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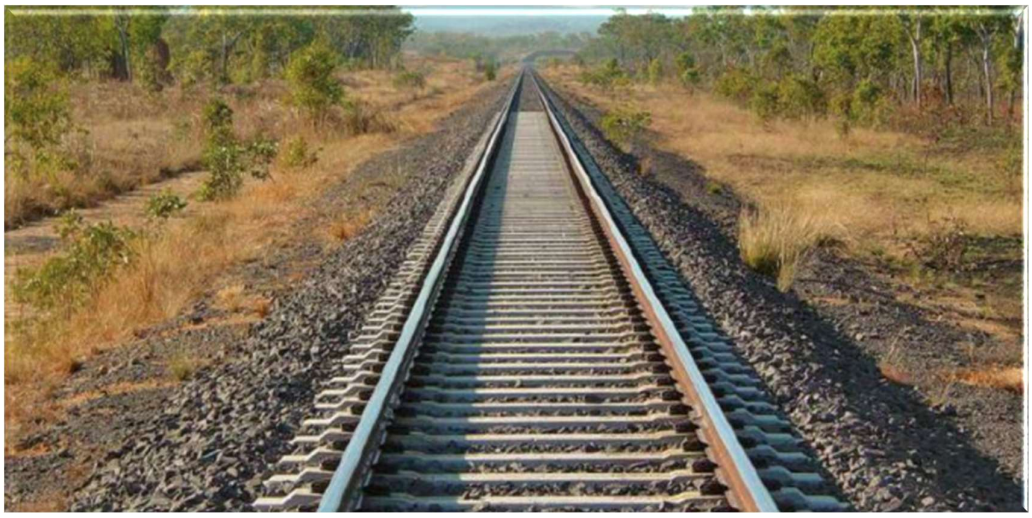

"Meppem" Quarry

# Traffic Impact Assessment

John Meppem

"Blackridge", Gurley 2398

October 2020

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# 1 Introduction

SMK Consultants have been engaged by Regional Quarries Australia to provide a Traffic Impact Assessment for the proposed development of a 490,000-tonne hard rock quarry on Lot 10 in Deposited Plan 751753 and Lot 110 in Deposited Plan 257328. Regional Quarries Australia propose to operate the quarry for the land owners and proponent, John Meppem.

A 2019 Traffic Impact Assessment had been prepared in accordance with the Secretary's Environmental Assessment Requirements (SEARs) dated the 24th August 2018 and was lodged with Moree Plains Shire Council as part of the development application submissions. Narrabri Council were consulted in the process as the original proposal involved utilising a haul route within Narrabri Shire to Bellata. Narrabri Shire raised concern with the use of Berrigal Road and therefore an alternative haul route was identified for the haulage of quarry product from the Meppem Quarry to Inland Rail construction sites. The alternate haul route was identified in conjunction with Moree Plains Shire Council.

This amended Traffic Impact Statement provides details of the revised haul route.

The assessment complies with requirements under the *Environmental Planning and Assessment Act 1979* to consider the environmental impact of a development proposal. In this instance, the environment considered is the road network servicing the proposed development.

## 1.1 Aims and Objectives

This assessment aims to identify the likely impact of the proposed heavy vehicle traffic 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 regards to the design of the proposed quarry (adequacy of on-site parking provision, internal traffic circulation and site access to the public road network).

Plans of intersection and/or road upgrades are not included in this assessment but may be required as a part of operational works or negotiated through conditions of approval.

The proposed objectives for the Meppem Quarry are to:

- Minimise adverse impacts upon the public road network; and
- Ensure the practicality and safety of traffic management measures on site.

### 1.2 Scope of Works

The scope of works includes preparation of Traffic Impact Assessment (TIA). The TIA will include the following:

- Determination of the key haulage routes with special considerations for any school zones, school bus routes, residential areas or potential risk locations;
- Assessment of the surrounding environment, existing conditions and road safety;
- Assessment of existing private property driveways and farm access points;
- Liaison with Moree Plains Shire Council and Narrabri Shire Council in relation to existing road traffic numbers;
- Assessment of likely impacts associated with road haulage;
- Any mitigation measures required to minimise road impacts, e.g. dust and noise suppression;
- Recommendations for any accesses to the quarry site;
- Calculation of expected contribution rate; and
- Inclusion of Traffic Management Plan and Truck Driver Code of Practice as prepared by Groundwork Plus.

## 2 Existing Conditions

### 2.1 Development Site

The development site is approximately 7.85 hectares on Lot 10 in DP751753. The site is located within the Moree Plains Shire Council (MPSC) local government area. The quarry is to be developed in three stages for supply of a range of quarry products to mainly the Inland Rail project and other local projects including reconstruction of sections of the Newell Highway.

The haul route is fully contained with the Moree Plains Shire. The development of this quarry site has been presented to MPSC and an agreement has been reached for use of the haul route through to Gurley which is across MPSC roads. This agreement includes upgrades of the haul road as presented in the following sections of this report.

The proposal involves haulage of quarry product to link with the Newell Highway at Gurley. The haul route will include:

- Gurley Creek Road between the Newell Highway and Boo Boo Road
- Boo Boo Road between Gurley Creek Road and Manamoi Road
- Manamoi Road between Boo Boo Road and the Meppem Quarry site
- An internal property road between Manamoi Road and the quarry site

The locality of the proposed development site is shown in Figure 1, which includes the identified haulage route.

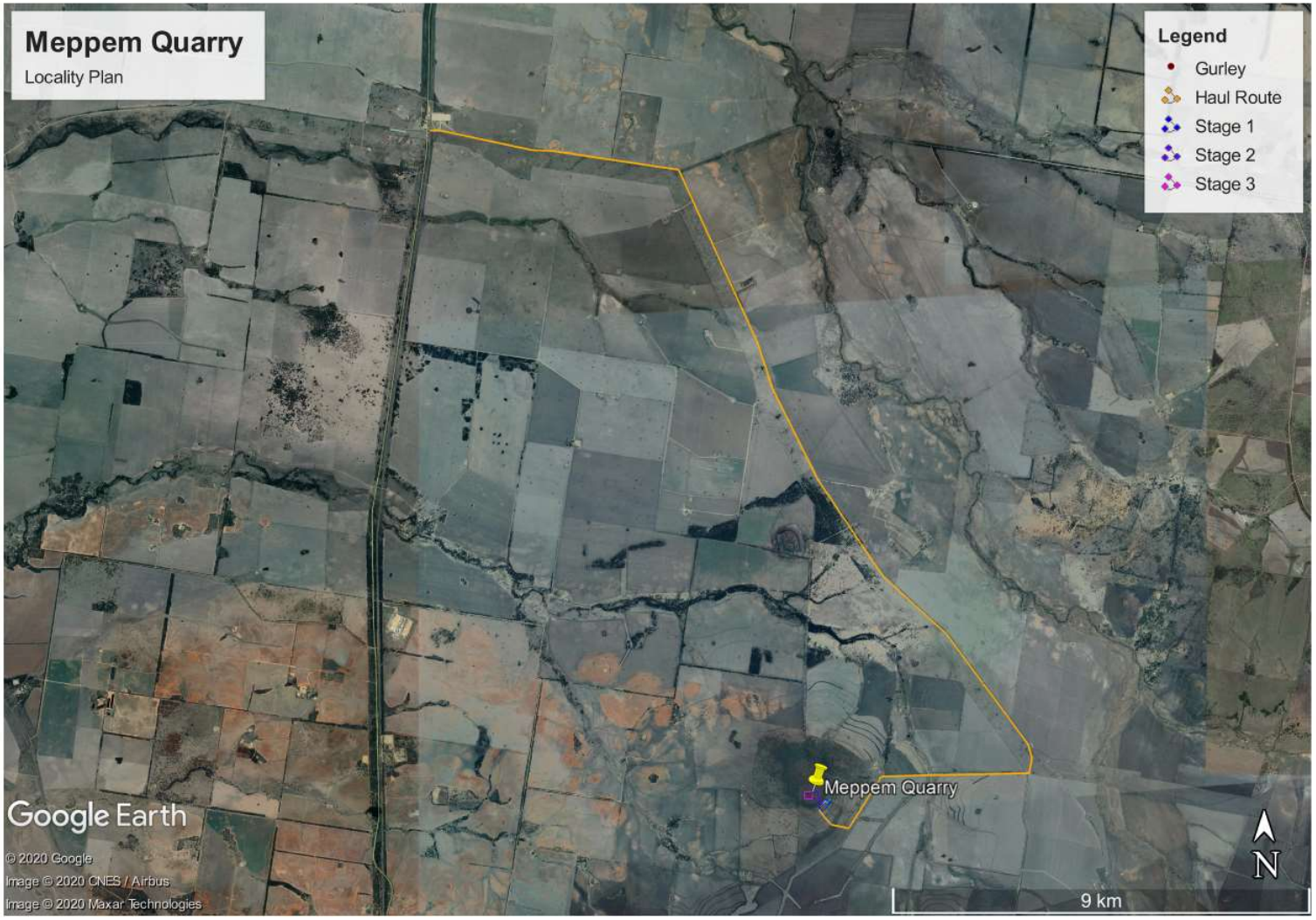
The layout of the proposed development site is presented in a site plan included as Appendix 1.

## 2.2 Access Suitability

### 2.2.1 Access from Meppem Quarry to Boo Boo Road

Access between the Quarry and Boo Boo Road will involve construction of an internal farm road between the quarry site and the southern unformed section of Manamoi Road which adjoins Lot 7309 DP1160820. This section of Manamoi Road is owned by MPSC but has never been formed. A new section of road is to be constructed by the developer to link the quarry to the southern end of the existing road to link with Boo Boo Road. This will be undertaken at the developer's cost. The road will consist of a two-lane gravel road constructed of material obtained from the quarry .

Figure 1: Locality Plan showing Meppem Quarry and Haul Route



### 2.2.2 Manamoi Road to Boo Boo Road

Council has advised that the section of Manamoi Road (SR190) that is constructed, "*is a Local B-road servicing one property and is a single lane natural surface road (sparse gravel in places).*" The request from MPSC for use of this road will involve:

- Complete rebuilding to Council standards (modify for the low volume of traffic).
- Construction of a single lane road with 3 or 4 "Whale belly" pull over areas that will be managed through a traffic management plan – favouring the local farmer.

MPSC has considered that this road can be single lane based on the frequency of truck traffic if pull-over areas are established. Unloaded trucks returning to the quarry can therefore pull off the single lane road to allow loaded trucks, including any local farm traffic, to continue toward Boo Boo Road.

At present, the constructed section of Manamoi Road is considered as a black soil road with minimal gravel present. The road in its present form would not support truck traffic for an extended period after rain. The proposal will therefore require the construction of a minimum of 100mm of high-quality wearing gravel to avoid deformation of the road surface when trucks recommence operation after rain. It should be noted that the quarry may cease operations in the event of a rainfall event of 10mm or more as the quarry material would have an uncontrolled moisture content and the delivery of gravel to most projects would not be possible after rainfall due to the black soil on the delivery sites. The road to be constructed will be all-weather which will provide the option of continuing work in the event of rain.

### 2.2.3 Boo Boo Road

MPSC has advised that Boo Boo Road (SR139) is classified as a Local A road, meaning that it has through traffic and services several properties. The road has minimal continuous gravel remaining and is therefore deformed is sections as a result of local traffic during and after rainfall events. Gravel depth in some sections is estimated to be in the order of 150mm. In other sections, there is no gravel. The gravel that is present is a white rock (claystone) material which is suitable for local traffic but wears under heavier harvest traffic and dry conditions as the material powderises and blows away.

There is approximately 11.5 km of Boo Boo Road between Manamoi Road and Gurley Creek road which remains as a gravel road. Council has indicated that if this road is to be used as a haul road, the following works will be required:

- A minimum of 100mm of compacted gravel to be constructed as a road surface
- Gravel is to be a selected material and Council approved
- Minimum width of formation to be 7m
- The southern 8.5 km to be widened to an 8m formation
- Table drains to be regraded as part of the formation
- Widen the sealed section to a minimum of 7m width
- Install a concrete causeway to replace the bitumen sealed floodway at approximately 3.8 km south of Gurley Creel Road

The proposal from MPSC would provide a suitable formation for standard trucks on a local road. Work would also involve upgrade of any culverts present. The road currently supports

mainly causeway type crossings for local water as the road does not cross any significant watercourses. Local runoff would occur for a short period after a rain event.

The northern 4.1 km of Boo Boo Road is bitumen sealed. Pavement width along this section at present is between 7m and 7.1m with a shoulder width of approximately 1m. The depth of gravel beneath the pavement is minimal. The gravel sub-grade extends for a width of between 0.5m and 1m on either side of the road but the depth is variable. Some natural soil has mixed with this shoulder area. Council has identified that they will require this bitumen section to be widened to 7m and this will involve an additional 0.5m of bitumen on either side of the road.

The geometry of this road is defined by long straight sections with no significant bends. Sight distance along this road is significant.

### 2.2.4 Gurley Creek Road

Gurley Creek Road (SR109) is defined as a Collector Road by MPSC. The road has been bitumen sealed between the Newell Highway and approximately 3.6 km to the east of Gurley Creek. The bitumen seal has been in place for an extended period and in parts has been re-sheeted.

Council has indicated an average seal width of 6.7m and requested that for a haul route, the seal width needs to be a minimum of 7.7m. This will require an additional 0.5m seal width on both sides of the road and regrading of the shoulder and table drain area. Total length of Gurley Creek Road to be resealed is approximately 5.49 km between the intersection of Boo Boo Road and the Newell Highway.

### 2.2.5 Gurley Creek Intersection onto Newell Highway

Gurley Creek Road intersects with the Newell Highway within Gurley. A distance of approximately 50m is available between the rail crossing and the highway edge (give-way sign). A stop sign is present for the rail crossing. This section of road is an approved road train area. A single road train can stop between the rail line and the highway with appropriate separation distance between the rail track and the highway.

All vehicles will need to stop at the rail crossing. In the case of a truck waiting between the rail and the highway, any following vehicle will need to stop before proceeding across the rail line.

The geometry of the intersection onto the Newell Highway is considered sufficient in radius to exceed AustRoads Standards for a road train to turn left or right from Gurley Creek Road onto the highway. The curve width is in excess of 16m which is considered suitable for this standard of intersection.

The highway has not right or left turn lanes onto Gurley Creek Road. This highway is outside of the jurisdiction of MPSC and subject to Transport NSW management. This intersection is discussed in more detail in the following sections of this report.

### 2.2.6 Newell Highway

The Newell Highway is the primary haul route for all regional and interstate traffic. The Highway will service the primary project to utilise the proposed Meppem quarry, being the Inland Rail construction work. Various Newell Highway upgrades may also be serviced by quarry material from this site.

The Newell Highway consists of a duel lane bitumen sealed road supporting more than 2,000 vehicle movements per day. Highway upgrades include the development of various passing lane areas and subsequent improvement of intersections onto the Highway.

The haulage route will utilise an existing access road (Gurley Creek Road) onto the highway. This is located within a section through Gurley village with a speed limit of 60 km/h. This is considered ideal for safety in relation to trucks entering or exiting Gurley Creek Road. The 60 km/h section extends for a distance of approximately 400m either side of the centre of Gurley.

# 3 Traffic Generation and Distribution

The proposal involves the development of a hard rock quarry with a maximum production capacity of 490,000 tonnes/year. The lifespan of the quarry at an annual extraction rate of up to 490,000 tonnes per year will depend on whether other major infrastructure projects occur after the Inland Rail project is completed. The Inland Rail project between Narrabri and Moree may extend over 2-years or more before works move closer to other regionally significant quarries that would supply gravel to the project at a more economic rate due to shorter transport distances.

To establish the impact of the development on the adjacent road network and assess the need for improvements to accommodate traffic generated based on the proposed Meppem Quarry, traffic generation and trip distribution to the proposed development have been estimated. The traffic generated by the development will include heavy-vehicle traffic carrying materials, and light vehicles transporting employees, visitors and service personnel.

The components of traffic generation for the proposed development are:

- Staff trips
- Visitor trips
- Haulage of equipment
- Haulage of quarry materials

It is noted that construction traffic will be minimal consisting of delivery of plant and heavy equipment to site.

## 3.1 Light Vehicle Movements

Light vehicles would be required for staff and service operators attending the quarry site. Due to its remoteness, very few visitors are expected to the site and therefore visitor numbers are assumed to be an average one per week.

The site will have 5-6 full time equivalent (FTE) staff and will therefore utilise 2 light vehicles per day. It is expected that staff would travel from their place of residence or accommodation in either Moree or Narrabri. The staff travel distances will be limited under standard Work

Health & Safety policy. A travel distance of less than three quarters of an hour is not considered to present issues of fatigue.

## 3.2 Heavy Vehicle Movements

Road traffic would be considered to travel along internal roads before entering Manamoi Road to the north. Traffic would then travel east onto Boo Boo Road before turning left onto Gurley creek Road toward the Newell Highway. Once on the Newell Highway, traffic would travel north or south to various project sites. The movement of light vehicles would be along the same route.

The Highway runs parallel to the proposed Inland Railway alignment. The quarry expects to provide quarry materials to the section of new rail between Moree and Narrabri.

The current projected start date for construction of the Narrabri to North Star section of the Inland Railway Project is in March 2020.

Truck size and therefore load capacity may vary during the project. The truck size will generally be defined by access at unloading points. The primary configuration to be used to date for supply of gravel to Inland Rail consists of a truck and dog trailer with a standard load capacity of 38-tonnes. Other truck units including side tipping road trains and B-triple units will be considered as they provide greater haulage efficiency, however the manoeuvring ability of such units is limited on the delivery sites. The following calculations are therefore based on a truck and dog trailer as the standard unit. This may over-estimate the total truck movements as the larger truck units can carry up to 63-tonnes of material or approximately 1.66 times the load capacity.

### *Normal Heavy Vehicle Movements*

The following assumptions have been made in regard to traffic calculations:

- 490,000 tonne/year of material will be hauled utilising the road network.
- Haulage vehicles will typically be truck & dog configurations although B-doubles and PBS road trains may also be used where approved routes are available.
- The General Mass Limit (GML) is 55.95 tonnes for truck & dog configurations.
- A 38-tonne haulage capacity per trip has been assumed.
- Hours of operation for haulage of material are 6.00am to 6.00pm Monday to Friday and 6:00am to 1:00pm on Saturdays.
- Daily peak truck traffic would occur between 7am and 10am.
- 300 working days per year (6 working days/week and 50 working weeks/year).
- Movement is one-way (i.e. a truck entering and leaving is considered two movements).
- The movement of trucks to and from the site would be controlled by management through a Driver Code of Conduct and GPS locators and truck monitoring system.

- If external water for dust suppression is required, up to 4-additional truck trips would be generated but these would occur from within the property of Meppem or from the north of the property and therefore not utilise Berrigal Road
- Quarry operations can occur via all-weather roads and therefore provide the potential for continuing operations in wet weather.

Table 1: Calculated Average Heavy Vehicle Movements from the Meppem Quarry

| Traffic Calculations | |
|---|---|
| Tonnes Processed | 490,000 tonnes/year |
| | 9,800 tonnes/week |
| | 1,630 tonnes/day |
| | |
| Trucks | 12,895 trucks/year |
| | 258 trucks/week |
| | 47 trucks/day |
| | |
| Truck Movements – Each way | 25,790 truck movements/year |
| | 516 truck movements/week |
| | 94 truck movements/day |

Note: These figures have been rounded up to the nearest whole number. These calculations do not include the use of Road Trains – Prime Mover Hauling Unit's. These vehicles may be used on occasion and would reduce the number of truck movements calculated above.

Assuming demand is evenly spread across each day and week in a year this could equate to an average of 9,800 tonnes of material moved per week by an average of 47 laden trucks per day exiting the quarry or an average of 4 laden trucks per hour exiting the quarry. However, quarries do not work on an average basis and must meet demand which fluctuates outside of the control of the quarry operator. This is specifically the case where a quarry may supply large infrastructure projects such as the Inland Rail project.

The delivery program of the Inland Rail project has not been confirmed. It is expected that the demand for construction materials will fluctuate throughout the project. Regional Quarries Australia has advised that demand for construction materials might reach up to 5,000 tonnes per day. Therefore, during peak demand periods it is possible that up to 132 laden trucks per day or an average of 12 trucks per hour may exit the quarry. This is equivalent to approximately 5 minutes between trucks at the peak times. The frequency of trucks leaving the quarry would be dependent on the time taken to load a truck. The time to load a truck would range between 5 and 20-minutes.

Regional Quarries Australia have advised that the peak demand periods are unlikely to occur on a prolonged basis, but flexibility is required in operating conditions so that the

requirements of the Inland Rail project during peak demand periods can be met. The peak periods will be offset by wet weather days and lower demand periods which would generate less deliveries.

Regional Quarries Australia has identified that a 5-minute gap between trucks leaving the site will be a minimum gap for loaded trucks. At this spacing, the expectation of potential queuing at the Newell Highway intersection, is predicted to be minimal. The existing traffic frequency along the haul route is relatively minimal other than during grain harvest periods.

Gravel trucks will irregularly be required to stop at the Newell Highway intersection unless a stop sign is installed. Trucks will stop on either side of the rail line. For the Newell Highway, some traffic peaks will occur as a result of local issues and highway issues. A gap of 5-minutes between trucks should decrease potential queuing at this intersection quite significantly.

A Driver Code of conduct will have the potential to limit the distance between trucks to a minimum of 100m. This is to include radio contact between drivers and GPS tracking of vehicles.

## 3.3 Operating Hours

The proposed operating hours are included in Table 1. The loading of trucks to haul product would occur 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.

Table 2: Hours of Operation

| Activity | Monday to Friday | Saturday | Sunday and Public Holidays |
|---|---|---|---|
| Loading of trucks to haul product. | 6.00am to 6.00pm | 6:00am to 1:00pm | Nil |
| Light vehicle traffic associated with employees, or light service vehicles entering or leaving the site. | 24 hours a day | | |
| Maintenance of plant and equipment including repairs/alterations to processing equipment and unloaded test runs. | 6.00am to 6.00pm | 6:00am to 1:00pm | Nil |
| Drilling | 6.00am to 6.00pm | 6:00am to 1:00pm | Nil |
| Blasting | 9.00am to 5.00pm | Nil | Nil |
| Operation of associated equipment within the confines of the excavated quarry area. | 6.00am to 6.00pm | 6:00am To 1:00pm | Nil |
| Operation of loaders, excavators, trucks, screening & crushing equipment within the property. | 6.00am to 6.00pm | 6:00am to 1:00pm | Nil |
| Exceptional circumstances – all crushing, loading and product haulage activities within the site to enable manufacture and delivery of high priority ARTC projects only. | 24 hours with written notification and approval from Moree Plains Shire Council and the Environment Protection Authority. | | |

# 4 Assessment of Proposed Haulage Route

The primary purpose of this Quarry is to supply material to the Inland Railway Project, which is scheduled to commence in early 2020 and continue for approximately 3 years.

The designated haulage route from the development site is described in the above sections. This will be the only haul route utilised for trucks to move quarry product from this site. Alternative routes for haulage of product are not available.

## 4.1 Manamoi Road

Manamoi Road is an MPSC maintained road but services one farm residence. No new gravel has been placed on this road for an extended period. MPSC grade the road on an as-needed basis, mainly in preparation for grain harvest periods or when significant damage occurs following a wet weather period.

The road in its current condition is not suitable as a heavy haulage route. This has been recognized by the developer and MPSC. Use of this road will therefore require an upgrade as outlined in section 2.2.1.

## 4.2 Boo Boo Road

Boo Boo Road has been subject to MPSC current policy of gravel maintenance only and no new gravel. Recent photographs of this road are presented in appendix 2. The road is mostly raised above the surrounding natural surface level. It was once a gravel road but due to cost, MPSC has reduced work on this road to maintenance only.

The road is generally utilised by local traffic only. This is estimated to generate between 40 and 64 vehicle movements per day (based on the number of properties being serviced). Additional truck movements occur during a harvest and planting period. Truck traffic is generated as a result of haulage of grain to either Gurley or Bellata grain storage facilities, including the facilities at Penny's Lane.

As a result of limited traffic flow, a large part of the southern end of this road is utilised as a single lane road and therefore road shoulders have subsided. Sections of potholes have created wider sections where local traffic drives around the potholes. The potholes have resulted from minor water ponding on the road due to a lack of slope from the road centre to the shoulders. Road width is therefore an average of 6m.

The central section of this road on either side of the Gurley Station entrance, extends in width to approximately 7m but is variable. Some depth of gravel has been maintained in parts. This central section is not suited to a heavy haulage road at present.

The northern end of this road is bitumen sealed. Council has indicated that the average seal width is 5.9m. The road needs to be a minim of 7.1m for road train use. The road at present is not considered suitable for a heavy haulage route as a higher frequency of trucks would potentially impact road shoulders and therefore deformation of both sides of the road. The required works to resolve this as identified by Council are presented in section 2.2.3 of this report. The proposed works will be required to upgrade the road to the necessary standard.

## 4.3 Gurley Creek Road

Gurley Creek Road is a relatively straight section of road which services an extended region to the east of Gurley. Gurley village has a large grain storage facility which generates extensive truck movements during harvest periods. To date, the road has supported the current traffic load with regular maintenance works being undertaken. This includes pothole repairs and scheduled resealing works.

A large proportion of the grain stored in Gurley is moved by rail and therefore existing truck movements are concentrated during October through to December.

Council has indicated that this road will require widening of the sealed surface before it is suitable for a heavy vehicle haulage route for quarry operations. The works required are identified in section 2.2.4 of this report.

Gurley Creek Road has one formal property entrance between Boo Boo Road and Gurley. Several informal truck access points have been made for trucks to haul grain from adjoining paddocks.

## 4.4 Newell Highway Intersection

Gurley Creek Road crosses the rail line in Gurley. This crossing has been identified as a crossing to be upgraded as part of the Inland Rail project. As a minimum, this will include installation of gates across the rail line and flashing lights. It is highly likely that gravel for this upgrade will be obtained from the Meppem quarry site.

The rail crossing has a stop sign on both sides of the track. This is considered appropriate for safety if trains are operating. It should be noted that once the Inland Rail project commences, rail activity is expected to cease for a period of approximately 18-months while the section of rail between Narrabri and Moree is being built. The rail crossing may therefore be reduced to a give-way sign during this period.

For trucks moving west onto the Newell Highway, only one truck can queue between the rail and the edge of the highway. If other vehicles arrive, they would be required to form a queue on the eastern side of the rail line at the stop sign. This would avoid the issue of queuing across the rail line as the distance between the rail line and the highway is limited to approximately 50m. This would be suitable for one truck to queue.

For trucks turning left or right off the Newell Highway onto Gurley Creek Road, they may be required to stop on the highway, if a truck has stopped at the stop sign. The following photo shows the perspective of a truck turning right into Gurley Creek Road from the highway. There is no formal right-hand turn lane to allow traffic following the stopped vehicle on the highway to move around the inside of the right turning vehicle. Informally, traffic may utilise the bitumen sealed road shoulder to pass the stopped vehicle on the left-hand side. This is not considered as a safe solution to this intersection for right turning vehicles if there is a truck stopped at the rail crossing.

Figure 2: Google image of Newell Highway intersection with Gurley Creek Road

The presence of the Gurley-Millie road on the western side of the highway complicates this intersection. This western road is also utilised by local truck traffic and the entrance cannot be impacted by traffic conflict for trucks turning into Gurley Creek Road. The issue is exacerbated by the traffic volume on the Newell Highway being >2,000 vehicles per day.

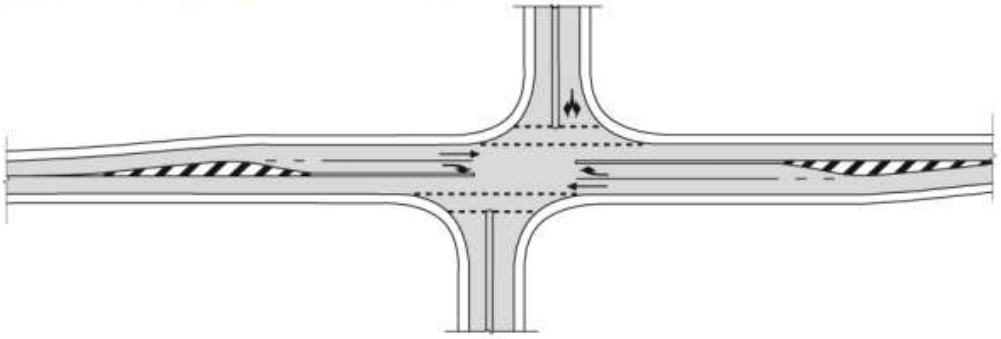
It is recommended that a detailed design is undertaken. A preliminary review of AustRoads design guidelines suggest that the intersection may require treatment as a “right-left staggered T-intersection” for a two-lane road. The following sketch plan is an excerpt from AustRoads Road Design Guide. This provides a sketch of the lanes that may need to be developed. The design process will need to consider several parameters, including:

- Frequency of trucks turning left and right from the Highway into Gurley Creek Road
- Length of trucks to be used
- Speed limit within Gurley
- Traffic frequency on the Newell Highway
- Traffic frequency on Gurley Creek and Gurley-Mille Roads
- Local traffic within Gurley including rest area
- Queuing of trucks along Newell Highway

Figure 3: AustRoads typical section for treatment of a right-left staggered T-intersection

Guide to Road Design Part 4: Intersections and Crossings – General

**Figure A 17: Right-left staggered T-intersections**



(a) Two-lane two-way road

It is noted that the existing infrastructure on the western side of the Highway may be restrictive in lane width as per following image. This includes a power pole and street signs.

Figure 4: Google image showing infrastructure on west side of highway which will need to be considered if an intersection upgrade is required.

Peak traffic frequency to be generated by the quarry may be in the order of one truck every 5-minutes. This should allow a truck to exit the highway, stop and move over the rail line before the next truck arrives and wishes to turn right off the highway. This process could be proactively managed by truck movement management, until other highway traffic interrupts the flow of trucks moving back to the quarry.

This intersection has been identified as a key issue that will require a design investigation to determine whether it meets the requirements of the quarry or whether a redesign and upgrade is required. Based on preliminary analysis, an upgrade is recommended. The minimum upgrade would involve installation of a right turn lane. Some remarking would be possible on the existing pavement for a left turn exit off the highway. Consideration would

need to be given to the extent of the rest area on the eastern side of this section of highway and the movement of trucks and other vehicles in and out of this rest area.

This intersection should have been subject to investigation as part of the Inland Rail corridor assessment. This should have included the involvement of Inland Rail and Transport NSW. At present, trains along this section of rail are infrequent. Development of the Inland Rail would significantly increase rail traffic. The length of the proposed trains to use the upgrade rail will be in the order of between 1500m to 1800m. This would further exacerbate issues and queuing of vehicles on the highway while waiting for a train to pass. It is recommended that a design proposal is obtained from Inland Rail that resolves this existing issue of highway safety if the Inland Rail is developed.

### 4.4.1 Key Local Intersections

There are two key intersection involved along the proposed haul route between the quarry and Gurley. These are the Manamoi-Boo Boo and Boo Boo-Gurley Creek intersection. Neither intersection has sign posting for either a give-way or stop requirements. This is assumed to be based on the low level of traffic volume and extensive sight distances.

Whilst not typically signposted the local rural roads have a speed limit of 100 km/h subject to road conditions. Light vehicle traffic is able to traverse the bitumen roads at this speed. Truck and other heavy vehicles generally adopt a voluntary reduced speed due to some bumps and sections where road width is considered older style (6m) as against newer road width (>7m). Local gravel roads are traversed at a much slower speed by most vehicles.

The Safe Intersection Sight Distance (SISD) for the two intersections has been calculated as:

$$\text{SISD} = \frac{\text{D}_\text{T} \times \text{V}}{3.6} + \frac{V^2}{254 \times (d + [0.01 \times a])}$$

Where:

- SISD = Safe Intersection Sight Distance
- $D_T$ = Decision Time (s) = Observation Time (s) + Reaction Time (s) = 5.0s
- $V$ = Operating (85%ile) speed (Km/h) = 100km/h
- $d$ = Coefficient of deceleration = 0.22
- $a$ = Longitudinal grade (% + uphill - downhill) = 0.0%

$$\text{SISD} = \frac{5.0 \times 100}{3.6} + \frac{100^2}{254 \times (0.22 + [0.01 \times 0])}$$

$$\textbf{SISD} = \textbf{318m}$$

The available SISD at each of the intersections exceeds the required 318m.

The intersection between Gurley Creek and the Newell Highway occurs within an area with a sign-posted speed limit of 60km/h. The Safe Intersection Sight Distance (SISD) for the Newell Highway intersection has been calculated as:

$$\text{SISD} = \frac{\text{D}_\text{T} \times \text{V}}{3.6} + \frac{V^2}{254 \times (d + [0.01 \times a])}$$

Where:

- SISD = Safe Intersection Sight Distance
- $D_T$ = Decision Time (s) = Observation Time (s) + Reaction Time (s) = 5.0s
- $V$ = Operating (85%ile) speed (Km/h) = 60km/h
- $d$ = Coefficient of deceleration = 0.22
- $a$ = Longitudinal grade (% + uphill, - downhill) = 0.0%

$$\text{SISD} = \frac{5.0 \times 60}{3.6} + \frac{60^2}{254 \times (0.22 + [0.01 \times 0])}$$

$$\mathbf{SISD = 147.75m}$$

The available SISD at the intersection exceeds the required 147.75 m.

Key intersections along the proposed haulage route are deemed satisfactory in terms of Safe Intersection Sight Distance.

## 4.5 Safety and Efficiency of Access

The local roads do not have a sign posted speed limit. All road users would be expected to drive to the road conditions. Based on the condition of the road at the time of inspection it is expected that travel speeds would be restricted to 80 km/h. The proposal to improve the road conditions with additional gravel sections and widening of the bitumen sealed sections may change this slightly, however, the presence of wildlife such as Kangaroos tends to limit the speed of vehicles.

Intersection performance is dependent upon adequate horizontal and vertical sight distance for all entering traffic (Department of Main Roads Chapter 13 Road Planning and Design Manual Intersections at Grade, 2006). It is therefore necessary to undertake a check of the available sight distance to assess whether or not it can operate under safe parameters. The types of sight distance that must be provided in the design of all intersections include:

- Approach Sight Distance (ASD)
- Safe Intersection Sight Distance (SISD)
- Minimum Gap Sight Distance (MGSD)

Intersections should be designed to provide the more conservative value of SISD or MGSD for all vehicle movements that may be required to give way to other vehicles at the intersection. Details regarding how the sight distances are applied are provided in the following sections.

### *Approach Site Distances (ASD)*

Provision of ASD for cars:

- The minimum level of sight distance which must be available on the minor road approaches to all intersections to ensure that drivers are aware of the presence of an intersection;
- For major road approaches where practical, drivers should see the pavement markings within the intersection and should be achieved where practicable. However, the provision of ASD on the major road may have implications (e.g. costs, impact on adjacent land and features) in which case Stopping Site Distance (SSD) is the minimum sight distance that should be achieved on the major road approaches to the intersection and within the intersection;
- Numerically equal to normal car SSD – which is defined as the distance travelled by a vehicle between the time the driver receives a stimulus signifying a need to stop, and the time at which the vehicle comes to rest; and
- Varying the SSD may include the object height used in its calculation. ASD is measured from a driver's eye height (1.1m) to 0.0m, which ensures that a driver is able to see any line marking and kerbing at the intersection whereas SSD is measured from 1.1m to 0.2m (a nominal object height).

Provision of ASD for trucks: ASD for trucks should be provided at intersections to ensure that trucks approaching the intersection, at the 85$^{th}$ percentile operating speed of trucks, are able to stop safely. ASD for trucks on the intersection approaches should be measured from the truck driver eye height (2.4m) to the pavement level at the stop or holding line (0.0m).

Approach sight distance for trucks are numerically the same as the SSD values for trucks provided in the Austroads Document Guide to Road Design – Part 3: Geometric Design. ASD is applied as shown in Figure 3.

$$\mathrm{ASD} = \frac{\mathrm{R_T} \times \mathrm{V}}{3.6} + \frac{V^2}{254 \times (d + [0.01 \times a])}$$

Where:

- ASD = Application Sight Distance
- $R_T$ = Reaction Time (s) = 2.0s
- $V$ = Operating (85%ile) speed (Km/h) = 60km/h
- $d$ = Coefficient of deceleration = 0.22
- $a$ = Longitudinal grade (% + uphill, - downhill) = 0.0%

$$\text{ASD} = \frac{2.0 \times 60}{3.6} + \frac{60^2}{254 \times (0.22 + [0.01 \times 0])}$$

**ASD = 97.75m**

The available ASD for all intersections along the proposed haul route is in excess of the required ASD (97.75m).

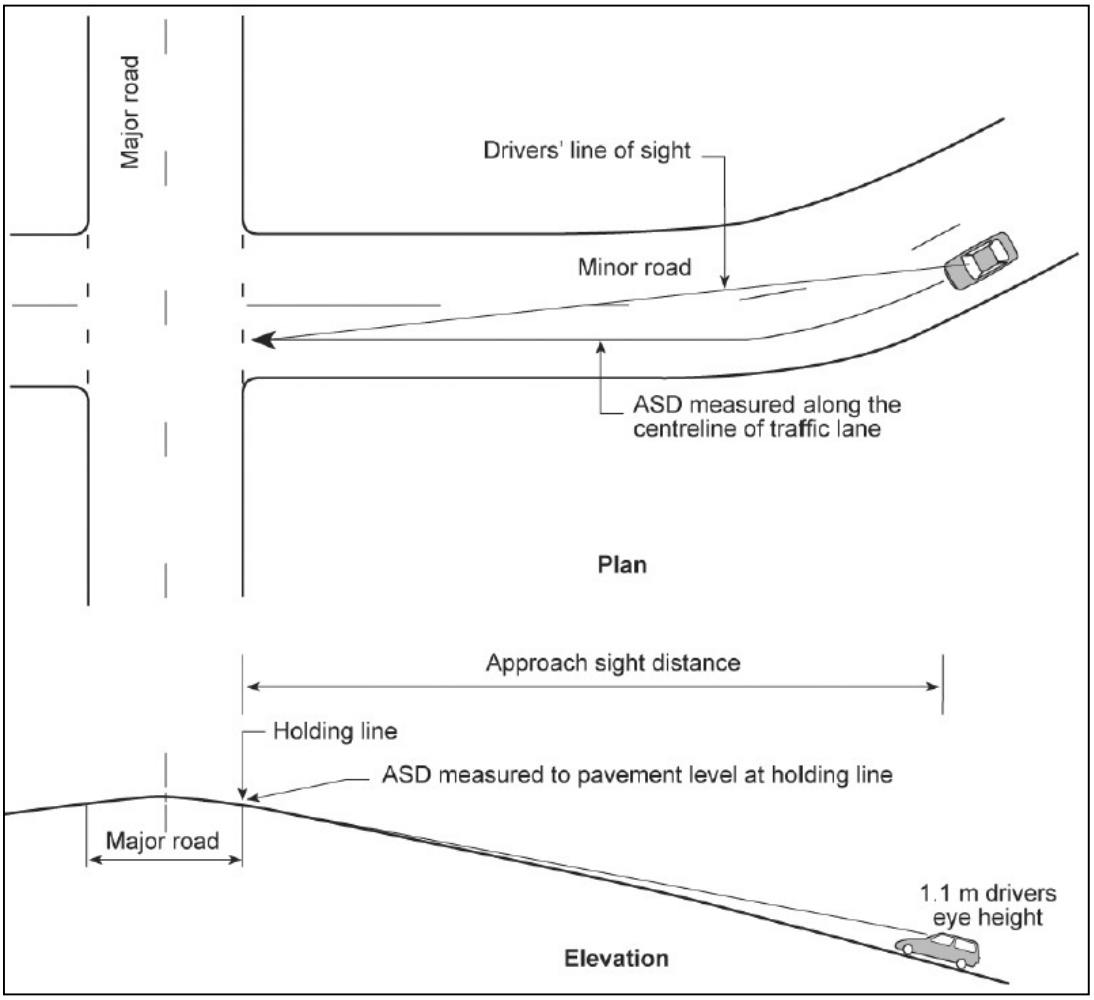



Figure 5: Application of ASD (Source Figure 3.1. AGRD04A/09).

*Safe Intersection Sight Distance (SISD)*

SISD refers to the distance required for the driver of a vehicle, on the non-terminating road, to observe a vehicle entering from a minor road, decelerate and stop prior to a point of collision. In this context, it is the minimum sight distance which should be provided on the major road of the intersection. SISD:

- Is viewed between two points to provide inter-visibility between drivers and vehicles on the major road and minor road approaches. It is measured from a driver eye height

of 1.1 m above the road to points 1.25 m above the road which represents drivers seeing the upper part of cars. Figure 4 illustrates the longitudinal section for the two cases representing inter-visibility; one for drivers on the major road and the second for a driver waiting in the minor road for an opportunity to enter the major road;

- Assumes that the driver on the minor road is situated at a distance of 5.0 m (minimum of 3.0 m) from the lip of the channel or edge line projection of the major road. SISD allows for a 3 second observation time for a driver on the priority legs of the intersection to detect the problem ahead, (e.g. car from minor road stalling in through lane) plus the SSD;
- Provides sufficient distance for a vehicle to cross the non-terminating movement on two-lane two-way roads, or undertake two-stage crossings of dual carriageways, including those with design speeds of 80 km/h or more;
- Should also be provided for drivers of vehicles stored in the centre of the road when undertaking a crossing or right-turning movement;
- Enables approaching drivers to see an articulated vehicle, which has properly commenced a manoeuvre from a leg without priority, but its length creates an obstruction; and
- Is measured along the carriageway from the approaching vehicle to the conflict point, the line of sight having to be clear to a point 5.0 m (3.0 m minimum) back from the holding line or stop line on the side road.

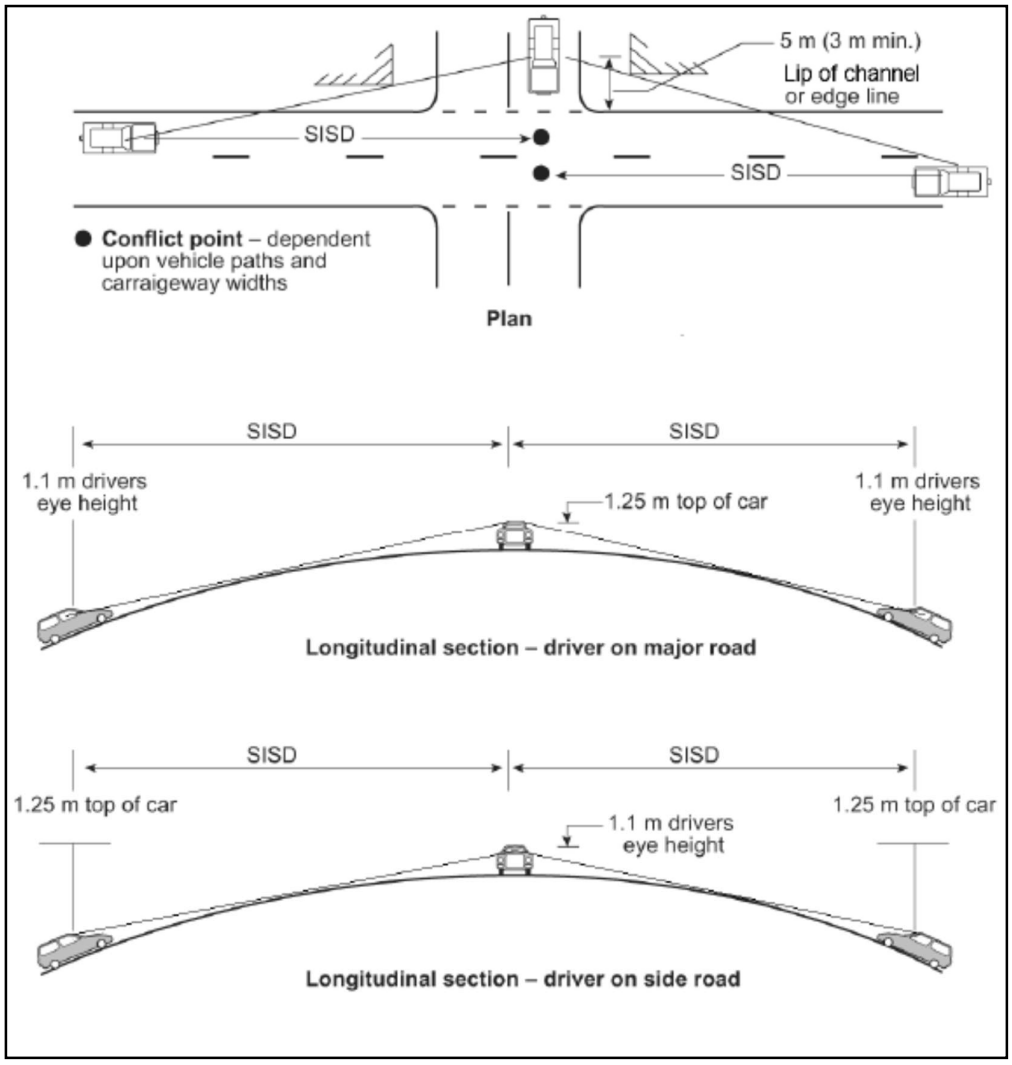



Figure 6: Application of SISD (Source Figure 3.1. AGRD04A/09)

The Safe Intersection Sight Distance (SISD) for the access intersection has been calculated as:

$$\text{SISD} = \frac{\text{D}_\text{T} \times \text{V}}{3.6} + \frac{V^2}{254 \times (d + [0.01 \times a])}$$

Where:

- SISD = Safe Intersection Sight Distance
- $D_T$ = Decision Time (s) = Observation Time (s) + Reaction Time (s) = 5.0s
- $V$ = Operating (85%ile) speed (Km/h) = 60km/h
- $d$ = Coefficient of deceleration = 0.22
- $a$ = Longitudinal grade (% + uphill, - downhill) = 0.0%

$$\text{SISD} = \frac{5.0 \times 60}{3.6} + \frac{60^2}{254 \times (0.22 + [0.01 \times 0])}$$

**$\text{SISD} = 147.75\text{m}$**

The available SISD exceeds this minimum requirement at all intersections. The only limitation may relate to an extended height of grass and shrubs at the Boo Boo-Gurley Creek Road intersection. This is currently managed by MPSC and shown in the following photograph.

Figure 7: Boo Boo-Gurley Creek Road intersection looking east with mown grass along the road verge that is managed by Council

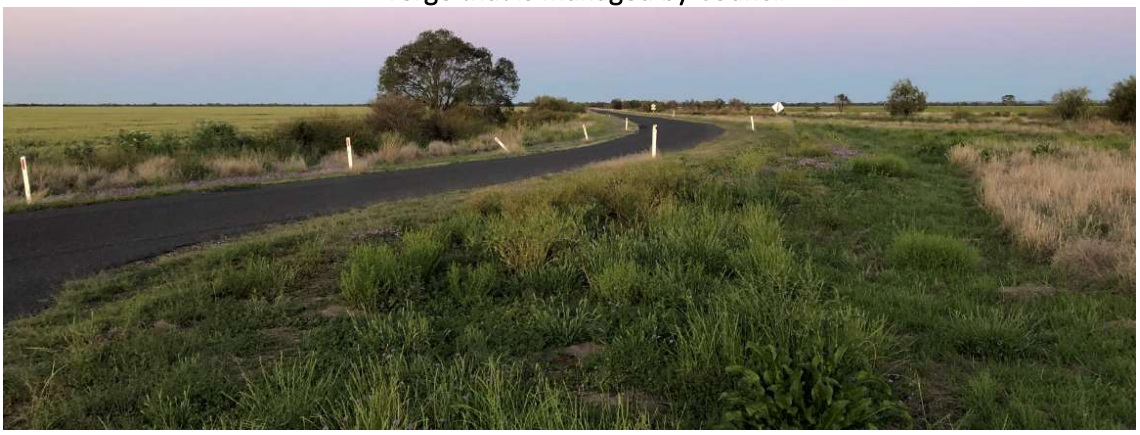


Figure 8: Sight distance along the Newell Highway intersection exceeds the minimum requirements

## 4.6 Internal Traffic Circulation

All traffic would enter and exit the site from Manamoi Road. Internal roads should be gravelled to provide all-weather access to the Quarry site. It is recommended that the internal road widths be constructed to a minimum width of 8 metres.

The quarry operator intends to place an internal traffic speed of 20 km/h for all vehicles. This intention is to maximise traffic safety in addition to minimising dust.

## 4.7 Parking Supply

The development site will be a site that is fenced and controlled by the operator. No public access will be available. Access for site visitors other than employees or contractors will be by appointment only.

For industries, it is recommended that parking spaces be provided in accordance with the following rate:

- 1 parking space per 2 staff employed.

Parking will be available adjacent to the site office. Final parking arrangements will be subject to WH&S compliance. It is expected that as a minimum, up to 10-carparks would be available for light vehicles used by staff and visitors. Truck parking areas would vary according to loading and stockpiling arrangements within the quarry site. Trucks would potentially queue in line along the stockpile area to wait for loading at peak periods. All truck parking would be contained within the quarry area which would not impact external roads. The intent is that if trucks are required to park overnight on this site, they would utilise the haul road to wait to be loaded the following morning.

The quarry operator has advised that up to 3 hectares of land will be available for truck and machinery parking if required.

## 4.8 Existing Traffic Volumes and Impact

Current traffic from the proposed development site along Manamoi Road is considered as highly infrequent as the road is only used by the landowner on occasions for access to the property. The road consists of a single lane road. Use by one landowner may involve one or two trips per day with an increase in truck traffic during harvest periods. The potential impact of between 47 and 132 two-way truck movements along this road is significant. Council requirements for “Whale Bellies” and management of this traffic, including contact with the local landowner, is considered essential if this road is to be used for quarry activity.

Boo Boo Road carries traffic from approximately eight properties. Additional properties use the southern end of this road which is not included as a haul route. Traffic generated from these 8-properties is estimated to be in the order of 4-trips per day and therefore each property would generate approximately 8-total movements per day. Daily average traffic is therefore estimated to be in the order of 64-vehicles per day. This may increase in harvest periods when grain is being hauled to various grain receival facilities. This includes on-farm facilities for these 8-properties. Once grain is stored on-farm, the truck movements are spread-out over an extended period outside of the harvest peak period.

As a minimum, the daily operations of quarry vehicles would result in a 67-percent increase in traffic on Boo Boo Road. The ensure road safety, it will be essential to adopt the MPSC upgrades to this road to ensure that road width is suitable and road condition is maintained with good quality gravel.

Publicly available traffic data is limited to the Newell Highway. The following table presents this data.

Table 3: Available Traffic Data for Key Haulage Roads

| Road | Date of Observation | Average Daily Traffic (ADT) | Heavy Vehicles |
|---|---|---|---|
| **Newell Highway Site: 92220** 960m South of Tarlee Road, Edgeroi | 2006 | 1,579 | N/A |
| **Newell Highway Site: 91022** 120m North of Brigalow Lane, Gurley | 2008 | 2,421 | 1,065.24 (44%) |
| **Newell Highway Site: BGBSTC** 670m South of Marshall Street, Boggabilla | 2009 | 3,859 | 1,157.70 (30%) |
| | 2010 | 3,683 | 1,141.73 (31%) |
| | 2011 | 3,650 | 1,168.00 (32%) |
| | 2012 | 3,674 | 1,138.94 (31%) |
| | 2015 | 3,847 | 1,231.04 (32%) |
| | 2017 | 4,051 | 1,296.32 (32%) |
| | 2018 | 3,847 | 1,269.51 (33%) |

The closest traffic count data for the Newell Highway is located 120 metres north of Brigalow Lane, south of Gurley. Annual Average Daily Traffic (AADT) is available for the site (91022). The counter recorded 2,421 AADT in 2008. This included approximately 1,065 heavy vehicles. This information is presented in Figure 9.

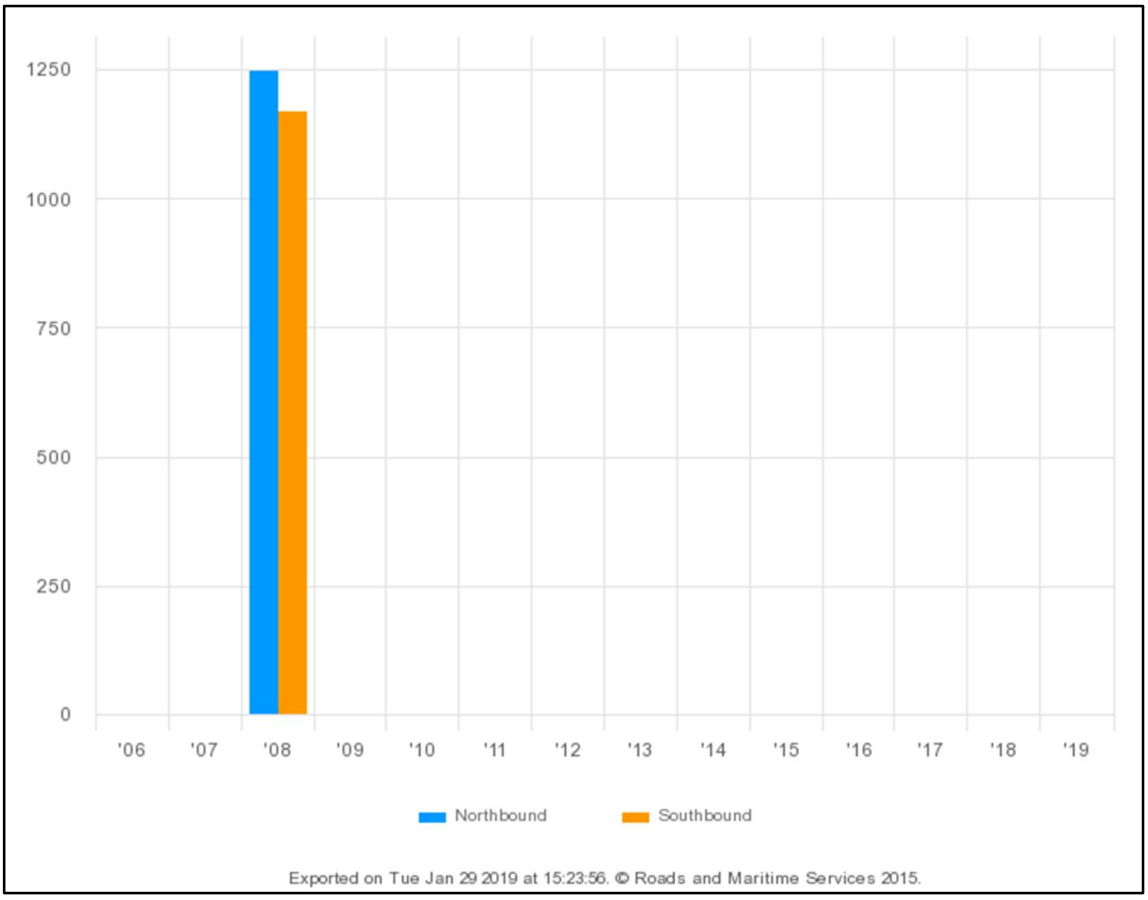



Figure 9: 2008 Annual Average Daily Traffic Distribution of the Newell Highway, Gurley
Source: RMS Traffic Volume Viewer (Site: 91022)

Hourly traffic flow data is also available for the Newell Highway (Site: 91022) as shown in Figure 10. The data shows that the traffic distribution is even throughout the daytime period and reduces at night.

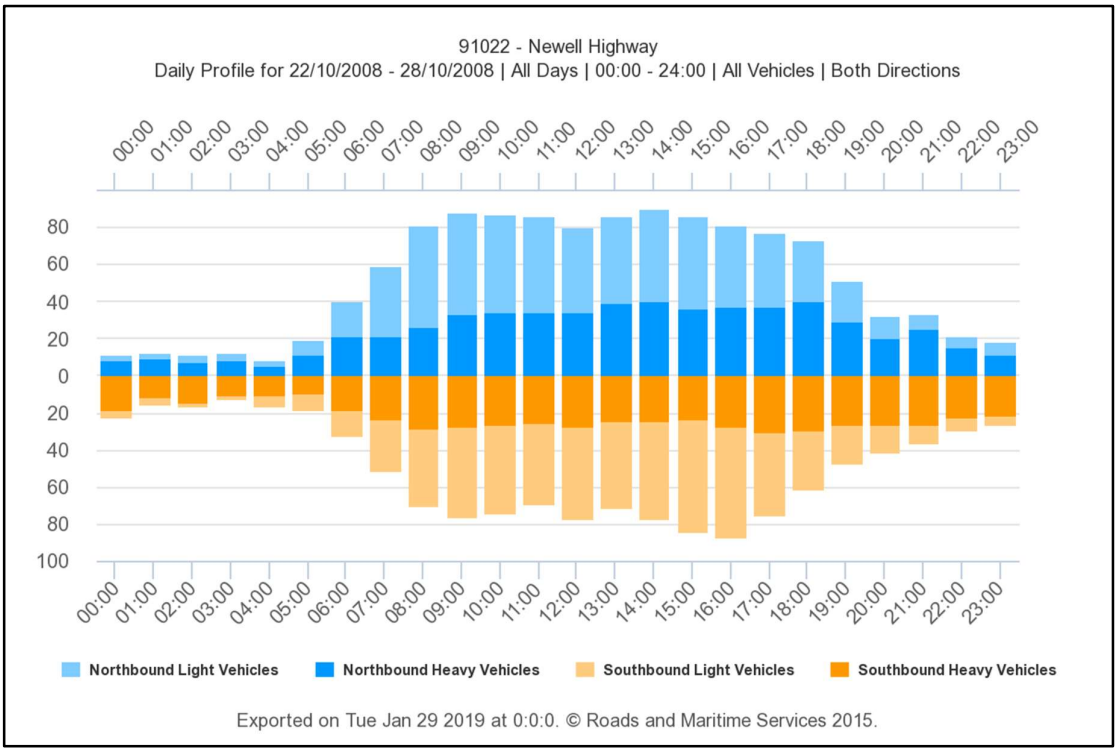



Figure 10: 2008 Hourly Average Traffic Distribution of the Newell Highway, 120m North of Brigalow Lane, Gurley. Source: RMS Traffic Volume Viewer

The addition of between 47 and 132 trucks trips on the Newell Highway will result in between 4-percent and 12-percent increase in heavy vehicle movements per day. The quarry trucks will operate on the highway between 6am and 6pm during the week and reduced hours on the weekend. This conforms to the busiest periods of vehicle movements.

The 4-percent increase for average traffic movements will have minimal impact on existing traffic volumes. It should be noted that development of the Inland Rail will generate a large amount of other traffic along the same sections of highway as the quarry trucks. The extent of traffic generated by Inland Rail construction is not well identified.

The potential peak delivery period that may generate a 12-percent increase in heavy vehicle traffic would be considered as noticeable. However, the quarry operator has identified this potential peak to potentially occur over a short period of possibly a few days only and therefore this is considered as a short period of impact on the Highway. The potential impact on the highway maintenance requirements is considered minor for such short campaigns.

## 4.9 Traffic Safety

The NSW Centre for Road Safety provides crash statistics for all reportable accidents to occur within both the Moree Plains Shire and Narrabri Shire areas from 2013-2017. Mapping of reportable accidents is presented in Figure 11. Figure 11 indicates that a low number of traffic incidents occur on rural roads in the vicinity of the development site. This is likely to be a result of low traffic density of these roads. By contrast, roads with higher traffic densities (such as the Newell Highway) experienced a greater number of collisions during this time period.

From 2013 to 2017, no reportable incidents occurred on Manamoi Road. One (1) serious incident occurred on Berrigal Road approximately seven (7) kilometres to the east of the proposed Meppem Quarry. No other reportable incidents occurred on any rural roads in close proximity to the development site. Given the lack of traffic incidents within the region, it is unlikely that any particular section of roads in the vicinity of Meppem Quarry presents a traffic hazard.

The following Figure presents a map of reportable crash statistics for the Bellata to Gurley area generated from Transport NSW. The statistics show there are reported crashes along the Newell Highway but none on the local roads to be used as a haul route. Gurley is not as the "brown circle" on this map.

Figure 11: Reportable Crash Statistics, 2013-2017


## 4.10 Proposed Developments in the Vicinity

The Moree Plains Shire Council and Narrabri Shire Council were contacted with a request for any proposed traffic generating developments within the vicinity of the Quarry. Both Councils responded that there are no other known traffic generating development proposals in the vicinity of the proposed Meppem Quarry. The heavy vehicle traffic associated with any existing developments is considered to have been included within the existing traffic data.

# 5 Traffic Management

## 5.1 GPS Monitoring System

Regional Quarries Australia recognises the need for safe, responsible and efficient transport of quarry materials in the interest of public benefit and safety. To ensure the quarry is managed in accordance with best practices all staff and drivers must adhere to the Traffic Management Plan prepared by Groundwork Plus (January 2019) and Drivers Code of Conduct, provided as Appendix 2.

One of the primary management tools to be implemented at the Meppem Quarry is the installation of GPS monitoring devices on haulage trucks engaged by the quarry operator. A GPS monitoring unit is to be installed on each truck. A GPS 'fob' or 'key' is assigned to an individual driver as per the Driver Induction Procedure. The driver logs on to the GPS monitoring unit on the truck prior to commencing each shift. The GPS monitoring unit tracks the vehicle location, speed, exceedance of speed limits and harsh vehicle movement and braking as well as mapping the location of any potential incident or infringement to assist in future investigations. In the event of an incident or infringement (e.g. exceedance of speed limit) alerts are sent immediately by email and 'phone app' to the Quarry Manager, Operations Manager, Transport Manager and General Manager. All alerts provide detailed information including, date, time, nature of the infringement, driver name, truck registration and type and the location of the event.

The key safety benefits as a result of the GPS monitoring system include the ability to:

- Track the location of individual trucks;
- Monitor speed;
- Manage fatigue of the driver;
- Link the driver to the truck on any given day;

Truck queuing will be avoided by appropriate separation distances between trucks leaving the quarry site. There are no intersections between Bellata and the quarry site which would result in trucks moving to the site having the queue. The intention is to provide a minimum of 5-minutes between trucks. To achieve this would involve rapid truck loading which may not be possible. Assessment of existing traffic frequencies indicate that a separation distance of much greater than 5-minutes between local traffic between Manamoi Road and the Newell Highway and therefore a 5-minute gap would avoid queuing along this road, including local traffic entering from side roads.

The only issue of potential queuing would occur at the Gurley Creek Road-Newell Highway intersection. This intersection is impacted by general Newell Highway traffic and the rail crossing. Queuing may occur on occasions when one or more trucks encounter a long line of traffic on the Highway or a train.

The 5-minute minimum distance between quarry related trucks entering on to the Newell Highway is expected to avoid queuing at this intersection for the majority of the day. The potential exists for road works with traffic lights on the Newell Highway may generate longer lines of traffic that may take more than 5-minutes to pass through Bellata. In such an event, two trucks may need to wait for longer than 5-minutes before sufficient distance is available to enter onto the Newell Highway. Sufficient space is available for queuing of trucks on the eastern side of the rail crossing.

## 5.2 Public Transport

### 5.2.1 School Bus Routes and Bus Stop Locations

There is no school in Gurley. The closest schools are in Moree and Bellata. At present, the school bus collects and drops off school children at Gurley Station on Boo Boo Road and then turns around. The bus would generally operate between 7am and 8am in the morning and between 3.45pm and 4.30 pm of an afternoon. It is noted that there are fewer children utilising public school buses in the local area.

The truck drivers will need to identify the presence of the school bus and undertake appropriate precautions when it is present. The bus and trucks will travel at similar speeds. As there appears to be only one bus stop along the haul route, the risk of conflict between the bus and haulage trucks is considered manageable.

## 5.3 Pedestrian Network

The proposed haul route will not cross any areas that are used by pedestrians or have pedestrian crossings. The haul route is based in a rural area where no pedestrian traffic is expected.

The only potential pedestrian area would be considered within Gurley. A rest area has been established on the eastern side of the highway within Gurley. This extends from Gurley Creek to the north. It does not extend across Gurley Creek Road and therefore no conflict is predicted.

# 6 Impact on Road Network

## 6.1 Impact on Traffic Volumes

The data available to assess traffic impact on traffic volumes is limited to the data available for the Newell Highway. This impact has been discussed in section 4.8 of this report.

## 6.2 Impacts on Road Condition

The proposed haulage route includes sealed and unsealed roads considered to range between poor to good condition with minor pavement damage. Existing road conditions would limit traffic along approximately half of the proposed haul route to dry weather only. As identified in previous sections of this report, the current road conditions along MPSC managed roads are not suitable for the heavy traffic to be generated from this quarry operation.

The proposed haulage route includes roads controlled and maintained by the MPSC and are therefore subject to the MPSC "Section 94 Development Contribution Plan – Traffic Generating Development" (April 2016). Contributions made under this policy are designed to cover the costs of maintenance, repair and reconstruction of roads as a result of damage caused by heavy vehicles generated by the development.

An agreement has been reached with MPSC for the developer to pay upfront costs for gravelling and widening of the MPSC controlled roads. Once this capital expenditure occurs and the roads are upgraded to the required standard, the developer will pay a road maintenance contribution under the Council contribution plan. Any money paid to Council will be placed in trust for use on the haul road only. It has been agreed that the contribution will be based on a per tonne rate. Council will set this figure based on agreed road maintenance costs and the money will be used by Council to maintain the haul road once the initial capital works are completed.

Use of the Newell Highway as a haul route to various projects, including Inland Rail gravel stockpiles, is subject to review by Transport NSW. Maintenance costs for the highway are generally covered by vehicle registration costs and from other State and Federal grants. The identified increase in traffic is considered to have a minor impact on road maintenance requirements. The pavement on the highway is generally designed for a life-span of greater than 5-years. The peak production of this project will be completed within 3-years and after that, any major project to be supplied from this quarry would generally consist of upgrade works to the Newell Highway. Such works would be undertaken by Transport NSW.

The exception to this is if capital works are required prior to operation of the development. In this case, the intersection of Gurley Creek Road and the Newell Highway has been identified to have some limiting factors for high levels of truck traffic turning off the highway. The road

condition at this section of the highway is relatively poor as the bitumen seal on the highway is reasonable with some deformation and wear along the shoulders. This is possibly the result of softer edge areas after rainfall events as the area has poor drainage. In the circumstances of a truck turning left or right off the highway onto Gurley Creek Road, the pavement in the turning path is considered suitable to support the vehicle. If the left turning vehicles moves to the road shoulder and enters Gurley Creek Road, it will potentially travel on an unsealed section of the highway. If a vehicle following a right turning vehicle continues around on the inside of the turning vehicle, it will travel off the edge of the highway on gravel. This occurs as the road shoulder is impacted by wheel marks.

Subject to further investigation of this Newell Highway intersection, the developer will need to provide an appropriate intersection solution that can support the turning truck traffic and meet appropriate safety and geometrical standards as set by AustRoads.

## 6.3 Impact on Traffic Safety

The proposed site access and local road intersections have appropriate sight distances suitable for all heavy vehicle traffic.

The purpose of the development is to provide materials for the proposed Inland Rail, a project aimed at reducing heavy vehicle traffic and improving the safety and efficiency of existing road infrastructure.

The quarry operator has included a “Driver Code of Conduct” as part of the development. The Code has been reviewed and considered appropriate to manage risks associated with traffic safety once operations commence. The Code includes “Always drive in a manner that is in accordance with road conditions”. This condition specifically refers to weather conditions where visibility is reduced and road condition in the case of a section of road being less trafficable. Management will need to ensure that this conduct is adopted, including cessation of haulage when visibility is significantly impaired by events such as fog.

MPSC has addressed this issue in pre-development agreements through a process of improving road conditions.

## 6.4 Impact on Traffic Noise and Dust Production

The proposed development will result in significant increases in local traffic volumes on the MPSC road network. Therefore, the potential for noise and dust impacts throughout the local road network related to the development has been considered as part of Noise and Dust impacts presented in separate reports to this Traffic Impact Assessment.

Regional Quarries Australia will contact the residences adjoining the local roads along the MPSC managed haul routes prior to operation to discuss acceptable mitigation measures and

resolve concerns related to potential noise and dust impacts. Regional Quarries Australia has advised that they will also implement dust and noise mitigation measures in accordance with the Environmental Management Plan.

Dust management measures in all trafficable areas on site will include:

- Enforce a maximum speed of 40 km/h on internal roads.
- Keep trafficable areas as clean as possible.
- Maintain road surfaces in good condition.
- Use water sprays on trafficable areas (approx. rate 2 L/$m^2$/hr).

When transporting materials, the following dust management measures will be implemented:

- Ensure loads are appropriately contained and covered prior to leaving the site.
- Clear spillages from side rails, tailgates and draw bars of trucks (following loading and tipping).
- Securely fix tailgates of all material transport vehicles prior to loading to prevent material.

Dust is therefore not considered to be an issue on the proposed haulage route.

When transporting materials, the quarry operator has advised that the following noise management measures will be implemented:

- Heavy vehicle traffic being limited to the hours of 6am-6pm Monday to Friday and 6am-1pm on Saturdays in accordance with the conditions of consent.
- Enforce a maximum speed of 40 km/h on internal roads.
- Operate well-maintained plant, vehicles and equipment, and ensure all plant, vehicles and equipment are serviced in accordance with, or more frequently than, manufacturers' specifications.
- Avoid unnecessary revving of engines.
- Ensure that any extraneous noises are rectified.
- Avoid the use of compression braking on product delivery trucks in residential areas.
- The Quarry operator is able to monitor truck driver behaviour through the GPS monitoring system.

Provided the Operator manages dust and noise effectively and addresses the concerns of sensitive rural receptors, including ongoing discussion during operations, the potential for heavy vehicle traffic to adversely impact the amenity of rural areas within the vicinity of the freight routes to be utilised by the Meppem Quarry is considered manageable.

# 7 Cumulative Impacts with Neighbouring Developments

Potential cumulative impacts are those which are generated by the combined impacts on the local environment as a consequence of the project, together with other developments of a similar nature (both existing and proposed). For the purposes of this report, the assessment of cumulative impacts considers the impacts of existing and proposed extractive industry development in the local area. It is not appropriate, when considering the methodology for determining cumulative impacts to consider other land uses.

## 7.1 Other Quarry Proposals

There are several other quarry operations and proposals situated within the Gurley-Bellata region that may cause a cumulative impact in relation to traffic along the Berrigal Creek Road. At present, none of these local quarries that are generally on-farm type quarries utilised by local landowners and Council, are subject to application or have obtained approvals for more than 30,000 tonnes of production per year. None are located along the proposed local road haul route.

Other larger quarries are aiming to supply quarry material to Inland Rail. These other large quarries will utilise the Newell Highway as a haul route. The total volume of quarry material is yet to be determined but this it will be a fixed amount. On this basis, the number of quarry trucks generated for this rail project will be the same, regardless of quarry location. The rate of delivery if several quarries are utilised may allow be increased. This would be a logistical matter for the Inland Rail contractors. Total tonnage for this project will be limited.

## 7.2 Construction Phase

The construction phase for Meppem Quarry will involve the delivery of site offices, plant and machinery to the development site. It is estimated that the delivery would involve approximately 10 low-loaders. It is considered unlikely that the delivery periods would occur at the same. The presence of oversized vehicles on the local roads would be subject to permit approvals by MPSC, but the presence of such in a rural area would not be considered out of place when large farm machinery is being moved about. If permits are required, appropriate applications would be submitted with the aim of obtaining the permits prior to use of the roads.

Once established onsite and quarry operations commence, the second stage of construction would involve the upgrades of the local road network as identified by MPSC.

## 7.3 Operation Phase

The Meppem Quarry intends to deliver materials primarily to the Narrabri - Moree section of the Inland Railway and associated road upgrade projects in the region. This is expected to commence in early 2020 and continue for approximately 3-years for Inland Rail and up to 10 years for irregular works on the Newell Highway with a range of campaign type delivery

schedules. No detail is available at present to determine quantities, locations for deliveries or scheduled delivery rates.

Trucks from the Meppem Quarry are not required to travel south along Manamoi Road intersection onto Boo Boo Road and as such will not impact of Narrabri Shire roads.

# 8 Calculation of Expected Development Contribution Rate

The method of calculating contribution rates is based on the reconstruction costs, average road maintenance costs and the length of road likely to be used by vehicles associated with the development. The impact is calculated on the Equivalent Standard Axle (ESA) loading on the road per vehicle as a proportion of the total loadings on the road. This is then converted to a total cost per tonne (1,000 kilograms) per kilometre. The designated haulage route will form the length of road upon which the contribution will be levied. Where the designated haulage route involves the use of more than one road then each road will be treated separately in terms of the road maintenance contribution. Therefore, the total contribution payable for the development will be the sum of all the calculated contribution rates for all the individual roads on the designated haulage route/s.

For the Meppem quarry, additional calculations would need to be considered. As part of the initial agreement with Council, the operator has agreed to approximately 27 km of road upgrades as an upfront payment to enable quarry operations to commence.

For gravel road sections, it is assumed that the quarry operator will be able to provide gravel for maintenance works as an in-kind donation being part of self-help provisions available within Council policy.

# 9 Consultation with Government Agencies and Community

Regional Quarries Australia have met with MPSC on more than one occasion to discuss the option of utilising MPSC roads as a haul road for quarry products from the Meppem quarry site. Meetings remain ongoing, however an agreement in principle was reached with MPSC in August 2020.

The adjoining Narrabri Shire Council were contacted at a similar time and advised that use of Narrabri Shire roads was not an option.

# 10 Conclusion and Recommendations

SMK Consultants were commissioned by Regional Quarries Australia to prepare a Traffic Impact Assessment in support of a development application for a 490,000 tonne Quarry on Lot 10 in Deposited Plan 751753 and Lot 110 in Deposited Plan 257328. This Traffic Impact Assessment has considered the potential impacts of the proposed Meppem Quarry upon traffic on site and within the wider region.

The proposed site access and internal roads within the Quarry footprint should be constructed to be suitable for road trains to support the construction and operational traffic associated with the proposed development. Roads to be constructed in association with the proposed development should be constructed in accordance with relevant standards to ensure that the site will be operated and maintained at a high standard.

An agreement had been reached with MPSC prior to finalisation of this Traffic Impact Assessment. The agreement included the standard of upgrades to be undertaken if the quarry were to haul material over the designated haul route through MPSC controlled roads. This agreement has been reviewed as part of this assessment. The agreement is considered necessary on the basis that if this work were not undertaken, the roads available along the haul route would be characterised as not suitable for use by the quarry.

It has been concluded that the proposed development would result in a large increase in traffic generation on the local roads between the quarry site and Gurley. Based on the proposed traffic management plan to be adopted by the quarry operator, this traffic impact upon road safety, traffic density, road utility or general amenity within the region is considered manageable. A factor in this conclusions is that road condition of designated routes to be utilised by the Operator will be maintained through road user development contributions made under Section 94 Development Contributions Plan. The contribution rate is yet to be finalised, but this is based on existing Council road maintenance and reconstruction costs. The method of adopting this road contribution may vary from a straight contribution rate per tonne but may also include self-help type upgrades of the existing road and contribution of gravel during the quarry's lifespan.

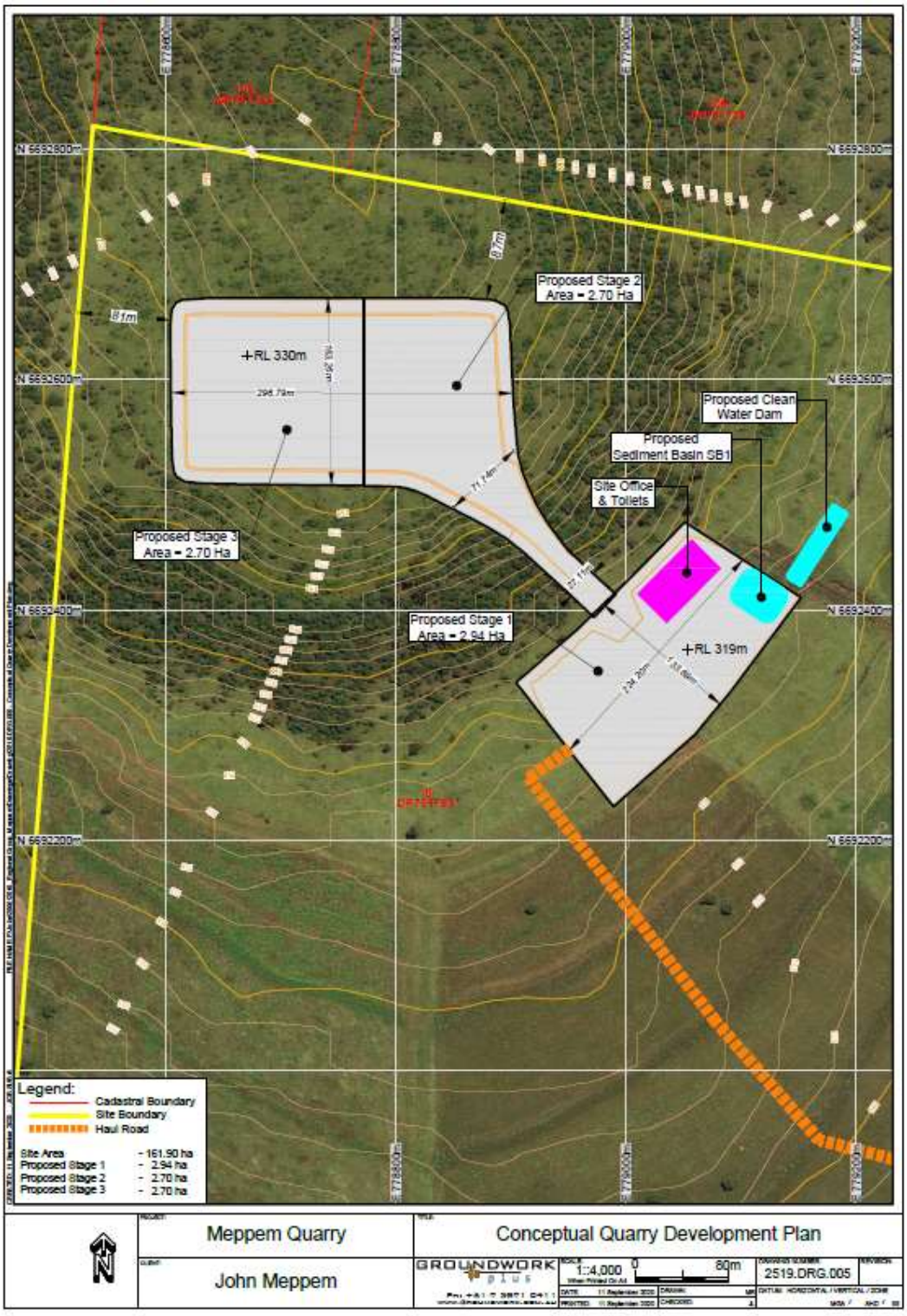
This traffic impact assessment has identified one main issue with the proposed haul route that is outside of the agreement reached with MPSC. This matter is the intersection of Gurley Creek Road onto the Newell Highway. This is an existing traffic safety issue that is exacerbated by the presence of a rail line at 50m off the highway. The use of longer trains and more frequent use of the rail as intended after the Inland Rail project is completed, will further exacerbate this issue, with or without the proposed quarry.

The potential frequency of trucks turning off the highway is considered an issue when the distance between the Newell Highway and the railway line is considered. This is a complex

matter that needs to be subject of a detailed design process including consultation with ARTC, Inland Rail, Transport NSW and potentially MPSC. It is recommended that a detailed design study will be required once full consultation is undertaken. It is noted that this intersection has already been subject to an upgrade proposal as part of the Inland Rail project and therefore such an upgrade may already be designed by Inland Rail. The issue identified is the queuing of trucks on the Newell Highway while waiting for a truck to move through the stop sign or waiting for a train to pass. This historical issue that would have been clearly identified by Transport NSW as this same activity of trucks turning off the highway would have been occurring ever since the grain receival facility in Gurley has been operating. No additional road treatments have been undertaken to date for grain truck movements, however, this is identified as a safety risk for Newell Highway and quarry related traffic.

Overall, the impact of the proposed development upon the road network is considered to be manageable once the proposed roadwork identified by MPSC is completed.

# Appendix 1 – Site Plans



# Appendix 2 – Haulage Route Photos

Figure 12: Boo Boo Road near Manamoi Road showing deformation due to lack of gravel

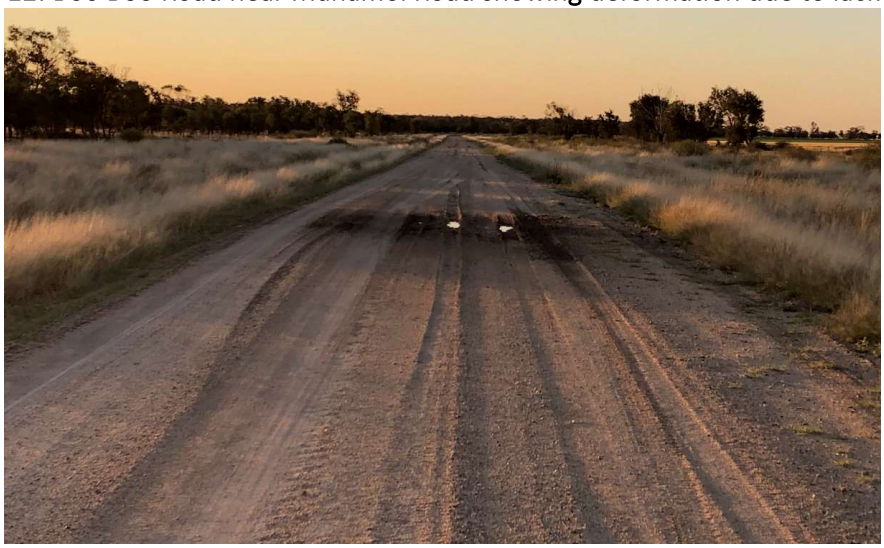


Figure 13: Boo Boo Road at Gurley Station entrance – new gravel section to south


Figure 14: Boo Boo Road north of Gurley Station entrance -deformation due to lack of gravel and widened road as vehicles avoid centre of road

Figure 15: Boo Boo Road bitumen section looking north

Figure 16: Intersection of Boo Boo Road and Gurley Creek Road with widened should for left turning vehicles from Boo Boo Road

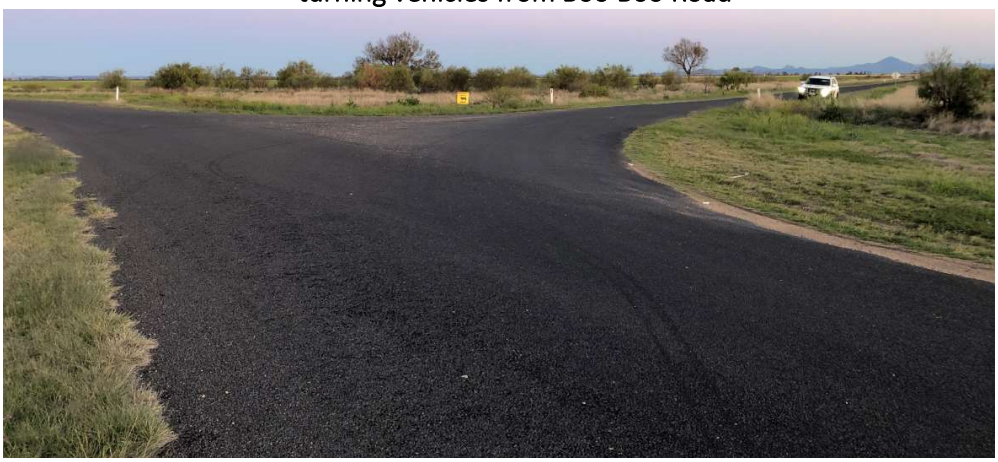


Figure 17: Minor road deformation over culvert at Boo Boo-Gurley Creek road intersection

GROUNDWORK plus

# Meppem Quarry

# Traffic Management Plan

Prepared for:

Regional Quarries Australia Pty Ltd

Date:
October 2020

File Ref:
2519 DA1 003

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# Table of Contents

# 1.0 INTRODUCTION

The Meppem Quarry is located at Manamoi Road, Bellata being described as Lot 10 DP751753 and Lot 110 DP257328.

This Traffic Management Plan (TMP) outlines the management measures proposed to be utilised for the quarry. The TMP supports and forms part of the development application for the quarry. The TMP will be updated in response to future conditions of development consent.

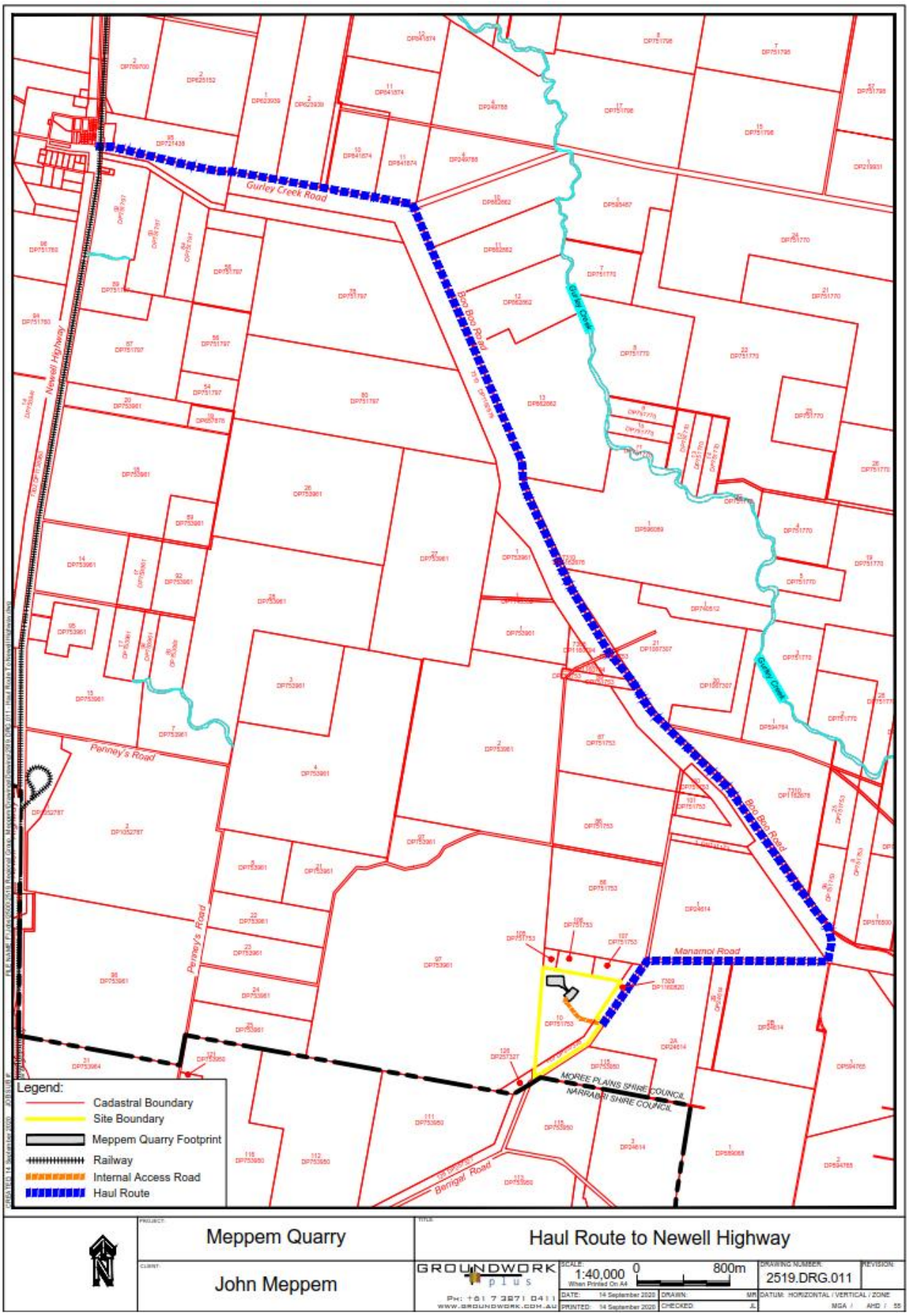
# 2.0 SITE DESCRIPTION

The real property description of the land is Lot 10 on DP751753 and lot 110 DP257328. The site is located within the Local Government Area of Moree Plains Shire Council and is approximately 160 hectares in size. The land is currently zoned `RU1 'Primary Production' under the Moree Plains Local Environmental Plan 2011.

The site is located on Manamoi Road, Bellata, approximately 9 kilometres east of the Inland Rail Project. The site is approximately 50 kilometres North of Narrabri, 44 kilometres south of Moree and 9 kilometres north-east of Bellata, in north-east New South Wales. The site is predominantly used for agricultural purposes.

The adjoining properties are all zoned RU1 'Primary Production' and have historically been used for dryland farming. Bellata is a small town with a population of approximately 200 people, located 9.5 kilometres south-west of the subject site. Bellata is a rich agricultural region known for its natural minerals such as petrified and opalised wood and agate, and its farming productivity.

An internal access road will connect the proposed quarry to Manamoi Road. Manamoi Road is an unsealed road maintained by the Moree Plains Shire Council and connects to Boo Boo Road and Gurley Creek Road to reach the Newell Highway and the construction alignment of the Inland Rail Project. The haulage route is shown below.


Gurley Creek Road
Boo Boo Road
Newell Highway
Penney's Road
Penney's Road
Boo Boo Road
Manamoi Road
Gurley Creek
Gurley Creek
Gurley Creek
MOREE PLAINS SHIRE COUNCIL
NARRABRI SHIRE COUNCIL
Bengal Road
Legend:
Cadastral Boundary
Site Boundary
Meppem Quarry Footprint
Railway
Internal Access Road
Haul Route
Meppem Quarry
John Meppem
Haul Route to Newell Highway
GROUNDWORK plus
1:40,000
0
800m
2519.DRG.011

# 3.0 TRAFFIC MANAGEMENT MEASURES

The following traffic management measures will be implemented for on-site haulage:

1. An incident/complaints register will be maintained.
2. All drivers will be required to comply with the legislated road rules, including driver fatigue requirements and separation distances. Accurate records will be kept of the amount of quarry materials transported by each vehicle. The weighbridge management software will be configured in a manner which will not issue a 'docket' to a driver if the vehicle weight exceeds the limits prescribed by the Heavy Vehicle (Mass, Dimension and Loading) National Regulation 2013. Haulage of quarry materials from the site will be limited to the approved hours of operation under the development consent. The weighbridge management software will be configured in a manner which will not issue a 'docket' to a driver outside of the approved hours of operation.
3. All drivers will be required to sign on to the Electronic Daily Prestart Management System at the weighbridge each morning or on first entry into the site.
4. All laden trucks operating on, entering and leaving the site are to have their loads covered and be cleaned of materials that may fall on the road. During peak time trucks are to be distributed with a 6 min gaps to ensure queuing is minimised. When hauling on public roads a minimum separation distance of 100m from other trucks will apply.
5. Implement a Driver Induction Procedure, which is summarised as follows:

   *Prior to commencing work a Driver will be subject to the Driver Induction. The Quarry Manager will be responsible for the site induction and will inform the Driver of the following details:*
   - *The approved transport route for the quarry (if applicable)*
   - *The approved hours of operation of the quarry*
   - *The Community Engagement, Complaints and Incidents Procedure*
   - *The procedures for interaction with school buses and the GPS monitoring system*
   - *The terms of the Driver Code of Conduct*
   - *The Driver Code of Conduct will be enforced through random inspections prior to issuing a 'docket' from the weighbridge or through review in response to a complaint; and*
   - *Occupational, Health and Safety briefing information for the site*

6. Implement and enforce compliance with a Driver Code of Conduct. Compliance with the Driver Code of Conduct will be administered by the Quarry Manager.
7. Installation of GPS monitoring devices on haulage trucks managed by the quarry. Each GPS monitoring unit is installed on the truck. A GPS 'fob' or 'key' is assigned to an individual driver as per the Driver Induction Procedure. The driver logs on to the GPS monitoring unit on the truck prior to commencing each shift. The GPS monitoring unit tracks the vehicle location, speed, exceedance of speed limits and harsh vehicle movement and braking as well as mapping the location of any potential incident or infringement to assist in future investigations. In the event of an incident or infringement (e.g. exceedance of speed limit) alerts are sent immediately by email and 'phone app' to the Quarry Manager and other nominated persons. All alerts provide detailed information including, date, time, nature of the infringement, driver name, truck registration and type and the location of the event.

# 4.0 TRUCK NOISE MANAGEMENT MEASURES

The following truck noise management measures will be implemented and enforced through the Driver Code of Conduct:

1. Require drivers to comply with the approved hours of operation stated in the development consent.
2. Require drivers to appropriately cover/secure loads.
3. Require drivers to comply with posted speed limits on all roads.
4. Require drivers to only use horn when appropriate do to so.
5. Require drivers to limit engine brake noise in residential areas.
6. Require drivers to reduce truck speed in residential areas, at road works and when passing stationary vehicles.
7. Preference to rely upon modern trucks with Euro 5 and Euro 6 compliant engines
8. Preference to rely upon modern trucks with airbag suspension

# 5.0 COMMUNITY ENGAGEMENT AND COMPLIANTS PROCEDURE

The community engagement, complaints and incident procedure which applies to all aspects of the quarry will be outlined in the Meppem Quarry Environmental Management Plan (EMP).

# 6.0 CORRECTIVE ACTION

The Quarry Manager shall take appropriate action to rectify problems or any identified deficiencies in accordance with the requirements of the Meppem Quarry EMP.

# 7.0 CONTINGENCY PLAN

In the event of unpredicted impacts, the Quarry Manager shall investigate the potential cause in accordance with the Meppem Quarry EMP. The Quarry Manager shall undertake appropriate action to rectify any identified deficiencies in the management measures immediately. The Quarry Manager may request the services of a specialist consultant to investigate and to give advice to assist in resolving the unpredicted impacts.

# 8.0 AUDITING AND REVIEW

The Quarry Manager shall review this management plan and its management measures to confirm their effectiveness and investigate ways to improve environment performance over time plan at least once every year at the time of completing the Annual Review as required by the development consent.

# 9.0 SUMMARY

The need for safe, responsible and efficient transport of quarry materials is in the interest of public benefit and safety. The implementation of the measures outlined in this TMP will manage impacts to the community from haulage of quarry materials from the Meppem Quarry.