NAMOI MINING PTY LTD

ABN: 24 071 158 373

Sunnyside Coal Project

via Gunnedah

Traffic and Transport Assessment

Prepared by

Constructive Solutions Pty Ltd

October, 2007

Specialist Consultant Studies Compendium
Part 6

Traffic and Transport Assessment

of the

Sunnyside Coal Project
via Gunnedah

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EXECUTIVE SUMMARY

Namoi Mining Pty. Ltd. (NMPL) proposes to establish a small scale open cut coal mine with a capacity to produce up to 1 million tonnes per annum (Mtpa) from the Hoskissons Seam. The mine would be located within a 231ha Project Site within the "Sunnyside" property approximately 15km west of Gunnedah in the Liverpool Plains Region.

It is proposed to haul the coal by road to the Whitehaven Coal Handling and Preparation Plant (CHPP) and Rail Loading Facility, which is located approximately 5km northwest of the Gunnedah Post Office. The roads included in the route include local and State Roads.

NMPL have investigated a number of potential existing and potential coal transport routes. NMPL believes the proposed route is the one that best meets community and company requirements.

A number of sections of the proposed route would need to be upgraded to provide a safe coal transport route that would accommodate the increase in traffic volumes. Using conventional 28t capacity trucks, there would be up to 125 loads of coal per day (Monday to Friday) and up to 86 loads of a Saturday and other associated worksite traffic. Should B-Double vehicles be used to transport coal, the number of loads per day would drop to a level of up to 88, Monday to Friday and up to 61 on a Saturday.

In order to create the standard of road required by NMPL, the primary works would include:

- the construction of a re-aligned section of road aligned parallel to Coocooboonah Lane; and
- upgrades to all of the intersections in accordance with the RTA Road Design Guide. Two dimensional layouts have been prepared for the respective layouts and are included in **Appendix 2**.

Some sections of the coal transport route provide minimum sealed pavement width. As a minimum, it is recommended that generally two 3.5m lanes with 0.5m sealed shoulders are required.

NMPL and related companies operate, or are planning to operate, a number of mines in the Gunnedah/Narrabri/Boggabri area that involve coal transport by road to the Whitehaven CHPP and Rail Loading Facility. At all locations, the Company has entered into an agreement with the relevant local council to contribute to the inspection and maintenance of the respective coal transport route. NMPL would enter a similar agreement with Gunnedah Shire Council in relation to the Sunnyside Project. These types of agreements are required because the existing sealed pavements along the routes to be used would deteriorate at a faster rate as a result of their use by heavy vehicles. In addition, increased inspection and maintenance intervals would be required as pavement failures would develop more quickly due to the increased volume of heavy vehicles on the route.

Coal transportation is not anticipated to have any noticeable impact on public transport or pedestrian activity as there is limited public transport and negligible pedestrian activity along the coal transport route. Parts of the proposed coal transport route are also used as school bus routes. Pick-up and drop-off locations are ad-hoc at present, often using property entrances which do not provide adequate room for the school buses to pull off the road. It is recommended that school bus pick-up and drop-off locations along the coal transport route be determined in consultation with relevant stakeholders with remediation works undertaken, where necessary.

1 INTRODUCTION

1.1 Description of Project

Namoi Mining Pty. Ltd. (NMPL) proposes to establish a small scale open cut coal mine with a capacity to produce up to 1 million tonnes per annum (Mtpa) from the Hoskissons Seam. NMPL is part of the Whitehaven Group of Companies. Whitehaven Coal Limited is a listed company.

The proposed Sunnyside Mine would be located within a 231ha Project Site within the "Sunnyside" property approximately 15km west of Gunnedah in the Liverpool Plains Region. The Project Site is located just north of the Oxley Highway and the old Gunnedah No. 5 Colliery site facilities and west of Coocooboonah Lane.

1.2 Coal Transportation

It is proposed to transport coal by road to the Whitehaven Coal Handling and Preparation Plant (CHPP) and Rail Loading Facility, which is located approximately 5km northwest of the Gunnedah Post Office. The coal would then be transported from the Whitehaven CHPP and Rail Loading Facility via rail to Port Newcastle.

The proposed mine production capacity of 1 million tonnes per annum equates to a averaged daily production rate of up to 3,500 tonnes which would generate 125 loads per day using 28t capacity trucks or 88 loads per day using 40t capacity trucks (B-Doubles).

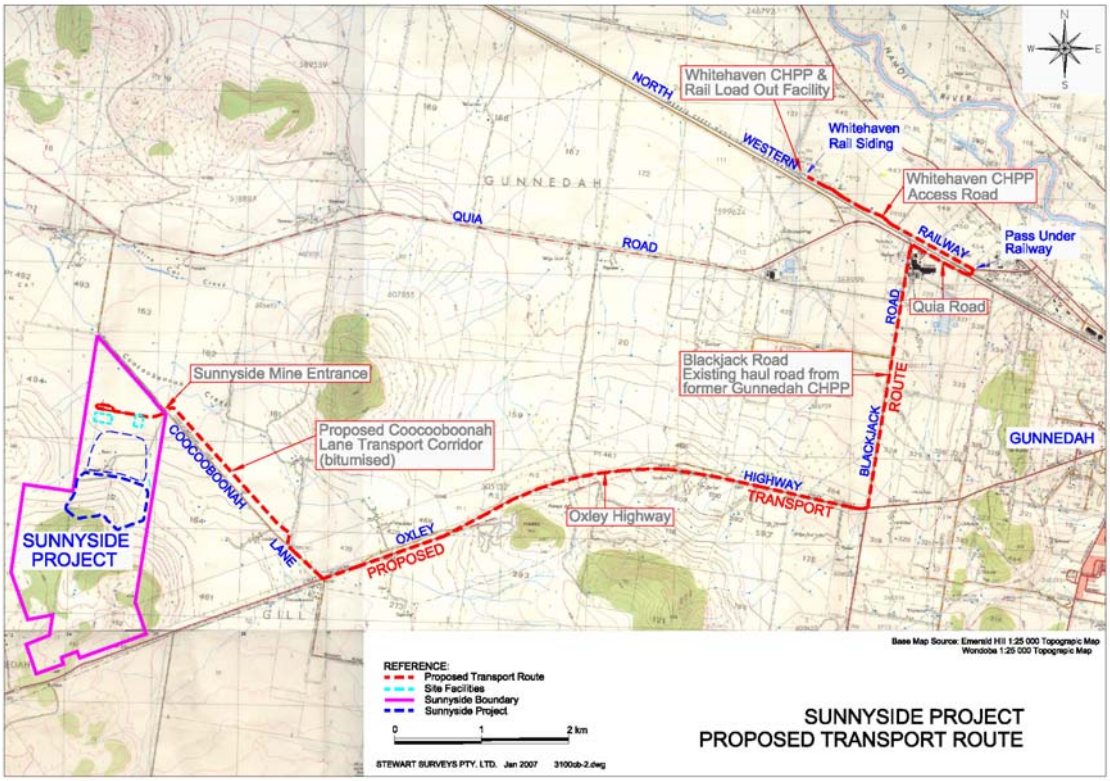
It has been estimated that at these production rates the mining and coal transportation, would continue for a period of approximately 5 to 7 years.

1.3 Proposed Coal Transport Route

Figure 1 shows the nominated coal transport route between the Sunnyside Project Site and the Whitehaven CHPP and Rail Loading Facility. The nominated route incorporates a re-aligned Coocooboonah Lane, the Oxley Highway, Blackjack Road, Quia Road and Torrens Lane.

This route was chosen over alternative routes on the basis that:

- it provides good site access to the Oxley Highway;
- it avoids potential Koala habitat in the vicinity of the Project Site, particularly within the road reserve for Coocooboonah Lane;
- the re-aligned section of Coocooboonah Lane and Coocooboonah Lane itself is relatively flat which improves transport efficiency; and
- has the least disturbance to the surrounding area as it predominantly utilises, or is aligned to existing road infrastructure.



Note: A colour version of this figure is presented on the Project CD

Figure 1 Proposed Coal Transport Route

The current Project is for 28t capacity trucks to be used to transport coal from Sunnyside. However, it is possible that B-Double configurations could be used and this would increase truck capacity to 40t.

Coal trucks of nominal 28t capacity would be loaded at Sunnyside under the bin within the Coal Processing Area. They would leave the property and cross over the existing Coocooboonah Lane and proceed along the re-aligned section of Coocooboonah Lane approximately 100m east of and parallel to the existing lane. Approximately 450m before the existing intersection of Coocooboonah Lane with the Oxley Highway, the re-aligned section would rejoin the Lane. The re-aligned section of Coocooboonah Lane would also serve as the public road to simplify traffic interaction along the Lane.

Trucks would turn left out of Coocooboonah Lane and proceed along the Oxley Highway before turning left into Blackjack Road. Blackjack Road was used in the past to transport coal from the Gunnedah Colliery to the old Gunnedah Mine rail siding opposite the Whitehaven CHPP. At the northern end of Blackjack Road, trucks would turn right into Quia Road and then turn left and pass under a rail overpass, then immediately turn left again and proceed directly to the Whitehaven CHPP and Rail Loading Facility via Torrens Road (for 0.6km) and the Torrens Road Access Way on Whitehaven private property.

The trucks would unload at this site and return to the Sunnyside Mine along the same route.

The roads and their corresponding lengths in the transport route are included in **Table 1**.

Table 1
Road Lengths affected by the Coal Transport Route

Road name	Length (km)
Coocooboonah Lane	2.7
Oxley Highway	6.7
Blackjack Road	3.0
Quia Road	0.8
Torrens Road	0.6
Torrens Road Access Way*	1.3
TOTAL	**15.1**
* Private Road on Whitehaven Property.	

1.4 Scope of Report

This report forms part of the supporting documentation of the *Environmental Assessment* for the Project by considering the traffic-related impacts. The scope of the report is to:

(i) assess traffic-related impacts in accordance with the RTA's *Guide to Traffic Generating Developments* where relevant; and

(ii) address any requirements or issues raised by the Director-General, other related agencies, stakeholders and local residents.

Noise-related impacts associated with coal transportation is being considered in a noise assessment by Spectrum Acoustics Pty Ltd included as Part 2 of the *Specialist Consultant Studies Compendium* – Volume 1.

2 EXISTING ROAD NETWORK

2.1 Existing Traffic Volumes

Existing traffic counts were provided by the RTA and Gunnedah Shire Council as a result of the placement of periodic counters. **Figure 2** shows the counts that were available for the respective roads.

No detailed traffic information was available displaying peak periods of traffic flow or historic traffic counts with the exception of the Oxley Highway. There is no specific trend in the counts within the vicinity of the section of the highway between Blackjack Road and Coocooboonah Lane.

No counts were available for Coocooboonah Lane. Traditionally, traffic volumes along the lane are less than 15 AADT with 20% heavy vehicles[1]. Existing heavy vehicle movements have been primarily associated with agricultural production resulting in variable heavy traffic volumes.

[1] Assumed traffic volume based on discussion with Gunnedah Shire Council

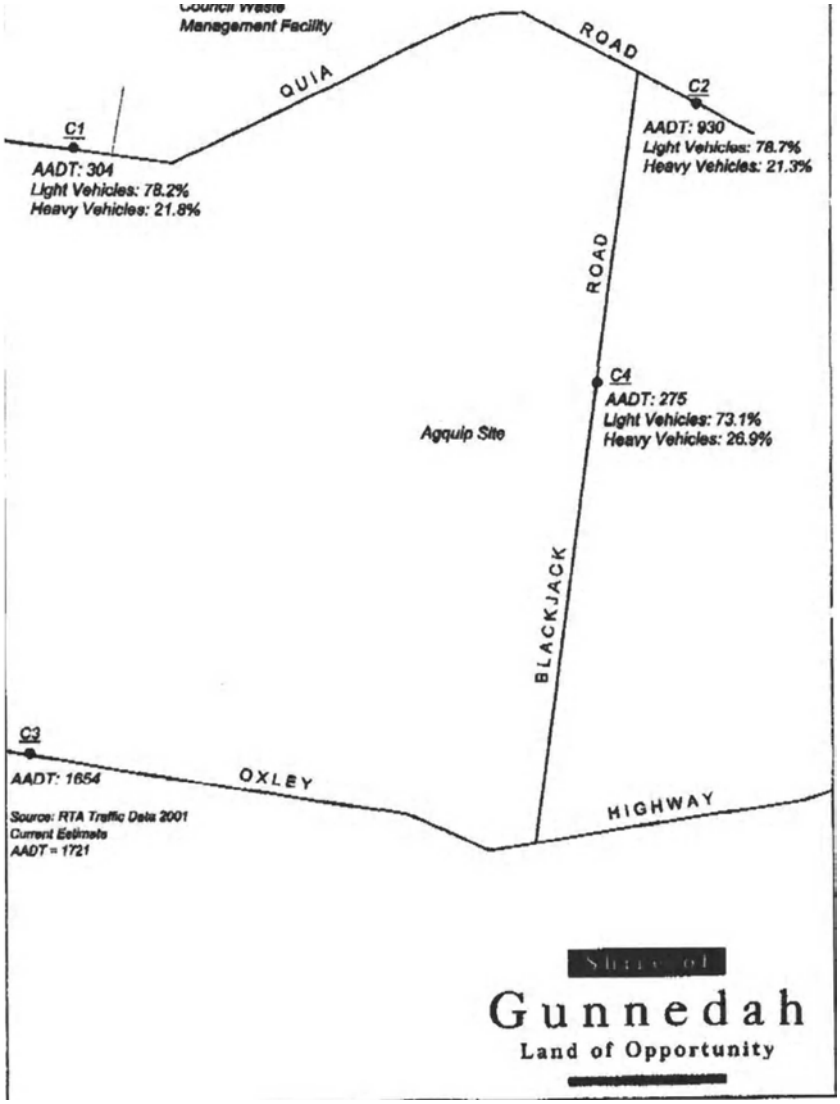


Figure 2 Existing Traffic

2.2 Existing Road Standards

2.2.1 Coocooboonah Lane

Coocooboonah Lane is a local road which primarily services the existing properties along its length. The lane services the property 'Plain View' to the right approximately 450m from the Oxley Highway and 'Lilydale' to the left approximately 750m from the Highway as well as others beyond the Project Site entrance.

The lane is a low trafficked road that consists of gravel pavement approximately 6m in width between the table drains. The road accommodates two-way traffic in one travelling lane with enough width between the table-drains to allow passing. **Plate 1** displays the typical road formation.

Plate 1 Coocooboonah Lane
Note: A colour version of this photograph is presented on the Project CD

Gunnedah Shire Council is the road authority for the lane. The lane is maintained by Council. The intervals between grading are generally one year, however, this varies depending on available resources and the prevailing road condition.

2.2.2 Coocooboonah Lane – Oxley Highway Intersection

At present, the Coocooboonah Lane intersection with the Oxley Highway is unformed and is controlled by a give way sign on Coocooboonah Lane as shown in **Plate 2**. **Plates 3** and **4** show the intersection from both approaches and gives some indication to the sight distance which is good in both directions.

Barlow Road intersects with the highway approximately 50m on the southern side of Coocooboonah Lane. Although traffic counts are not available for this road, it is probable that the traffic volumes are less than Coocooboonah Lane. Again, sight distance for vehicles approaching the highway from this road is good in both directions.

Plate 2 Coocooboonah Lane Intersection

Plate 3 Oxley Highway Looking East at Coocooboonah Lane Intersection

Note: A colour version of these photographs are presented on the Project CD

Plate 4 Oxley Highway Looking West at Coocooboonah Lane Intersection

Note: A colour version of this photograph is presented on the Project CD

2.2.3 Oxley Highway

The section of the Oxley Highway from Gunnedah to Coonabarabran provides a strategic link between the two centres and beyond. The section of the highway between Coocooboonah Lane and Blackjack Road is approximately 6.7km in length and has an estimated traffic volume of 1448 vehicles per day[2] at the Coocooboonah Lane end. It is likely that the traffic volumes are slightly higher on the highway in the vicinity of the Blackjack Road intersection. Council has estimated the current volumes to be closer to 1721 vehicles per day.

No commercial vehicle estimates were provided. It is likely that the percentage of commercial vehicles on this road is in the vicinity of 25 to 30%.

The formation consists of two lanes between 3.25m and 3.5m wide with some sealed shoulder of variable width. The alignment is generally good.

The Oxley Highway is maintained on behalf of the RTA by Gunnedah Shire Council through a single invitation maintenance contract.

2.2.4 Oxley Highway – Blackjack Road Intersection

The Blackjack Road intersection with the Oxley Highway has moderate traffic volumes for most of the year with larger volumes experienced before, during and after AgQuip which is usually held in August of each year.

[2] Source; RTA Traffic Volume Data – Site Located 20km South West of Gunnedah.

The intersection is a modified rural treatment with tapers on all turning manoeuvres on and off the Oxley Highway to assist turning articulated vehicles. The upgrade is likely to have been undertaken to facilitate traffic movements to and from the AgQuip site.

Plate 5 Oxley Highway Looking East towards Blackjack Road Intersection
Note: A colour version of this photograph is presented on the Project CD

The sight distance is good approaching from Gunnedah along the Oxley Highway and is reasonable approaching from Coonabarabran.

2.2.5 Blackjack Road

Blackjack Road is a local road which links the Oxley Highway with Quia Road past the AgQuip site. The road is straight, is approximately 3km long and has an approximate seal width of 6.5m to 7m.

The road is primarily used by through traffic except during AgQuip. The traffic volumes provided by Gunnedah Shire Council for this road are 275 vehicles per day with 26.9% heavy vehicles. The traffic volumes during AgQuip on Blackjack Road and other linked roads would be significantly greater before, during and after AgQuip.

At present, there is a large scale industrial subdivision proposed adjacent to Blackjack Road which, if realised, would increase traffic volumes. The extent of the increase would be dependent on the staging of the development. Blackjack Road is currently an approved B-Double route which enables large stock carrying vehicles to access the Gunnedah Saleyards, without the need to pass through the central business area.

2.2.6 Blackjack – Quia Road Intersection

The northwestern end of Blackjack Road terminates at a T intersection when it meets Quia Road. The general geometry of the intersection appears reasonable for the existing traffic volumes on the respective roads. From the traffic counts, it appears as though the predominant flow of traffic is to and from Quia Road onto Blackjack Road.

Plate 6 displays the approach to the T intersection along Blackjack Road.

Plate 6 Blackjack Road Approach to Quia Road Intersection
This figure is presented in colour on the CD for the Sunnyside Coal Project

Guardrail has been placed on the inside corner turning left onto Quia Road. The area behind the guardrail was utilised as a school bus stop during the site inspection although there are no corresponding school bus stop signs.

2.2.7 Quia Road

Quia Road is a local road located to the West of Gunnedah. The road runs from the Kamilaroi Highway under the rail line where it meets the Farrar Road and continues parallel to the rail line before heading west.

The road consists of two sealed lanes with minimal sealed shoulder. The estimated seal width is between 6.5m and 7.0m. Pavement age and quality is variable as displayed in **Plate 7**.

Plate 7 Quia Road Looking West at Blackjack Road Intersection

Note: A colour version of this photograph is presented on the Project CD

At present, there are 930 vehicle movements a day (21.8% commercial vehicles) to the east of the Blackjack Road intersection which decreases to 304 (21.3% commercial vehicles) to the west of the intersection.

2.2.8 Underpass and Adjoining Intersections

The coal transport route leaves Quia Road via the intersection adjoining the underpass. Torrens Road joins Quia Road just to the north of the underpass. **Plates 8**, **9** and **10** display the approach to the intersection prior to the underpass, the underpass and the Torrens Road intersection respectively.

The Quia Road - Farrar Road intersection has been aligned to accommodate the restraints of the underpass and the associated drainage.

The Quia Road – Torrens Road intersection is also constrained by the underpass and associated drainage as well as other utilities. The left turn manoeuvre onto Torrens Road from Quia Road the underpass has a tight radius of curvature. The pavement in this intersection is failing due to the quantity of heavy vehicles, the grade and tight radius turning left onto Torrens Road.

As shown in the respective photos, the pavement adjacent to the underpass is concrete. The remaining pavement area is presumed to be constructed of unbound granular pavement with the exception of the Quia Road - Torrens Road intersection which is constructed of asphalt.

Plate 8 Quia Road Looking East at the Underpass Intersection

Plate 9 Rail Underpass

Note: A colour version of these photographs are presented on the Project CD

Plate 10 Torrens Road Intersection

Note: A colour version of this photograph is presented on the Project CD

2.2.9 Torrens Road

Torrens Road is one of the two routes used for the transportation of coal and by-products to and from the Whitehaven CHPP and Rail Loading Facility. The pavement consists of unbound granular pavement.

The road pavement in Torrens Road is too narrow and is on the verge of failing. Torrens Road is shown in **Plate 11**.

Torrens Road is a no through road to the public and enters Whitehaven private property 600m west of the Quia Road - Torrens Road intersection.

2.2.10 Torrens Road Access Way

The access to the Whitehaven CHPP and Rail Loading Facility continues beyond the end of Torrens Road onto a road referred to by NMPL as the “Torrens Road Access Way”, a road located on the Whitehaven property. The road is a comparatively new section of road and is sealed to a width of 7.0m.

3 DETAILED ASSESSMENT OF THE PROJECT

3.1 Future Traffic Volumes

Future non-Project related traffic volumes in and around the vicinity of the coal transport route are likely to remain comparable with the exception of Blackjack and Quia Roads where other traffic generating development such as the proposed subdivision to the northeast of Blackjack Road is likely to increase in traffic volumes around this area and on adjoining roads.

Other development applications in the vicinity of these roads include the creation of an industrial precinct in and around the former abattoir site. If realised, traffic in and around this section would increase during construction and from its ongoing development.

Plate 11 Torrens Road
Note: A colour version of this photograph is presented on the Project CD

The proposed Gunnedah ethanol plant would also result in a significant increase in traffic volumes, however, there is no current development application before Council for the Project.

3.2 Traffic Generation from the Project

The Project would generate traffic from various activities occurring at the Project Site through the various stages of the development. The volumes of traffic likely to be experienced during the construction and operation of the mine have been estimated in the following sections.

3.2.1 Construction Traffic Volumes

Mine site construction and the construction / upgrading of the intersections along the route would occur prior to the commencement of coal transportation from the Project Site. During this phase of the Project, traffic generated by the construction would vary in number and composition depending on the phase, location and type of construction.

3.2.2 Heavy Vehicle Traffic Volumes

As previously introduced in Section 1.2, the transportation of coal is proposed to be undertaken using a standard articulated truck configuration with an assumed payload of 28t. Based on this payload, the estimated truck movements would involve up to 125 loads per day over a 13 hour period Monday to Friday and up to 86 loads per day over a 9 hour period on a Saturday. Consideration would be given to using B-Double configuration vehicles with a 40t load capacity. Based on this payload, the estimated truck movements would be up to 88 per day over a 13 hour period, Monday to Friday and up to 61 loads over a 9 hour period of a Saturday.

The proportion of the trucks transporting coal compared with the current number of commercial vehicles per day is shown in **Table 2**.

Table 2
Estimated Increase in Commercial Vehicles

Road	Estimated Existing Commercial Vehicles	Heavy Vehicles		Percentage Increase	
		28t Cap.	40t Cap	28t Cap.	40t Cap
Coocooboonah Lane	3	250	176	8400%	5867%
Oxley Highway	500[3]	250	176	50%	35%
Blackjack Road	74	250	176	341%	238%
Quia Road	198	250	176	127%	89%

The increase in commercial vehicles as a result of the proposed coal transportation would be significant on all roads.

It is probable that increased traffic and increased commercial vehicles would occur on the Oxley Highway, Quia and Blackjack Roads as a result of other developments proposed in the vicinity of this Whitehaven Rail Loading Facility over the life of the Project.

The coal transportation vehicles would be parked overnight at the contractor's compound.

3.2.3 Workforce Traffic Volumes

The workforce travelling to and from the mine site has been estimated to be approximately 24 full time employees a day. There could be up to 7 part time employees per day also accessing the mine, resulting in the maximum number of 31 persons attending the mine on any one day. Workers residing in Gunnedah would approach the Project Site along the Oxley Highway. Realistically, the workforce would contribute up to 20 light vehicle return trips each day.

[3] Based on an assumed % of commercial vehicles between 25 and 30%.

It is assumed that the majority of the workforce would reside in or in the immediate vicinity of Gunnedah and travel to and from work via the Oxley Highway. It is estimated that less than 25% of the workforce would reside in a location whereby they access the Project Site along an alternative route either to the west of the Oxley Highway – Coocooboonah Lane intersection or to the northwest of the Project Site along Coocooboonah Lane.

3.2.4 Other Traffic

Other traffic travelling to and from the mine site would include site deliveries, intermittent visits by NMPL management and regulatory authorities. Overall, it is presumed that other traffic would be relatively low at around 10 vehicles per day of which 20% would be expected to be commercial vehicles.

3.3 Traffic Impacts

3.3.1 Heavy Vehicles

As previously introduced in Section 1.2, both standard articulated vehicles and B-Doubles are being considered for use to transport coal from the Sunnyside Mine. Both configurations are used extensively in the Gunnedah area with an increasing emphasis being placed upon phasing out the standard articulated vehicles.

The primary impacts associated with the use of B-Doubles is considered to be the dimensional capacity of the existing road infrastructure and traffic interaction. All recommended road and intersection upgrades would be designed to accommodate B-Double use. Intersection upgrades would also provide simplified traffic interaction and provide appropriate warning relating to the increased volume in heavy vehicles. “Truck Entering” signs would be placed at all intersections.

Speed and other related driving infringements need to be managed. A suitable Code of Conduct as well as disciplinary procedures would be implemented to control driver activity.

Spillage from the trucks transporting coal needs to be controlled. All vehicles would be fitted with automated tarps as well as undertaking regular ‘clean up’ runs along the coal transport route.

3.3.2 Coocooboonah Lane

The section of Coocooboonah Lane from the Project Site entrance to the Oxley Highway would experience a significant increase in traffic volumes. The road would form part of the coal transport route as well as providing general site access for employees, site deliveries and other associated traffic.

In order to achieve NMPL's commitment to avoiding removal of existing Koala habitat along the lane, coal would be transported on a new re-aligned (but temporary) section of road running parallel to the existing lane until it rejoins the lane approximately 450m from the Oxley Highway. **Plate 12** displays an oblique aerial photograph of the proposed Coocooboonah Lane re-alignment. This section would also serve as the public road throughout the life of the mine. The existing section of Coocooboonah Lane between the mine site access and the point where the haul road re-aligns with the lane would be decommissioned whilst the coal transportation route is in service. The proposed re-alignment of the lane is shown in **Figure 3**.

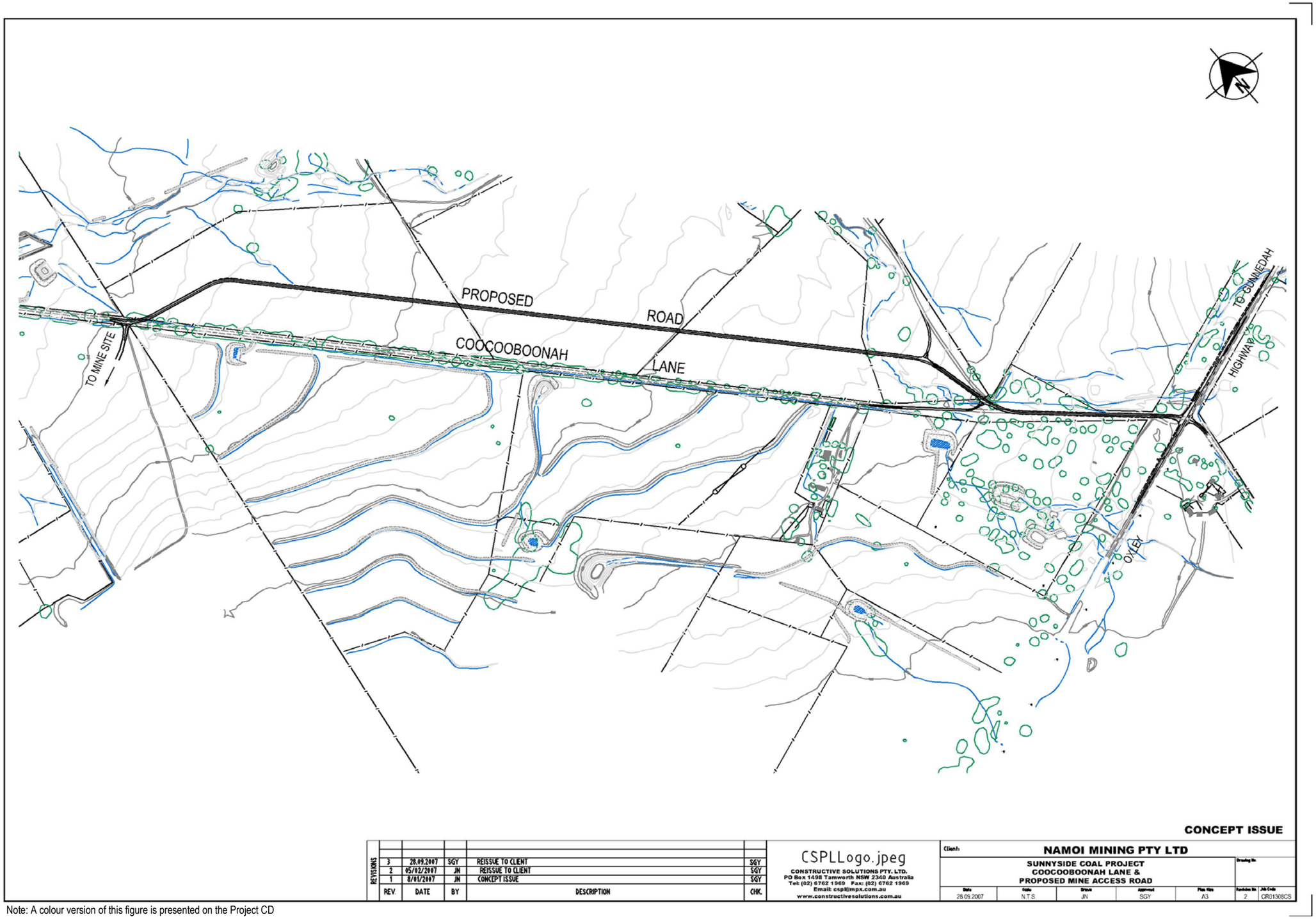
This crossing would create an intersection where the existing lane meets the re-aligned road as shown in **Figure 3**.

A basic left turn (BAL) treatment as proposed in the 2D layout contained in **Appendix 2** (**Figure 2.1**) with a sealed approach along Coocooboonah Lane is recommended. As shown, all vehicles (including trucks) entering Coocooboonah Lane from the mine site would be required to give way to traffic along Coocooboonah Lane.

The section between the mine site entrance and the Oxley Highway would be constructed to avoid removing Koala habitat along the sides of the existing Lane. The Coocooboonah Road re-alignment would be constructed through the existing cultivation paddock and would consist of two sealed lanes 3.5m wide. The road would have sealed shoulders 0.5m wide on both sides.

Plate 12 An oblique aerial view to the southeast along the proposed route of the Coocooboonah Lane re-alignment. Ref: E675B023

Note: A colour version of this photograph is presented on the Project CD



Note: A colour version of this figure is presented on the Project CD

Figure 3 Coocooboonah Lane Diversion

Figure 4 shows a typical cross section of the new section of road.

The two property access roads that join the existing Coocooboonah Lane would require some re-alignment to provide adequate sight distance for each access and approaching vehicles where they join the re-aligned road. The proposed layouts included in **Appendix 2** (**Figures 2-2** and **2-3)** would accommodate the volume and type of traffic likely to be using the accesses to the respective properties. Bituminous seal would be provided to the respective property boundaries.

Unbroken double centre lines are recommended along this section of the haul road due to the number of commercial vehicles using the road and the limited overtaking opportunities.

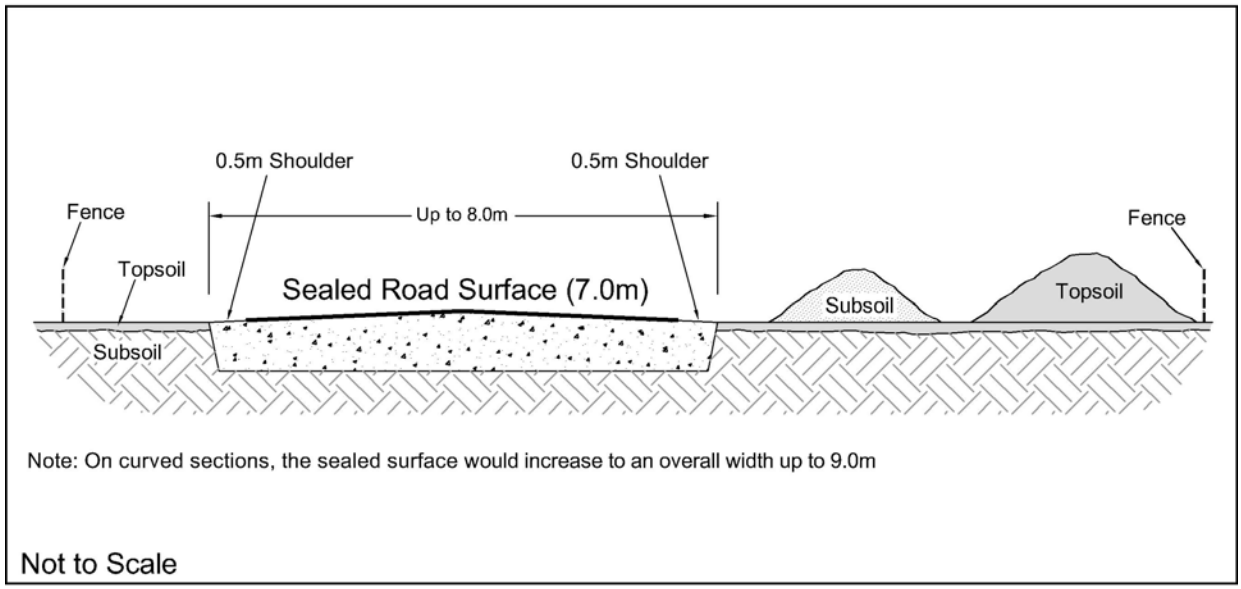


Figure 4 Typical Cross Section Coocooboonah Road

3.3.3 Coocooboonah Lane – Oxley Highway Intersection

The traffic volumes through this intersection would increase markedly as discussed. The trucks and other associated Project Site traffic would predominantly originate from Gunnedah, however, some increase in traffic volumes is likely from the westerly direction.

The Coocooboonah Lane – Oxley Highway intersection is inadequate in its current form and would require a significant upgrade in line with the proposed upgrade of Coocooboonah Lane. **Plate 13** displays an oblique aerial photograph of the Coocooboonah Lane – Oxley Highway intersection. The new intersection is proposed to be located in the vicinity of the existing intersection which joins the highway along a straight section of the highway at a low point between two crests. The sight distance in both directions is very good due to the general topography surrounding the Project Site and is well in excess of 250m.

Laden trucks travelling towards Gunnedah through the intersection would have good sight distance to merge into the existing traffic, however, with an approach speed of approximately 20km/hr combined with a slight uphill grade on the Oxley Highway to the east, it is unlikely that the heavy vehicles would reach in excess of 80km/hr before travelling over the crest on the Gunnedah side of the intersection.

An acceleration lane is recommended (BAL treatment) for the laden vehicles turning left onto the Oxley Highway to maintain and develop a reasonable speed on the gentle uphill climb thus providing for a smoother merge into existing traffic.

A deceleration lane is also recommended for the returning unladen vehicles to decrease their speed without hindering through traffic. Adequate storage capacity is required to ensure that the deceleration distance is not too short.

Plate 13 An oblique aerial view to the northwest across the existing intersection of Oxley Highway and Coocooboonah Lane. Ref: E675B-008.

Note: A colour version of this photograph is presented on the Project CD

The layout included in **Appendix 2** (**Figure 2-4**) allows for a deceleration lane of 195m of which 37m was nominated as storage capacity to accommodate one commercial vehicle and two standard vehicles at any given time. If two commercial vehicles were at the intersection at the same time, it would only reduce the nominated deceleration distance by 10 to 15m. An opposing right turn lane for Barlow Road has also been provided.

Barlow Road intersects with the highway on the opposite side of the road less than 60m east of the existing intersection. A staggered T intersection was initially investigated, however, the existing distance between the intersections was not in accordance with the RTA Road Design Guide. Vehicles turning right onto the highway would also have to cross the deceleration lane as well as identify vehicles in the acceleration lane which was also of concern.

The alignment of Coocooboonah Lane and Barlow Road were both modified to make the intersection a four way intersection to simplify traffic interaction and to avoid confusion.

All other alternative accesses to the mine site would be closed to ensure all access is via the nominated coal transportation route.

3.3.4 Oxley Highway

The section of the Oxley Highway between Coocooboonah Lane and Blackjack Road varies considerably in condition. Significant sections of the highway have been 'heavy patched'.

The increase in heavy vehicles is likely to exacerbate pavement failure and edge break especially in the lane heading towards Gunnedah where the heavy vehicles are laden. As the shoulders vary in width, the impact of edge break would be variable, however, it would be undesirable to have a sealed shoulder less than 0.5m.

Significant amounts of edge break would reduce effective pavement width and create hazardous conditions for lighter vehicles and vehicles with smaller tyres.

It is recommended that shoulder maintenance techniques be negotiated with Council as part of the overall maintenance agreement. In some areas, shoulder reconstruction would be required.

As there are expected to be between an additional 125 to 88 return trips per day depending on vehicle configuration, more rigorous maintenance inspections and intervals would be required particularly in wet weather where isolated pavement failures could become extensive failures in a short period of time.
Although no signs indicating the location of school bus stops were identified during the site inspection, if any are located along this section of the Oxley Highway, an assessment would be required to ensure the bus and other vehicles have suitable sight distance and that the buses are entirely off the road at pick-up and drop-off points.

3.3.5 Oxley Highway – Blackjack Road Intersection

The modified rural treatment at this intersection has assisted in achieving the dimensional capacity to improve semi and B-Double manoeuvres onto Blackjack Road. **Plate 14** displays an oblique aerial photograph of the Oxley Highway – Blackjack Road Intersection.

Although the existing intersection could accommodate the proposed increased level of heavy vehicle movements, it is recommended that a left turn deceleration lane (AUL) and opposing right turn lanes be included to reduce the impact on through traffic.

The existing width of the road pavement on Blackjack Road when approaching Oxley Highway from the north provides sub-standard left and right turn lanes onto the highway. It is recommended that dedicated left and right turning lanes be created for south-bound traffic approaching the intersection to enable turning movements onto the highway to be made safely..

At least 250m sight distance is provided in both directions along the highway, however consideration would be given to relocating some of the signs based on the final layout of the intersection.

The layout proposed in **Appendix 2** (**Figure 2-5**) would minimise the impact of the coal transportation in the vicinity of this intersection.

Plate 14 An oblique aerial view to the west across the intersection of Oxley Highway and Blackjack Road. Ref: E675B-003.
Note: A colour version of this photograph is presented on the Project CD

3.3.6 Blackjack Road

The increase in traffic on Blackjack Road would be predominantly associated with coal transportation rather than commuting workers or other traffic generated by the Project.

The pavement is generally in good condition, however, the coal transportation would exacerbate the rate of deterioration particularly in the north-bound lane.

The existing sealed pavement width along Blackjack Road is considered inadequate. Two 3.5m lanes with 0.5m sealed shoulders one considered appropriate based on the high percentage of commercial vehicles, including B-Doubles.

Linemarking, including edge lines, is also recommended to define travelling lanes and to try and keep the outer wheel path of heavy vehicles off the shoulder.

3.3.7 Blackjack Road – Quia Road Intersection

With the current traffic volumes combined with trucks transporting the coal from the Sunnyside Mine, the throughput at this intersection would increase significantly. If non-project related traffic volumes remain the same over the period that coal transportation occurs, the construction of an auxiliary right turn lane would be recommended and considered sufficient to accommodate the increase in traffic. However, based on discussions with Council, development applications in the vicinity of this intersection and potential land use rezoning being considered, it is probable that non-project related traffic volumes through this intersection would increase considerably in the medium to long term.

In light of the potential traffic increases, a roundabout has been proposed by Gunnedah Shire Council to reflect longer term traffic predictions from all traffic generating developments. NMPL proposes to continue discussions with Gunnedah Shire Council regarding its capital contribution towards the construction of a roundabout.

The roundabout, as proposed for this intersection, would more than adequately accommodate the increase in traffic from coal transportation as well as moderate annual increases in background traffic related to other traffic generating developments.

3.3.8 Quia Road

Quia Road already carries a significant volume of commercial vehicles which from the last traffic count was 198 per day to the east of the Blackjack Road intersection.

As with Blackjack Road, coal transportation would exacerbate the rate of deterioration of the unbound pavement especially in the east-bound lane. Edge break would also be prevalent due to the lack of sealed shoulder.

The existing sealed pavement width is considered inadequate. Two 3.5m lanes with 0.5m sealed shoulders are considered appropriate based on the high percentage of commercial vehicles, including B-Doubles.

Linemarking, including edge lines, is also recommended to define travelling lanes and to try and keep the outer wheel path of heavy vehicles off the shoulder.

3.3.9 Underpass and Adjoining Intersections

The existing underpass and adjoining intersections are constructed to a reasonable standard which, with the exception of the pavement in the Torrens Road intersection, appear to be functioning satisfactorily for existing traffic. **Plate 15** displays an oblique aerial photograph of the underpass and adjoining intersections.

Traffic counts on the network in the vicinity of the underpass were not available, however, it is understood that the primary traffic flow at present is from Quia Road to Farrar Road which continues to run parallel to the rail line. The coal transportation is likely to change the primary traffic flow through the underpass.

The existing T intersection between Quia and Farrar Roads is considered inadequate in its current form as it does not provide the dimensional capacity for B-Doubles to undertake both turning manoeuvres.

The creation of an industrial precinct on the land contained within the old abattoir site is likely to result in an upgrade to this intersection as one of the proposed accesses is via a roundabout at this junction.

Plate 15 An oblique aerial view to the south across the rail underpass on Quia Road.
Ref: E675B-001

Note: A colour version of this photograph is presented on the Project CD

Based on the traffic impacts associated with the Project alone,, it is recommended that a typical seagull treatment with a basic left turn lane for laden heavy vehicles be provided to facilitate traffic flow. A basic layout of the recommended treatment is provided in **Appendix 2** (**Figure 2-7**).

The underpass provides two 3.5m lanes with approximately 250mm shoulders which are bound by concrete piers for the underpass on both sides. The existing width is considered adequate on the provision that B-Doubles have the capacity to enter the respective lanes completely prior to going through the underpass.

The Torrens Road intersection with Quia Road requires upgrading as it has insufficient dimensional capacity to accommodate turning articulated vehicles without crossing the centreline of the existing road. The tight radius of curvature combined with the grade falling towards Quia Road is causing the pavement to fail under the screwing of the trucks.

A power pole on the inside of the corner turning left into Torrens Road limits the available room to achieve a suitable turning radius for B-Double use. The power pole should be re-located to provide additional room to achieve the desired turning radius.

A shoulder extension, as well as ancillary drainage works, as shown in **Appendix 2**, would accommodate the turning heavy vehicles satisfactorily. A heavy duty pavement such as a concrete pavement would be required.

3.3.10 Torrens Road

The 600m length of Torrens Road west of its intersection with Quia Road is on the verge of failing due to continued heavy vehicle use. This section is not suitable for the proposed heavy vehicle use and would need to be fully rehabilitated.

It is recommended that the rehabilitated pavement consist of two 3.5m lanes with 0.5m sealed shoulders on both sides.

3.3.11 Torrens Road Access Way

The pavement and alignment of Torrens Road Access Way is sufficient for the proposed coal transportation.

3.4 School Bus Routes

School bus routes are located along the coal transportation route. Council indicated that there are no designated pick-up and drop-off points along the school bus routes as pick-up and drop-off locations vary depending on the number of children and their location.

It is recommended that pick-up and drop-off points be determined in consultation with school bus proprietors along the coal transportation route as well as other stakeholders to prevent ad-hoc use of areas that may be unsuitable.

3.5 Pedestrian and Cycling Activity

There is very limited pedestrian or cycling activity along the coal transportation route. No pedestrian or cycling activity was witnessed during the site inspection other than that associated with school bus routes. On this basis, it is not anticipated that there would be any significant impact on pedestrian activity.

Cycling activity along the Oxley Highway would be discouraged by the presence of truck entering signs.

4 RECOMMENDATIONS

The proposed Sunnyside Coal Project would generate significant traffic volumes between the CHPP and the mine site as well as on adjoining parts of the road network. The primary impact would result from the transportation of coal to the Whitehaven CHPP and Rail Loading Facility.

The existing roads included along the coal transportation route range in classification, function and condition. The majority of the route traverses local roads with the exception of the Oxley Highway which is a State Highway.

As a result of the increase in traffic, extensive road upgrades are required. An inventory of the recommendations, including upgrades, are included in **Table 3**.

Table 3
Summary of Proposed Road Upgrading Activities

Road Section	Road Upgrade Actions
General	• Complete all relevant intersection upgrades to AUSTROADs and Gunnedah Shire Council standards. • "Truck Entering" signs should be erected approaching all intersections where relevant.
Coocooboonah Lane	• Proposed re-alignment is shown in Overall Plan for Coocooboonah Lane in **Figure 3.** • Construct new section of road parallel to existing road. • Merge road back with Coocooboonah Lane 450m north of highway and reconstruct 450m section of Coocooboonah Lane. • Re-align and reconstruct property accesses as shown in **Appendix 2** (**Figures 2-2 and 2-3**).
Coocooboonah Lane – Oxley Highway Intersection	• Upgrade existing intersection as shown in **Appendix 2 (Figure 2-4)**.
Oxley Highway	• Negotiate shoulder maintenance strategy with Council. • Close all alternative accesses between the Project Site and the Highway.
Oxley Highway – Blackjack Road Intersection	• Upgrade existing intersection to include a deceleration lane turning left into Blackjack Road as shown in **Appendix 2** (**Figure 2-5**).
Blackjack Road	• Widen Blackjack Road to provide 2 x 3.5m wide lanes with 0.5m wide sealed shoulders. • Negotiate road maintenance strategy with Gunnedah Shire Council.
Blackjack Road – Quia Road Intersection	• Intersection upgrade would suffice, however, roundabout proposed to accommodate other traffic generating developments. • If required, a roundabout would be constructed in accordance with **Appendix 2 (Figure 2-6).**
Quia Road	• Widen Quia Road to provide 2 x 3.5m wide lanes with 0.5m wide sealed shoulders. • Negotiate road maintenance strategy with Gunnedah Shire Council.
Underpass and Adjoining Intersections	• Upgrade Quia Road – Farrar Road intersection in accordance with **Appendix 2 (Figure 2-7)**. • Upgrade Quia Road – Torrens Road intersection in accordance with **Appendix 2 (Figure 2-7)**.
Torrens Road	• Reconstruct the initial failed section to achieve 2 x 3.5m wide lanes with 0.5m wide sealed shoulders. • Widen Torrens Road to provide 2 x 3.5m wide lanes with 0.5m wide sealed shoulders.

APPENDICES

(No. of pages excluding this page = 14)

Appendix 1	**Guide to Traffic Generating Developments Checklist**
Appendix 2*	**Two Dimensional Intersection Layouts**
Appendix 3	**Director Generals Requirements**

* Note: This Appendix is presented in full on the CD for the Sunnyside Coal Project

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Appendix 1

Guide to Traffic Generating Developments Checklist

(No. of pages excluding this page = 5)

2.3 Issues to be addressed

A traffic impact study should follow the standard format and structure that is listed in Table 2.1. This format covers the key issues to be addressed in determining the impact on traffic of a development. Use of this format and the checklist will ensure those involved in the preparation and / or assessment of Development Applications that the most significant matters are considered.

Table 2.1
Key issues in preparing traffic impact studies

Procedures & Key Parameters	Source	Check ✓
Brief description of the development		✓
Application and study process		✓
Introduction		
Background		✓
Scope of report		✓
The key issues and objectives of a traffic impact study		✓
General Data Collection / Existing Conditions		
Description of the Site and Proposed Activity		✓
Site location		✓
Current land use characteristics (zoning) of the proposed site and land use in the vicinity	Council	Where relevant
Site access		✓
The Existing Traffic Conditions		✓
Road hierarchy; including the identification of the classified road network (major and minor roads) which may be affected by the development proposal	Council / RTA	✓
Inventory of road widths, road conditions, traffic management and parking control	Council, RTA and Survey	In part
Current and proposed roadworks, traffic management works and bikeways	Council / RTA	Maintenance Only
Traffic Flows		
Selection of key streets - possibly divided into the major and the minor road network; selection of key assessment periods, chosen to cover the times at which the development would be expected to have its major impacts	Section 3	
AADT on key streets	RTA / Council / Survey	✓
Daily traffic flow hourly distribution, particularly in or near residential areas	Survey	Not Available

Section 2 - Traffic impact studies

Procedures & Key Parameters	Source	Check ✓
Estimate of the speed of traffic on the road to which vehicular access is proposed	Survey	×
Current traffic generation of site	Survey	In part
Daily and peak period heavy vehicle flows and percentages	Survey	×
The adaptation of appropriate computer models or techniques for assessing levels of traffic congestion and queuing conditions		No
Traffic Safety		
Accident history of road network in the area	Accident Histories	Discussed with Council
Parking Supply and Demand		
On-street parking provision	Local Council	Not Applicable
Off-street parking provision	Councils / Surveys	Not Applicable
Current parking demand, including utilisation by time of day and turnover rates	Survey	Not Applicable
Short term pick up and set down areas	Council / Survey	Not Applicable
Modal Split	STA / Survey	Not Applicable
Public Transport		
Rail station locations	SRA	Not Applicable
Bus routes and bus stop locations; Pedestrian access to bus stops; Constraints and conflicts	STA / Private Operators / Survey	Bus routes considered
Rail and bus service frequencies, ideally separated into Monday to Friday, Saturday and Sunday, for both peak and off-peak times	SRA /STA / Private Operators	School bus routes only
Commuter parking provision	SRA / Survey	NA
Pedestrian Network		
Identify major pedestrian routes	Survey	NA
Pedestrian flows and potential conflicts with vehicles, particularly where such conflicts cause capacity constraint on either vehicular or pedestrian movement	Observation	NA
Pedestrian infrastructure	Survey	NA
Proposed developments in the vicinity	Council	Yes

Procedures & Key Parameters	Source	Check ✓
Proposed Development		
The Development		
Plan reference, if plans not contained in study report		✓
Nature of development		✓
Gross floor areas of each component of development		NA
Projected number of employees/users/residents		✓
Hours and days of operations		✓
Staging and timing of development		✓
Selection of appropriate design vehicles for determining access and circulation requirements	Section 6	NA
Access		
Driveway location, including review of alternative locations	Sections 5, 6	✓
Sight distance of driveways and comparisons with stopping and desirable minimum sight distances	Section 6	NA
Service vehicle access	Section 6	NA
Analysis of projected queuing at entrances	Section 6	✓
Current access to site and comparison with proposed access		✓
Provision for access to, and by, public transport	Section 6	
Circulation		
Proposed pattern of circulation	Section 6	NA
Internal road widths	Section 6	NA
Provision for bus movements		NA
Service area layout		NA
Parking		
Proposed supply		NA
Parking provision recommended by State Government policy	RTA	NA
Council code and local parking policies and plans	Council	NA
Parking layout		NA
Projected peak demand, based where appropriate on similar research reports and on surveys of similar developments;	Section 5	NA
Parking for Service / courier vehicles and bicycles	Section 5	NA

Procedures & Key Parameters	Source	Check ✓
Impact Of Proposed Development		
Traffic generation during design periods		
Daily and seasonal factors		NA
Pedestrian generation and movements		NA
Traffic Distribution and Assignments		
Hourly distribution of trips		✓
Assignments of these trips to the road system, based where possible on development feasibility studies or on origin/destination surveys undertaken at similar developments in the areas		✓
Impact on Traffic Safety		
Assessment of Road Safety Impact		✓
Impact of Generated Traffic		
Daily traffic flows and composition on key streets and their expected effect on the environment, particularly in residential areas		✓
Peak period volumes at key intersections and effect of generated traffic on congestion levels	Survey	NA
Impact of construction traffic during construction stages		✓
Other proposed developments in the vicinity, their timing and likely impact, if known	Local Council	✓
Assessment of pedestrian movements	Survey	NA
Assessment of traffic noise		Separate study
Public Transport		
Options for extensions and changes to bus routes and bus stops, following discussions with the STA and or private bus operators	STA	NA
Provision for pedestrian access to bus stops		NA
Recommended Works		
Improvements to site access and circulation		✓
Improvements to roads, signals, roundabouts and other traffic management measures		✓
Improvements to pedestrian facilities		NA
Effect of recommended works on the operation of adjacent developments		✓

Procedures & Key Parameters	Source	Check ✓
Effect of recommended works on public transport services, including bus routes, bus stops and access thereto		NA
Provision of LATM measures		NA
Funding of proposed improvement projects		✓
Noise attenuation measures		Separate Study

Appendix 2

Two Dimensional Intersection Layouts

(No. of pages excluding this page = 7)

* Note: This Appendix is presented in full on the CD for the Sunnyside Coal Project

Figure 2-1 Coocooboonah Lane and Mine Site Entrance
Figure 2-2 Private Access Re-alignment to “Plain View”
Figure 2-3 Private Access Re-alignment to “Lilydale”
Figure 2-4 Oxley Highway – Coocooboonah Lane Intersection
Figure 2-5 Oxley Highway – Blackjack Road Intersection
Figure 2-6 Quia Road – Blackjack Road Intersection
Figure 2-7 Torrens Road – Quia Road Intersection

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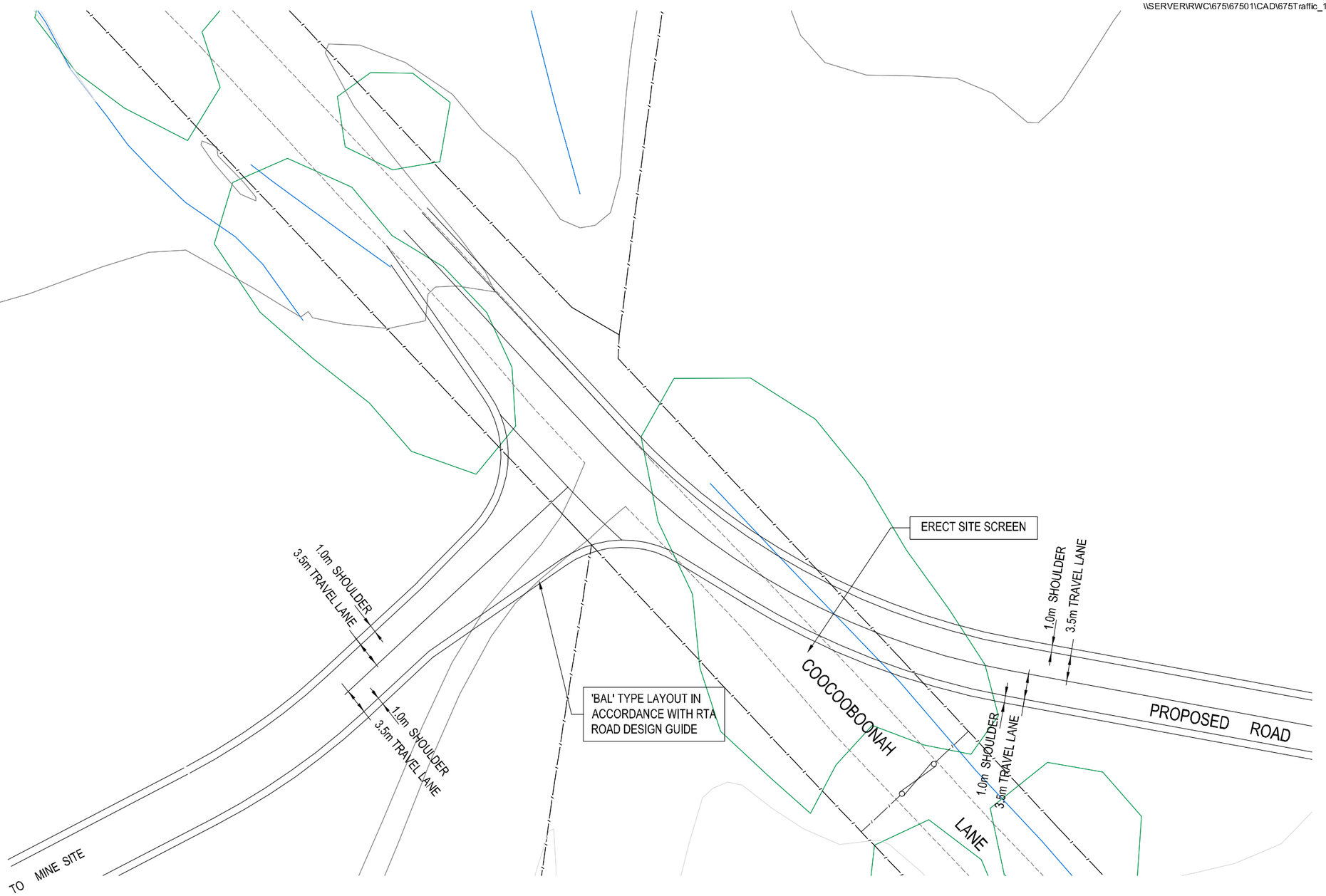

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SUNNYSIDE COAL PROJECT
COOCOOBOONAH LANE &
MINE SITE ENTRANCE

Drawing No. **2-1**

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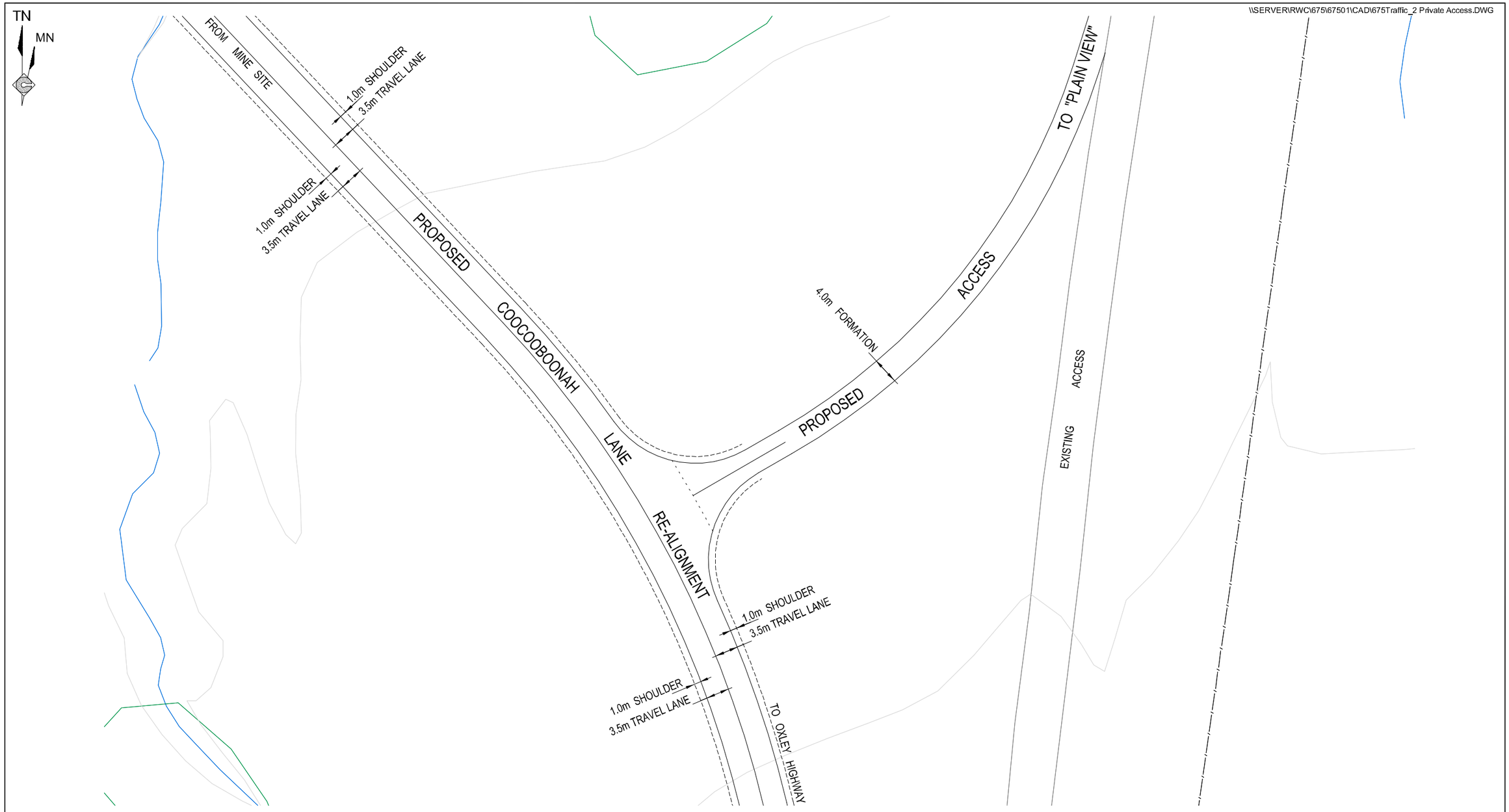

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SUNNYSIDE COAL PROJECT
PRIVATE ACCESS RE-ALIGNMENT

Drawing No. **2-2**

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PROPOSED ACCESS TO "LILYDALE"
4.0m FORMATION
FROM MINE SITE
3.5m TRAVEL LANE
1.0m SHOULDER
PROPOSED COOCOOBOONAH LANE RE-ALIGNMENT
1.0m SHOULDER
3.5m TRAVEL LANE
COOCOOBOONAH LANE

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SUNNYSIDE COAL PROJECT
PRIVATE ACCESS RE-ALIGNMENT
TO "LILYDALE"

Drawing No. **2-3**

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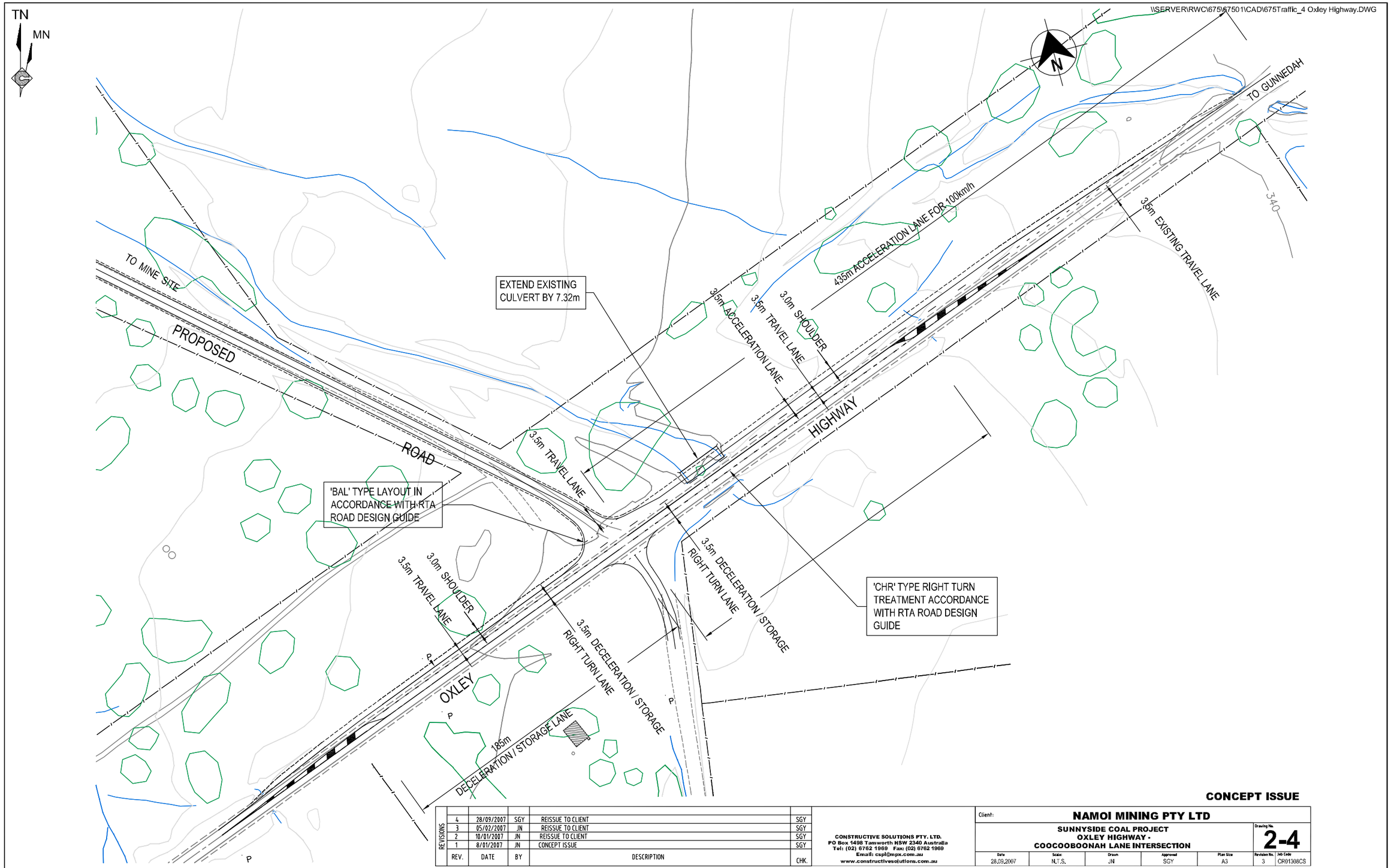

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SUNNYSIDE COAL PROJECT
OXLEY HIGHWAY -
COOCOOBOONAH LANE INTERSECTION

Drawing No. **2-4**

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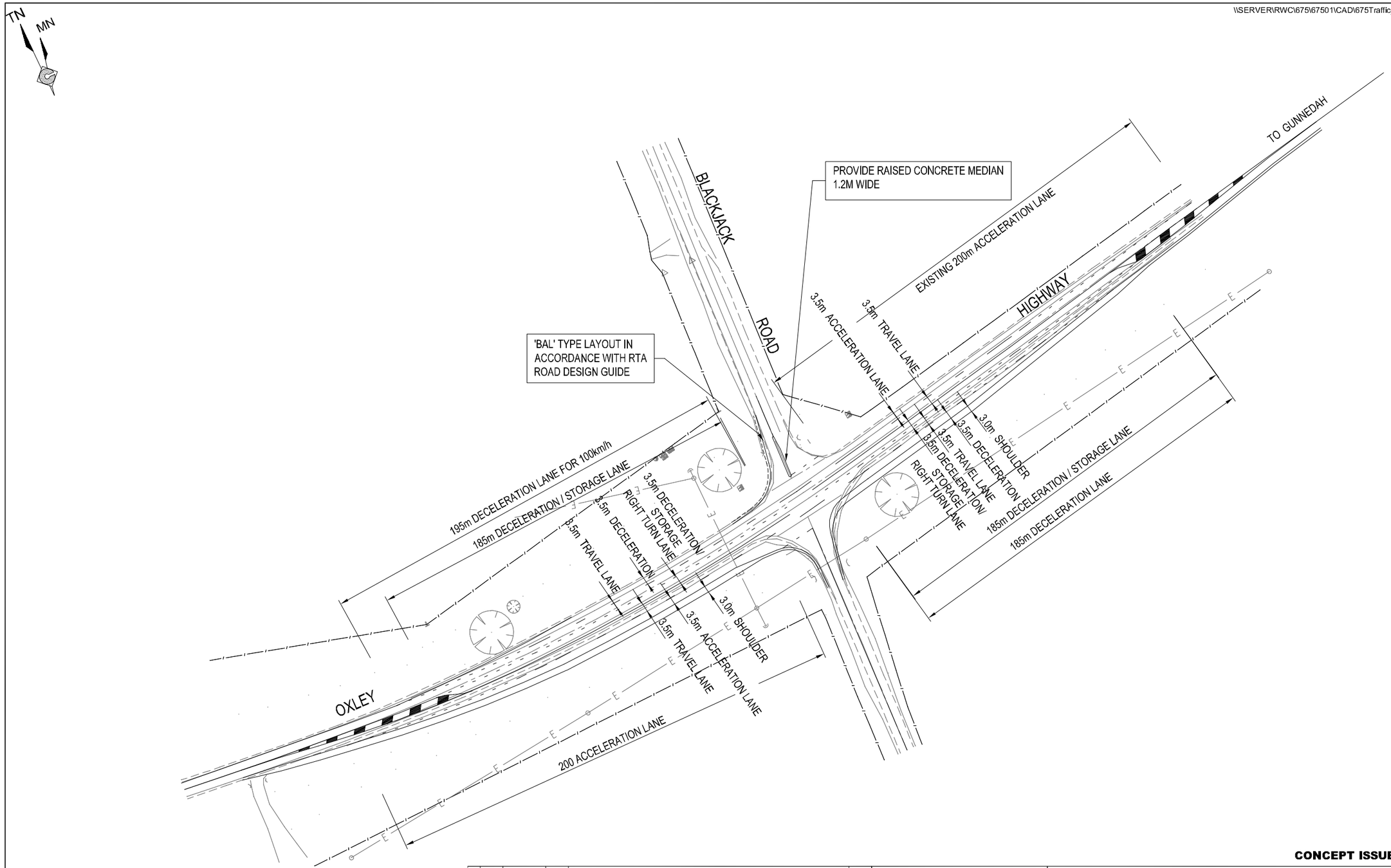

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OXLEY HIGHWAY -
BLACKJACK ROAD INTERSECTION

Drawing No. **2-5**

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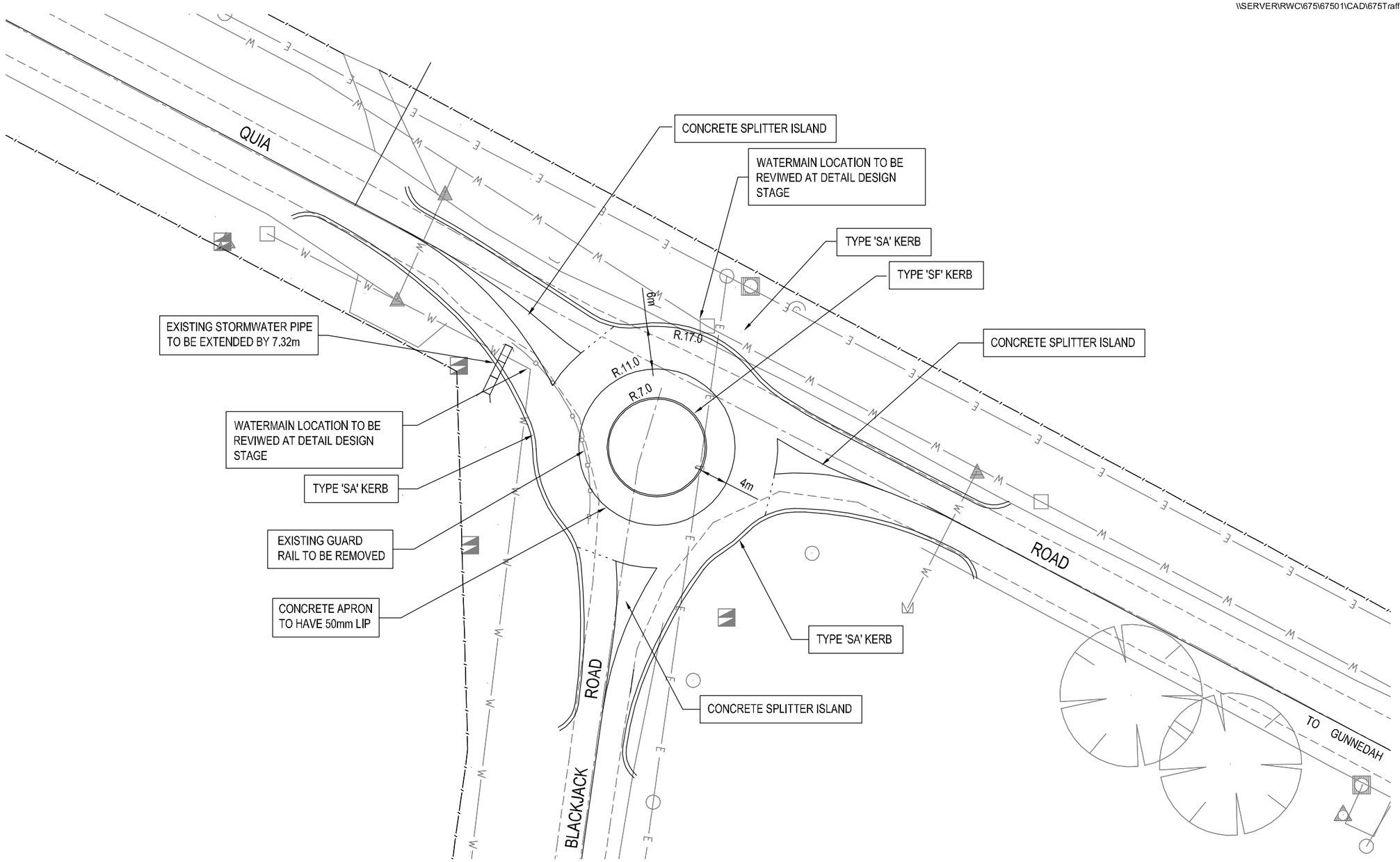

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SUNNYSIDE COAL PROJECT
QUIA ROAD - BLACKJACK ROAD INTERSECTION

Drawing No. **2-6**

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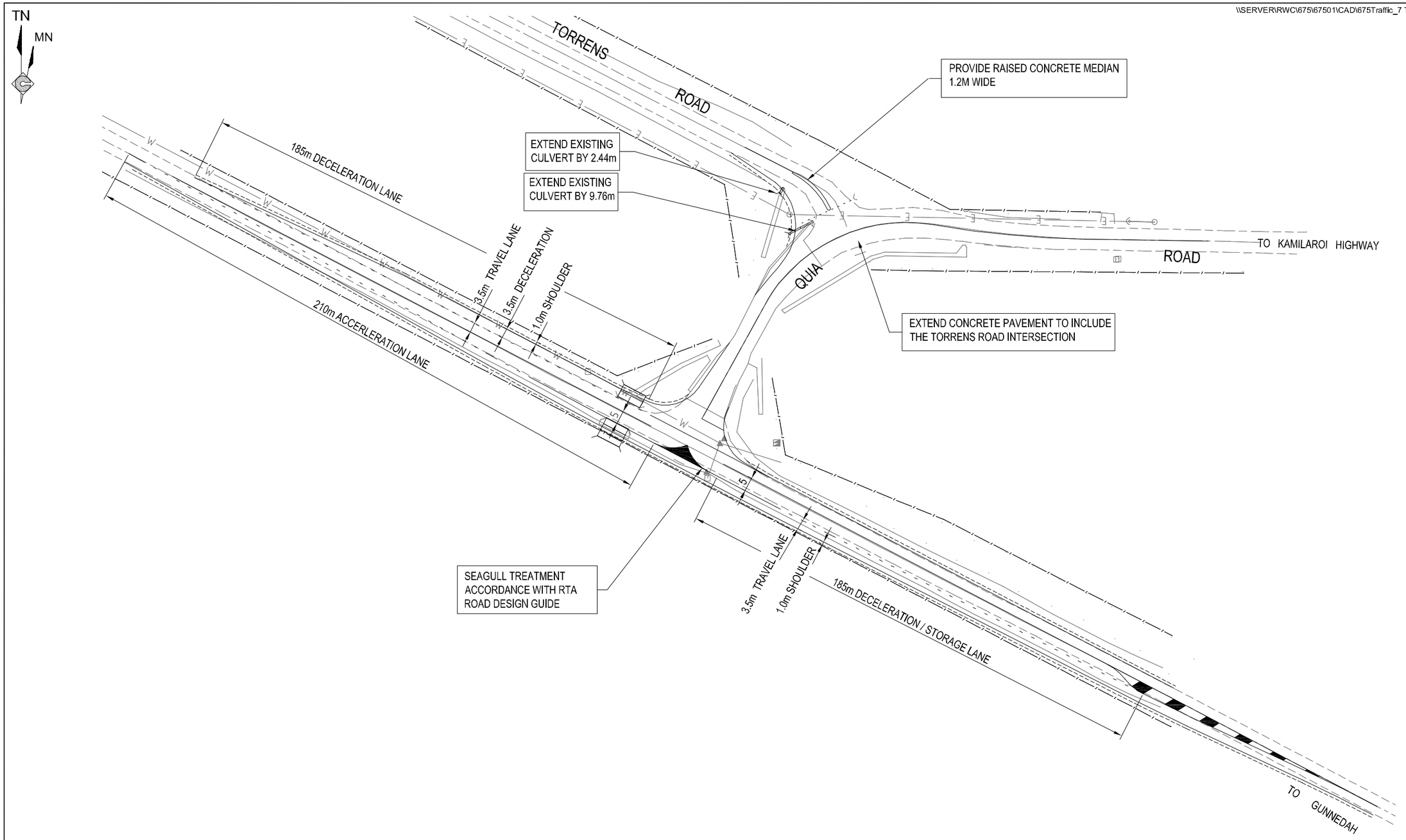

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SUNNYSIDE COAL PROJECT
TORRENS ROAD -
QUIA ROAD INTERSECTION

Drawing No. **2-7**

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Appendix 3

Coverage of Director-General's Requirements

(No. of pages excluding this page = 1)

Appendix 3
Coverage of Director-General's Requirements

Requirement		**Comments**	**Section No.**
Department of Planning	Traffic and transport – including a detailed quantitative traffic impact assessment of the proposed coal transport route and suitability of the intersections of the Oxley Highway with Coocooboonah Lane and Blackjack Road, and local roads from the Oxley Highway to the Whitehaven siding	The traffic and transport Assessment takes into consideration the coal transport route and all intersections between Sunnyside and the Whitehaven siding	
RTA	A traffic study should be undertaken	Completed	
	Austroads Part 5 – Intersections at Grade should be used	RTA Road Design Guide – Intersections at Grade was used	
	Impact of vibration, dust and road traffic noise	Dust should be mitigated by ensuring the entire haul route is sealed. Vibration and road traffic noise has been considered in separate reports	
	Blackjack and Quia Road could require upgrading to Councils local road standards	Roads inspected with Council representative. Ongoing discussions with Council required	
	If new access is required on Oxley Highway it is to be located where there is at least 250m sight distance	Utilising existing access	
	Eastbound left turning trucks may require acceleration lane	Acceleration lane included for left turning vehicles	
	New connections to the highway would require Councils approval and RTA concurrence	There are no new connections to the highway	
	Impacts on school bus routes need to be assessed	Recommendation regarding school bus routes has been made	
	If B-Doubles are used road infrastructure needs to cater for them	Oxley Highway, Blackjack and Quai Roads are approved for B-Double use. Recommendations for upgrades have taken into consideration B-Double use	
	Agreement beforehand sought as to the scope of road works on the Oxley highway so a determination is not delayed.	No prior agreement has been sought to date but will be sought once 2D layouts are finalised	