

23.0 Transport

23.1 Introduction

The chapter discusses the outcomes of the traffic impact assessment completed for the Ensham Life of Mine Extension Project (the proposed project, hereafter referred to as ‘the Project’). Topics of interest are road safety, access requirements, intersection operations, road link capacity and pavement loadings and identifies the required mitigation and/or management measures for the Project. This chapter considers the potential impacts of the proposed mining activities on the operation and condition of the surrounding transport network.

Environmental objectives and outcomes

The Project seeks to manage traffic in a way that protects environmental values in accordance with the Environmental Protection Regulation 2019 (EP Regulation). The Project is not anticipated to generate traffic in excess of what is currently generated at the existing operations at Ensham Mine.

The existing Ensham Mine currently manages environmental nuisance impacts in accordance with Environmental Authority (EA) conditions Schedule E in the EPML00732813. Given the nature and scale of the Project, impacts to environmental values as a result of Project traffic are not considered to be significant and, therefore, are not considered a critical matter in the environmental impact statement (EIS).

23.2 Relevant policy, legislation and guidelines

The Department of Transport and Main Roads’ (TMR) Guide to Traffic Impact Assessment (the Guidelines) sets out the process to assess the transport impacts of a development on the State-controlled road network (TMR, 2018). TMR then administers the approval of Projects based on the requirements of the Guidelines.

In general, local government agencies, such as Central Highlands Regional Council (CHRC), also utilise the Guidelines in the assessment of the traffic impacts of developments on their road networks.

As such, the assessment for the Project was required to undertake traffic impact assessment on the relevant sections of the state controlled (Capricorn Highway) and local government controlled (CHRC – Duckponds Road) as well as the key intersection of the Capricorn Highway/Duckponds Road.

23.3 Methodology

The transport assessment was carried out to determine the level of potential impacts of the Project on the operation of the surrounding road network.

The methodology for the assessment is summarised below:

- broadly identify the existing transport infrastructure which is of relevance to the Project
- estimate traffic generation associated with the Project and the distribution of this development traffic on the identified road network
- assess the potential impact of the Project on the surrounding transport infrastructure

- identify potential mitigation and management strategies to be implemented to offset the impact of the Project (if required).

The assessment established an existing or background traffic scenario for the identified transport routes and compared this with a scenario including the Project-generated traffic (i.e. the 'with Project' scenario), and assessed the traffic impacts of the Project in terms of road safety, access requirements, intersection operations, road link capacity and pavement loadings.

Following the assessment, if required, potential mitigation and/or management measures were formulated to address any potential traffic impacts caused by the Project.

23.4 Existing environment

23.4.1 Traffic volumes

The background traffic volumes for the road sections relevant to the Project were established using the available 2018 annual average daily traffic (AADT) segment traffic count data provided by TMR, while an estimate of the daily traffic volumes on Duckponds Road was established from the total recorded 12 hour inbound and outbound traffic volumes recorded from the count undertaken at the Capricorn Highway/Duckponds Road intersection.

A summary of the forecast background traffic volumes for each of the relevant road segments at the adopted design horizon is provided in **Table 23-1**.

Table 23-1 Forecast future road link AADT volumes

Road	Road ID	AADT segment		Base data year	Base year (2018) AADT		10 year GR %	Background AADT (2019)	
		Start (km)	End (km)		Gaz	A-Gaz		Gaz	A-Gaz
Capricorn Highway (Duarina – Emerald)	16B	118.855	127.950	2018	1,076	1,079	1.00	1,087	1,090
		127.950	157.560	2018	1,415	1,414	1.00	1,429	1,428
		157.560	158.950	2018	4,903	4,834	1.00	4,952	4,882
		158.950	159.250	2018	5,850	6,921	1.00	5,909	6,990
Duckponds Road	CHRC	0.000	8.600	2019	164	242	1.00	164	242

Gaz = TMR Gazettal Direction/A-Gaz = Against TMR Gazettal Direction
 TMR Ch. 118.855 km (16B) – Township of Comet.
 TMR Ch. 127.950 km (16B) – Capricorn Highway/Duckponds Road intersection.

In addition to the road link volumes, an estimate of the current traffic movement volumes at the key Capricorn Highway/Duckponds Road intersection was established from a traffic movement count undertaken by Austraffic on Monday 11 November 2019 (Austraffic, 2019). A summary of the observed 2019 background peak hour volumes for this intersection is shown in **Figure 23-1** and **Figure 23-2** below.

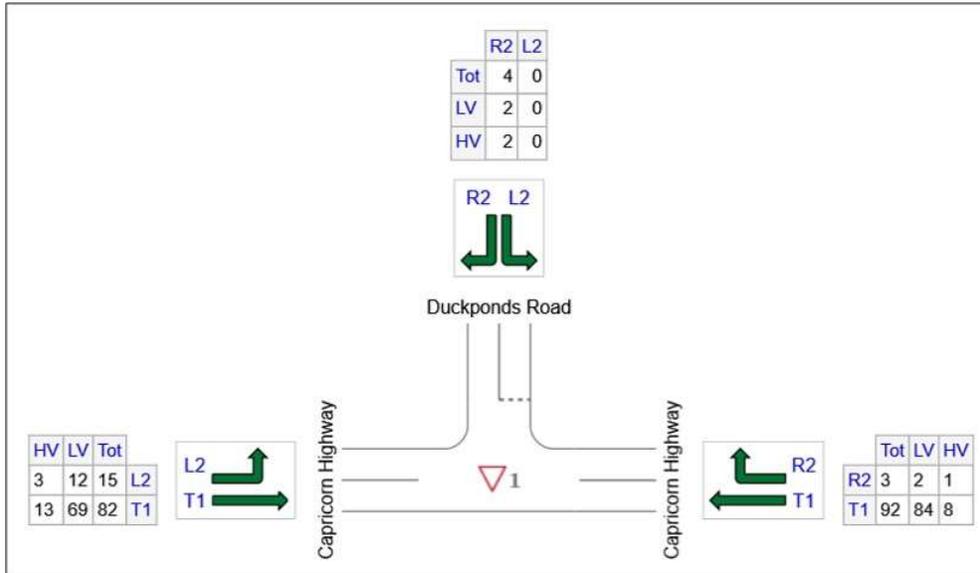


Figure 23-1 2019 am peak (observed 7 to 8 am) – Capricorn Highway/Duckponds Road intersection (Austraffic, 2019)

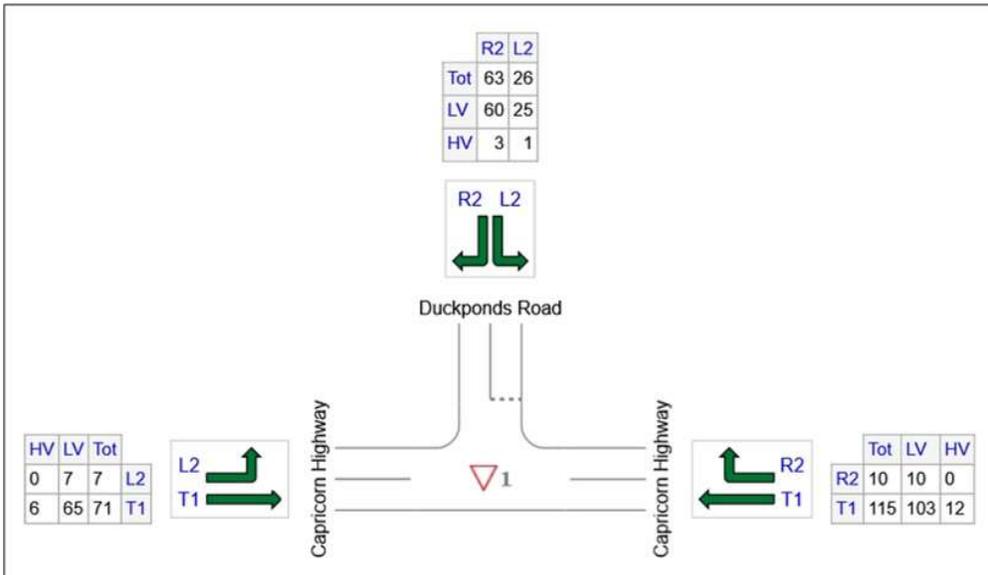


Figure 23-2 2019 pm peak (observed 4:15 to 5:15 pm) – Capricorn Highway/Duckponds Road intersection (Austraffic, 2019)

23.4.2 Road network operation

Based on the daily traffic volumes identified on the road network (see **Table 23-1**), all road segments can be considered to be currently operating satisfactorily and within capacity, with all daily traffic volumes within the acceptable range for their relevant road classification (i.e. highway/rural access road).

Furthermore, the recorded traffic volumes at the Capricorn Highway/Duckponds Road intersection were utilised to undertake preliminary intersection analysis to establish the current operational performance of the intersection, representing the existing operation of the Ensham Mine. A summary of the Signalised and Unsignalised Intersection Design and Research Aid (SIDRA) results of this analysis is provided in **Table 23-2**.

Table 23-2 SIDRA results – existing (2019) – Capricorn Highway/Duckponds Road (existing configuration)

Analysis scenario	Intersection degree of saturation	Level of service (LOS)**	Intersection average delay (seconds)
2019 am peak	0.052	A	0.7
2019 pm peak	0.104	A	2.4

** LOS value identified is for worst movement at the intersection, not the overall intersection.

The results of this assessment indicate that the existing configuration of the Capricorn Highway/Duckponds Road intersection currently operates satisfactorily, with all values for degree of saturation (DOS), level of service (LOS), average delay and vehicle queueing well within the acceptable limits of operation.

23.5 Potential impacts

23.5.1 Project traffic

The extension of the underground operation is proposed to be undertaken as part of normal operation and development of the mine, using existing infrastructure. Zone 2 and Zone 3 will require flaring infrastructure for gas drainage and to reduce greenhouse gas emissions. While minor surface disturbance activities will be required as part of the Project no increase in traffic volumes are expected from Ensham Mine.

Furthermore, the Project will not generate any increase in traffic volumes on the adjacent road network during future operations, and that in general, the traffic volumes associated with the Ensham Mine will only reduce from the current (2019) traffic volumes as the number of operational staff at Ensham Mine decrease during the transition from open-cut to underground mining activities and ultimately to rehabilitation works.

23.5.2 Road safety

A review of the existing traffic conditions on the relevant sections of the surrounding road network relevant identified no significant, existing road safety concerns, with only one minor “property damage only” accident recorded over the past 10 years in the vicinity of the Duckponds Road link and intersection with the Capricorn Highway.

Further to this, the current Capricorn Highway/Duckponds Road intersection configuration provides designated turn lane treatments and the provision of intersection road lighting, which improves the safety for vehicles utilising the intersection.

23.5.3 Access requirements

Access to the Project Site is proposed to be provided via an extension of the current Ensham Mine underground mine extents. Current access arrangements to Ensham Mine, via the gated access on Duckponds Road, will be retained as the vehicular access upon the commencement of mining within the Project Site.

As the Project is not anticipated to lead to an increase in traffic volumes associated with the operation of Ensham Mine, the current access facilities are considered to be adequate and no additional access works are deemed to be required as part of the Project.

23.5.4 Intersection operation

Detailed SIDRA analysis of the Capricorn Highway/Duckponds Road intersection was undertaken to establish the operational performance of the existing configuration for the proposed future operation of the Project.

This assessment was undertaken using forecast 2043 'with Project' traffic volumes, and indicated that the existing configuration of the intersection is expected to operate satisfactorily during both the am and pm peak hours for the forecast 2043 'with Project' traffic volumes. This is shown by all operational parameters being well within acceptable limits for a priority controlled intersection, as shown in **Table 23-3**.

Table 23-3 SIDRA results – 2043 operation - Capricorn Highway/Duckponds Road (existing configuration)

Analysis scenario	Intersection degree of saturation	Level of service**	Intersection average delay (seconds)	Maximum 95% back of queue length (metres)
2043 am peak 'with Project'	0.066	LOS A	0.8	0.4
2043 pm peak 'with Project'	0.142	LOS A	2.6	4.1

** LOS value identified is for worst movement at the intersection, not the overall intersection.

As the Project is not anticipated to lead to an increase in traffic volumes, the impact of the Project on the operation of the Capricorn Highway/Duckponds Road intersection would be negligible and the existing configuration of the intersection is considered appropriate to accommodate the future traffic volumes at the intersection from the ongoing operation of Ensham Mine (including the Project).

23.5.5 Road link capacity

The extension of the current Ensham Mine into the Project Site is not anticipated to generate any increase in traffic volumes on the adjacent road network. Therefore, it is expected that the Project will have no impact on the link capacity of the surrounding road network as the current traffic volumes on both Duckponds Road and the Capricorn Highway are considered to be well within the capacities of a sealed two lane rural access road and two lane rural highway respectively.

23.5.6 Pavement loadings

All coal from Ensham Mine is currently transported via an existing spur line to Queensland Rail's Rockhampton to Longreach rail network, and that no road haulage on the external road network is required. As a result, there is not expected to be a significant volume of heavy vehicles generated from either the current operations of Ensham Mine or the Project on the external road network, and therefore there is expected to be no pavement impacts from the Project.

23.6 Mitigation measures

As the Project will not increase traffic volumes, there are no expected impacts on the operation of the relevant sections of both the state-controlled (Capricorn Highway) and CHRC controlled (Duckponds Road) road networks. Further to this, the existing access facilities for Ensham Mine, provided via the gated access on Duckponds Road, will be suitable for the expected future operations.

The detailed assessment of the Capricorn Highway/Duckponds Road intersection identified that the current configuration would be more than adequate to cater for expected future 'with Project' traffic volumes for the Project.

As such, no mitigation measures are required for the Project.

23.7 Residual impacts

As the Project is not anticipated to increase the traffic volumes generated by the operation of Ensham Mine, it is expected to have no impact on the operation of the surrounding state and local government controlled road networks.

Therefore, no residual transport impacts are expected to be associated with the Project.