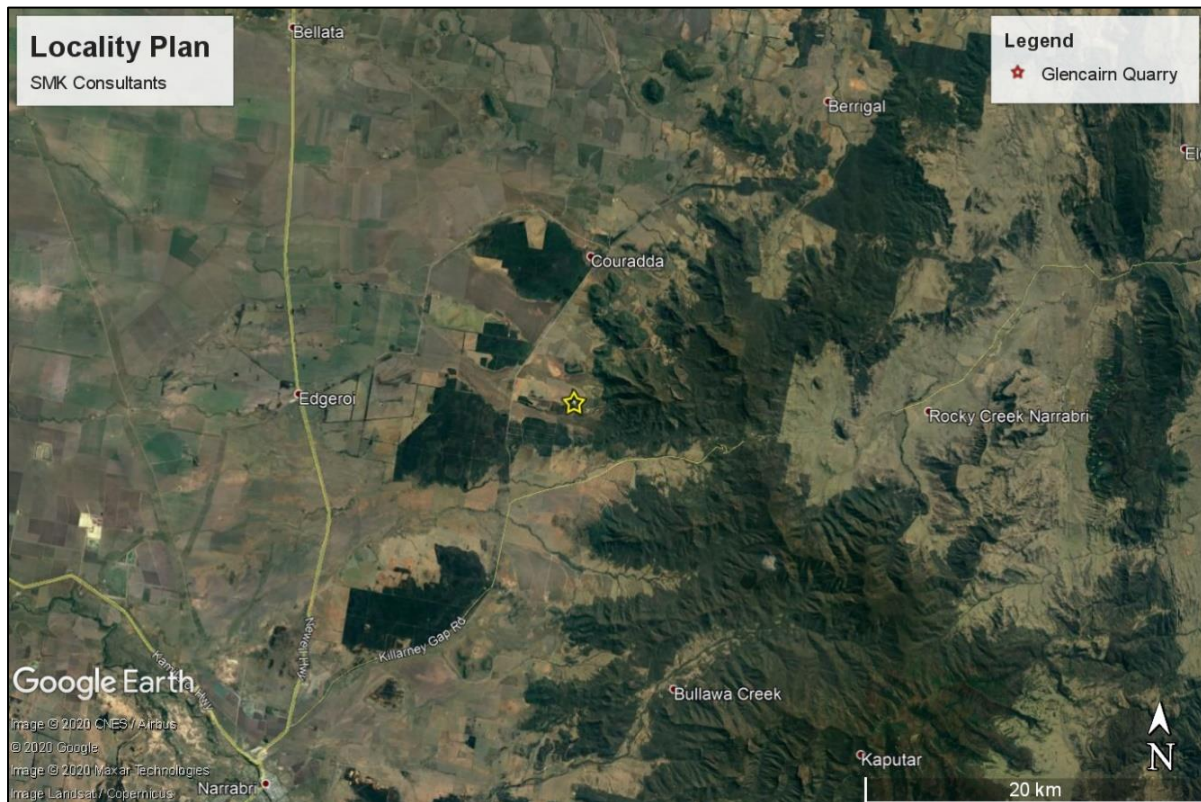
- Ensure the delivery of aggregate materials from the quarry can be achieved in an efficient and financially competitive manner;
- Minimise the impact on roads used as haul routes; and
- Minimise traffic conflict with other road users.

## 2 Background

The proposed development site has an area of approximately 1.9 Hectares on Lot 24 in DP753920. The site is located within the Narrabri Shire local government area. The public roads proposed to be utilised as the haulage route are located within the Narrabri Local Government area. The locality of the proposed development site is shown in Figure 1.



Figure 1: Locality Plan



The Glencairn Quarry was initially developed by Narrabri Shire Council in the 1990's. No development approval has been issued for the development to date. The current proposal (DA2020/73) aims to obtain a formal approval for continued extraction activities at the quarry development at Glencairn, in conjunction with the expansion of the existing extraction footprint. It is estimated that there are approximately 160,000 cubic metres of gravel within the proposed extraction area footprint, with the resource extending to a minimum depth of approximately 5.5 metres and a maximum depth of up to 9.5 metres.

### 3 Existing Conditions

#### 3.1 Current Operations

At present, gravel extracted at Glencairn quarry is mainly utilised to supply raw material to local road works and construction projects undertaken by Narrabri Shire Council within the Narrabri Shire. The quarry also supplies small private developments on an ad hoc basis.

At present, excavators are utilised to win gravel material from the quarry site which is temporarily stockpiled prior to loading onto trucks. Trucks are then loaded using a front-end loader, and these then haul the gravel directly to work sites.

Truck & Dog (PBS) combinations are utilised to haul material from the quarry. These trucks must not exceed a total length of 19m and are accepted for deliveries at most work sites. They carry a payload of up to 38 tonnes.

Transport from the quarry generally occurs in campaigns involving regular deliveries to projects within the surrounding Shire and larger campaigns for deliveries to larger projects such as significant road upgrades. The quarry is small, and gravel is infrequently won and hauled from the site. The Applicant has indicated that haulage of material would typically occur over two to three days per month to supply small-scale local Council projects. In recent years, peak campaigns have involved up to 55 truck movements in one day, over a nine-hour shift. Typical campaigns have usually been much smaller, consisting of approximately eight truck movements per day over eight to ten consecutive days to supply council projects. These smaller campaigns usually occur on average once per year.

The proposed operation of Glencairn Quarry would be similar in nature to existing operations, with the exception of the possible installation of a mobile crushing or screening plant onsite. There would be no significant alteration to the quantity of material extracted from the site. The Applicant estimates the lifetime of the quarry to be between ten and twenty years, which represents an average extraction rate of 8,000 – 16,000 tonne of raw material per year.

### 3.2 Site Layout and Access

The layout of the proposed development site is presented in the site plans included as Appendix 1.

The proposal involves general maintenance to improve internal roads from the quarry site to Melburra Road. The eastern section of this road is located on the Applicant's land for a distance of approximately 580m. The entrance road from this point to Melburra Road is located on a Crown road. This Crown road was an internal farm road, but improvements have occurred to allow Council and others to access the quarry from Melburra Road. The road is gravelled but has poor maintenance in parts. Figures 5 and 6 show recent photos of this internal access road. The road is maintained and graded on an as-required basis when gravel is to be hauled from the quarry site. The road also provides access for grain and general farm vehicles.

The quarry will utilise the existing site access point onto Melburra Road. The existing site access is shown in Figures 2 and 3. The access point provides good visibility along Melburra Road. Available sight distances to the north and south along Melburra Road are in excess of 500m. Melburra Road is a Shire road and maintained by the Shire. Recent work has been



undertaken by the Shire to improve in the form of grading the access into the property boundary.

**Figure 1: Existing Intersection Looking from the Crown Road onto Melburra Road**



**Figure 2: View from Melburra Road onto Crown Road leading to Lot 24 in DP753920**





**Figure 3: Crown Road Intersection with Melburra Road, looking South along Melburra Rd**



**Figure 4: Internal Haul Rd Intersection with Melburra Rd, looking North along Melburra Rd**



**Figure 5: Internal Haul road leading to Lot 24 in DP 753920 (Sole access route to the site)**





**Figure 6: Crown Road leading to Lot 24 in DP 753920**

### 3.3 Internal Traffic Circulation

All traffic would enter and exit the site from the Crown Road off Melburra Road. Existing internal roads within Lot 24 in DP753920 are contained within the Quarry site. Due to the low frequency of truck movements within the quarry, internal traffic plans are developed on an as-needed basis. The need for an internal traffic plan is subject to the daily tonnage removed from the site and the location of the stockpiles. In general terms, the applicant has indicated that truck traffic routes within the quarry are based on one-way movements and allow trucks to enter, load and exit the quarry in a forward direction only.

The entrance road from Melburra Road is confined in width in sections. The general pavement width is variable, but the formation extends to a trafficable width of up to 10m. It should be noted that the quarry does not operate in wet weather and therefore it is possible for an incoming trucking to slow onto the road verge to allow a loaded truck to pass toward Melburra Road.

Peak operations on this site occur when Council is obtaining gravel from the site. To date, the applicant has not been advised on any traffic conflict or issues of accessing the quarry along this haul road. It is assumed that Council had previously adopted appropriate traffic management controls if a risk was present.

### 3.4 Parking Supply

The only traffic entering the quarry involves traffic either involved in the quarry operation or trucks moving to and from stockpiles. No permanent facilities are present in the form of an

office or outbuilding. During peak operations, two operators may be present on this site and therefore two light vehicles may need parking space. Sufficient area is available for this purpose without interfering with the movement of trucks to and from stockpiles.

### 3.5 Operating Hours

The proposed operating hours are between 6.00am and 6.00pm Monday to Friday and 6:00am to 1:00pm on Saturdays with no haulage to occur on Sundays or public holidays.

## 4 Proposed Traffic Generation

Traffic generation from this site will be highly variable due to the fact that a significant part of the works will involve deliveries to Council projects. Council generally undertake projects to replace sections of local roads with the limitation being available funding and the need to distribute this funding throughout the Shire. The region's main roads are bitumen sealed and therefore do not require a regular supply of gravel. The potential use of the Glencairn gravel resource is limited as it is considered suitable for local roads, building foundations and sub-grades of main roads. It is not a suitable resource for final gravel material on main roads in the local area.

The quarry will therefore operate in campaigns as discussed in Section 3.1 of this assessment. Smaller projects will involve the use of one or two trucks with an average turn-around time of more than 1-hour. Larger campaigns will be limited to the number of trucks engaged by the contractor and the rate of loading of each truck. The average turn-around time within the quarry for loading and covering of loads is estimated to be 15-minutes.

The following table presents a summary of predicted heavy traffic movements for proposed quarry operations.

Table  
1: Proposed Average Heavy Traffic Movements at Maximum Annual Extraction Rates

	Load Weight	Proposed Average Movements per day
Annual Extractions		29,000 tonnes
Working days available		307
Daily Tonnage moved		94
Truck and Dog movement per day	38-tonnes	2

Allowing for 4-trucks per hour to enter and leave the site, the potential exists for truck and dog haulage units to undertake 39-truck movements in one day. This will result in the movement of 1,500 tonne of quarry product from this site. It is noted that a Council project

involved a peak of 55-truck movements from this site in one day. The total weight of product moved on this date is unknown, however with 55-truck movements, the hourly rate would need to be in the order of approximately 5-trucks per hour, starting from 6am with the last truck leaving at 5pm.

The following table presents a calculation showing the number of truck movements when 1,500 tonne of product is moved. If this were to occur on a regular basis, the quarry would reach its annual limit after 19.3 days of operations.

Table 2: Peak Truck Movements for 1,500 tonnes per day

	Load Weight	Proposed Average Movements per day
Daily peak despatch		1,500 tonnes
Truck and Dog Movements	38-tonnes	39
Movement per hour (11-hour day)		4

## 5 Existing Road Conditions

### 5.1 Description of Existing Quarry Haul Routes

Trucks leaving the quarry site can turn either left or right onto Melburra Road. Turning left provides a road connection onto Killarney Gap Road. At this intersection trucks can turn either right toward the Newell Highway or left toward Bingara.

Turning right onto Melburra Road from the quarry leads north toward Moree Plains Shire. The Couradda Road provides a connection through to the Newell Highway via Edgeroi or Byalla Lane.

No other formal road access is available between the quarry and the Newell Highway. Some internal farm road access is available between Melburra Road and the Newell Highway, but these would only be used by private arrangement.

The primary haul road from this quarry is therefore Melburra Road. Historically, gravel from Glencairn quarry has been utilised within a distance of 50km from the quarry. This includes mainly Shire roads but also Killarney Gap Road which is a Transport NSW funded road.

The quarry is located approximately 35 km from the Narrabri town area. The gravel from this quarry could be provided at a competitive price for quarry material within the town area if contracts are available. It would be competing against several other quarries which provide different ranges of product.

## 6 Proposed Haulage Routes

No changes will occur between the existing and proposed haul roads as there are limited options available for local access.

The Glencairn quarry intends to supply quarry materials to the general market which at this time includes Council road construction and other general construction projects in the market area that might occur as a result of the additional economic investment in the region. As such, the location and distance to client delivery points cannot be specified at this time.

The proposed haulage route from the development site will utilise a Crown Road linking the quarry site to Melburra Road before proceeding either north or south along Melburra Road as required to provide material to various projects.

The extent of this assessment, shown in Figure 8, is limited to the major components of the surrounding road network likely to be impacted by the development including the following roads and intersections. Beyond the immediate network, the number of additional trips associated with the development and their impact are considered to be minimal and less than 5% of total trips. Impacted road infrastructure may include:

- Melburra Road;
- Couradda Road;
- Kilarney Gap Road; and
- Newell Highway.

For clarification purposes, road names are based on NSW Land and Property Service data base referred to as Six Maps.

### *Melburra Road (SR3)*

Melburra Road is a rural two-way gravel road maintained by both Narrabri Shire Council (NSC) and Moree Plains Shire Council (MPSC). The road services the farming community and several other smaller arterial roads. The road is trafficable in all weather conditions apart from times of heavy rain and flood events. The section that may potentially be impacted by the quarry involves 17 kilometres in length with the following characteristics:

- Gravel pavement except for a short section of bitumen seal at the Killarney Gap intersection (refer photographs in Appendix 3)
- The average road width is 11 metres including shoulder areas



- The road is relatively flat and straight.
- The road has limited guideposts.
- There are table drains either side.
- Culverts have partially collapsed at several locations along this road, with collapsed sections cordoned off to form a single lane road over watercourses.
- Road works were in progress along this road at the time of the site assessment. This included re-sheeting carried out by NSC.
- The road is generally raised above surrounding natural surface by a 200mm to 400mm subgrade and gravel pavement layer.
- Melburra Road is a B-double approved route.
- Melburra Road is a school bus route.

Melburra Road is considered in a moderate condition. Several culverts have collapsed along this road and need repair. The depth of gravel in some sections of this road is minimal. Such sections will be prone to impact from heavy vehicles as the weight of the trucks is being supported by the clay subgrade only. This road is considered a dry weather road only because of a lack of gravel pavement in some sections.

**Figure 7: Example of road culvert damage along Melburra Road resulting in narrowing of road pavement**



#### *Couradda Road (SR7)*

Couradda Road is a partially bitumen sealed two-way road maintained by the Narrabri Shire Council. The bitumen seal extends from the intersection with Newell Highway for approximately 5 kilometres. The remainder of the road is gravelled. The road services the

farming community and several other smaller arterial roads. The road is trafficable in all weather conditions apart from times of extreme flood events. The proposal would potentially impact the Couradda Road over its entire length (approximately 25 kilometres) for haulage of quarry product to the Newell Highway via Edgeroi. The quarry is situated approximately 40 kilometres from Edgeroi in total. The road has the following characteristics:

- The average road width is 6.86 metres with a minimum of 6.2 metres of sealed pavement.
- There are no line markings.
- There are table drains either side.
- The road is generally raised above surrounding natural surface.
- No severe corners are present which may cause traffic conflict.

#### *Killarney Gap Road (MR133)*

Killarney Gap Road is a bitumen sealed two-way road maintained by both Narrabri and Gwydir Shires using State funding assistance. The road services the farming community and several other smaller arterial roads. Killarney Gap Road also provides a tourist route through the region between Narrabri and Bingara.

The road is trafficable in all weather conditions apart from times of extreme flood events. The section to be potentially impacted by the quarry involves 21 kilometres in length from the intersection with Melburra Road to its intersection with the Newell Highway. Killarney Gap Road has the following characteristics:

- The average road width is 6.0 metres of sealed pavement.
- There are line markings.
- There are table drains either side.
- The road is generally raised above surrounding natural surface.

Killarney Gap Road is overall considered in good condition.

#### *Newell Highway (A39)*

The Newell Highway is a national highway with the following characteristics in the vicinity of the development:

- Generally, a 10-metre-wide sealed pavement with 3.3 metre lanes, centre lines and edge-lines.

- The Newell Highway is a B-double and road train approved route in the section between Moree and Narrabri.

Newell Highway is in good condition. Significant expenditure has been announced for this road and it is expected that large sections will be upgraded to new standards of road width and the construction of more passing lanes.

### **Summary**

Potential haulage routes include sealed and unsealed roads considered in good to moderate condition. The identified roads were therefore considered suitable for use by quarry traffic under the intended management proposals. Several matters of note need to be considered for road use, mainly:

#### **1. Floodways**

Floodways by nature will have water over them at various times. Heavy vehicles crossing floodways when under-water or when still wet will accelerate road wear. Haulage of materials from the quarry should cease during flood events. (Any flood would normally cause a cessation of works as roads would be declared closed by the Local Roads Authority).

#### **2. Quarry Road and Melburra Road Intersection**

This intersection has sufficient sight distance in both directions. The road geometry is considered to meet the current Austroads standard for a rural intersection but the pavement condition at this intersection is relatively poor. An upgrade will involve widening the shoulder in the intersection to create a tapered area and a minimum of a 12m turning radius.

#### **3. Bitumen seal to access points and intersections**

The primary intersections from the quarry onto major roads include the intersections of Couradda Road onto the Newell Highway and Melburra Road onto Killarney Gap Road. Both intersections are bitumen sealed and have been constructed to appropriate standards of geometry to meet Austroads Guidelines for a rural road intersection for articulated vehicles.

#### **4. Wet Weather**

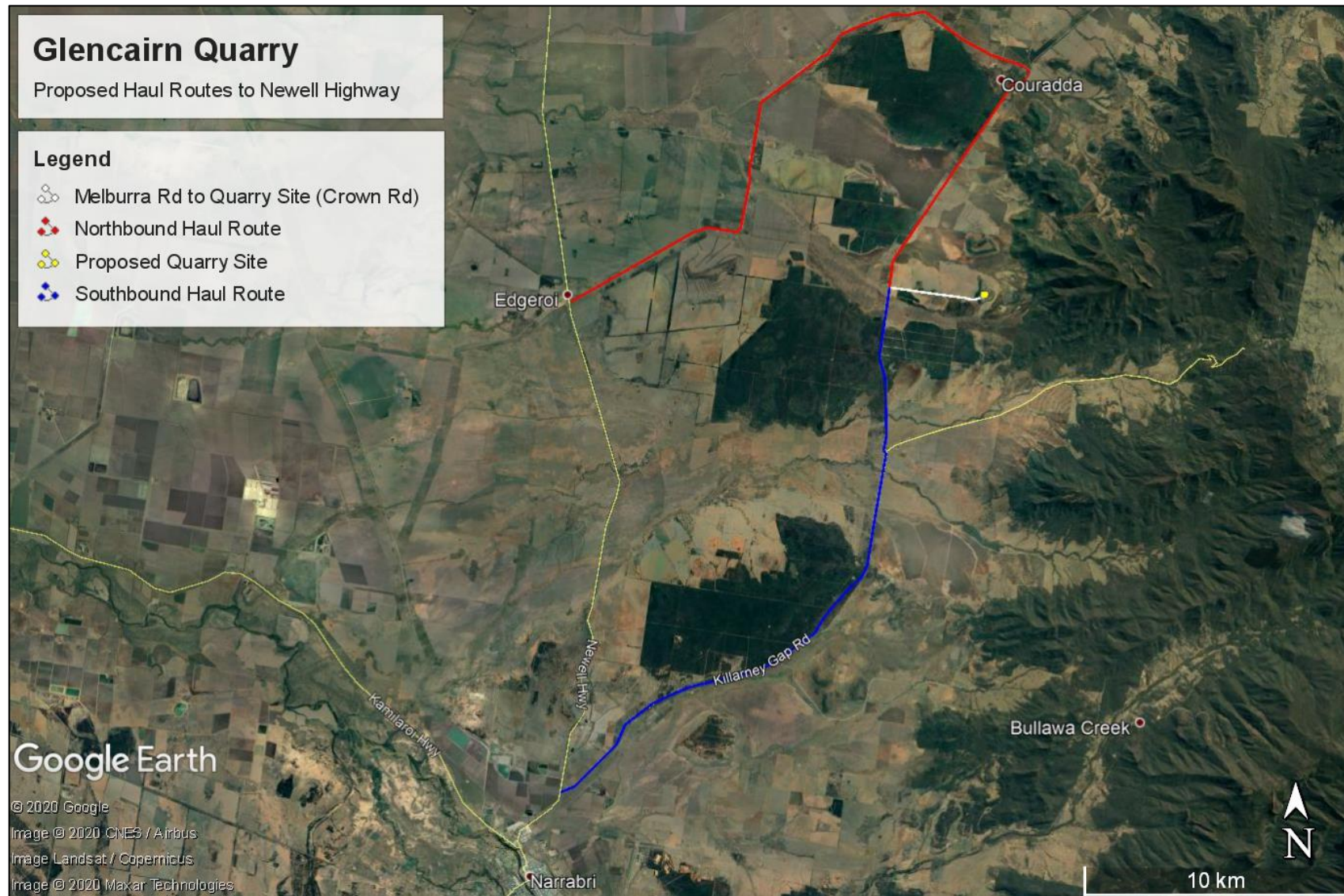
Many of the local road connections between the primary bitumen sealed roads and highways are gravel roads only. Sections of gravel along these roads is considered thin

(<100mm) which is not ideal to support heavy traffic (grain trucks and quarry trucks).  
Quarry operations will cease in wet weather as deliveries to work sites will not be possible.

Figure 9 shows the proposed haul routes from Glencairn Quarry.



Figure 8: Major Haulage Routes



## 7 Traffic Volumes on Current Haul Route

### 7.1 Data Availability

Council has provided the traffic data included in Table 3 for the intended haul roads.

Table 3: Average Daily Traffic Data

Road	ADT	Percent Heavy traffic	Number of trucks per day
Mellburra	61	19.1	11.6
Couradda	70	19.4	13.6
Killarney Gap	373	17.5	65.3

During grain harvest periods, the volume of truck traffic will increase substantially for delivery of grain to either Narrabri or Edgeroi grain receival facilities. This heavy traffic period will last for a period of 4 to 8 weeks, depending on harvest conditions in November and December. A second harvest period occurs in March through to June if local farmers grow a summer crop of sorghum or cotton. This summer crop traffic will be more dispersed as the harvest period extends over several months as planting dates can vary from October through to January.

### 7.2 Melburra Road

Mellburra provides a link road to the north into Moree Plains Shire. Melburra Road provides a better-quality road than some of the less used roads to or from the Moree Plains Shire which carry minimal traffic.

Based on the traffic data provided by Council, Melburra Road supports a similar amount of traffic to Couradda Road. The two roads are of similar quality in relation to pavement conditions.

### 7.3 Couradda Road

Couradda Road is a local road providing access between Melburra Road and the Newell Highway. The road carries minor local traffic only. This would include farm workers based in Edgeroi, traffic generated from approximately 12-farms along this road and traffic moving east or west across the Newell Highway. The Council data would suggest an equivalent of about one truck per day per property.

The village of Edgeroi had a shop in the recent past, but this is now closed and therefore local traffic associated with Edgeroi would now be limited to truck traffic delivering grain to the grain receival facility in Edgeroi. This traffic would be more extensive during grain harvest periods.



#### 7.4 Killarney Gap Road

Traffic on Killarney Gap road is occasionally dominated by tourist traffic. The volume of traffic is highly variable due to seasonal travel through the region. Local traffic peaks are predicted to occur in the morning and late afternoon for commuters living on farms that work or attend Narrabri. This is a school bus route.

Killarney Gap has a steep section of road over the Kaputar Range. Truck size is limited to semi-trailers and does not include B-doubles to cross the range.

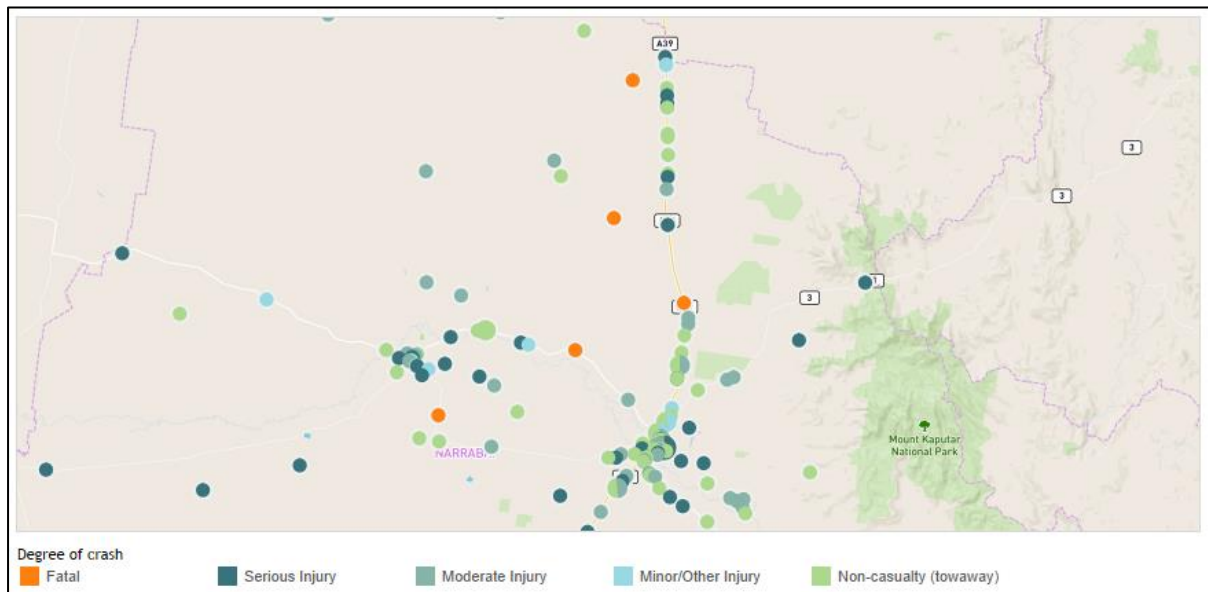
Killarney Gap Road from the intersection of Melburra Road to the intersection with the Newell Highway has been upgraded to improve tourist access.

Council data indicates an ADT of 373 vehicles which includes 65-trucks.

Observation of this road suggests a vehicle frequency in the order of 5 to 10-vehicles per hour during the middle of the day. This would equate to an AADT of between 70 and 100 per day, however Council data indicates an ADT of 373. This road provides a link between the eastern New England Region and the Narrabri region. The ADT suggests that this link road connection is well utilised.

#### 7.5 Traffic Safety Statistics

The NSW Centre for Road Safety provides crash statistics for all reportable accidents within Narrabri Shire Council from 2014-2018. Mapping of reportable accidents in Narrabri Shire Council is presented in Figure 10.

**Figure 9: Reportable Crash Statistics, 2014-2018**

**Error! Reference source not found.**10 indicates that there are no reported traffic accidents on the Melburra Road and Couradda Road; this is likely to be a result of the low traffic density on these roads. It is therefore noted that no accidents have occurred in the vicinity of the proposed quarry.

From 2014 to 2018, three accidents were reported along the section of the Killarney Gap Road between the intersection with Melburra Road and that with the Newell highway. Another accident was reported at the intersection with the Newell Highway. Of the incidents which occurred on Killarney Gap Road, none of the three incidents occurred in the same location, which suggests that there is no particular location at which the condition of the road is unsafe in such a way as to lead to the occurrence of accidents. None of the accidents caused serious harm or injury to the persons involved.

The area with the highest number of reportable accidents is within the township of Narrabri, and along major roads such as the Newell Highway. The high number of incidents in these localities is likely to be the result of a high traffic density in these locations.

## 7.6 Proposed Developments in the Vicinity

The proposed Inland Rail will result in one or two new hard rock quarries being developed in the Bellata Region. Traffic generated from these quarries will utilise direct routes to the Newell Highway and, consequently, will not utilise Melburra or Couradda Roads.

The potential exists for development of small cattle feedlots in the local area. The scale of these developments is generally limited by water and road access and therefore the feedlots are expected to carry a maximum of 1000 head. A 1000 head cattle feedlot will generate less than one truck per day and therefore not make a significant impact on local roads. Most of this truck traffic involves redirection of existing traffic.

The quarry is located in a rural area and no significant changes to farming operations which would result in substantial changes to local traffic levels are predicted.

No other proposed traffic generating developments are noted for this local area.

## 8 Impact on Road Network

### 8.1 Impacts on Road Condition

This investigation has identified a local road network with some minor issues. These include depth of gravel pavement on sections of targeted haul routes and some minor issues relating to maintenance requirements for one or more culverts along the haul routes. These issues are generally targeted by Council when funds are available.

The proposed quarry operation is considered as an existing local development. The primary user of this quarry is Narrabri Shire Council, who utilise the quarry material on local roads.

The use of average daily traffic for this quarry has limited value, in that the majority of large movements of gravel from this site will involve campaigns over one or more weeks. In between these campaigns, quarry operations generally cease. However, if formal approval is obtained for the quarry, the applicant would be in a position to sell quarry material to other projects including local farmers and projects within Narrabri and north to Bellata. The potential exists for the quarry to be more active, however many of the additional projects are predicted to be small and involve one or two trucks hauling gravel on an irregular basis. It is expected that general Council policy would result in at least one project of 10,000 – 15,000 tonne of gravel in the local roads in this part of the Shire to occur once every year or every second year to maintain the local road network.

The extraction of up to 29,000 tonnes of quarry product from this site would generate up to 760 truck loads if this were to occur in one year. During a campaign period, this is anticipated to generate up to 39 two-way truck movements per day. This movement of trucks will result in some minor degradation of the gravel pavement on the local roads but have limited if any impact on the region's bitumen sealed roads.

The impact of any truck movements is considered to be more severe on existing sections of Melburra and potentially Couradda Road where the gravel pavement is less than 100mm thick. The local gravel is not a hard rock and therefore trucks will break up some of the softer rock which will then blow off the road as dust. Council is aware of this and evidence of this includes current road works. This would be considered as general maintenance but due to budget limitations dictated to Council, only the worst areas can be targeted. A complete rebuild of roads will generally not occur unless state or federal funding is obtained.

## 8.2 Impact on Traffic Volumes

If the haulage of gravel from the quarry site is averaged over the whole year, the increase in heavy traffic from the quarry will represent a 21% increase along Melburra Road. When deliveries are occurring via Couradda Road, heavy truck numbers will increase by 18%. If these trucks utilise Killarney Gap Road, the increase is in the order of 4%.

During a campaign when 1,500 tonne per day is leaving the quarry, the respective percentage increases in heavy traffic based on Council ADT's are 340 %, 290 % and 65 %, respectively. This represent a significant but short-term increase in heavy traffic along these roads.

Road width condition during a campaign period may be impacted quickly as a result of the significant increase in heavy traffic. Appropriate mitigation measures would need to be adopted to firstly determine the condition of the road prior to such a campaign and secondly to implement action to avoid any significant deterioration of the road during a busy campaign which may impact on other local road users ability to access their properties.

## 8.3 Impact on Traffic Safety

This investigation has identified some minor issues relating to existing damage on road culverts on Melburra and Couradda Roads. These sites were marked by Council being the road authority. It is assumed that current works programs are in place for repairs. If such repairs are not completed or other similar issues are identified during a gravel haulage campaign, it is recommended that appropriate sign posting is erected to manage road safety at these locations. Road signs may include reduced speed areas, temporary give-way signs, or trucks-turning signs at the exit point from the quarry onto Melburra Road.

No significant road geometry issues were identified that may reduce road safety during a campaign period from the quarry. The only issue identified related to the fact that the main haul roads are gravel and dust will be generated from trucks. The length of road is considered

too long to engage a water truck and therefore alternative measures would need to be adopted. Alternative measures may include reduced speed for haulage trucks such as an 80 km/h limit along the road and a 50 km/h limit when travelling past homestead areas that are within 150m of the gravelled sections of the main haul roads. This is applicable to two houses along Couradda Road and one house along Melburra Road.

It is also recommended that the school bus schedule is known during larger haulage campaigns. Quarry management should inform truck operators of school bus movements and adopt a policy of awareness of the school bus movements. This can be easily undertaken by utilising two-way radio communications between truck operators to notify other drivers when the school bus is travelling along the haul routes.

#### 8.4 Impact of Traffic Noise

The quarry site is isolated from nearby residences and therefore site operations and the movement of trucks from the quarry to Melburra Road will have no real noise impact on neighbouring residences.

Potential noise impacts will be restricted to trucks moving along either Melburra or Couradda Roads. A simple noise attenuation calculation indicates that approximately 25 dB(A) attenuation occurs over a distance of 150m with no barriers to deflect or absorb noise. Truck noise will range between 75 and 100 dB(A) whilst the truck is moving along a haul road as a result of engine noise and potentially empty trailer noise on a gravel road. The farm residences will therefore be exposed to noise levels ranging from between 50 dB(A) and 75 dB(A) while a truck is passing the homestead. This will extend for a period estimated to be in the order of 15 to 30 seconds, depending on the speed of the truck. This is an existing noise experienced by the residents as other trucks use the road. However, during larger campaigns, this noise will occur on a more regular basis, predicted to be in the order of four trucks per hour.

A reduction in speed will reduce the engine noise. Speed reduction will not significantly reduce noise from empty trailers on a gravel road.

The NSW Road Noise Policy 2011 provides the current framework for the assessment and management of noise issues associated with traffic. Criteria adopted from this policy are presented in Table 4.

**Table 1: Road Traffic noise assessment criteria for residential land uses.**

Road Category	Type of Project/Landuse	Daytime Assessment Criteria
Local Roads	Existing residences affected by additional traffic on existing local roads generated by landuse developments	L <sub>Aeq</sub> , (1-hour) 55 dB(A) (External noise)
Freeway/arterial/sub-arterial roads	Existing residences affected by additional traffic on existing freeways, arterial and sub-arterial roads generated by landuse developments	L <sub>Aeq</sub> , (15-hour) 60 dB(A) (External noise)

According to the NSW Road Noise Policy:

*“For existing residences and other sensitive land uses affected by additional traffic on existing roads generated by land use developments, any increase in the total traffic noise level should be limited to 2 dB above that of the corresponding ‘no build option’.*

Melburra and Couradda Roads would be referred to as local roads. Killarney Gap Road and the Newell Highway would be classified as Arterial Roads.

For a local road, the noise criteria is 55 dB(A) average over a 1-hour period. Allowing for 4-trucks per hour for a period of 30-seconds per truck generating the worst-case noise of 75 dB(A) at the receiving residence, the average noise increase over a 1-hour period is less than 1 dB(A). This is considered to be compliant with current NSW Road Noise Policy.

## 9 Cumulative Impacts with Neighbouring Developments

No new neighbouring developments have been identified that may create a cumulative traffic impact.

During a harvest period, grain truck traffic numbers would increase substantially. If a significant gravel hauling campaign occurred during a harvest period, some conflicts may occur. On this basis, it is recommended that quarry management consider harvest periods when planning larger gravel haulage campaigns with the aim to avoid this potential cumulative impact.

It is normal policy for Council to avoid local road works during harvest. As Council have been the major client from this quarry, Council is considered to be well aware of such issues and therefore plan to avoid such conflicts.



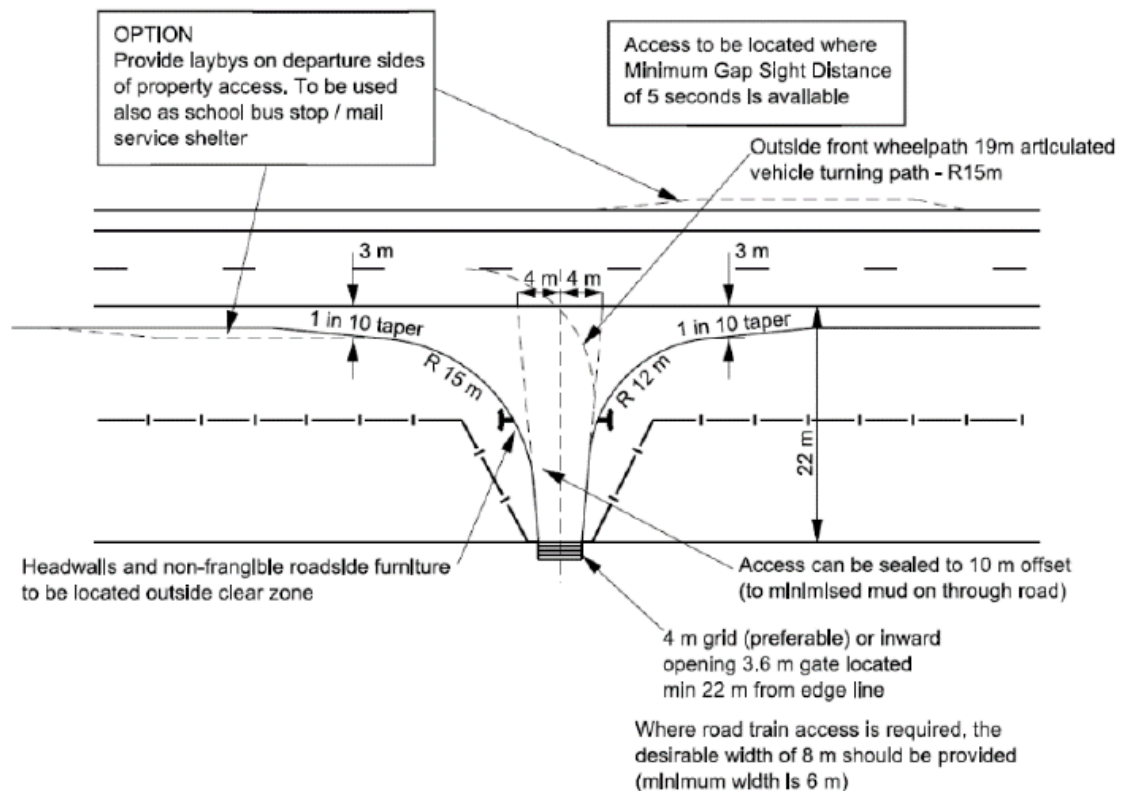
## 10 Recommended Works

An assessment of potential traffic impacts along the existing and intended haul roads for Glencairn quarry has identified several minor issues that need to be addressed during larger gravel haulage campaigns. Such campaigns will be irregular, but action needs to be taken as part of planned quarry operation to ensure truck operators are fully aware of the issues.

The primary matter relating to works involves an awareness of road conditions. This is limited to Melburra and Couradda Roads. Minor defects are present in these roads. These defects include culverts damage that present a narrowing of specific road sections and sections of relatively thin gravel pavement. The works associated with repairs to eliminate these issues are the responsibility of the local road authority, being Council. The cost of such repairs would need to form part of the costs included in the pricing of the gravel from this quarry. As Council has historically been the main client from this quarry, the cost of such repairs may be borne by Council. The work is relatively minor and potentially forms part of existing works programs being undertaken by Council.

The general road geometry is considered acceptable for the volume of traffic that may be generated from this quarry. No specific works are recommended for intersections or straightening of corners on anticipated haul roads.

The existing entrance from Melburra Road into the quarry site meets the required standard in relation to intersection geometry. This is outlined in the following Figure 7.4 below (Source: Department of Main Roads 2006). This represents an example of a typical rural property intersection with a taper for left and right turn entry and exit. This design is considered acceptable for the quarry site, based on the traffic volumes along Melburra Road and the extensive sight distances available at the intersection.

**Figure 7.4: Example of a rural property access specifically designed for articulated vehicles**

*Note: Minimum requirement for a single carriageway with design AADT < 2000 or minimum requirement for dual carriageway left-in-left-out access for single unit truck. Where AADT > 1000 and access is required for a semi-trailer then use the layout.*

*Source: Department of Main Roads (2006)<sup>10</sup>.*

The current issue that needs a work program relates to the presence or absence of a suitable pavement width at the intersection. The following photo shows the existing gravel pavement does not extend across the full entrance width. It is therefore recommended that additional gravel pavement to a minimum depth of 200mm is constructed to form the appropriate intersection layout as per Figure 7.4 above. The entrance needs to be a two-lane road.

The works may be subject to obtaining a Council approval or alternatively, Council is engaged to undertake this work as part of an agreement to enable Council to continue taking gravel from this quarry site. The gravel material could be obtained from the quarry and therefore form part of the contribution to road upgrade works imposed under any development consent issued for this quarry.

**Figure 10: Melburra Road intersection from the quarry site showing limited gravel on left hand turn area.**



## 11 Conclusions

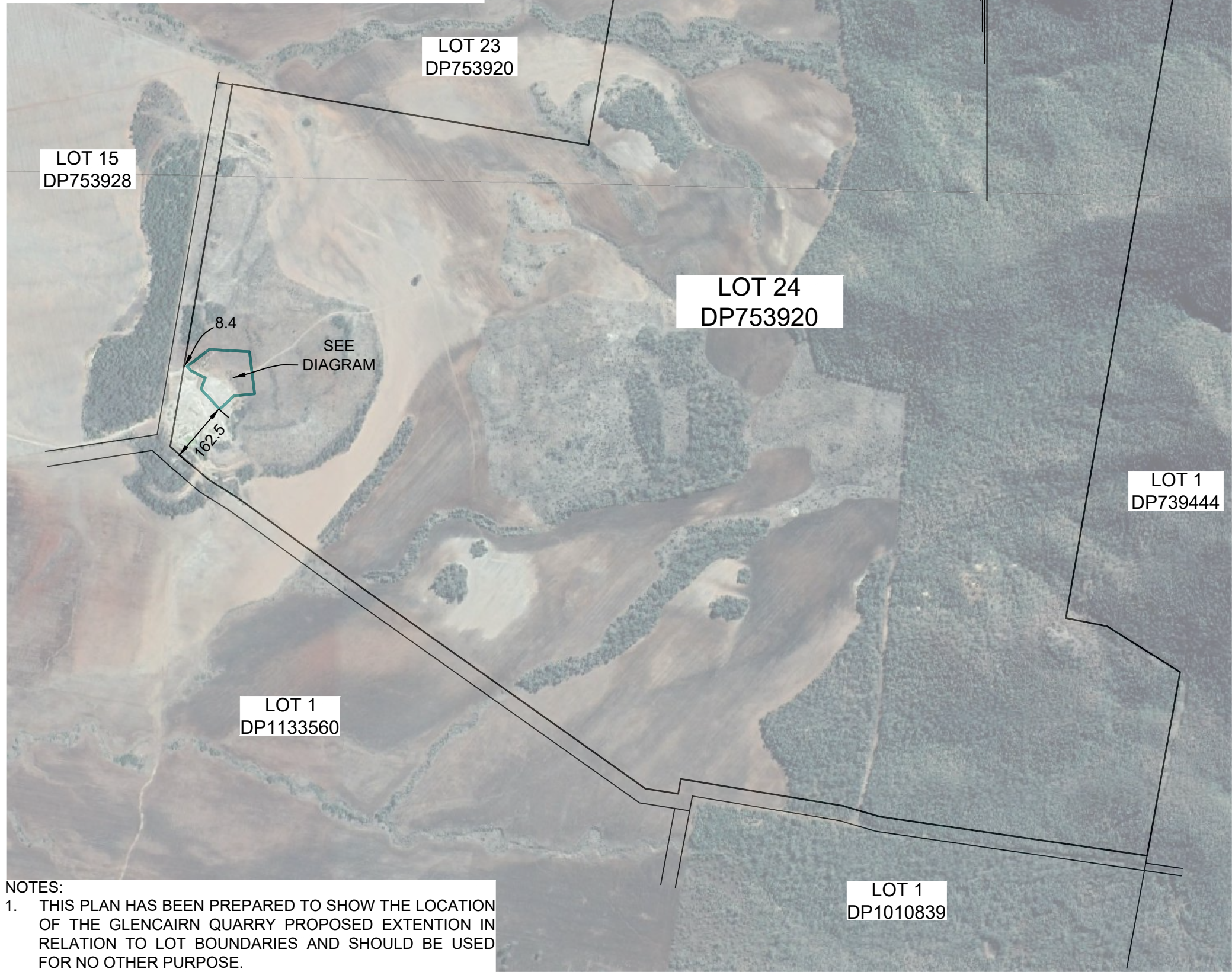
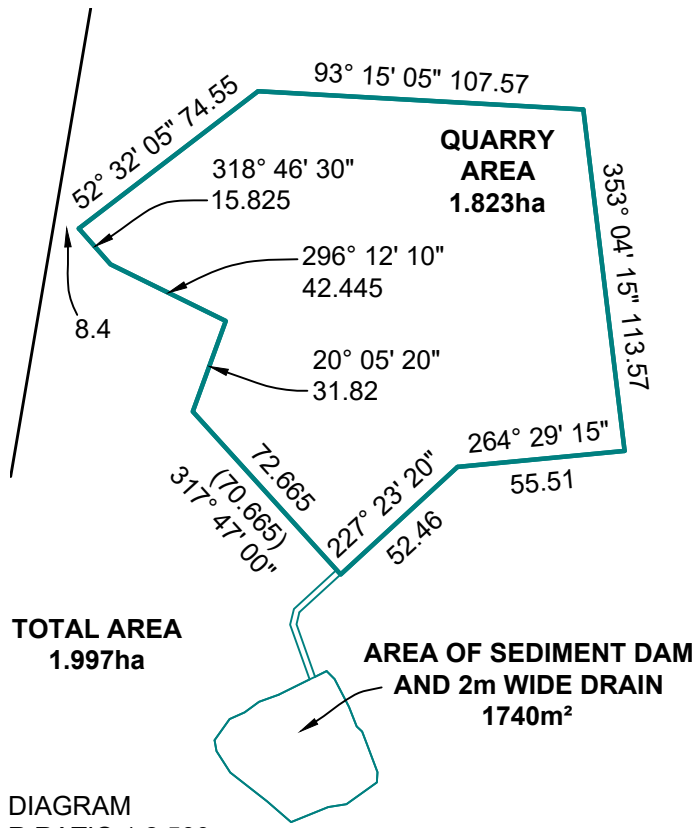
Conclusions drawn from this Traffic Impact Assessment include the following:

- Minor road works for the repair of existing sections of Melburra and Couradda road have been identified. These are existing conditions and subject to repairs by the local road authority but if such issues are present during operations of the quarry, appropriate signage needs to be in place to avoid traffic safety issues;
- Pavement depth along both Melburra and Couradda Roads is limited in places and this may cause issues during significant haulage campaigns over short periods where road damage will occur rapidly as a result of the frequency of truck movements. Such sections need to be identified during ongoing operations and planned actions need to be determined in conjunction with Council for either upgrades or limiting truck movements;
- The gravel pavements on both Melburra and Couradda Roads are not considered as all-weather and therefore operations from the quarry will need to cease during significant wet weather periods. Discussion may be required prior to resuming haulage operations after significant rainfall and local flooding;
- The intersection of the quarry haul road and Melburra Road needs to be upgraded to Austroads standards as per figure 7.4 of the Austroads guidelines as a minimum standard for this intersection.

It is recommended that an Operational Management Plan is developed for this site. Such a plan would include driver induction documentation to ensure that drivers hauling quarry material from this site are aware of road conditions and safety measures to be adopted as part of routine haulage contracts and driver behaviour.

## Appendix 1: Site Plans





- NOTES:
1. THIS PLAN HAS BEEN PREPARED TO SHOW THE LOCATION OF THE GLENCAIRN QUARRY PROPOSED EXTENTION IN RELATION TO LOT BOUNDARIES AND SHOULD BE USED FOR NO OTHER PURPOSE.
  2. THIS DRAWING HAS BEEN PROVIDED ON MGA94 PROJECTION, BUT WITH GROUND DIMENSIONS SHOWN. SCALE FACTOR IS 1.000542




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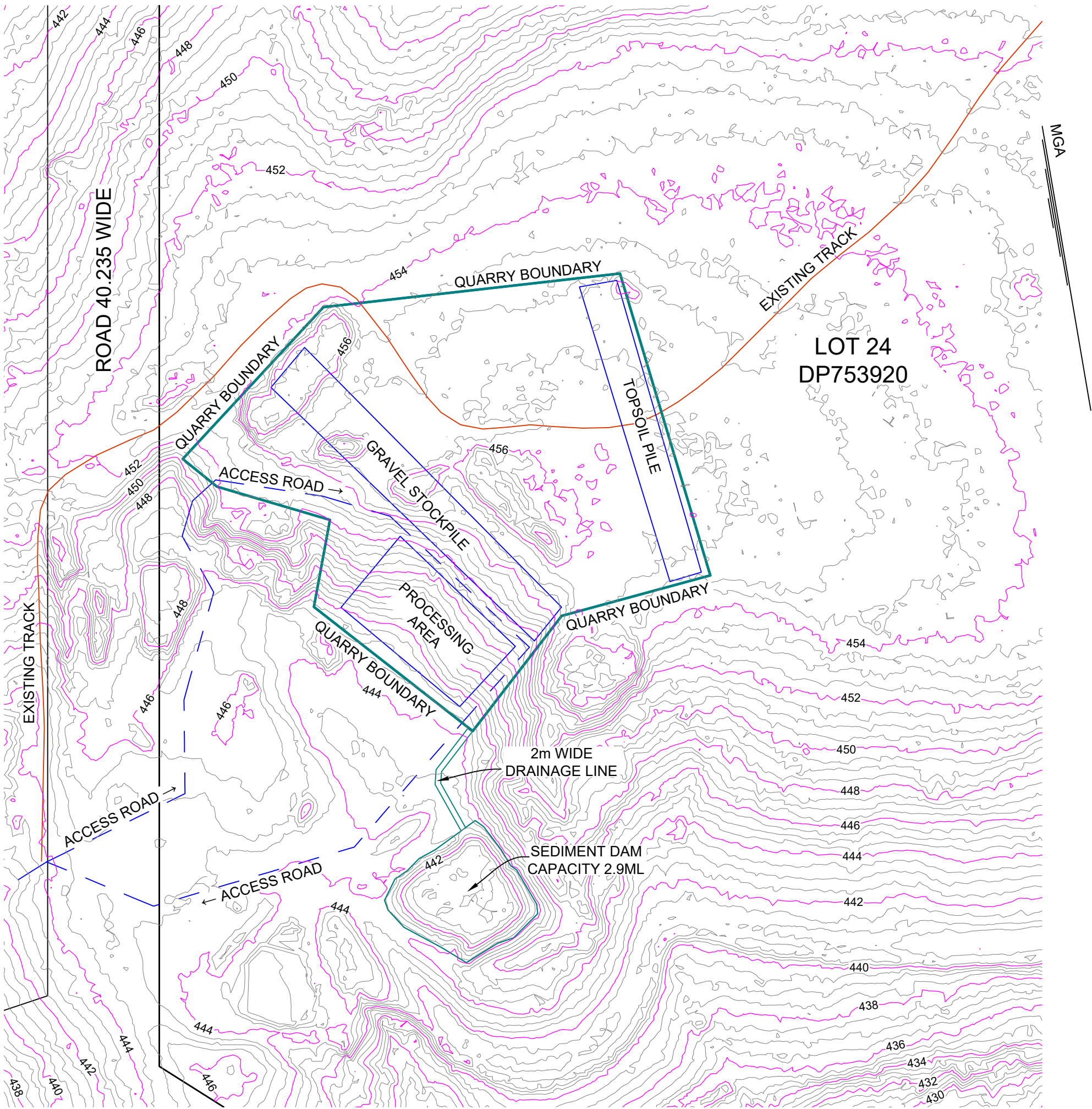
## GLENCAIRN QUARRY

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Proj. No.: 95108-1	Datum: AHD	Projection: MGA94	Sheets: 1 of 2
Surveyor: 		Date: 28/07/2020	

Rev.	Date	Revision Type	Dr. By	Ch. By
1	28-07-20	Diagram Added	L.B.	R.G.
0	22-07-20	Original Issue	L.B.	R.G.





NOTE:  
THIS PLAN HAS BEEN PREPARED TO SHOW CONTOURS WITHIN  
THE SURVEYED AREA AND PROPOSED QUARRY FEATURES  
AND SHOULD BE USED FOR NO OTHER PURPOSE.

LEGEND	
	LOT BOUNDARY
	CONTOUR MAJOR (2m)
	CONTOUR MINOR (0.5m)
	PROPOSED QUARRY BOUNDARY
	EXISTING TRACK
	PROPOSED ACCESS
	PROPOSED QUARRY FEATURES

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GLENCAIRN QUARRY

GLENCAIRN QUARRY SUPPLIES PTY LTD

File Name:  
95108-1-001.dwg

Scale:  
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Drawing Description:  
CONTOUR PLAN

Proj. No.:  
95108-1

Datum:  
AHD

Projection:  
MGA94

Sheets:  
2 of 2

Surveyor:

Date:  
22/07/2020

0	22-07-20	Original Issue	LMB	REG
Rev.	Date	Revision Type	Dr. By	Ch. By

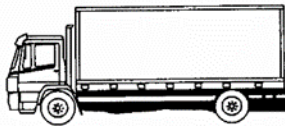
## Appendix 2: Austroads Vehicle Classifications



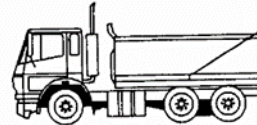
**Class 1**  
Short Vehicle



**Class 2**  
Short Vehicle Towing



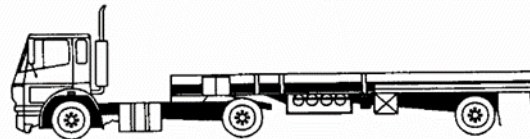
**Class 3**  
Two Axle Truck



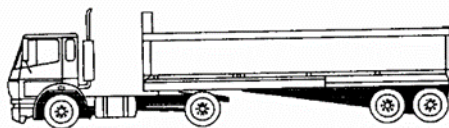
**Class 4**  
Three Axle Truck



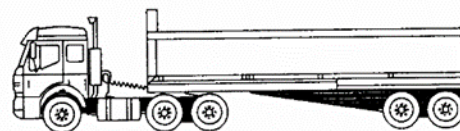
**Class 5**  
Four Axle Truck



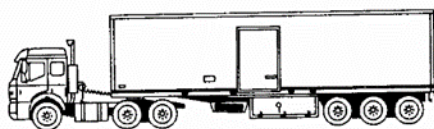
**Class 6**  
Three Axle Articulated Vehicle



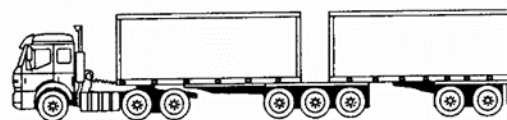
**Class 7**  
Four Axle Articulated Vehicle



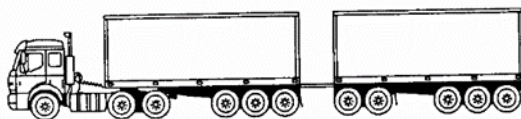
**Class 8**  
Five Axle Articulated Vehicle



**Class 9**  
Six Axle Articulated Vehicle



**Class 10**  
B Double



**Class 11**  
Double Road Train

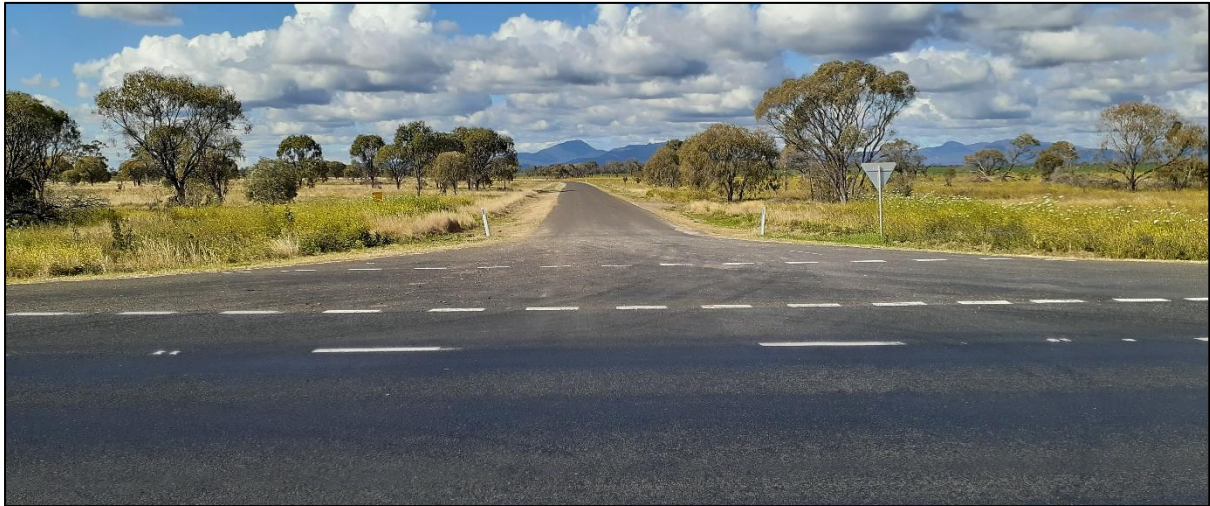


**Class 12**  
Triple Road Train

## Appendix 3: Photographs



**Figure 11: Newell Highway intersection with Couradda Rd (Looking from Newell Highway)**



**Figure 12: Sight distance from Couradda Road onto Newell Highway, Looking North.**



**Figure 13: Sight distance from Couradda Road onto Newell Highway, Looking South.**





**Figure 14: Melburra Road Intersection with Killarney Gap Road (Looking from Melburra Rd)****Figure 15: Sight Distance from Melburra Rd onto Killarney Gap Rd, Looking South****Figure 16: Sight Distance from Melburra Rd onto Killarney Gap Rd, Looking North**



**Figure 17: Killarney Gap Road Intersection with Newell Highway (Looking from Newell Highway)**



**Figure 18: Sight Distance from Killarney Gap Rd onto Newell Highway, Looking South**



**Figure 19: Sight Distance from Killarney Gap Rd onto Newell Highway, Looking North**

