

# Appendix Q

---

## Mine development traffic and transport assessment



# **McPhillamys Gold Project**

## **Traffic and Transport Assessment**

Prepared for  
**EMM Consulting Pty Ltd**

**August 2019**

Report prepared by Constructive Solutions Pty Ltd

PO Box 1498  
TAMWORTH NSW 2340

Phone: 02 6762 1969

Fax: 02 6762 1969

Email: [admin@constructivesolutions.com.au](mailto:admin@constructivesolutions.com.au)

© 2019

This work is protected by copyright. Apart from any fair dealings for the purposes of study, research, criticism, or review, as permitted under the Copyright Act 1968, no part may be reproduced by any process without written permission. Copyright is the responsibility of the Director, Constructive Solutions Pty Ltd. Requests and enquiries should be directed to the Director, Constructive Solutions Pty Ltd, PO Box 1498, Tamworth, NSW 2340.

This report has been prepared in accordance with the scope of services described in the contract or agreement between Constructive Solutions Pty Ltd and the client. The report relies upon data, surveys, measurements and results taken at or under the particular times and conditions specified herein. Any findings, conclusions or recommendations only apply to the aforementioned circumstances and no greater reliance should be assumed or drawn. Constructive Solutions Pty Ltd does not warrant that the information provided is complete and disclaims all responsibility and liability for any loss or damage incurred as a result of relying solely on the accuracy or completeness of this information. Furthermore, the report has been prepared solely for use of the Client and Constructive Solutions Pty Ltd accepts no responsibility for its use by other parties.

Constructive Solutions Pty Ltd does not warrant the accuracy of any documents that are not provided directly by them in a hardcopy or non-editable electronic format.

## DOCUMENT HISTORY AND STATUS

Issue	Rev	Issued To	Date	Reviewed	Approved
1	A	Internal	22/03/19	M. Bloem	
1	0	Client	28/03/19	M. Bloem	
1	1	Client	07/06/19	M. Bloem	
1	2	Client	04/07/19	M. Bloem	
1	3	Client	10/07/19	M. Bloem	
1	4	Client	20/08/19	D. Greentree	J. Krick

Author: Doug Seymour

Project Manager: Doug Seymour

Project Name: McPhillamys Gold Project – Traffic and Transport Assessment

Project Number: 201907

Name of Client: EMM Consulting Pty Ltd

## Table of Contents

<b>1</b>	<b>Introduction .....</b>	<b>1</b>
1.1	Overview .....	1
1.2	Project Overview .....	1
1.3	Assessment Requirements .....	5
<b>2</b>	<b>The Surrounding Road Network .....</b>	<b>8</b>
2.1	The Study Area .....	8
2.2	Roads .....	9
2.2.1	Mid Western Highway .....	9
2.2.2	Great Western Highway .....	10
2.2.3	Dungeon Road .....	10
2.2.4	Vittoria Road .....	11
2.2.5	Guyong Road .....	12
2.3	Intersections .....	13
2.3.1	Mid Western Highway and Dungeon Road .....	13
2.3.2	Mid Western Highway and Guyong Road .....	13
2.3.3	Vittoria Road and Dungeon Road .....	14
2.3.4	Vittoria Road and Guyong Road .....	15
2.3.5	Mitchell Highway and Vittoria Road .....	16
2.3.6	Dungeon Road and the Existing Mine Access Road .....	16
2.4	Crash History .....	17
2.5	Bus Services .....	18
2.6	Pedestrian and Cyclist Activity .....	18
<b>3</b>	<b>Project Related Traffic .....</b>	<b>19</b>
3.1	Project Phases .....	19
3.1.1	Construction Phase .....	19
3.1.2	Operational Phase .....	19
3.1.3	Rehabilitation Phase .....	20
3.2	Traffic Data .....	20
3.2.1	Current and Forecast Background Traffic Volumes .....	20
3.2.2	Development Generated Traffic .....	21
3.3	Parking .....	22
3.4	Access to the Project Area .....	22
3.4.1	Existing Shared Property Access .....	23
3.4.2	Alternative Options 1 and 2 .....	23
3.4.3	Option 3 - Dungeon Road .....	23
3.4.4	Option 4 - Preferred Access to the Project Area .....	23
3.4.5	Internal Road Network .....	24
<b>4</b>	<b>Assessment and Recommendations .....</b>	<b>25</b>
4.1	Construction and Operational Traffic Impacts .....	25
4.1.1	Heavy Vehicle impacts .....	25
4.2	Warrants for Intersection Turn Treatments .....	25

4.3	Impacts on the Surrounding Road Network .....	27
4.3.1	Mid Western Highway .....	27
4.3.2	Great Western Highway .....	27
4.3.3	Guyong and Vittoria Roads .....	27
4.3.4	Closure of Dungeon Road .....	28
4.4	Buses .....	28
4.5	Pedestrians and Cyclists .....	28
4.6	Transport Management Plan (TMP) and Code of Conduct .....	29
4.7	Local Climate Conditions .....	29
4.8	Road Traffic Noise, Dust and Lighting. ....	30
4.9	Cumulative Traffic Impacts .....	30
<b>5</b>	<b>Conclusions .....</b>	<b>31</b>
<b>6</b>	<b>References .....</b>	<b>32</b>
	<b>Appendix 1: Crash History .....</b>	<b>A</b>
	<b>Appendix 2: Background Traffic Data .....</b>	<b>B</b>
	<b>Appendix 3: Project Personnel and Traffic Data .....</b>	<b>C</b>
	<b>Appendix 4: Option 4 Concept Design .....</b>	<b>D</b>
	<b>Appendix 5: Swept Paths .....</b>	<b>E</b>

## List of Figures

Figure 1 – Locality Plan .....	3
Figure 2 – Project Area Layout .....	4
Figure 3 – Surrounding Road Network and Traffic Count Locations .....	9
Figure 4 - Personnel and Vehicle Movements – Years 1 to 15 .....	21
Figure 5 - Personnel and Vehicle Movements – Months 1 to 24 .....	22
Figure 6 - Warrant for turn treatments - Months 10-11 5:30am-6:30am .....	26
Figure 7 - Combined Traffic - Mid Western Highway .....	27
Figure 8 - Combined Traffic - Guyong Road .....	28
Figure 9 – Fog Activated Sign .....	29

## List of Tables

Table 1 – DPIE Road and Transport related EARs .....	5
Table 2 – Agency Project Specific Assessment Recommendations .....	5
Table 3 – Crash Data (2013 to 2017) .....	17
Table 4 – Background and Forecast Traffic Volumes .....	20
Table 5 - Traffic Parameters (Vehicles Per Hour) .....	26

## List of Plates

Plate 1 – Mid Western Highway - Typical section .....	10
Plate 2 – Dungeon Road – Typical unsealed section .....	11

Plate 3 – Dungeon Road – Typical sealed section .....	11
Plate 4 – Vittoria Road - Typical section .....	12
Plate 5 – Guyong Road - Typical section.....	12
Plate 6 - Mid Western Highway – view east from Dungeon Road .....	13
Plate 7 – Mid Western Highway – view west from Dungeon Road.....	13
Plate 8 – View North of Dungeon Road from the Mid Western Highway .....	13
Plate 9 – Mid Western Highway – view east from Guyong Road .....	14
Plate 10 – Mid Western Highway – view west from Guyong Road.....	14
Plate 11 – View south of the Mid Western Highway from Guyong Road .....	14
Plate 12 – Vittoria Road – view north-east from Dungeon Road .....	14
Plate 13 – Vittoria Road – view south-west from Dungeon Road.....	14
Plate 14 - Dungeon Road – view south from Vittoria Road .....	15
Plate 15 – Vittoria Road – view north-west from Guyong Road .....	15
Plate 16 – Vittoria Road – view south-east from Guyong Road .....	15
Plate 17 - Guyong Road – view south-west from Vittoria Road.....	15
Plate 18 – Mitchell Highway – view east from Vittoria Road.....	16
Plate 19 – Mitchell Highway – view west from Vittoria Road .....	16
Plate 20 - Vittoria Road – view south-west from the Mitchell Highway.....	16
Plate 21 – Dungeon Road – view north-east from Dungeon Road.....	17
Plate 22 – Dungeon Road – view south-west from Dungeon Road .....	17
Plate 23 - Access Road – view south from Dungeon Road.....	17

## Commonly Used Acronyms

Abbreviation	Description
AADT	Average Annual Daily Traffic
AUL(s)	Auxiliary Left Turn Lane (short)
AUR	Auxiliary Right Turn Lane
BAL	Basic Left Turn Lane
BAR	Basic Right Turn Lane
CHR(s)	Channelised Right Turn Lane (short)
DPIE	Department of Planning, Industry and Environment
EARs	Environmental Assessment Requirements
EIS	Environmental Impact Statement
HV	Heavy Vehicle
LV	Light Vehicle
RMS	Roads and Maritime Services
SISD	Safe Intersection Site Distance
WAD	Works Authorisation Deed

# 1 Introduction

## 1.1 Overview

LFB Resources NL is seeking development consent for the construction and operation of the McPhillamys Gold Project, a greenfield open-cut gold mine and associated water supply pipeline in the Central West region of New South Wales (NSW). The Project application area is illustrated at a regional scale in **Figure 1**.

As shown in **Figure 1** the McPhillamys Gold Project comprises two key components; the mine site where the ore will be extracted, processed and gold produced for distribution to the market (the mine development), and an associated water pipeline which will enable the supply of water from approximately 90 km away near Lithgow to the mine site (the pipeline development). This report assesses the potential traffic and transport impacts associated with the mine development component of the McPhillamys Gold Project. References to 'the Project' throughout this report are therefore referring to the mine development only. The potential traffic and transport impacts associated with the pipeline development component are addressed in the main report of the Environmental Impact Statement (EIS) (Volume 1, EMM 2019) and Appendix AB.

LFB Resources NL is a 100% owned subsidiary of Regis Resources Limited (referred to from now on as Regis). The mine development project boundary (referred to from now on as the Project Area) is illustrated in Figure 2. The mine development is approximately 8 km north-east of Blayney, within the Blayney and Cabonne local government areas (LGAs).

This traffic and transport assessment report forms part of the Environmental Impact Statement (EIS). It documents the assessment methods, results and the initiatives built into the Project design to avoid and minimise traffic and transport impacts as a result of the Project, and the additional mitigation and management measures proposed to address residual impacts which cannot be avoided.

As part of the Project, a new intersection from the Mid Western Highway is proposed to enable vehicular access to the Project Area. It is also proposed that Dungeon Road will be closed in part as the Project Area encompasses most of the Dungeon Road alignment.

## 1.2 Project Overview

A full Project description is provided in Chapter 2 of the EIS (EMM 2019). The key components of the Project are as follows:

- Development and operation of an open-cut gold mine, comprising approximately one to two years of construction, approximately 10 years of mining and processing, and a closure period (including the final rehabilitation phase) of approximately three to four years, noting there may be some overlap of these phases. The total project life for which approval is sought is 15 years.
- Development and operation of a single circular open-cut mine with a diameter of approximately 1,050 metres (m) and a final depth of approximately 460 m, developed by conventional open-cut mining methods encompassing drill, blast, load and haul operations. Up to 8.5 million tonnes per annum (Mtpa) of ore will be extracted during the project life.
- Construction and use of a conventional carbon-in-leach processing facility with an approximate processing rate of 7 Mtpa to produce approximately 200,000 ounces, and up to 250,000 ounces, per annum of product gold. The processing facility will comprise a run-of-mine (ROM) pad and crushing, grinding, gravity, leaching, gold recovery, tailings thickening, cyanide destruction and tailings management circuits. Product gold will be taken off-site to customers via road transport.
- Placement of waste rock into a waste rock emplacement which will include encapsulation of material with the potential to produce a low pH leachate. A portion of the waste rock emplacement will be constructed and rehabilitated early in the project life to act as an amenity bund.
- Construction and use of an engineered tailings storage facility to store tailings material.
- Construction and operation of associated mine infrastructure, including:



- administration buildings;
  - workshop and stores facilities, including associated plant parking, laydown and hardstand areas, vehicle washdown facilities, and fuel and lubricant storage;
  - internal road network;
  - explosives magazine and ammonium nitrate emulsion (ANE) storage;
  - topsoil, subsoil and capping stockpiles;
  - ancillary facilities, including fences, access roads, car parking areas and communications infrastructure; and
  - on-site laboratory.
- Establishment and use of a site access road, and an intersection with the Mid Western Highway.
- Construction and operation of water management infrastructure, including a raw water storage dam, clean water and process water diversions and storages, and sediment control infrastructure.
- A peak construction workforce of approximately 710 full-time equivalent (FTE) workers (590 for the mine development and 120 for the pipeline development). During operations, an average workforce of around 260 FTE employees will be required, peaking at approximately 320 FTEs in around years four and five of the project.
- Construction and operation of a water supply pipeline (approximately 90 km long) from Centennial Coal's Angus Place and SCSO and EA's MPPS operations near Lithgow to the mine project area. The pipeline development will include approximately four pumping station facilities, a pressure-reducing system and a communication system. Approximately 13 megalitres per day (ML/day), up to a maximum of 16 ML/day, will be transferred for mining and processing operations.
- Installation and use of environmental management and monitoring equipment.
- Progressive rehabilitation throughout the mine life. At the end of mining, the mine infrastructure will be decommissioned, and disturbed areas will be rehabilitated to integrate with natural landforms as far as practicable. The final landform, apart from the final void, will support land uses similar to current land uses, or land uses which are consistent with the land-use strategies of the relevant LGAs.

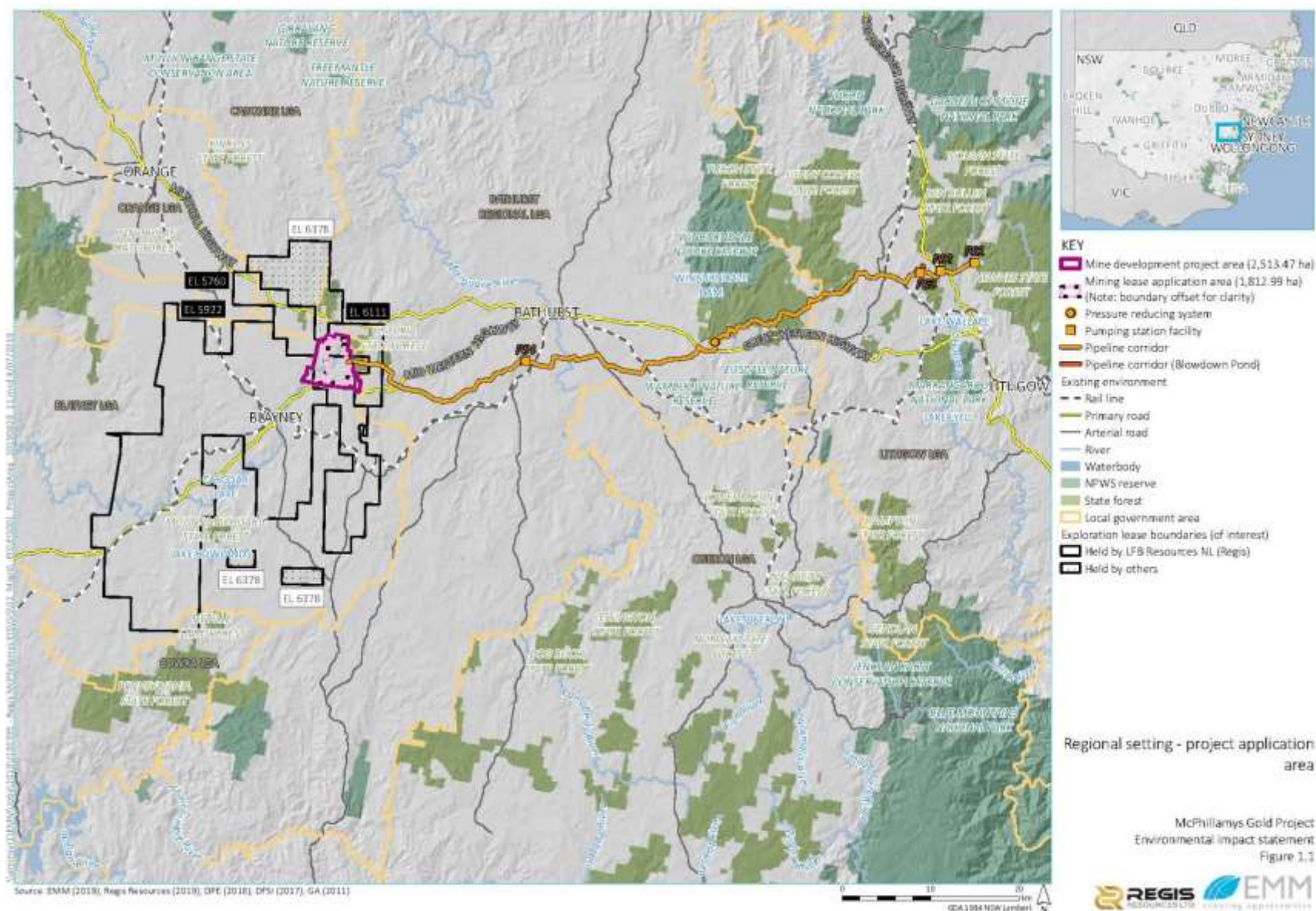


Figure 1 – Locality Plan

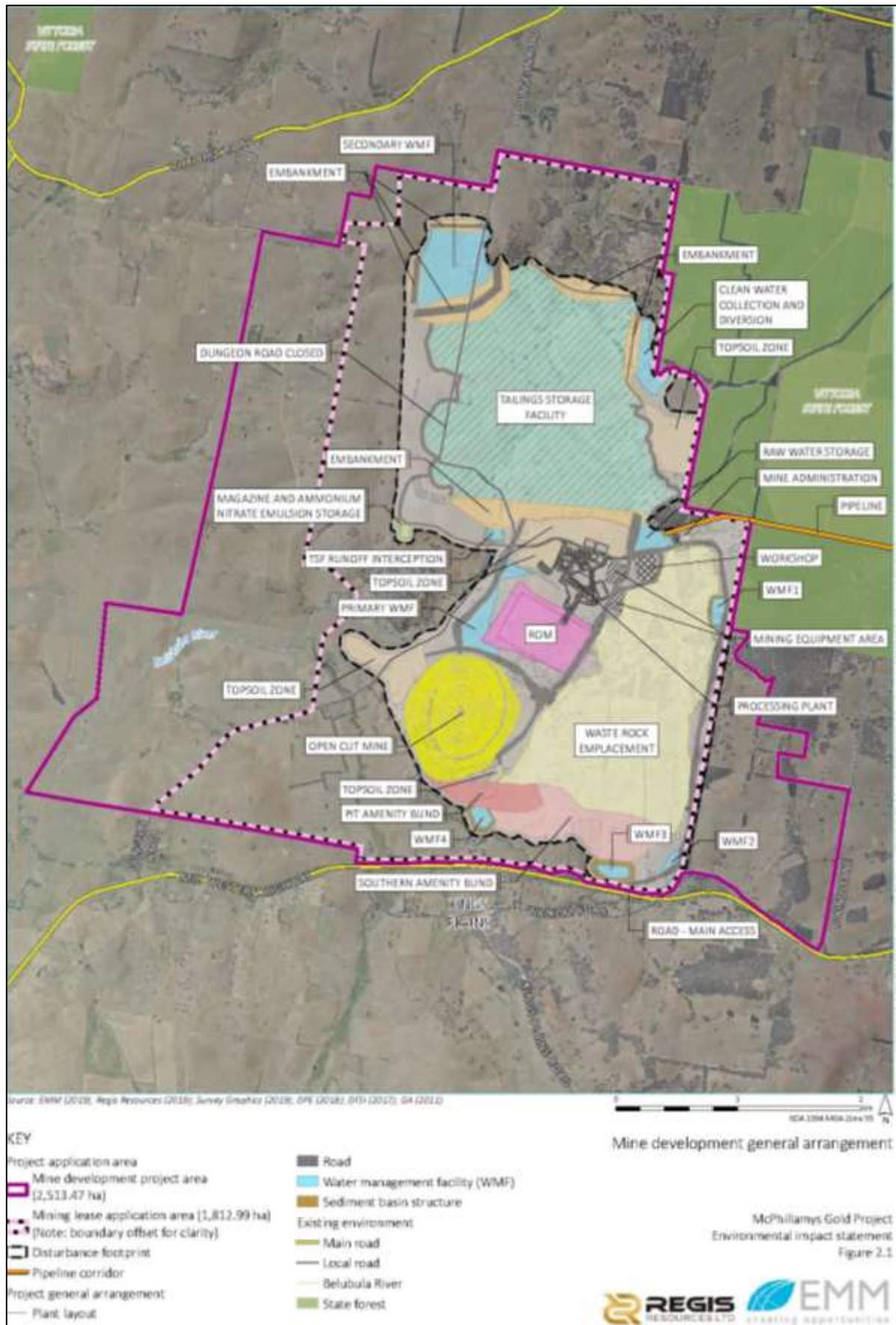


Figure 2 – Project Area Layout



### 1.3 Assessment Requirements

This report assesses the transport and traffic related impacts of the Project on the surrounding road network with reference to the following guidelines and standards:

- Guide to Traffic Generating Developments (RTA 2002);
- Road Design Guide (RMS) & relevant Austroads Standards; and
- Austroads Guide to Traffic Management Part 12: Traffic Impacts of Development.

This assessment has been prepared in accordance with requirements of the NSW Department of Planning, Industry and Environment (DPIE). These were set out in DPIE's Environmental Assessment Requirements (EARs) for the Project, issued on 24 July 2018 and revised on 19 December 2018. The EARs identify matters which must be addressed in the EIS and essentially form its terms of reference. **Table 1** lists individual requirements relevant to this traffic and transport assessment and where they are addressed in this report.

**Table 1 – DPIE Road and Transport related EARs**

Item	Description	Report Section
1	An assessment of the likely traffic and transport impacts of the development on the capacity, condition, safety and efficiency of the road network and any cumulative impacts of other developments in the locality;	4
2	An assessment of the site access routes (including Mid Western Highway and Great Western Highway) and site access points in accordance with the Roads Act 1993; and	2 & 3.4
3	A description of the measures that would be implemented to mitigate and / or manage potential traffic impacts including a schedule of all required road upgrades, road maintenance contributions, management of oversized and over mass traffic and other traffic control measures, developed in consultation with the relevant road authority (if required).	4

To inform the preparation of the EARs, DPIE invited other government agencies to recommend matters to be addressed in the EIS. These matters were taken into account by the Secretary for DPIE when preparing the EARs. Copies of the government agencies' advice to DPIE were attached to the EARs.

RMS and Cabonne Council raised matters relevant to the traffic and transport assessment. The matters raised are listed in **Table 2** and have been taken into account in preparing this assessment.

**Table 2 – Agency Project Specific Assessment Recommendations**

Item	Agency	Description	Report Section
1	RMS	A traffic impact study prepared in accordance with the methodology set out in Section 2 of the Guide RTAs Guide to Traffic Generating Developments 2002, including:	Entire Report
2	RMS	Hours and days of construction;	3.1.1
3	RMS	Schedule for phasing/staging of the Project;	3.1
4	RMS	Traffic volumes: Existing background traffic;	3.2.1
5	RMS	Traffic volumes: Project related traffic for each stage of the Project including construction, operation and decommission;	3.2.2

Item	Agency	Description	Report Section
6	RMS	Traffic volumes: Projected cumulative traffic volumes;	4.3
7	RMS	Ratio of light vehicles to heavy vehicles;	3.1.1 & 3.1.2
8	RMS	Peak times for existing traffic;	3.2.1
9	RMS	Peaks times for Project-related traffic;	3.1.1 & 3.1.2
10	RMS	Transportation hours;	N/A
11	RMS	Project related traffic interaction with existing and projected background traffic;	4.1, 4.2, 4.3
12	RMS	The origin, destination and routes for: Employee and contractor light traffic;	3.1.1 & 3.1.2
13	RMS	The origin, destination and routes for: Heavy traffic;	3.1.1 & 3.1.2
14	RMS	The origin, destination and routes for: Over size and over mass traffic;	4.1.1
15	RMS	A description of all over size and over mass vehicles and the materials to be transported, including proposed travel routes;	4.1.1
16	RMS	The impact of traffic generation on the public road network and measures employed to ensure traffic efficiency and road safety during construction, operation and decommissioning of the Project;	4
17	RMS	The need for improvements to the road network, and the improvements proposed such as road widening and intersection treatments, to cater for and mitigate the impact of Project related traffic;	4
18	RMS	At the proposed mine location, the Mid Western Highway, pursuant to section 49 of the Roads Act 1993 (please see Attachment 1) is a controlled access road. There are currently four agreed access points along the frontage to the Mid Western Highway with two being coincident. The proposed mine site entrance does not currently match any of the current locations. Once a new access point is agreed in consultation with Roads and Maritime and relevant stakeholders, the remaining current accesses should be removed. Scope for access by Emergency vehicles needs to be considered and catered for appropriately;	3.4
19	RMS	Proposed road facilities, access and intersection treatments are to be identified and be in accordance with Austroads Guide to Road Design including Safe Intersection Sight Distance (SISD);	3.4.4 & 4.2
20	RMS	The layout of the internal road network, parking facilities and infrastructure within the Project boundary;	Figure 2
21	RMS	An assessment of the likely risks to public safety, in particular, transport and use of any dangerous goods, and in accordance with State Environmental Planning Policy No. 33 Hazardous and Offensive Development and transporting reagents in accordance with the requirements of Australian Dangerous Goods Code and Australian Standard 4452 Storage and Handling of Toxic Substances;	Refer to Chapter 18 of the EIS and separate Preliminary Hazard Analysis Report contained in

Item	Agency	Description	Report Section
			Appendix R of the EIS
22	RMS	Identification and assessment of potential impacts of mining operations, such as blasting, lighting, visual and drainage, including the pipeline development on the function and integrity of all affected roads;	Refer to separate reports for pipeline, blasting, lighting, visual and drainage impact assessments
23	RMS	The mine site will be visible to motorists using the Mid Western Highway as well as public vantage points to the south and west. Roads and Maritime will await further investigation into impacts of lighting from the site and potential mitigating measures such as establishing visual screens, construction of buildings and structures using non-reflective cladding and colours;	Refer to separate Visual Assessment Report
24	RMS	Local climate conditions that may affect road safety for mine related traffic during construction, operation and decommissioning of the Project (e.g. fog, wet and dry weather, icy road conditions);	4.7
25	RMS	A Traffic Management Plan (TMP) developed in consultation with relevant councils and Roads and Maritime. The TMP is to identify and provide management strategies to manage the impacts to Project related traffic, including: <ul style="list-style-type: none"> <li>• Haulage of materials to site; and</li> <li>• The management and coordination of construction and staff vehicle movements to and from site and measures to be employed to limit disruption to other motorists. The management of construction staff access to the work site is to include strategies and measures employed to manage the risks of driver fatigue, road hazards and driver behaviour. This is to include a Driver Code of Conduct.</li> </ul>	4.6
26	RMS	Roads and Maritime requests the following be addressed in the Environmental Assessment regarding the Pipeline Development as outlined in Appendix 1: <ul style="list-style-type: none"> <li>• The Great Western Highway (HW5) is a Controlled Access Road, under section 49 of the Roads Act 1993 where the proposed pipeline crosses;</li> <li>• A Construction Management Plan (CMP) is to be developed for the pipeline development in consultation with Roads and Maritime and bounding Councils; and</li> <li>• The CMP is to detail how traffic generation, traffic movements and construction activities on or close to the classified road network will be managed to ensure the safety and traffic efficiency of the classified road network is not compromised by construction activities.</li> </ul>	Refer to Section 3.4 regarding controlled access road  Refer to separate pipeline impact assessment report for the CMP
27	Cabonne Council	Traffic and Transport Issues: <ul style="list-style-type: none"> <li>• Access;</li> </ul>	3.4
28		<ul style="list-style-type: none"> <li>• Use of public roads/crown lands;</li> </ul>	2 & 4
29		<ul style="list-style-type: none"> <li>• Increased truck traffic levels on main roads; and</li> </ul>	4.3
30		<ul style="list-style-type: none"> <li>• Truck traffic levels and impact upon local roads.</li> </ul>	4.1.1 & 4.3

## 2 The Surrounding Road Network

### 2.1 The Study Area

An inspection of the roads in the vicinity of the Project Area was conducted on 11 May 2017. The roads of the study area are shown in **Figure 3** and include:

- Mid Western Highway (Walkom Road (East) to Guyong Road);
- Dungeon Road (Mid Western Highway to Vittoria Road);
- Vittoria Road (Guyong Road to Mitchell Highway); and
- Guyong Road (Mid Western Highway to Vittoria Road).

Access to the Project Area is currently from Dungeon Road via the Mid Western Highway. Traffic travelling to the Project Area from Blayney and Bathurst will use the Mid Western Highway whilst traffic originating from the north and west are anticipated to use Vittoria Road and Guyong Road (for example from Orange).

The Mid Western Highway is a state road controlled by RMS. All other local roads as listed above are partially located within both the Blayney Shire Council (BSC) and Cabonne Council areas. Each council is responsible for the section of each road within their Local Government Area (LGA).

Observations from the inspection of these roads are outlined in the following sections.

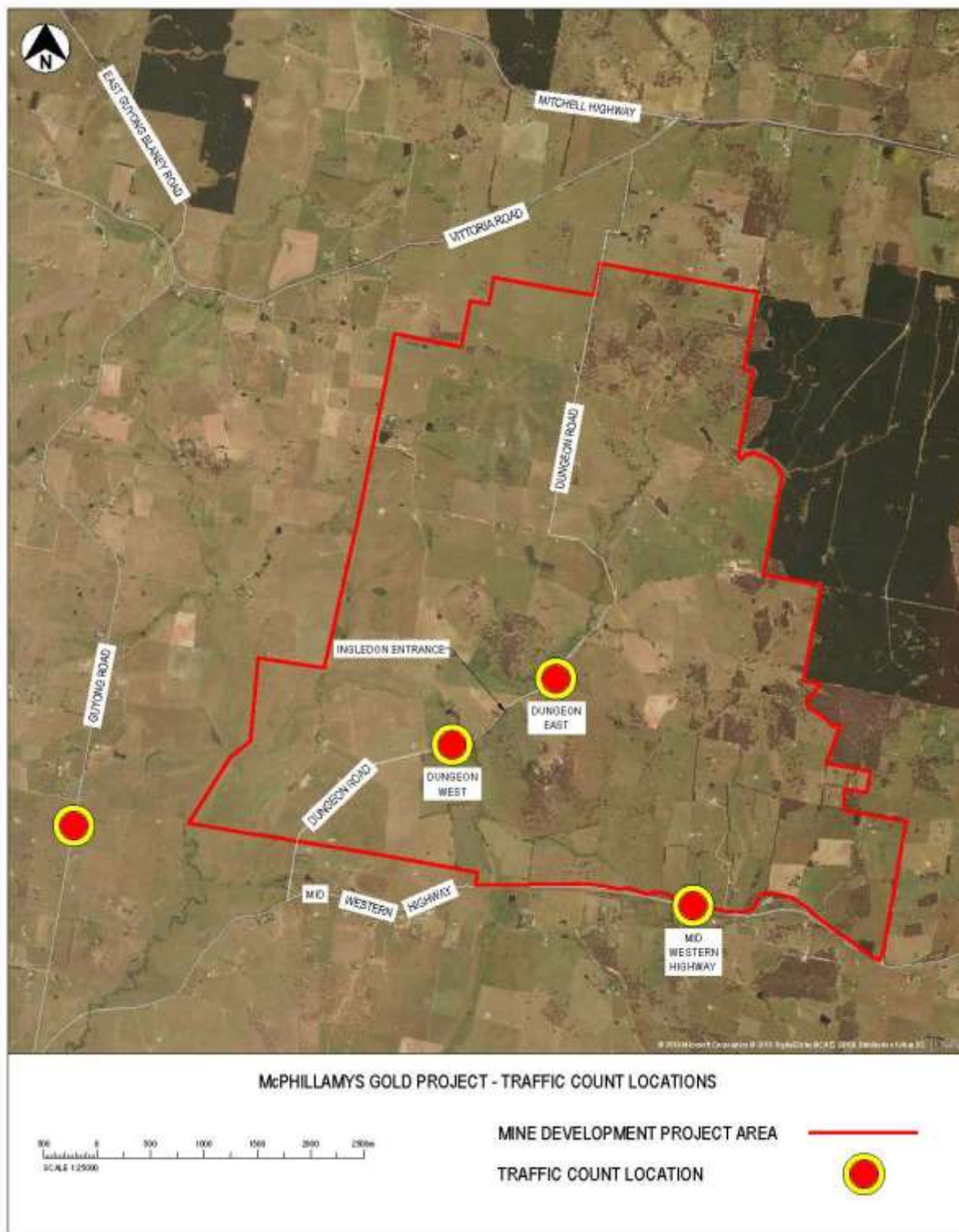


Figure 3 – Surrounding Road Network and Traffic Count Locations

## 2.2 Roads

### 2.2.1 Mid Western Highway

The Mid Western Highway is a classified road referred to as State Highway 6 (SH6) and provides a link from Bathurst to the east with the Cobb Highway at Hay to the west. It is a transport route for regional centres including Bathurst, Blayney, Cowra, and Hay.



In the vicinity of the Project Area, the Mid Western Highway is a two-lane / two-way bitumen sealed road. The travel lanes are 3.5m wide with 1m sealed shoulders and delineation consists of line marking, inclusive of centre line and edge lines, and guide posts (refer **Plate 1**).



**Plate 1 – Mid Western Highway - Typical section**

Pavement and wearing course are considered to generally be in good condition however some rutting and isolated failures were observed during the inspection. The posted speed limit is 100km/h and the Highway travels in an east-west direction in the vicinity of the Project Area.

The Mid Western Highway is identified as approved for B-double heavy vehicles up to 25m in length from the RMS online interactive Restricted Access Vehicle Maps<sup>1</sup>.

### **2.2.2 Great Western Highway**

The Great Western Highway is a classified road referred to as State Highway 5 (SH5). It provides a link from Sydney in the east to the Mid Western Highway at Bathurst to the west and varies in configuration from a two lane / two way road to a four lane dual carriageway.

The Great Western Highway will be used as part of the transport route for Project deliveries from Sydney and is identified as approved for heavy vehicle combinations up to 19m in length from the RMS online interactive Restricted Access Vehicle Maps<sup>1</sup>.

### **2.2.3 Dungeon Road**

Dungeon Road is a local road that provides access to numerous rural properties and the Project Area. It is approximately 9.3km long and joins the Mid Western Highway in the south and Vittoria Road to the north.

Dungeon Road is predominantly unsealed with a formation width that varies between approximately 4m to 6m. The gravel pavement is considered to generally be in good condition with some potholes and corrugations observed during the inspection (refer **Plate 2**). There is a 300m long sealed section located approximately 2.5km north of the Mid Western Highway which is situated in a low lying area that is regularly inundated by floodwater. The bitumen seal width is approximately 4 to 5m and there were a number of pothole failures observed during the inspection (refer **Plate 3**).

---

<sup>1</sup> RMS Website – 21/03/2019



**Plate 2 – Dungeon Road – Typical unsealed section**



**Plate 3 – Dungeon Road – Typical sealed section**

Delineation consists of limited guideposts only. There is no posted speed limit, however the adjoining Mid Western Highway is signposted at 100km/h.

The alignment is windy, undulating and steep in places. There are numerous substandard curves with no curve warning signs in place, including three 90-degree bends.

There are numerous trees, fallen branches, and fence corner posts located within the clear zone. There are a total of 17 single and multi-cell pipe and box culverts located along Dungeon Road. The width between headwalls varies from approximately 4.5m to 10m.

The local government area boundary between BSC and Cabonne Council is located approximately 7.4km north of the Mid Western Highway. Both ends of the Cabonne Council section of Dungeon Road are signposted with gravel road warning signs.

#### **2.2.4 Vittoria Road**

Vittoria Road is a regional road that travels in an east-west direction between the Mitchell Highway and the town of Millthorpe. For the purpose of this assessment, a 5.2km section of Vittoria Road from the Mitchell Highway to the Guyong Road intersection was inspected as described below.

Vittoria Road is a sealed road with a bitumen seal width varying between approximately 5.5 to 7m. The seal is considered to be in good condition with some pothole repairs observed in numerous locations during the inspection. Line marking consists of a centre line only and this was faded in numerous locations.

There is no posted speed limit, however the adjoining Mitchell Highway is signposted at 100km/h. A 10t load limit sign for through traffic only is posted at the Mitchell Highway end of Vittoria Road.

The road cross-section is typical of a rural road consisting of table drains and culvert crossings with headwalls to cater for drainage. Delineation consists of intermittent guideposts only. Refer to **Plate 4** for typical road cross section.



**Plate 4 – Vittoria Road - Typical section**

### **2.2.5 Guyong Road**

Guyong Road is a local road that joins the Mid Western Highway in the south and Vittoria Road to the north. The road is approximately 8.4km in length and is sealed with bitumen for its entirety. Delineation consists of guideposts and centre line marking for approximately the first 2.2km north of the Mid Western Highway. There is no posted speed limit however the adjoining Mid Western Highway is 100km/h.

Pavement and seal condition vary from good to average. The bitumen seal width varies from approximately 5m to 8m and a 1.3km section commencing at Chainage 5.7km has been recently rehabilitated inclusive of a 6m wide bitumen seal.

The road cross-section is typical of a rural road consisting of table drains and culvert crossings with headwalls to cater for drainage. The local government area boundary between Blayney and Cabonne is signposted at Chainage 8.1km. Refer to **Plate 5** for typical road cross section.



**Plate 5 – Guyong Road - Typical section**

## 2.3 Intersections

### 2.3.1 Mid Western Highway and Dungeon Road

The intersection of the Mid Western Highway and Dungeon Road was upgraded in 2014 in conjunction with the realignment of the Highway to the west of the intersection. Turning manoeuvres are catered for on the Highway with a Basic Left (BAL) turn lane for east bound traffic and a Short Channelised Right (CHR(s)) turn lane for west bound traffic.

Safe Intersection Sight Distance (SISD) is approximately 250m to the east and approximately 300m to the west. The give way signs on Dungeon Road are duplicated on both sides of the road and a sight board is appropriately located opposite the intersection. The bitumen seal and line marking are considered to be in good condition (refer **Plate 6** to **Plate 8**).



**Plate 6 - Mid Western Highway – view east from  
Dungeon Road**



**Plate 7 – Mid Western Highway – view west from  
Dungeon Road**



**Plate 8 – View North of Dungeon Road from the Mid Western Highway**

### 2.3.2 Mid Western Highway and Guyong Road

Guyong Road intersects with the Mid Western Highway at an acute angle of approximately 25 degrees and there is an Auxiliary Right (AUR) turn lane on the Highway for west bound traffic to aid turning movements. Sight distance is greater than 300m in both directions and signage consists of a give way sign, sight board located opposite the intersection, and intersection warning signs on both approaches along the Highway. There is a continuity line at the intersection but no give way (TB) line. Pavement is considered to be in good condition in the mouth of the intersection (refer **Plate 9** to **Plate 11**).





**Plate 9 – Mid Western Highway – view east from Guyong Road**



**Plate 10 – Mid Western Highway – view west from Guyong Road**



**Plate 11 – View south of the Mid Western Highway from Guyong Road**

### **2.3.3 Vittoria Road and Dungeon Road**

The intersection of Vittoria Road and Dungeon Road is a basic rural T-intersection configuration with Vittoria Road as the priority road. The mouth of the intersection is unsealed and there are no signs or line marking other than street name finger board signs. Sight distance to the north-east is approximately 150m and approximately 200m to the south-west (refer **Plate 12** to **Plate 14**).



**Plate 12 – Vittoria Road – view north-east from Dungeon Road**



**Plate 13 – Vittoria Road – view south-west from Dungeon Road**



**Plate 14 - Dungeon Road – view south from Vittoria Road**

#### **2.3.4 Vittoria Road and Guyong Road**

The intersection of Vittoria Road and Guyong Road is a basic rural T-intersection configuration with Vittoria Road as the priority road. Signage consists of intersection warning signs on all three approaches and a sight board located opposite the intersection. There is no give way sign or line marking. Sight distance to the north-west is approximately 250m and approximately 175m to the south-east (refer **Plate 15** to **Plate 17**).



**Plate 15 – Vittoria Road – view north-west from Guyong Road**



**Plate 16 – Vittoria Road – view south-east from Guyong Road**



**Plate 17 - Guyong Road – view south-west from Vittoria Road**

### 2.3.5 Mitchell Highway and Vittoria Road

The intersection of the Mitchell Highway and Vittoria Road is a T-intersection configuration inclusive of a CHR turn lane for east bound traffic on the Highway and an Auxiliary Left (AUL) turn lane for west bound traffic on the Highway. Signage consists of a give way sign, T-junction warning signs on all three approaches and a sight board located opposite the intersection. Line marking is complete and the bitumen seal is considered to be in good condition. Sight distance in both directions is approximately 250m (refer **Plate 18** to **Plate 20**).



**Plate 18 – Mitchell Highway – view east from Vittoria Road**



**Plate 19 – Mitchell Highway – view west from Vittoria Road**



**Plate 20 - Vittoria Road – view south-west from the Mitchell Highway**

### 2.3.6 Dungeon Road and the Existing Mine Access Road

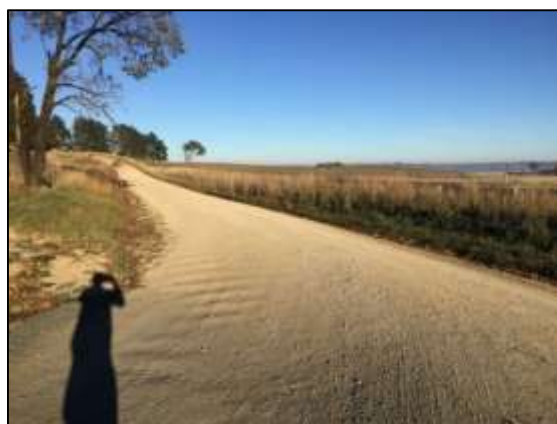
The intersection of Dungeon Road and the existing access to the mine exploration area is a basic rural T-intersection. The intersection is located approximately 3.1km north-east of the Mid Western Highway. Both Dungeon Road and the access road are unsealed.

The mouth of the intersection has been constructed wide enough to cater for the turning movements of long articulated vehicles. Two warning signs are located approximately 200m either side of the existing access to the Project Area along Dungeon Road.

Sight distance to the north-east is approximately 200m as it is obscured by a large tree located within the clear zone. Sight distance to the south-west is also limited to approximately 200m due to crest along Dungeon Road. (refer **Plate 21** to **Plate 23**).



**Plate 21 – Dungeon Road – view north-east from  
Dungeon Road**



**Plate 22 – Dungeon Road – view south-west from  
Dungeon Road**



**Plate 23 - Access Road – view south from Dungeon Road**

## 2.4 Crash History

Crash data for a five-year period from 2013 to 2017 from the NSW Government Centre for Road Safety Interactive Crashes website<sup>2</sup> was used to assess the crash history in the vicinity of the Project. Three crashes were reported on the Mid Western Highway, three crashes on Guyong Road, three crashes on Vittoria Road and no crashes on Dungeon Road.

The crash data is summarized in **Table 3**. Refer **Appendix 1** for a map on the crash sites and more detailed information from the website.

**Table 3 – Crash Data (2013 to 2017)**

Road	Location	Accident Type	Degree of crash
Mid Western Highway	2-way undivided	Rear end	Moderate Injury
	Walkom Rd East intersection	Head on	Serious Injury
	2-way undivided	Head on	Moderate Injury
Guyong Road	2-way undivided	Off bend	Moderate Injury
	2-way undivided	Off bend hit object	Fatal
	2-way undivided	Leaving parking	Moderate Injury

<sup>2</sup> RMS Centre for Road Safety Website – Interactive crash statistics – 9/03/2019



Road	Location	Accident Type	Degree of crash
Vittoria Road	2-way undivided	Struck Animal	Non-Casualty
	2-way undivided	Off bend hit object	Moderate Injury
	2-way undivided	Out of control on bend	Moderate Injury

The number of crashes reported is minor given the volume of traffic using these roads. No repetitive or reoccurring accident patterns were identified and it is therefore considered that the reported crash history in the vicinity of the Project does not indicate any areas of concern within the road network.

## 2.5 Bus Services

Several school buses operate along the Mid Western Highway, Walkom Road, Guyong Road, and Vittoria Road during morning and afternoon school times (7:30am to 9:00am and 3:30pm to 4:45pm). The school buses stop at informal locations along these roads to pick up and drop off passengers. (i.e.: side road intersections and property entrances).

Transport for NSW operates a bus service between Blayney and Bathurst along the Mid Western Highway multiple times per day and there are no bus stops in the vicinity of the Project Area.

## 2.6 Pedestrian and Cyclist Activity

No pedestrians or cyclists were observed during the inspections on the Mid Western Highway or the Council roads in the vicinity of the Project Area. As the surrounding area is rural, there are no dedicated on-road cycleways or off-road shared paths (for cyclists and pedestrians) along the surrounding road network.

## 3 Project Related Traffic

### 3.1 Project Phases

#### 3.1.1 Construction Phase

There will be overlap between the construction and operational phases of the Project. Construction of the processing plant and other site infrastructure and mine development activities will commence at the beginning of Year 1. Mining operations are anticipated to start in the middle of Year 1 while the construction phase of the processing plant and other site infrastructure will continue until around the middle of Year 2.

For the purposes of this Traffic and Transport Assessment, the construction phase of the Project is defined from the start of construction works and mine development activities until the completion of the processing plant mid Year 2 (Months 12 to 18).

The first six months of construction of the mine development will generally be carried out during standard construction hours as per the Interim Construction Noise Guideline (ICNG)(DECC 2009):

- Monday to Friday - 7:00am to 6:00pm
- Saturday – 8:00am to 1:00pm
- No work on Sundays or public holidays.

Outside of these hours, some works will be carried as required such as low intensity construction activities, environmental management such as dust control, delivery of oversized equipment, and servicing of equipment.

After six months, construction and mine development activities will be carried out 24 hours per day, 7 days per week in 12 hour shifts changing over at around 7am and 6pm for the remainder of the construction phase. Construction personnel will generally undertake rotating shifts of 4 weeks on and 1 week off resulting in a maximum of 80% of these workers within the Project Area during any one day.

The majority of construction workers are expected to be transported to the Project Area in mini buses with the remainder using light vehicles (LV) with some workers anticipated to carpool. The average occupancy rate of each vehicle is estimated to be 6 persons per mini bus and 1.5 persons per LV.

Workers for all phases are likely to commute to the Project Area from the towns in the surrounding area including Blayney, Bathurst, Orange and Cowra. It has therefore been estimated that approximately 80% of the construction workforce traffic will originate from the west (Blayney) and approximately 20% will originate from the east (Bathurst).

It is anticipated that the peak construction workforce and subsequent peak traffic movements will occur during months 10 and 11 of the construction phase as shown in **Figure 5**.

Construction deliveries are anticipated to peak at 30 LV and 20 heavy vehicles (HV) during month 3 of the construction phase before tapering back to 20 LV and 10 HV for the remainder of the construction period. The expected origin of these vehicles is 30% from the west (Blayney and Orange) and 70% from the east (Bathurst) on the Mid Western Highway. The ratio of HV to LV accessing the Project Area is anticipated to peak at 7% during month 2 of the construction period before tapering down to 3% during mining operations.

Construction traffic will initially use the existing entrance to the Project Area via Dungeon Road. Once the new access off the Mid Western Highway is complete and available for use, all construction traffic will then switch to the new access.

#### 3.1.2 Operational Phase

For the purposes of this Traffic and Transport Assessment, the operational phase of the Project begins from the start of commissioning of the processing plant and processing operations in the middle of Year 2 (around month 15) with operations anticipated to finish by Year 11.

Full scale mining and processing operations will commence in month 7 and month 16 respectively. Mining operations will initially be undertaken over a 12 hour daytime shift (between 6:30am and

6:30pm), progressing to 24 hours per day. Processing operations will be 24 hours per day with two 12 hour shifts changing over at 6:30am and 6:30pm respectively). Operational shift personnel will work a rotating roster of 5 days on, followed by 5 nights on, then 5 days off.

Office based administrative personnel will generally work a day shift from 7:30am to 5:30pm, Monday to Friday.

Operational and administrative personnel are expected to travel to the Project Area in private vehicles during normal operations, however, mini buses may be used during maintenance shutdown periods. Occupancy of these vehicles is estimated to be 1.25 per LV and 6 persons per minibus. As with the case during the construction phase, it has been assumed that 80% of operational and administrative personnel traffic will originate from the west (Blayney and Orange) and 20% will originate from the east (Bathurst).

The mine will operate as a 'drive in drive out operation' meaning all material extracted from the Project Area will be processed on-site and as a result, there will be no HV haulage of ore from the Project Area. The only HV movements to and from the Project Area will be for delivery of reagents and goods. The ratio of HV to LV vehicles is anticipated to be 3% throughout the mining operation phase.

Deliveries and visitors to the Project Area are estimated to be approximately 30 (20 LV and 10 HV) during mining operations. The directional origin of these deliveries and visitors is anticipated to be the same as construction traffic at 30% from the west (Blayney and Orange) and 70% from the east (Bathurst).

### 3.1.3 Rehabilitation Phase

Following the completion of the operation phase, rehabilitation of the Project Area will take place for approximately a further 4 years with minimal staff after which the Project Area will be closed. The numbers of workers for all three phases are shown in **Figure 4**.

## 3.2 Traffic Data

### 3.2.1 Current and Forecast Background Traffic Volumes

Background traffic counts were undertaken on the Mid Western Highway, Dungeon Road and Guyong Road for a two week period from 1 February 2017 to 16 February 2017. The locations of the traffic counts are shown on **Figure 3** and copies of the traffic count reports are included in **Appendix 2**. **Table 4** shows the current and forecast traffic volumes as annual average daily traffic (AADT) and percentage of heavy vehicles (%HV).

Analysis of historic traffic counts on the Mid Western Highway from 2015 to 2017 indicated that the average growth was 1% per annum however, for the purposes of this assessment a conservative growth rate of 2% has been adopted for all roads. Using the 2% growth rate, the estimated background traffic at the start and end of the expected 15-year Project life for all roads is provided in **Table 4**.

**Table 4 – Background and Forecast Traffic Volumes**

Road	Location	Background Traffic (2017)		Forecast Traffic (Year 1 - 2020)		Forecast Traffic (Year 15 - 2034)	
		AADT	HV%	AADT	HV%	AADT	HV%
Mid Western Highway	Proposed Mine Entrance	2900	19%	3078	19%	4061	19%
Dungeon Road	East of existing entrance	68	17%	72	17%	95	17%
Dungeon Road	West of existing entrance	32	22%	34	15%	45	22%

Road	Location	Background Traffic (2017)		Forecast Traffic (Year 1 - 2020)		Forecast Traffic (Year 15 - 2034)	
		AADT	HV%	AADT	HV%	AADT	HV%
Guyong Road	2.5km north of Mid Western Highway	250	15%	265	15%	350	15%

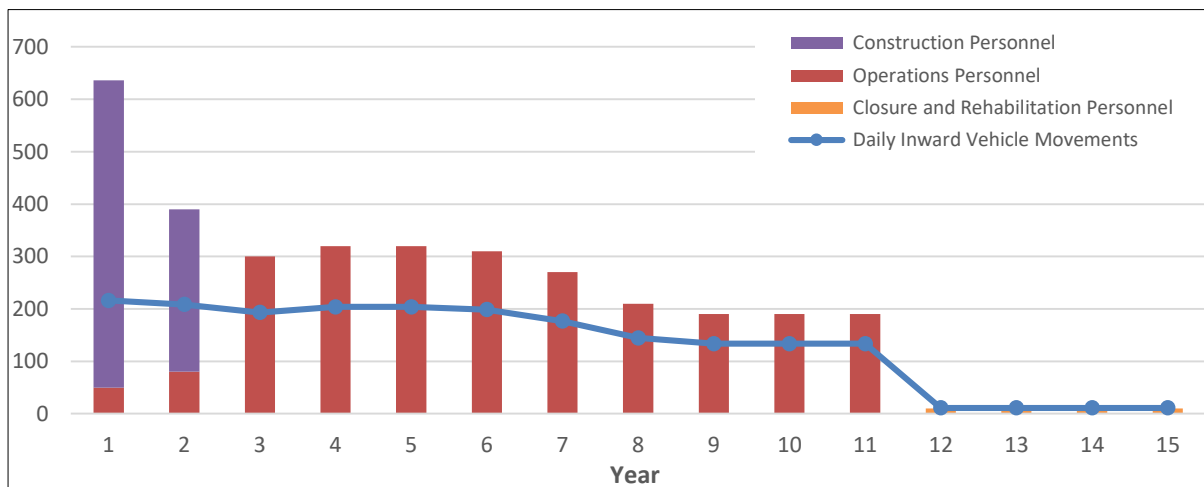
Morning and afternoon peak vehicles per hour on the Mid Western Highway occur as follows:

- AM Peak: 8:00am - 9:00am; and
- PM Peak: 4:00pm - 5:00pm

### 3.2.2 Development Generated Traffic

Estimates of traffic generated by the Project were provided by Regis and used to determine the required intersection turn lanes for the proposed new Project Area access intersection on the Mid Western Highway. Details of the Project personnel and associated vehicle movements are included in **Appendix 3**.

Refer to **Figure 4** and **Figure 5** for a summary of the numbers of on-site personnel and their associated traffic movements. The daily traffic movements shown are the quantities of inward movements as these values are used to determine the required access intersection turn lane requirements in **Section 4.2**. The traffic movements shown in **Figure 4** and **Figure 5** are the combined Project construction, operational and rehabilitation phase totals as well as delivery and visitor traffic. Operational personnel shown in **Figure 4** and **Figure 5** during Year 1 refer to mining contractors who will be carrying out mine development activities. These personnel will transition to mining operations at the beginning of Year 2.



**Figure 4 - Personnel and Vehicle Movements – Years 1 to 15**

Peak Project related traffic is expected to occur during the second half of Year 1 due to mine development activities, construction of the processing plant and other site construction works being carried out concurrently. **Figure 5** shows greater detail of the number of on-site personnel and the resulting Project related traffic movements during the first 24 months. Peak vehicle movements occur during months 10 and 11.

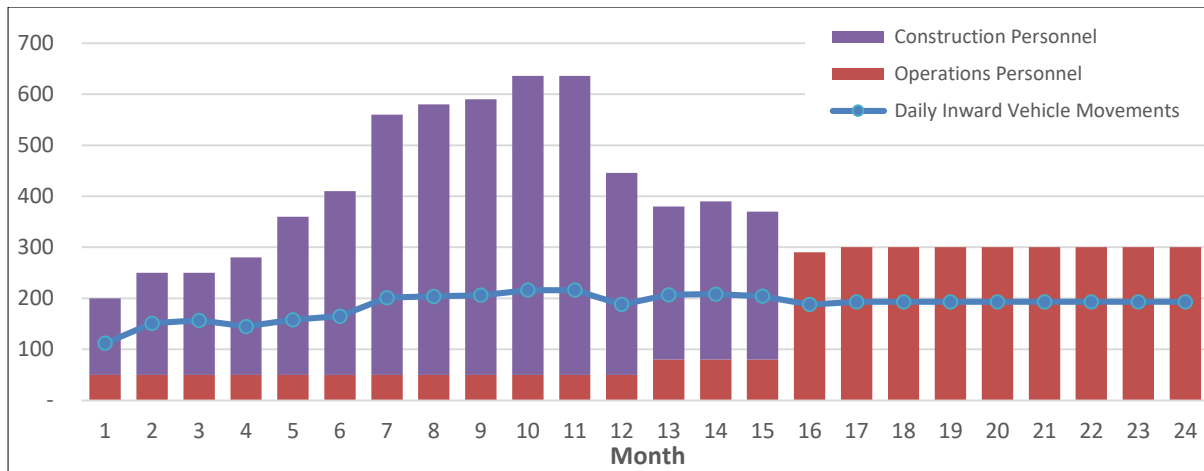


Figure 5 - Personnel and Vehicle Movements – Months 1 to 24

### 3.3 Parking

There are six separate car parking areas proposed within the Project Area as outlined below:

- **Car Park 1** – LV parking for process and maintenance personnel at the processing plant. Sealed car park with an area of 1,000m<sup>2</sup> to cater for 30 LV parking bays;
- **Car Park 2** – Located adjacent to the administration building. Sealed car park with an area of 1,920m<sup>2</sup> to cater for 40 LV parking bays and 2 bus bays;
- **Car Park 3** – Located to the east of the administration building. Unsealed car park with an area of 4,750m<sup>2</sup>. This overflow parking area is to cater for employee LV, mini buses, visitors and delivery vehicles;
- **Car Park 4** – Located further east of the administration building with a 12,500m<sup>2</sup> unsealed area to cater for all other parking requirements. Car Park 3 and Car Park 4 will have a combined capacity of 450 LV parking bays and will be used during periods of high demand such as maintenance shutdown periods for example;
- **Car Park 5** – Located at the gate house. Sealed car park with 7 LV parking bays for gate house staff and visitors. An area adjacent to the haul road at this location will be made available for truck bays with a wheel wash station to clean truck tyres as they exit the Project Area; and
- **Car Park 6** – Located adjacent to the mining workshop. Carpark with parking bays to cater for up to 20 mining contractor LV and several bus bays.

### 3.4 Access to the Project Area

The existing access to the Project Area is via Dungeon Road. As the Project Area fronts a 2.6km section of the Mid Western Highway, it is desirable for the mine to have its own dedicated access directly from the Highway. This will eliminate the need for Project related traffic to detour to the Project Area via Council local roads and will limit the numbers of additional traffic on these roads. Several proposed new Project Area access options directly from the Mid Western Highway have been considered including the use of an existing property access located approximately 100m to the west of the Walkom Road (East) intersection.

There are currently four access points to four separate lots located within the 2.6km section of the Mid Western Highway with two being shared as described in **Section 3.4.1** below. Once the proposed new Project Area access point has been approved, the remaining existing access points will be closed to all vehicles and will only be used by the Proponent when required as described in **Section 3.4.4**.

### 3.4.1 Existing Shared Property Access

The original proposal for access to the Project Area was to use an existing shared access off the Mid Western Highway located approximately 100m to the west of the Walkom Road (East) intersection. The access currently provides access to two rural properties with dwellings owned by Regis. Access to these properties will not be required once the Project is operational and this location was therefore considered as a potential Project Area access option. As part of the investigations for this option, it was identified that minimum sight distance requirements could be achieved with the trimming and/or removal of roadside vegetation along Mid Western Highway. It became apparent however, that this option was not viable due to its proximity to turn lane configurations already in place along the Mid Western Highway at the Walkom Road (East) intersection and as a consequence, the existing property access was ruled out.

### 3.4.2 Alternative Options 1 and 2

Following the elimination of the existing shared property access, a number of alternative locations off the Mid Western Highway were investigated. These included Options 1 and 2 which were located towards the western end of the Project Area that fronts the Mid Western Highway near the Walkom Road (West) intersection. These locations were eventually ruled out due to constructability issues and conflicts with the proposed internal layout of the Project Area.

### 3.4.3 Option 3 - Dungeon Road

The existing access to the Project Area is via Dungeon Road. The configuration of the Mid Western Highway and Dungeon Road intersection consists of a Basic Left (BAL) turn lane and a Short Channelised Right (CHR(s)) turn lane and is considered to be suitable for Project related traffic however, if Dungeon Road was to become the only Project Area access point, the road would require significant upgrades.

Existing deficiencies on Dungeon Road that would require resolution include:

- Narrow culverts (4m and 5m wide);
- Substandard curves with no warning signs;
- Trees and fence posts located within the clear zone; and
- Bitumen seal and pavement in poor condition in an area (approx. Chainage 2.5km) that regularly becomes inundated with floodwater.

There are two rural properties with dwellings located along Dungeon Road at the southern end and there would be unfavourable noise and dust impacts to these properties if Dungeon Road were used as the main Project Area access.

Consequently, the preference for Regis is to not use Dungeon Road as the main Project Area access.

### 3.4.4 Option 4 - Preferred Access to the Project Area

The proposed Option 4 Project Area access intersection is located on the Mid Western Highway approximately 190m west of the Walkom Road (East) intersection between an existing 1800mm diameter steel culvert located 370m further west. This proposed option is the preferred option for Regis and is shown in the Project Area layout drawing (**Figure 2**).

A concept design of this option is included in **Appendix 4** which includes AUL(s) and CHR(s) turn lanes on the Mid Western Highway. Option 4 satisfies minimum sight distance (SISD) requirements and has been designed with dimensional capacity to cater for the turning movements of a 25m B-Double. The proposed new turn lanes can be constructed while maintaining the existing turn lanes for the Walkom Road (East) intersection as shown on the concept design.

Signage for this option will consist of a give way sign and sight board opposite the intersection. Truck advanced warning signage are also proposed to be installed 300m in advance of the intersection in both directions along the Mid Western Highway.

Once construction of this proposed option is complete, all vehicular access to and from the Project Area (including emergency vehicles) would be via this new intersection. Access to the Project Area via the four existing lots from the Mid Western Highway as described in **Section 3.4** will be closed. The existing access via Dungeon Road will also be closed to all vehicles however, the Proponent will maintain access to the site via Dungeon Road through a locked gate in the event that emergency access is required, for inspection purposes, and in the event of an unplanned blockage along the Option 4 access road.

It is expected that all works in relation to the design and construction of the proposed Option 4 access intersection is to be in accordance with the requirements of an RMS Works Authorisation Deed (WAD).

### **3.4.5 Internal Road Network**

The location of the internal mine access road is shown in **Figure 2**. Initially the first kilometre from the Mid Western Highway to a gate house will be sealed with bitumen while the remainder will be constructed as an all-weather unsealed road to enable access at all times.



## 4 Assessment and Recommendations

The following subsections review the anticipated impacts of the Mine Development on the road network. Discussions relevant to the recommendations for impact mitigation or other controls are also included, where appropriate.

### 4.1 Construction and Operational Traffic Impacts

Peak Project related traffic movements are anticipated to occur during months 10 and 11 as shown in **Figure 5**. Construction traffic will initially use the existing entrance to the Project Area via Dungeon Road however, once the proposed Option 4 access from the Mid Western Highway is completed, all Project related traffic will switch to this new access and the Dungeon Road access will be closed to all traffic except for emergency access when required, inspection purposes and in the event of an unplanned blockage along the Option 4 access.

The vast majority of vehicle movements to and from the Project Area will be worker LV and mini busses. These LV will have negligible impact to road pavement condition. It is anticipated that the majority of workers will travel to the Project Area in mini buses during the Project construction phase which will minimise the volume of Project related traffic within the study area.

Potential traffic conflicts at the proposed Option 4 access for both LV and HV will be reduced given the provision of dedicated turn lanes on the Mid Western Highway.

A comprehensive Traffic Management Plan (TMP) including a drivers' code of conduct will be developed to control Project related traffic movements and driver behaviour both within the Project Area and the surrounding road network as described in **Section 4.6**.

#### 4.1.1 Heavy Vehicle impacts

As there will be no haulage of ore from the mine, HV impacts due to the Project are minimised, and will not trigger the requirement for road maintenance contributions. HV movements required for the Project are limited to those required during the construction phase and regular deliveries during the operations phase. Quantities of HV deliveries expected to occur during these phases are described in **Sections 3.1.1 and 3.1.2**. The expected origin of these vehicles is 30% from the west (Mid Western Highway) and 70% from the east (Great Western Highway and Mid Western Highway). No Project related HV movements are expected on Vittoria Road or Guyong Road.

The majority of oversized and over mass HV deliveries will occur during the construction phase. These deliveries will include building materials and plant for the processing facility and for the mining fleet. Delivery of large tyres and other parts will also be required during the construction and operations phases. These oversized and over mass HV deliveries will be conducted in accordance with requirements of the National Heavy Vehicle Regulator (NHVR). Oversize/overmass permits will be acquired prior to haulage of these loads and the transport route for each load will be planned in consultation with RMS and will vary depending on the origin of each load. Nevertheless, each journey will comply with the conditions outlined within each permit.

As the internal road network within the Project Area will not be sealed initially, truck bays with a wheel wash station to clean truck tyres will be constructed near the Project Area exit to eliminate mud tracking onto the Mid Western Highway.

### 4.2 Warrants for Intersection Turn Treatments

Figure A10 of AUSTROADS Guide to Road Design – Part 4: Intersections and Crossings General, specifies warrants for providing left and right turn treatments at unsignalised intersections. The Austroads graph is reproduced below as **Figure 6** and shows the turn treatment requirements at intersections subject to speed limits equal to or greater than 100km/h.

To determine the worst case scenario at the proposed Option 4 access location, several scenarios of peak background and Project related traffic were investigated. As described in **Section 3.2.1**, peak hour on the Mid Western Highway occurs between 8:00am to 9:00am and 4:00pm to 5:00pm. As shift



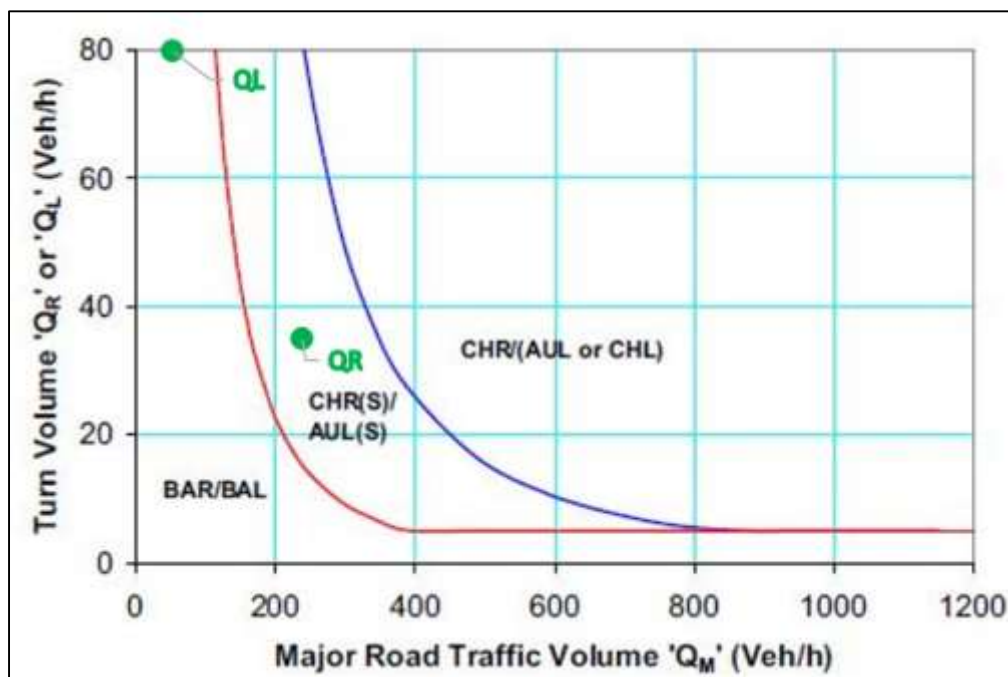
changeover times do not coincide with peak hours on the Mid Western Highway, the only Project related traffic entering the Project Area during these times will be visitor and delivery vehicles. As a result, these relatively low numbers of turning vehicles do not trigger any turn treatments.

A range of alternate scenarios for Project related traffic during morning and afternoon shift changeover times were investigated over the 15-year Project life. The resulting worst case occurred during months 10 and 11, during the morning shift start times between 5:30am to 6:30am.

Traffic volume parameters calculated for this scenario (as described in *Appendix A.8 of AUSTRROADS Guide to Road Design – Part 4: Intersections and Crossings General*) are listed in **Table 5**. These parameters were used to determine the warrant for turn treatments for the intersection by plotting them on the Austroads graph (**Figure 6**).

**Table 5 - Traffic Parameters (Vehicles Per Hour)**

Month 10 & 11 (5:30am to 6:30am)	
$Q_R$	35
$Q_L$	141
$Q_M (R)$	236
$Q_M (L)$	51



**Figure 6 - Warrant for turn treatments - Months 10-11 (5:30am-6:30am)**

The resulting warrant for turn treatments during this scenario indicates that the proposed Option 4 access will require a Basic Left (BAL) turn lane and a Short Channelised Right CHR(s) turn lane on the Mid Western Highway.

Given the nature of the Project and that 80% of Project related traffic is anticipated to originate from the west, it is recommended that the Basic Left (BAL) turn lane be upgraded to a Short Auxiliary Left (AUL(s)) turn lane.

### 4.3 Impacts on the Surrounding Road Network

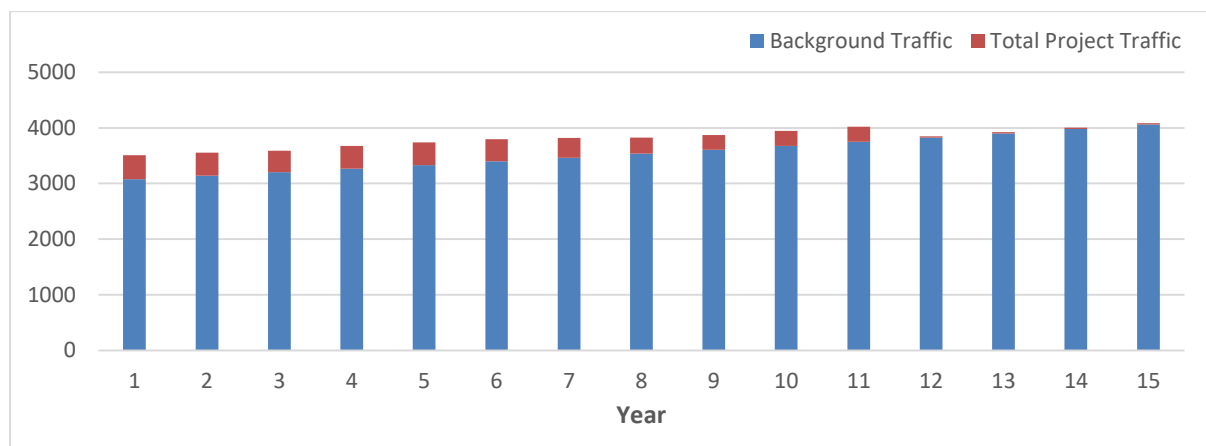
As described in **Section 3.2.1**, forecast background traffic volumes on the surrounding road network were calculated for the 15-year Project life. Combining these background traffic volumes with the expected Project related traffic results in a minor increase to traffic on the surrounding road network.

As there will be no haulage of ore off site, additional HV movements as a result of the Project are also considered to be minimal. The ratio of HV to LV Project traffic will peak at 7% during month 2 of the construction period before tapering down to 3% during mining operations.

The Mid Western Highway, Great Western Highway Guyong Road and Vittoria Road have sufficient capacity to accommodate the estimated cumulative background and Project related traffic for the 15 year Project life.

#### 4.3.1 Mid Western Highway

Combined background and total project traffic on the Mid Western Highway is shown in **Figure 7**. Project related traffic represents a maximum of 14% increase above background traffic during Years 1 and 2



**Figure 7 - Combined Traffic - Mid Western Highway**

#### 4.3.2 Great Western Highway

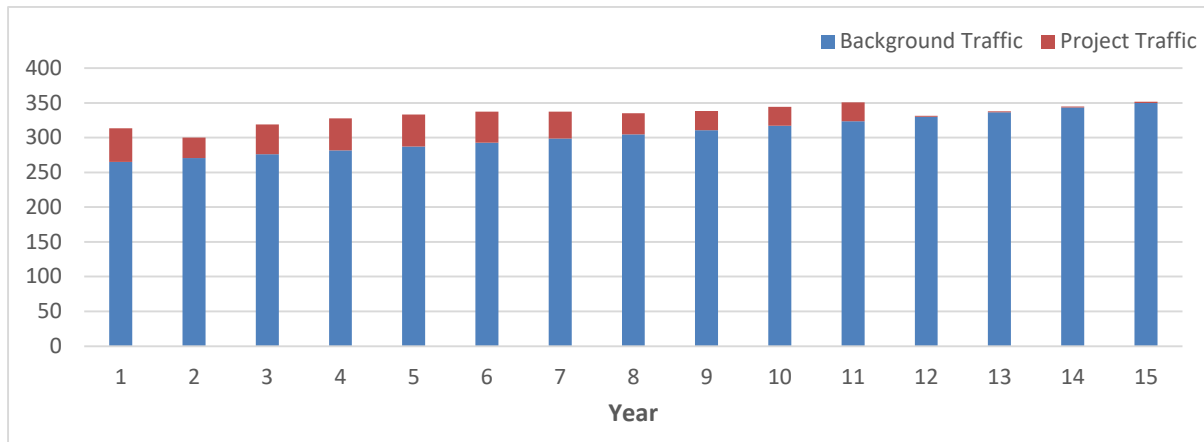
Project related traffic on the Great Western Highway will consist of delivery vehicles making their way to and from the Project Area from Sydney. There may also be a small number of workers using the western end of the Highway to commute to work. The total Project related additional vehicle movements on the Great Western Highway will be insignificant compared to the existing background traffic.

#### 4.3.3 Guyong and Vittoria Roads

Project traffic on Guyong Road and Vittoria Road will only consist of workers travelling to the Project Area who live adjacent to Vittoria Road and Guyong Roads or north-east of the Project Area. It is estimated that these movements will be approximately 11% of total Project related traffic movements.

To ensure that impacts to Guyong Road and Vittoria Road are minimised, a Drivers Code of Conduct will be implemented by Regis that requires all workers that do not live adjacent to Vittoria Road and Guyong Road or where an alternative route to the Project Area would take significantly longer, will be required to travel an alternate route to the Project Area. For example, from Orange, an alternative route with a similar travel time is available via Millthorpe Road to Blayney, then along the Mid Western Highway to the proposed Option 4 access intersection.

Combined background and Project related traffic for Guyong Road is shown in **Figure 8**. Project related traffic represents a maximum of 18% increase above background traffic along Guyong Road (during the Year 1 of the Project).



**Figure 8 - Combined Traffic - Guyong Road**

#### 4.3.4 Closure of Dungeon Road

At the start of construction activities Dungeon Road will be closed to the public around 1.8 km from the Mid-Western Highway at the southern end and 1.2 km south of Vittoria Road at the northern end (or realigned as per Blayney and Cabonne Council requirements). Following the completion of the new site access, project traffic will only access the mine development via Dungeon Road from time to time as described in **Section 3.4.4**.

There are two rural properties with dwellings that have access from Dungeon Road at the southern end. The road closure is expected to have no impact on these properties as their access to Blayney or Bathurst via the Mid Western Highway will remain unchanged.

At the northern end of Dungeon Road, Regis has acquired all properties that have access from Dungeon Road. Access for these properties west towards Bathurst will remain unchanged however, access to the south towards Blayney may be impacted. An alternative route with a similar travel time is available via Vittoria Road and Guyong Road. The alternative route is via sealed roads whereas Dungeon Road is unsealed.

#### 4.4 Buses

As described in **Section 2.5**, several school and passenger buses use the surrounding road network in the vicinity of the Project Area.

Worker shift changeover times occur before and after school bus morning and afternoon travel times. There are no formal bus stops on the Mid Western Highway in the vicinity of the proposed Option 4 access. At present the school bus travels along the Mid Western Highway towards Bathurst and then turns around and travels back towards Blayney. At approximately 8.20 – 8.30 the bus turns into eastern end of Walkom Road and picks up students wherever required and then exits western end of Walkom Road. It is considered that the Project is unlikely to impact bus services.

#### 4.5 Pedestrians and Cyclists

Given the rural environment, pedestrian and cyclist activity is considered to be rare in the vicinity of the Project Area. There are currently no dedicated on-road cycleways or off-road shared paths (for cyclists and pedestrians) along the surrounding road network. The concept design of the proposed Option 4 access maintains the existing 1m wide sealed shoulder on both sides of the Mid Western Highway and

it is therefore considered that the Project is unlikely to impact upon the passage of pedestrians and cyclists.

#### 4.6 Transport Management Plan (TMP) and Code of Conduct

A TMP will be developed in consultation with RMS, Blayney Shire Council and Cabonne Council. The TMP will provide management strategies to manage the impacts to Project related traffic, including construction and operations traffic. The TMP will consider the management of access to the Project Area for all on-site personnel and it will include strategies and measures to manage the risks of driver fatigue, road hazards and driver behaviour.

The TMP will include measures to reduce the impact of Project related traffic on Vittoria Road and Guyong Road. Workers traveling to the Project Area from within the Orange and Cabonne local government areas will be encouraged to use an alternative route via Millthorpe Road to Blayney, then along the Mid Western Hwy to the proposed Option 4 access intersection. A Drivers Code of Conduct will be implemented by Regis that requires workers that do not live adjacent to Vittoria Road and Guyong Road or where an alternative route to the Project Area would take significantly longer, will be required to use an alternate route to the Project Area.

The Drivers Code of Conduct will also outline rules to be followed within the Project Area and on the surrounding road network. The code will encourage driving in a considerate manner at all times and respect for the rights of others to use and share the road space. All drivers will be trained in and provided with a copy of the code during their workplace inductions to the Project Area. Failure to comply with the code of conduct may result in disciplinary action and for serious and repeat offences, removal from the Project Area.

To reduce the impact of project-related traffic on Vittoria Road and Guyong Road, workers travelling to the project area from within the Orange and Cabonne local government areas will be encouraged to use an alternative route via Millthorpe Road to Blayney, then along the Mid Western Hwy to the new access intersection. Workers that do not live adjacent to Vittoria Road and Guyong Road or where an alternative route to the project area would take significantly longer, will be required to use an alternate route to the project area. Similarly, all contractors and subcontractors based in Orange and Cabonne will be contractually required to use the alternate route to the project area. Mini buses used to transport workers will also use this route.

#### 4.7 Local Climate Conditions

The local area, including the Project Area, receives heavy fog, particularly early in the morning when shift changeover times occur. As a safety initiative and subject to approval from RMS, Regis proposes to install fog activated flashing yellow lights, also referred to as wigwags, above warning signs on the Mid Western Highway, in advance of the proposed Option 4 access. These flashing lights would be activated by a fog sensor integrated into the sign which can be programmed to stay on for a period of time after the fog clears. The sign can also be activated during rain. Refer to **Figure 9** of an example of the proposed sign arrangement.



Figure 9 - Fog Activated Sign

The flashing lights should alert all road users to take care on approach to the proposed Option 4 access during inclement weather conditions, thereby mitigating the potential for traffic accidents.

The proposed turn lane treatments for the proposed Option 4 access should also mitigate the chance of rear end vehicular accidents as a result of vehicles waiting to turn into the Project Area in times of reduced visibility.

#### **4.8 Road Traffic Noise, Dust and Lighting.**

Noise and dust assessments for the Project have been undertaken separately as part of the EIS. Details regarding noise, dust and lighting impacts attributable to traffic associated with the Project are detailed in the separate assessment reports included with the EIS.

#### **4.9 Cumulative Traffic Impacts**

There are no known other traffic generating developments or proposed developments in close proximity the study area as described in **Section 2**.

Significant traffic generating developments in the wider region include Blayney Cold Storage & Distribution (located approximately 1km east of Blayney on Newbridge Road), a proposed quarry (located approximately 3km north Blayney on Greghamstown Road) and Flyers Creek Windfarm (located approximately 15km west of Blayney). These developments are not located on roads in the vicinity of the Project Area and it is therefore considered that traffic from these developments will not have a significant cumulative impact with traffic generated by this Project.

## 5 Conclusions

The matters in the Project EARs for traffic and transport have been addressed in this report. The study area comprising of the surrounding road network and the proposed access to the Project Area has been assessed in respect the RTA Guide to Traffic Generating Developments and Austroads Guides.

The analysis and discussions presented in this report can be summarized as follows:

- The majority of workers are anticipated to travel to the Project Area in mini busses during the construction phase therefore minimising the impact of Project related traffic on the surrounding road network, particularly at the proposed Option 4 access intersection;
- As there will be no transportation of ore from the Project Area, HV impacts on the surrounding road network as a result of the Project are expected to be minimal;
- Project related traffic will result in a minor increase to traffic volumes on the surrounding road network however, it is considered that the impacted roads have sufficient capacity to cater for the combined background traffic and Project related traffic over the 15 year Project life;
- The proposed Option 4 access is to be designed and constructed with turn treatments to a greater standard than those determined using the Austroads Guides (i.e.: (AUL(s) as opposed to a BAL);
- Fog activated advance warning signs are proposed be installed on the Mid Western Highway in advice of the proposed Option 4 access to reduce potential traffic conflicts/accidents;
- A comprehensive TMP including a drivers' code of conduct will be developed to control Project related traffic movements and driver behaviour within the Project Area and on the surrounding road network; and
- Project related traffic is expected to have minimal impact on local bus services, pedestrians and cyclists.

## 6 References

- Austroads (2010), 'Guide to Road Design – Part 3: Geometric Design'.
- Austroads (2017), 'Guide to Road Design – Part 4: Intersections and Crossings General'.
- Austroads (2019) 'Guide to Traffic Management - Part 12: Traffic Impacts of Development'.
- EMM (2019) 'McPhillamys Gold Project Environmental Impact Statement'.
- RTA (2002) 'Guide to Traffic Generating Developments'.
- RMS (2017) 'Roads and Maritime Austroads Guide Supplement'.
- RTA Publication (Feb 2010), 'Delineation Guidelines – Section 6: Transverse Markings'.

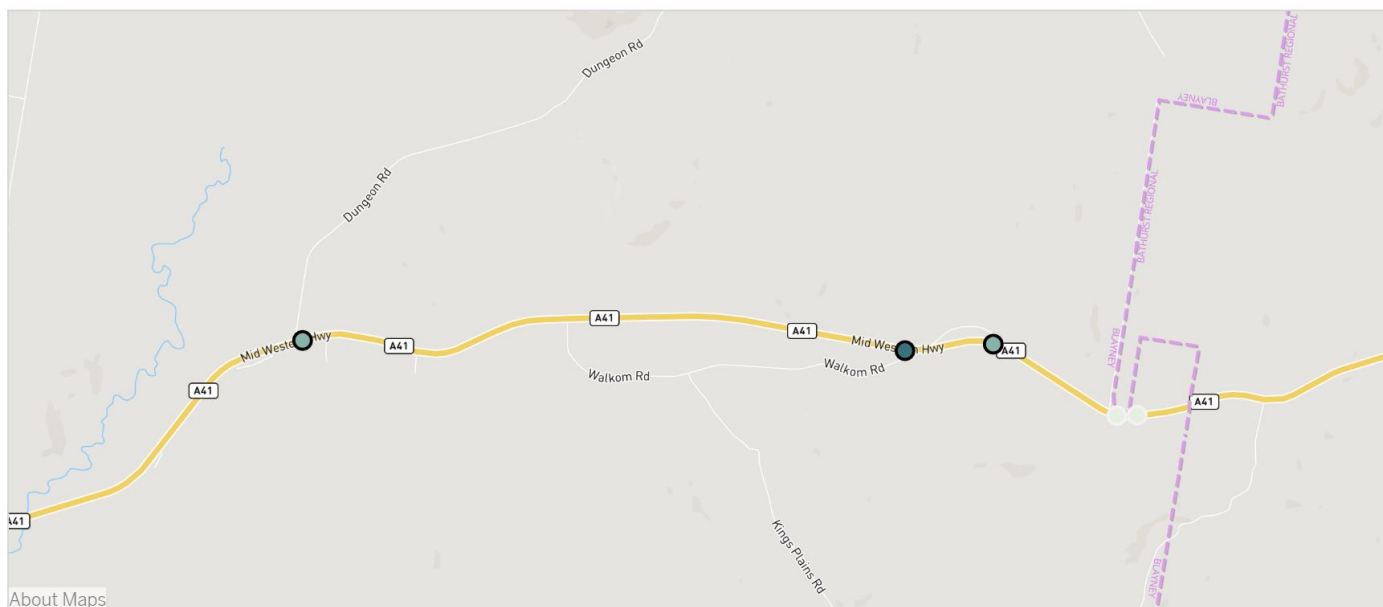
## Appendix 1: Crash History



## Mid-Western Highway

### Crashes Map - Blayney

Navigation  
and Help



About Maps

Degree of crash

■ Fatal
 ■ Serious Injury
 ■ Moderate Injury
 ■ Minor/Other Injury
 ■ Non-casualty (towaway)

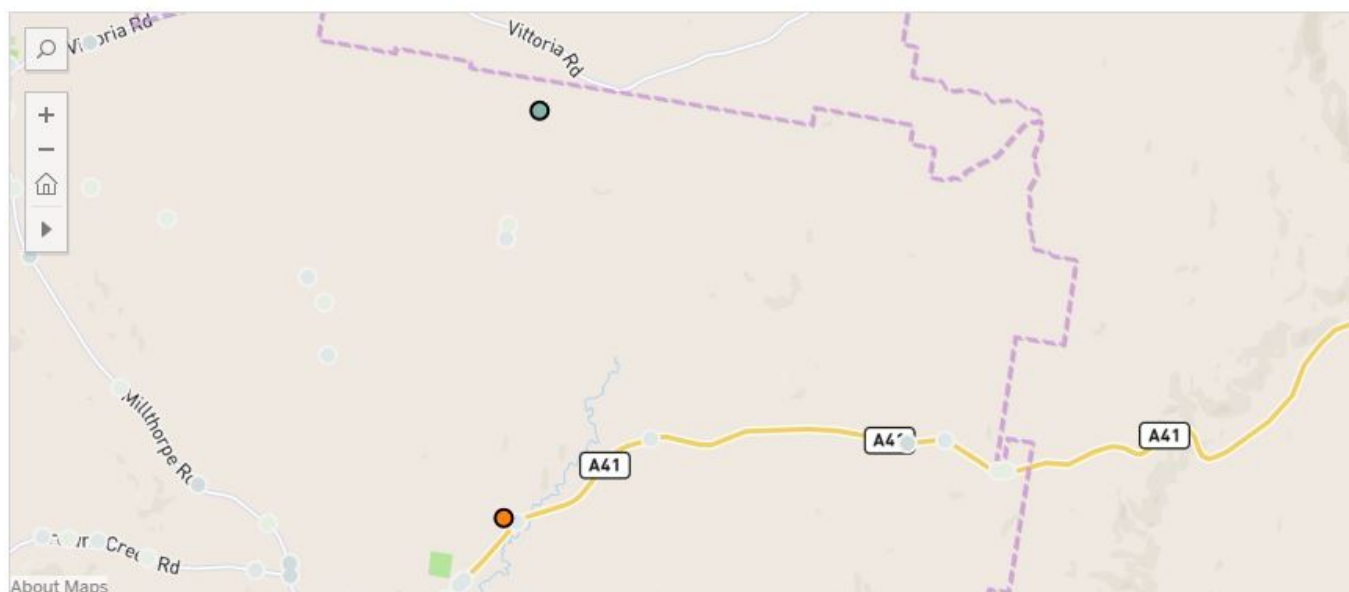
Repo..	Crash ID	Degree of crash	RUM - code	RUM - descripti..	Type of location	Natural l..	Longitude	Latitude	No ..	No Inju..
2015	1062249	Moderate Injury	30	Rear end	2-way undivided	Daylight	149.347105	-33.499093	-	1
2016	1110453	Serious Injury	20	Head on	T-junction	Dusk	149.340587	-33.499491	-	2
2017	1143516	Moderate Injury	20	Head on	2-way undivided	Daylight	149.296119	-33.498864	-	1

Source: RMS Centre for Road Safety Website – Interactive crash statistics – 6/03/2019  
[http://roadsafety.transport.nsw.gov.au/statistics/interactivecrashstats/lga\\_stats.html?tblga=4](http://roadsafety.transport.nsw.gov.au/statistics/interactivecrashstats/lga_stats.html?tblga=4)

## Guyong Road

### Crashes Map - Blayney

Navigation and Help



Degree of crash

■ Fatal
 ■ Serious Injury
 ■ Moderate Injury
 ■ Minor/Other Injury
 ■ Non-casualty (towaway)

Repo..	Crash ID	Degree of crash	RUM - code	RUM - descripti..	Type of location	Natural l..	Longitude	Lattitude	No ..	No Inju..
2013	847378	Moderate Injury	82	Off right/right bend	2-way undivided	Daylight	149.276877	-33.451428	-	1
	850242	Fatal	71	Off rd left => obj	2-way undivided	Daylight	149.270668	-33.51029	1	2

### Crashes Map - Cabonne

Navigation and Help



Degree of crash

■ Fatal
 ■ Serious Injury
 ■ Moderate Injury
 ■ Minor/Other Injury
 ■ Non-casualty (towaway)

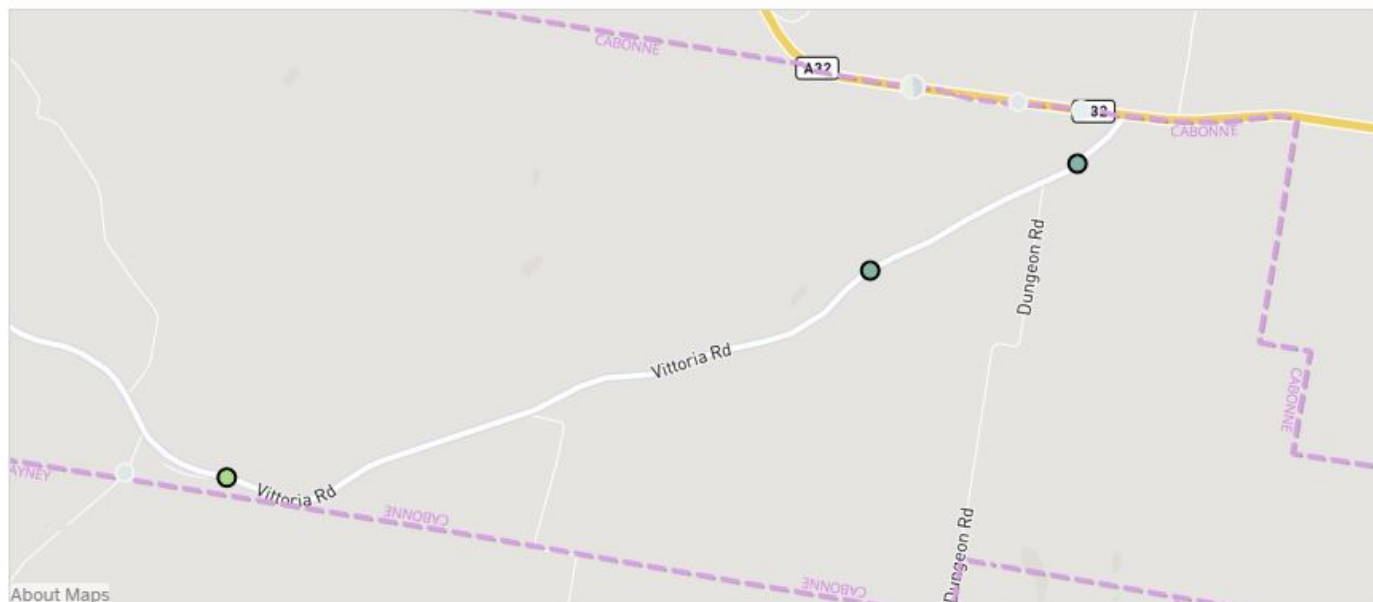
Repo..	Crash ID	Degree of crash	RUM - code	RUM - descripti..	Type of location	Natural l..	Longitude	Lattitude	No ..	No Inju..
2016	1099664	Moderate Injury	42	Leaving parking	2-way undivided	Daylight	149.282203	-33.447359	-	2

Source: RMS Centre for Road Safety Website – Interactive crash statistics – 6/03/2019  
[http://roadsafety.transport.nsw.gov.au/statistics/interactivecrashstats/lga\\_stats.html?tblga=4](http://roadsafety.transport.nsw.gov.au/statistics/interactivecrashstats/lga_stats.html?tblga=4)

## Vittoria Road

### Crashes Map - Cabonne

Navigation  
and Help



About Maps

Degree of crash

Fatal Serious Injury Moderate Injury Minor/Other Injury Non-casualty (towaway)

Repo...	Crash ID	Degree of crash	RUM - code	RUM - descripti..	Type of location	Natural l..	Longitude	Lattitude	No ..	No Inju..
2013	855678	Non-casualty (t..	67	Struck animal	2-way undivided	Darkness	149.287361	-33.447559	-	-
2014	1040041	Moderate Injury	81	Off left/rt bnd=>obj	2-way undivided	Darkness	149.319919	-33.438828	-	1
	1040073	Moderate Injury	88	Out of cont on bend	2-way undivided	Daylight	149.330406	-33.434316	-	1

## Appendix 2: Background Traffic Data

# TCS Instruments Traffic Count Report



## LOCATION OF COUNT: Road Name & Description

[TC01] Mid Western Highway, Kings Plains NSW

## TRAFFIC DIRECTION

East - West

## DATA COLLECTION INTERVAL DATE

14:00 Wednesday, 1 February 2017 => 12:46 Thursday, 16 February 2017

## ANNUAL AVERAGE DAILY TRAFFIC (AADT)

2,900

## PEAK TIME TRAFFIC (VPH)

AM Peak (8-9am) = 224

PM Peak (4-5pm) = 227

## POSTED SPEED

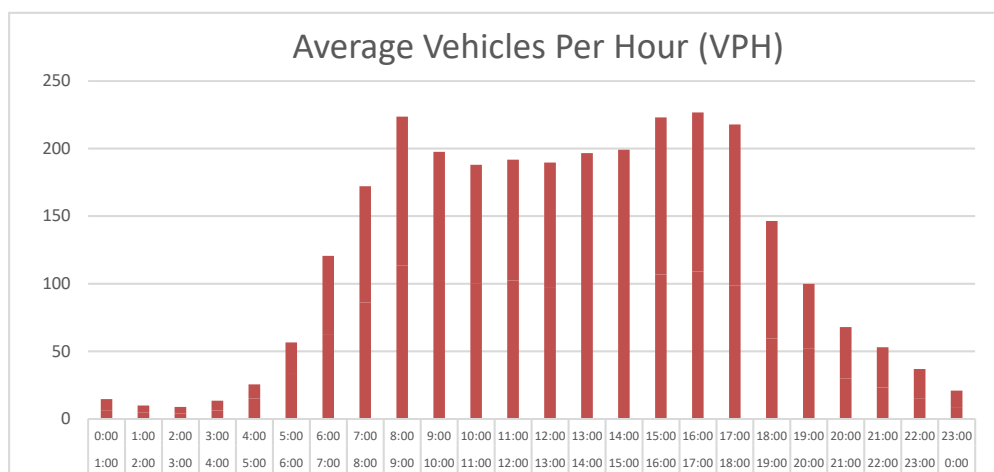
100 Km/hr

## 85th PERCENTIL SPEED

105.5 Km/hr

## HEAVY VEHICLE %

19%



# TCS Instruments Traffic Count Report



## LOCATION OF COUNT: Road Name & Description

[TC02] Dungeon Road, Kings Plains NSW

## TRAFFIC DIRECTION

North - South

## DATA COLLECTION INTERVAL DATE

15:00 Wednesday, 1 February 2017 => 13:19 Thursday, 16 February 2017

## ANNUAL AVERAGE DAILY TRAFFIC (AADT)

68

## PEAK TIME TRAFFIC (VPH)

AM Peak (6-7am) = 9

PM Peak (5-6pm) = 8

## POSTED SPEED

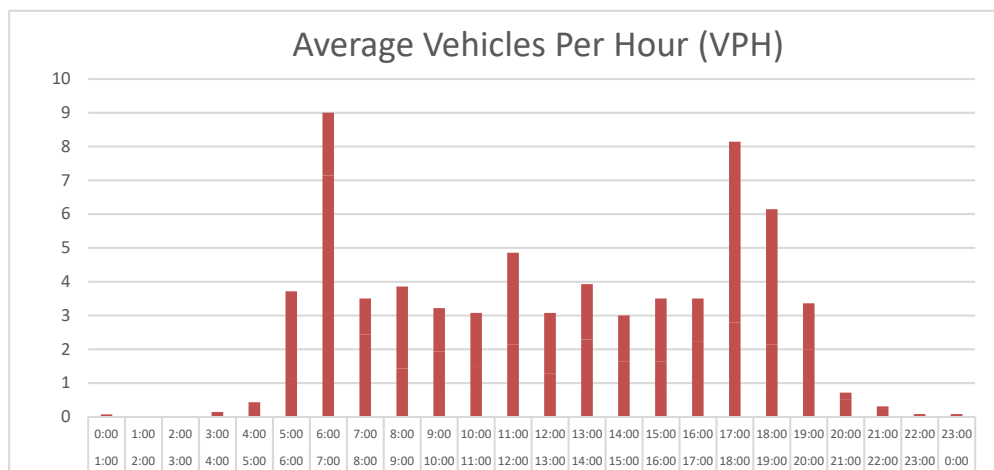
-

## 85th PERCENTIL SPEED

72.75 Km/hr

## HEAVY VEHICLE %

17%





# TCS Instruments Traffic Count Report



## LOCATION OF COUNT: Road Name & Description

[TC03] Dungeon Road, Kings Plains NSW

## TRAFFIC DIRECTION

North - South

## DATA COLLECTION INTERVAL DATE

15:00 Wednesday, 1 February 2017 => 13:30 Thursday, 16 February 2017

## ANNUAL AVERAGE DAILY TRAFFIC (AADT)

32

## PEAK TIME TRAFFIC (VPH)

AM Peak (6-7am) = 6

PM Peak (5-6pm) = 7

## POSTED SPEED

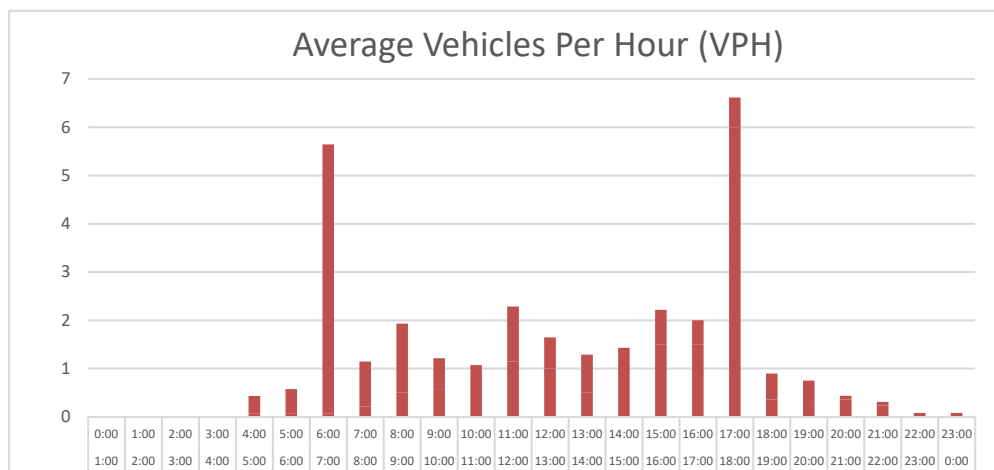
-

## 85th PERCENTIL SPEED

71.45 Km/hr

## HEAVY VEHICLE %

22%



# TCS Instruments Traffic Count Report



## LOCATION OF COUNT: Road Name & Description

[TC04] Guyong Road, Kings Plains NSW

## TRAFFIC DIRECTION

North - South

## DATA COLLECTION INTERVAL DATE

15:00 Wednesday, 1 February 2017 => 13:04 Thursday, 16 February 2017

## ANNUAL AVERAGE DAILY TRAFFIC (AADT)

250

## PEAK TIME TRAFFIC (VPH)

AM Peak (8-9am) = 23

PM Peak (4-5pm) = 22

## POSTED SPEED

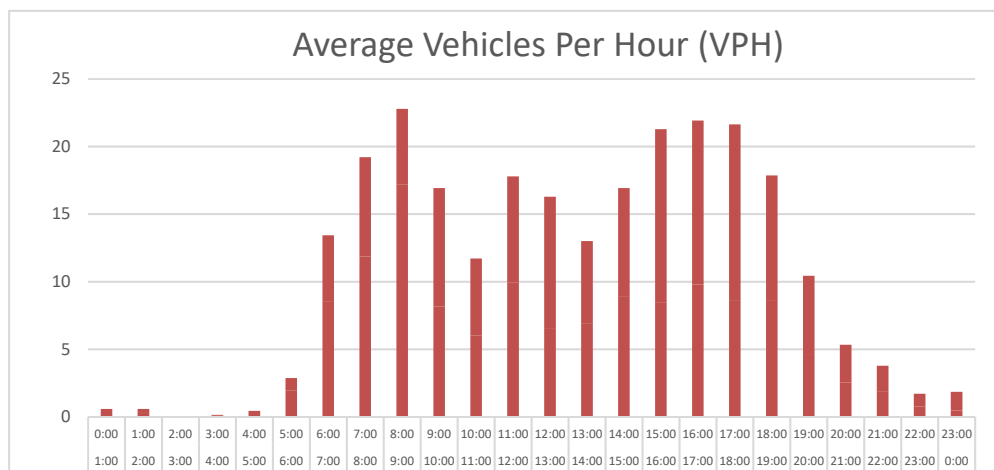
-

## 85th PERCENTIL SPEED

102.75 Km/hr

## HEAVY VEHICLE %

15%



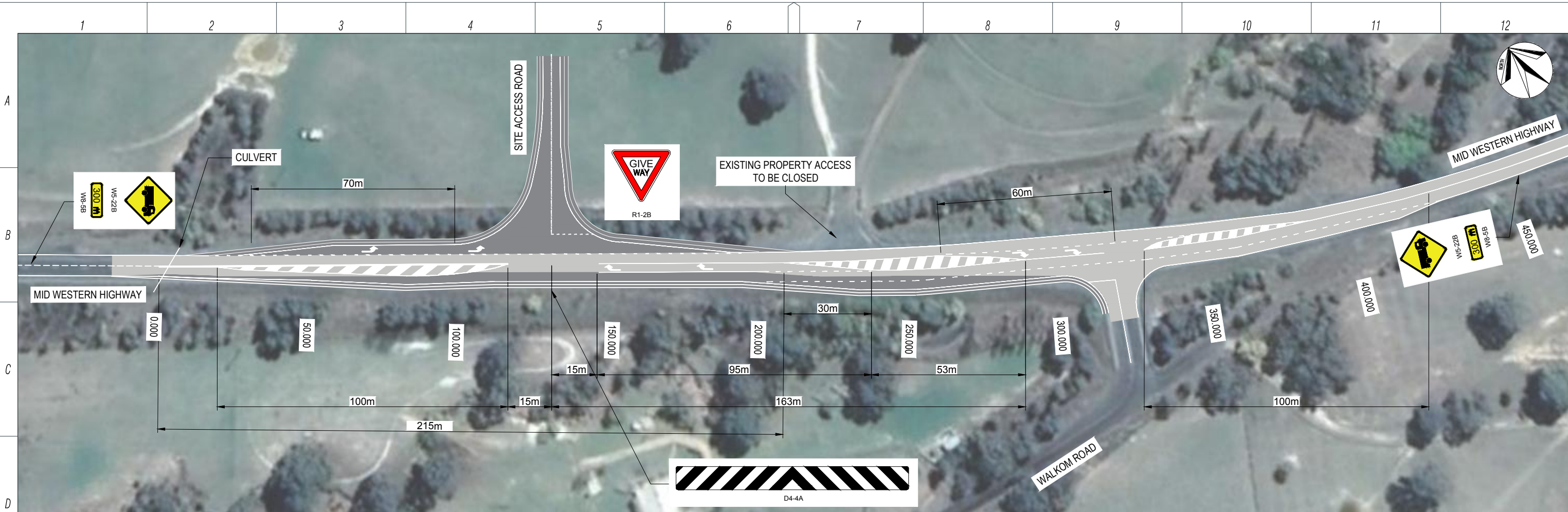
## Appendix 3: Project Personnel and Traffic Data

Average daily personnel and daily vehicle movements (inwards and outwards)

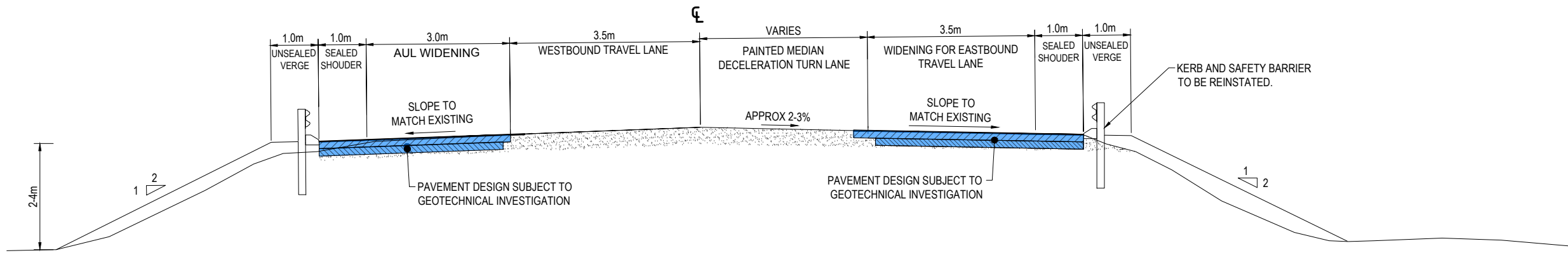
Months 1 - 24	Mth 1	Mth 2	Mth 3	Mth 4	Mth 5	Mth 6	Mth 7	Mth 8	Mth 9	Mth 10	Mth 11	Mth 12	Mth 13	Mth 14	Mth 15	Mth 16	Mth 17	Mth 18	Mth 19	Mth 20	Mth 21	Mth 22	Mth 23	Mth 24
Construction Personnel	190	270	310	350	430	480	630	640	650	600	600	400	300	310	290	-	-	-	-	-	-	-	-	-
Operations Personnel	50	50	50	50	50	50	50	50	50	50	50	50	80	80	80	290	300	300	300	300	300	300	300	300
Employee LVs and Minibuses	209	257	263	260	286	300	372	378	382	402	402	346	384	387	378	345	356	356	356	356	356	356	356	356
Light Vehicle Visitors/Deliveries	10	25	30	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Heavy Vehicle Deliveries	5	20	20	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Total Daily Vehicle Movements	224	302	313	290	316	330	402	408	412	432	432	376	414	417	408	375	386	386	386	386	386	386	386	386

Years 3 - 15	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Yr 11	Yr 12	Yr 13	Yr 14	Yr 15
Operations Personnel	300	320	320	310	270	210	190	190	190	-	-	-	-
Closure and Rehabilitation Personnel	-	-	-	-	-	-	-	-	-	10	10	10	10
Employee LVs and Minibuses	356	378	378	367	324	259	237	237	237	21	21	21	21
Light Vehicle Visitors/Deliveries	20	20	20	20	20	20	20	20	20	1	1	1	1
Heavy Vehicle Deliveries	10	10	10	10	10	10	10	10	10	-	-	-	-
Total Daily Vehicle Movements	386	408	408	397	354	289	267	267	267	22	22	22	22

## Appendix 4: Option 4 Concept Design



OPTION 4 - MID WESTERN HIGHWAY NEW SITE ACCESS INTERSECTION  
1:750



OPTION 4 - MID WESTERN HIGHWAY NEW SITE ACCESS INTERSECTION TYPICAL SECTION - CH 100  
1:50

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR



bsi

ISO 9001

Quality Management

ISO9001:2015

FS555072

121 Bridge Street

P.O. Box 1568

Tamworth, NSW, 2340

office@mitchelhanlon.com.au

www.mitchelhanlon.com.au

Telephone: 02-6762 4411

Facsimile: 02-6762 4412

J:\2019\19007 - McPhillamys Gold Intersection Design\ACAD\19007 - Constructive Solutions - McPhillamys Gold Mine\_Option 4\_Rev 04.dwg

Plot Date: 8 March 2019

REV	BY	DATE	DESCRIPTION	APPD.
B	TM	07/03/19	INITIAL ISSUE - PRELIMINARY 75% DESIGN	
A	TM	12/02/19	INITIAL ISSUE - PRELIMINARY 50% DESIGN	
A1	Original			

Co-ordinate System: MGA Zone 56

Height Datum: A.H.D.

Scale: 1:1000



This drawing and the information contained thereon have been created solely for a particular purpose and Client. Mitchel Hanlon Consulting provide no warranty and accept no liability, arising from the use of this drawing and the information shown thereon for any other purpose. This is protected by copyright. You may not reproduce any of it in any form without the written permission from Mitchel Hanlon Consulting. If you do, you may have to pay damages to Mitchel Hanlon Consulting or you may be prosecuted.



providing total solutions

DRAWN: K Smith

DRG CHECK: T Milsom

DESIGNED: T Milsom

DESIGN CHECK: T Milsom

APPROVED:

PROJECT: MCPHILLAMYS GOLD MINE ACCESS INTERSECTION

PLAN AND TYPICAL SECTION

FILE No. 19007

STATUS: PRELIMINARY DESIGN

DRG No. 1

SHEET: 1 OF 1

AWP PROJECT No.

EDMS No.

A1

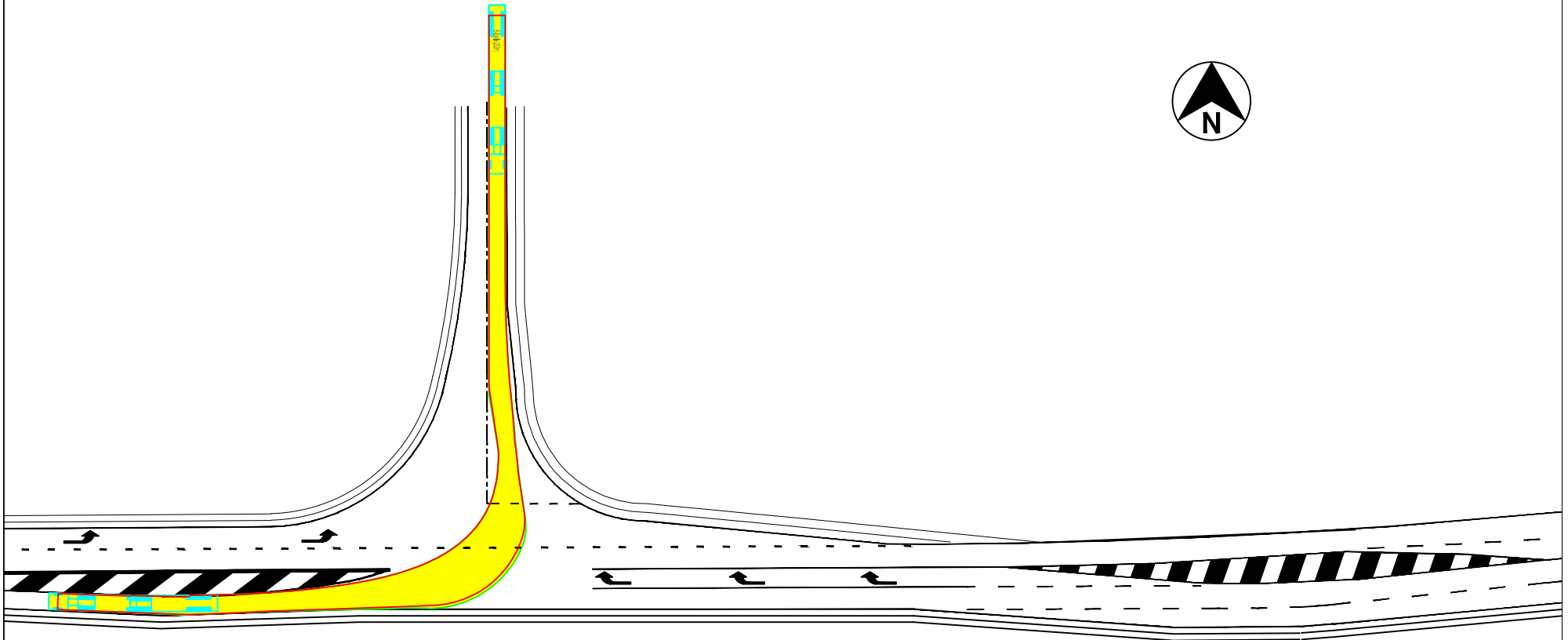
©

B

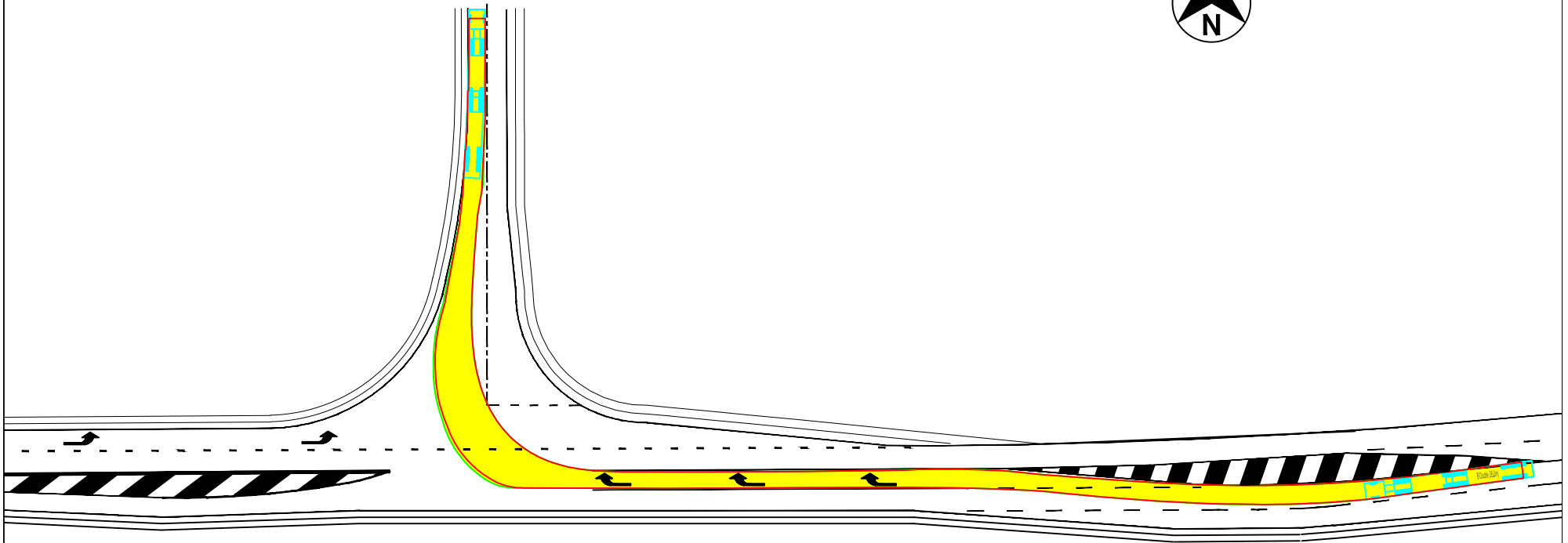


## Appendix 5: Swept Paths

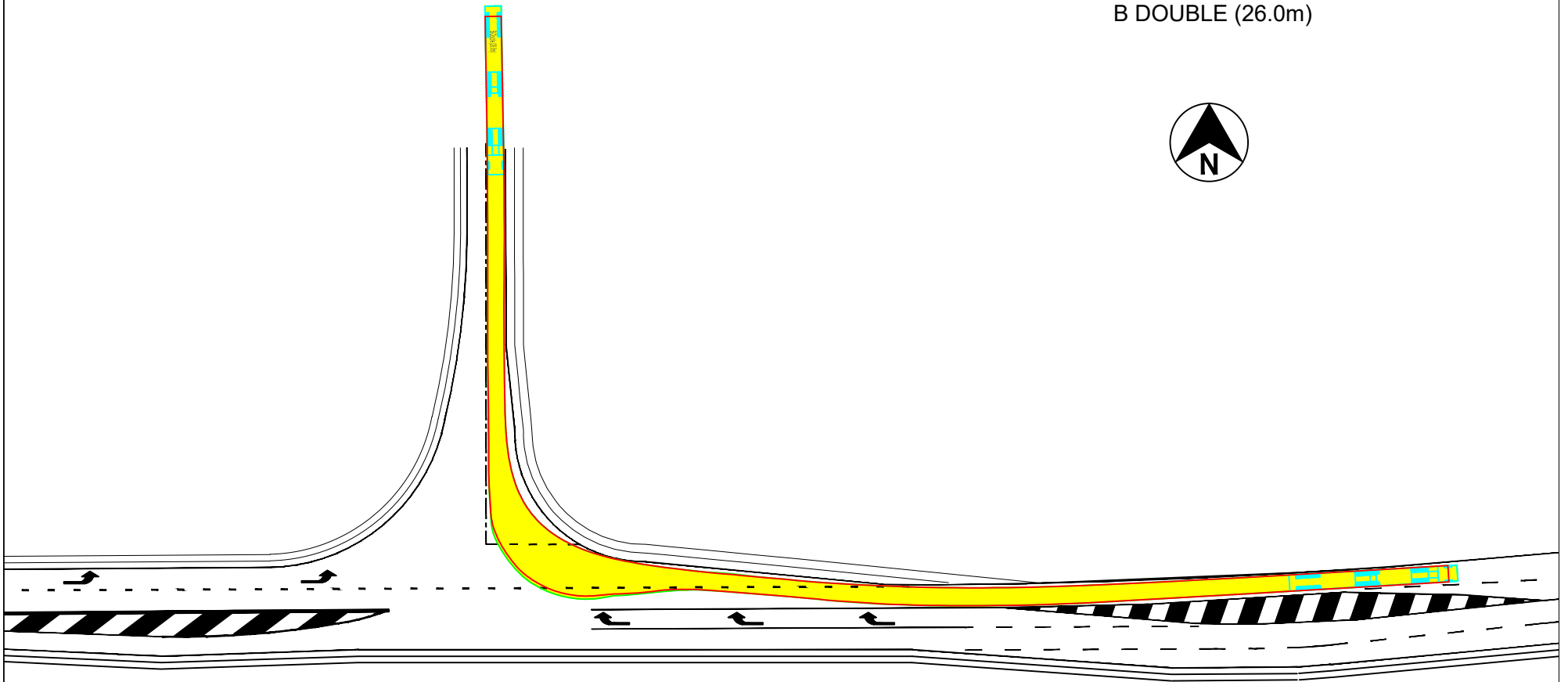
MCPHILLAMY'S SITE ACCESS TURNPATHS  
OPTION 4  
B DOUBLE (26.0m)



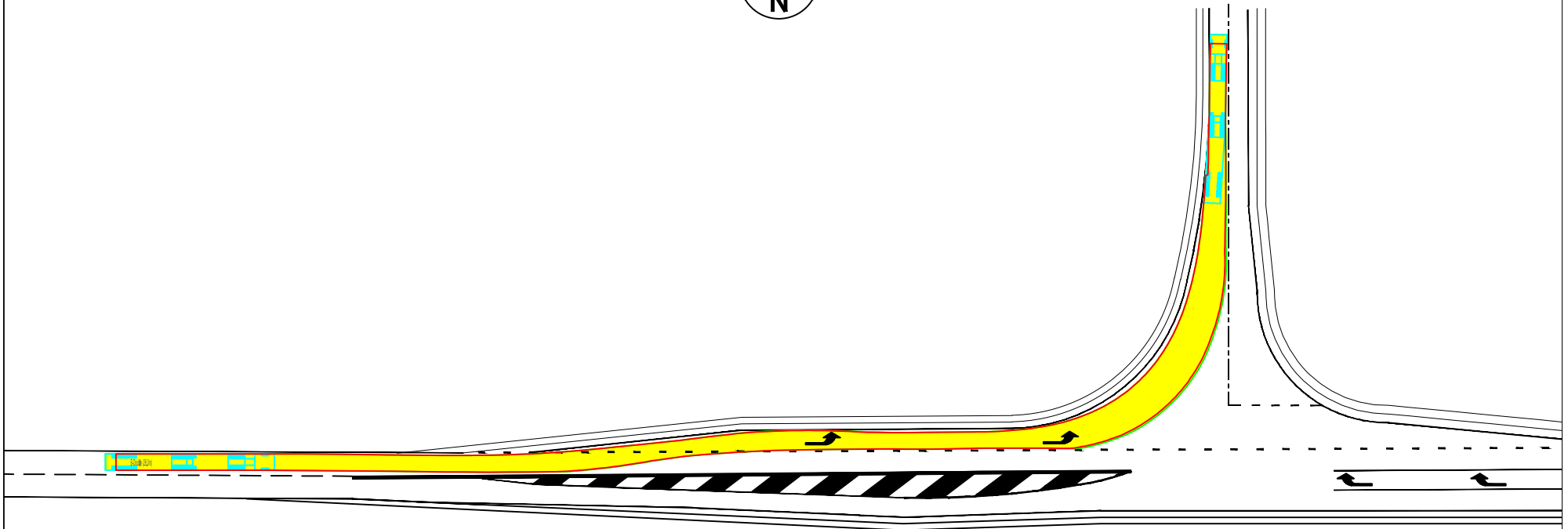
MCPHILLAMY'S SITE ACCESS TURNPATHS  
OPTION 4  
B DOUBLE (26.0m)



MCPHILLAMY'S SITE ACCESS TURNPATHS  
OPTION 4  
B DOUBLE (26.0m)



MCPHILLAMY'S SITE ACCESS TURNPATHS  
OPTION 4  
B DOUBLE (26.0m)



***This page has been intentionally left blank***



**Constructive Solutions Pty Ltd**

[www.constructivesolutions.com.au](http://www.constructivesolutions.com.au)

**Tamworth Office:**

PO Box 1498

Tamworth NSW 2340

Phone: 02 6762 1969

Email: [admin@constructivesolutions.com.au](mailto:admin@constructivesolutions.com.au)

**Brisbane Office**

PO Box 133

Paddington QLD 4064

Phone: 0427 011 143

Email: [admin@constructivesolutions.com.au](mailto:admin@constructivesolutions.com.au)



**constructive  
solutions**  
providing total solutions