



Appendix 4

VCM Transport Impact Assessment

TECHNICAL NOTE

Transportation Engineering



REF: 301401475

DATE: 18 November 2021

Vitrinite Pty Ltd
c/- Metserve Pty Ltd
310 Edward Street
BRISBANE CITY QLD 4000

Attention: Christine Jones (Senior Consultant - Environment)

Dear Christine,

VULCAN COAL MINE – TRANSPORT IMPACT ASSESSMENT

Background

Queensland Coking Coal Pty Ltd (QCC) and Queensland Coal Aust. No. 1 (QCA1), both fully owned by Vitrinite Pty Ltd (Vitrinite), hold a site-specific environmental authority (EA) for a resource Environmentally Relevant Activity (ERA) authorising the Vulcan Coal Mine (VCM). The EA (EA0002912) took effect on the issue of mining lease ML700060 on 1 October 2021.

The VCM is located approximately 40 kilometres (km) northwest of Dysart and 35 km southeast of Moranbah, in the Bowen Basin. The VCM lies to the immediate west of several established mining operations, including BHP's Peak Downs Mine and Saraji Mine. The VCM's regional location is shown in Figure 1.

In 2020, GTA Consultants, now Stantec (herein referred to as 'Stantec'), prepared a Transport Impact Assessment (TIA) (herein referred to as the '2020 TIA') to support the current EA. The 2020 TIA was prepared in accordance with the requirements of the Department of Transport and Main Roads (TMR) (2018) *Guide to Traffic Impact Assessment (GTIA)* and TMR's (2018) *Guide to Traffic Impact Assessment Practice Note: Pavement Impact Assessment (GTIA PIA)*.

In November 2021, Stantec was commissioned by Metserve Pty Ltd (on behalf of Vitrinite Pty Ltd) to prepare an updated transport assessment (herein referred to as the '2021 TIA') for the Project based on the proposed provision of additional infrastructure to support the VCM, including a Coal Handling and Preparation Plan (CHPP), Train Load-out Facility (TLO) and a dedicated Rail Loop. It is understood that this 2021 TIA will support a major change amendment to the existing EA approval.

Purpose of this Technical Note

This technical note has been prepared to provide a brief description of the Project, the revised expected vehicle demand for the Project compared with the existing approval, and revised transport assessment. This technical note includes consideration of the following items:

- the change in traffic volumes between the 2020 TIA (as part of the existing approval) and 2021 TIA (inclusive of the proposed changes to the Project)

- the traffic impact associated with expected construction activities for the additional infrastructure associated with the CHPP, TLO and Rail Loop
- the modified traffic impact associated with haulage operations resulting from the additional infrastructure
- determination of any mitigation measures required for the external road network due to increased vehicle demand
- revised Pavement Impact Assessment (PIA) having regard to the revised vehicle demand and associated pavement loading.

Figure 1: Vulcan Coal Mine – Regional Context



References

In preparing this technical note, reference has been made to the following:

- TIA report prepared by GTA (2020) as part of the existing approval

- historical traffic count data provided by TMR in October 2021 for the Peak Downs Highway
- other documents and data as referenced in this report.

Project Description

QCC and QCA1, both fully owned by Vitrinite, hold a site specific EA for a resource ERA authorising the VCM. The EA (EA0002912) took effect on the issue of mining lease ML700060 on 1 October 2021.

The development of a single open cut pit has commenced as authorised by mining lease ML700060 and EA0002912. The open cut pit will extend to a depth of approximately 45 metres (m), following the coal seam as it dips eastwards. The footprint of the open cut pit is approximately 136 hectares (ha). Truck and shovel mining operations are employed to extract waste rock and coal from the open cut pit.

The VCM will operate for approximately four years and will extract approximately six million tonnes (Mt) of Run of Mine (ROM) hard coking coal at a rate of up to 1.95 million tonnes per annum (Mtpa). The VCM will target the Alex and multiple Dysart Lower coal seams.

An ex-pit waste rock dump (WRD) is under development to facilitate the development of the open cut pit. Following this initial ex-pit waste rock placement, and once sufficient space is available in the open cut pit, in-pit dumping of waste rock will commence and will continue for the life of the operation. In-pit dumping will fill the majority of the open cut pit during operation, with the remaining void to be backfilled upon cessation of mining.

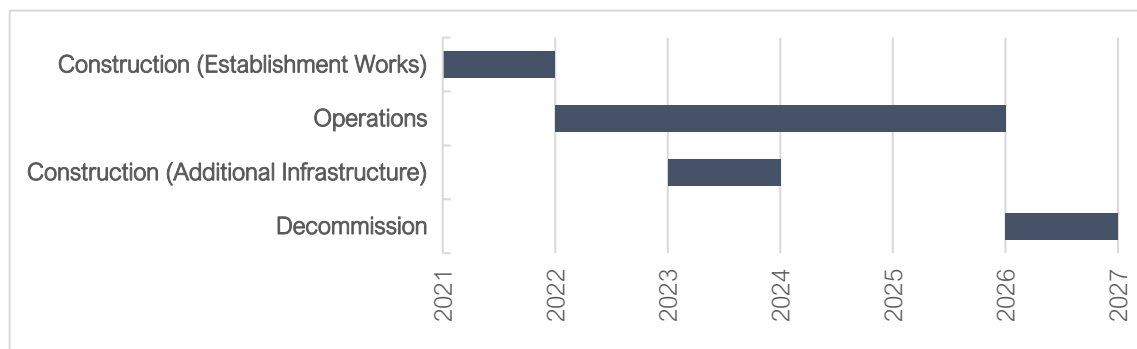
A Progressive Rehabilitation and Closure Plan (PRC Plan) and Progressive Rehabilitation and Closure Schedule (PRC Schedule) have been approved for the VCM in compliance with Vitrinite’s obligations under the Environmental Protection Act 1994 (QLD) and Mineral Resources and Energy (Financial Provisioning) Act 2018 (QLD). The PRC Plan describes a post mining land use of low intensity cattle grazing, public road, railway, supporting infrastructure and flood levee.

Construction of the mining infrastructure is planned to be completed in 2021 (aligning with on-road infrastructure upgrades of Saraji Road) and haulage associated with the Bulk Sample Project. Mining operations for the Project will commence in 2022 and have an operations cycle of 4 years. The second year of operations (Project year 3) will align with construction of additional infrastructure to support the VCM, including a CHPP, TLO and a dedicated Rail Loop. Following the completion of Project operations, decommissioning and rehabilitation works will be undertaken. The Project schedule is summarised in Table 1 and Figure 2.

Table 1: Project Schedule

Project Year	Project Activity	Year
Year 1	Construction (Establishment Works)	2021
Year 2	Operations	2022
Year 3	Construction (Additional Infrastructure) & Operations	2023
Year 4	Operations	2024
Year 5	Operations	2025
Year 6	Decommission	2026

Figure 2: Vulcan Coal Mine – Project Schedule



Comparison to Existing Approval

A comparison of Project specific transport related information between the 2020 TIA and those which form the basis the 2021 TIA is provided in Table 2 and Table 3. These assumptions underpinning the 2020 and 2021 TIA reports have been provided by Metserve Pty Ltd, in consultation with Vitrinite.

Table 2: Project Details & Workforce Comparison – 2020 TIA vs. 2021 TIA

Description	2020 TIA	2021 TIA
Construction Year – Establishment Works	2020 (Year 1)	2021 (Year 1)
Operational Years – Mining	2021 – 2023 (Year 2 – 4)	2022 – 2025 (Year 2 – 5)
Construction Year – Additional Infrastructure (CHPP, TLO, rail loop)	-	2023 (Year 3)
Decommissioning Year	2024 (Year 5)	2026 (Year 6)
Peak Construction Workforce – Establishment Works	42 persons	42 persons
Peak Construction Workforce – Additional Infrastructure (CHPP, TLO, rail loop)	-	65 persons
Peak Operational Workforce	116 persons	110 persons
Peak Decommissioning Workforce	30 persons	30 persons

Table 3: Project Traffic Comparison – 2020 TIA vs. 2021 TIA

Description	Project Year	2020 TIA (vehicles)	2021 TIA (vehicles)
Maximum Peak Hour Vehicle Demand ^[1]	Year 1	50	50
	Year 2	56	50
	Year 3	56	62
	Year 4	56	34
	Year 5	50	34
	Year 6	-	50
Average Daily Vehicle Demand ^[1]	Year 1	43	43
	Year 2	117	107
	Year 3	117	160
	Year 4	117	51
	Year 5	27	51

Description	Project Year	2020 TIA (vehicles)	2021 TIA (vehicles)
	Year 6	-	27
Annual Heavy Vehicle Demand ^[1]	Year 1	611	611
	Year 2	30,319	30,319
	Year 3	30,319	34,185
	Year 4	30,319	1,119
	Year 5	123	1,119
	Year 6	-	123
	Total Heavy Vehicle Demand ^[2]	91,691	67,415

[1] Total vehicles into and out of the Project site access on Saraji Road

As shown in Table 2 and Table 3, the expected workforce and vehicle demand associated with Project construction (Year 1) and Project decommissioning works (Year 6) are not expected to change between the 2020 TIA and the 2021 TIA. As such, the assessment of the initial construction year and decommissioning years have not been included in the 2021 TIA.

It is noted that whilst the total heavy vehicle demand is an overall reduction in the 2021 TIA, there is an expected intensification during Project year 3 corresponding with additional construction activities being undertaken within the 2021 TIA. This is discussed further below.

Baseline Traffic Volumes and Growth

State Controlled Roads

As part of the 2021 TIA, background traffic volumes for the Peak Downs Highway for the year 2020 have been sourced from TMR (obtained 4 November 2021) by way of Annual Average Daily Traffic (AADT) Marginal Costs spreadsheet (data request reference number: DR2675). These baseline traffic volumes include directional AADT volumes, pavement loading values and growth rates for the Peak Downs Highway between Clermont to Nebo and Nebo to Mackay.

Growth rates obtained from historic traffic data detailed within the 2020 AADT Marginal Costs spreadsheet indicate that sections of the heavy vehicle network over the past five years have experienced varying levels of growth (i.e. both negative and positive rates of growth). To be conservative, growth rates used in the traffic impact calculations have been limited to between 1% and 5% per annum, to limit variance and outliers in growth over long periods of time. These growth rates have been applied to each individual road section in the traffic impact calculations.

For the purpose of converting AADT volumes to peak hour volumes (for the road link and intersection assessment), a peak-to-daily ratio of 15% has been assumed. The application of this ratio is in accordance with guidance for rural roads provided in TMR's (2004) *Road Planning and Design Manual (Edition 1) – Chapter 5 – Traffic Parameters and Human Factors (RPDM 1st Edition – Chapter 5)*.

A summary of the Peak Downs Highway vehicle demands provided within the TMR Marginal Costs spreadsheet is provided in Table 4.

Table 4: Baseline Traffic Volumes – TMR Road Asset Data for Peak Downs Highway (2020)

Road Name	Segment Description	Direction	Chainage Start ^[1]	Chainage End ^[1]	AADT	5 Year Growth ^[2]	HV% ^[3]
33A - Peak Downs Highway (Clermont - Nebo)	Peak Downs Hwy West of Dysart Turnoff	Against Gazettal	0.0	89.1	281	0.2%	37%
		Gazettal	0.0	89.1	286	0.3%	29%
	33A Between Moranbah Turnoff & Dysart Turnoff	Against Gazettal	89.1	90.4	1,647	3.8%	34%
		Gazettal	89.1	90.4	1,669	4.6%	38%
	Peak Downs Hwy 150m West of Isaac River	Against Gazettal	90.4	101.8	1,528	3.9%	17%
		Gazettal	90.4	101.8	1,516	3.4%	20%
	West of Coppabella	Against Gazettal	101.8	128.0	1,977	4.2%	20%
		Gazettal	101.8	128.0	2,019	5.0%	45%
	East of Coppabella	Against Gazettal	128.0	149.4	1,783	4.6%	23%
		Gazettal	128.0	149.4	1,782	4.8%	34%
	East of Bee Creek	Against Gazettal	149.4	163.6	2,126	4.1%	34%
		Gazettal	149.4	163.6	2,089	3.8%	19%
	North of Braeside Road	Against Gazettal	163.6	178.2	2,047	4.7%	24%
		Gazettal	163.6	178.2	2,015	4.5%	19%
33B - Peak Downs Highway (Nebo - Mackay)	Retreat Hotel Permanent Counter	Against Gazettal	0.0	44.8	2,052	3.5%	24%
		Gazettal	0.0	44.8	2,110	4.2%	31%
	Weigh in Motion Site Eton	Against Gazettal	44.8	62.0	2,233	3.9%	24%
		Gazettal	44.8	62.0	2,261	5.3%	30%
	West of Walkerston Township	Against Gazettal	62.0	76.0	2,747	0.0%	20%
		Gazettal	62.0	76.0	2,725	-0.5%	13%
	East of Walkerston Cemetery	Against Gazettal	76.0	81.4	4,558	-0.3%	22%
		Gazettal	76.0	81.4	4,364	-0.2%	15%
	East of BSES	Against Gazettal	81.4	86.1	7,348	-0.5%	14%
		Gazettal	81.4	86.1	7,596	-0.7%	15%
	West of Bernborough Avenue	Against Gazettal	86.1	87.0	4,568	-0.1%	19%
		Gazettal	86.1	87.0	4,658	0.3%	14%
	Bernborough Avenue - City Gates	Against Gazettal	87.0	87.8	4,865	0.0%	16%
		Gazettal	87.0	87.8	4,913	-1.1%	19%

[1] Chainage based on TMR Road Asset Data 'TDistStart' and 'TDistEnd'

[2] Average linear growth over the 5-year period between 2014 and 2018

[3] HV% – Percentage of Heavy Vehicles

Council Controlled Roads

Background traffic volumes for the Isaac Regional Council controlled roads of Saraji Road and Peak Downs Mine Road have been sourced from traffic surveys sourced as part of the TIA for the 'Vulcan Project Bulk Sample' (QTT9045) prepared by Cardno (2 July 2019). This TIA included vehicle movement counts at the

Peak Downs Highway & Peak Downs Mine Road intersection and Peak Downs Mine Road & Saraji Road intersection. AADT volumes are based on peak hourly movement volumes and a peak-to-daily ratio of 15%. The application of this ratio is in accordance with guidance for rural roads provided in the *RPDM 1st Edition – Chapter 5*.

A background traffic growth rate of 3% per annum (linear) has been adopted to inform the basis of future traffic forecasts. The application of this growth rate aligns with the guidance set out within TMR's GTIA, where site-specific data is unavailable. A summary of traffic volumes on the local road network is provided in Table 5.

Table 5: Baseline Traffic Volumes – Local Road Network (2019)

Road Name	Segment Description	Direction	Section Length	AADT	5 Year Growth ^[1]	HV%
Saraji Road	Between Peak Downs Mine Road Site Access Location	Combined	43.1km ^[2]	2,270	3%	7.0%
Peak Downs Mine Road	Between Peak Downs Highway and Saraji Road	Combined	25.9km	3,185	3%	9.1%

[1] Site specific data unavailable. Growth Rate has been based on guidance from GTIA

[2] Site Access is located 4.1km south of the Saraji Road & Peak Downs Mine Road intersection

Project Traffic

Workforce Traffic Generation

The Project's workforce will be primarily sourced from the regional area (i.e. Isaac and Mackay regions) and make use of the existing accommodation camp facilities and private housing at Moranbah and Dysart. Project related transport is anticipated to include a combination of Drive-in / Drive-out (DIDO) from Mackay and Fly-in / Fly-out (FIFO) from Moranbah Airport, with daily transport from the Moranbah and Dysart accommodation camps by way of shuttle buses (approximately 22 seat capacity). The Project will also utilise local residents from Moranbah and Dysart who are expected to drive to the site with their own private vehicles. Projected workforce requirements are provided in Table 6.

Table 6: Project Workforce Projections

Project Year & Activity	Workforce Projection (Persons)
Year 2 - Operations	110
Year 3 - Operations and Construction	175 ^[1]
Year 4 & 5 - Operations	110

[1] Includes a workforce of 65 persons for Project construction activities and a workforce of 110 persons for Project operations

Assumptions have been made regarding the location of the workforce, likely roster arrangements and vehicle occupancies, as detailed in the following sections. These assumptions have been developed in consultation with Vitrinite. It is anticipated that during operations the workforce will be accommodated through a mix of local workers, DIDO and FIFO workers staying at the Moranbah and Dysart accommodation villages. In line with the 2020 TIA, the following assumptions have been used as the basis of this assessment:

- Location – workforce will be split 50/50 between Moranbah and Dysart
- Travel Mode – 80% travelling to site by bus (vehicle occupancy of 22 persons) and 20% travelling by private vehicles (vehicle occupancy of 1.2 persons)
- Roster / Shifts – Operations Workforce – 2 x 12-hour shift (day shift and night shift), 7 days per week

Construction Workforce – 1 x 12-hour shift (day), 5 days per week

- Peak Demand – traffic generation associated with shift start and end times will occur within a single hour coinciding with the network peaks.

The estimated workforce generated traffic (inclusive of bus movements) is summarised in Table 7.

Table 7: Workforce Traffic Generation Summary

Project Activity	Direction	AM Peak (veh / hr)		PM Peak (veh / hr)	
		In	Out	In	Out
Year 2 - Operations	Moranbah (North)	7	7	7	7
	Dysart (South)	7	7	7	7
Year 3 - Operations and Construction	Moranbah (North)	16	7	7	16
	Dysart (South)	16	7	7	16
Year 4 & 5 - Operations	Moranbah (North)	7	7	7	7
	Dysart (South)	7	7	7	7

veh / hr – vehicle movements per hour

Heavy Vehicle Traffic Generation

Vitrinite has provided estimates of heavy vehicle movements for each year of the Project. The anticipated origins / destinations of heavy vehicles during year 2 and year 3 are an off-site CHPP, Mackay and Moranbah (as per the 2020 TIA). Following completion of construction of the on-site CHPP, TLO, and rail loop in year 3, heavy vehicle movements will no longer access the off-site CHPP. A summary of the anticipated peak daily vehicle demand is provided in Table 8.

Table 8: Peak Daily Project Heavy Vehicle Demand

Project Activity	Austroads Vehicle Class	Peak Daily Vehicles (veh / day)		
		Off-site CHPP	Moranbah	Mackay
Year 2 Operations	Class 3	-	1	-
	Class 10	-	-	3
	Class 12	80	-	-
	Total	80	1	3
Year 3 Operations and Construction	Class 3	-	1	-
	Class 9	-	-	10
	Class 10	-	-	3
	Class 12	80	-	-
	Total	80	1	13
Year 4 & 5 Operations	Class 3	-	1	-
	Class 10	-	-	3
	Total	0	1	3

In line with the 2020 TIA, the assumed haul routes for all heavy vehicle movements are Saraji Road, Peak Downs Mine Road and the Peak Downs Highway.

It has been assumed that heavy vehicle traffic generation associated with the Project operations haulage (i.e. class 12 vehicles) will occur steadily over a 24-hour workday, with other heavy vehicle movements (typically relating to deliveries) arriving steadily over a 10-hour workday and conservatively assumed to arrive and depart in the same peak period.

Based on the assumptions documented in the preceding sections, peak hour estimates of heavy vehicle traffic are summarised in Table 9.

Table 9: Peak Hour Project Heavy Vehicle Traffic Generation Summary – Site Access

Project Activity	Peak Hour Movements (veh / hr)	
	In	Out
Year 2 Operations	7	7
Year 3 Operations and Construction	8	8
Year 4 & 5 Operations	3	3

veh / hr – vehicle movements per hour

Road Link Assessment

The GTIA describes key impact years which would ordinarily form part of a TIA. GTIA defined design horizons for the road link capacity is summarised in Table 10.

Table 10: GTIA Specified Design Horizons for Assessment – Road Link Impacts

Assessment / Impact Type	Assessment / Impact Year
Road Link Capacity	Year of opening of each stage including the final stage.

Taking into consideration the Project schedule, the years are of relevance to the assessment of the site access and intersection assessments are Project Year 2 (Operations - 2022), Project Year 3 (Operations and Construction - 2023), Project Year 4 (Operations - 2024), and Project Year 5 (Operations - 2025).

State Controlled Roads

Context of Road Link Assessment

The following section has been prepared to assess anticipated Project impacts on the road network with due consideration of forecast traffic volumes “with” and “without” the Project. This assessment has been prepared in accordance with the principles outlined in the GTIA which defines the impact assessment area to be:

“All road links where the development traffic exceeds 5% of the base traffic in either direction on the link’s annual average daily traffic (AADT) in the year of opening of each stage”

Impacted Road Links on State Controlled Roads

Table 11 summarises results of the comparison between expected peak daily Project traffic against baseline AADT traffic on State Controlled Roads (SCR), to determine whether the 5% traffic impact threshold of the GTIA is exceeded.

Table 11: Road Link Assessment – Impact Identification Table

Road Name	Road Section	Direction	Chainage Start	Chainage End	Percentage Increase			
					Year 2	Year 3	Year 4	Year 5
33A - Peak Downs Highway (Clermont - Nebo)	Peak Downs Hwy West of Wuthung Turnoff 65.28	Gazettal	0.0	89.1	0%	0%	0%	0%
		Against Gazettal	0.0	89.1	0%	0%	0%	0%
	33A Between Moranbah Turnoff & Dysart Turnoff	Gazettal	89.1	90.4	5%	6%	1%	1%
		Against Gazettal	89.1	90.4	5%	6%	1%	1%
	Peak Downs Hwy 150m West of Isaac River	Gazettal	90.4	101.8	4.9%	5%	0%	0%
		Against Gazettal	90.4	101.8	4.9%	5%	0%	0%
	West of Coppabella (Prior to CHPP turnoff)	Gazettal	101.8	112.0	4%	4%	0%	0%
		Against Gazettal	101.8	112.0	4%	4%	0%	0%
	West of Coppabella (Following CHPP turnoff)	Gazettal	112.0	128.0	0%	1%	0%	0%
		Against Gazettal	112.0	128.0	0%	1%	0%	0%
	East of Coppabella	Gazettal	128.0	149.4	0%	1%	0%	0%
		Against Gazettal	128.0	149.4	0%	1%	0%	0%
	East of Bee Creek	Gazettal	149.4	163.6	0%	1%	0%	0%
		Against Gazettal	149.4	163.6	0%	1%	0%	0%
	North of Braeside Road	Gazettal	163.6	178.2	0%	1%	0%	0%
		Against Gazettal	163.6	178.2	0%	1%	0%	0%
	Retreat Hotel Permanent Counter	Gazettal	0.0	44.8	0%	1%	0%	0%
		Against Gazettal	0.0	44.8	0%	1%	0%	0%
33B - Peak Downs Highway (Nebo - Mackay)	Weigh in Motion Site Eton	Gazettal	44.8	62.0	0%	1%	0%	0%
		Against Gazettal	44.8	62.0	0%	1%	0%	0%
	West of Walkerston Township	Gazettal	62.0	76.0	0%	0%	0%	0%
		Against Gazettal	62.0	76.0	0%	0%	0%	0%
	East of Walkerston Cemetery	Gazettal	76.0	81.4	0%	0%	0%	0%
		Against Gazettal	76.0	81.4	0%	0%	0%	0%
	East of BSES	Gazettal	81.4	86.1	0%	0%	0%	0%
		Against Gazettal	81.4	86.1	0%	0%	0%	0%
	West of Bernborough Avenue	Gazettal	86.1	87.0	0%	0%	0%	0%
		Against Gazettal	86.1	87.0	0%	0%	0%	0%
	Bernborough Avenue - City Gates	Gazettal	87.0	87.8	0%	0%	0%	0%
		Against Gazettal	87.0	87.8	0%	0%	0%	0%

On the basis of the summary provided in Table 11, the impact of forecast Project traffic exceeds 5% of the forecast AADT for road segments of Peak Downs Highway (road section 33A) during Year 2 and Year 3

between the Peak Downs Mine Road turnoff and the Peak Downs Mine CHPP turnoff. As a result, the Project impact on SCRs warrants further analysis.

Based on a peak-to-daily ratio of 15% for background traffic, the Peak Downs Highway experiences a single direction peak hour flow of approximately up to 350 vehicles per hour. These volumes are significantly below the typical midblock capacity for a single lane of 900 vehicles per hour as described in *Austrroads Guide to Traffic Management Part 3: Traffic Studies and Analysis (2017)*. As such, the increased vehicle demand as a result of the Project is expected to be accommodated by existing capacity provided on these road segments. On this basis, it is not expected that road impact mitigation works as a direct result of the Project is required.

Council Controlled Roads

Table 12 summarises the comparison of expected peak daily Project traffic against baseline AADT traffic on Council controlled roads, to determine expected traffic impacts resulting from the Project.

Table 12: Road Link Assessment – Impact Identification Table

Road Section	Direction	Percentage Increase			
		Year 2	Year 3	Year 4	Year 5
Saraji Road – South of Site Access	Combined	1%	2%	1%	1%
Saraji Road – North of Site Access	Combined	8%	8%	1%	1%
Peak Downs Mine Road	Combined	6%	6%	1%	1%

On the basis of the summary provided in Table 12, during Project Year 2 and Project Year 3 the forecast Project traffic is expected to result in an increase of the forecast AADT for Saraji Road (north of the site access) in the order of up to 8% , for Peak Downs Mine Road in the order of up to 6%, and for Saraji Road (south of the site access) in the order of up to 2%. During Project Year 4 and Project Year 5, impacts to Council controlled road sections of Saraji Road (north and south of the site access) and Peak Downs Mine Road are expected to be in the order of 1%.

Further analysis of the Project impact on council-controlled roads has been undertaken to confirm their capacity to accommodate peak hour vehicle demands. Based on a peak-to-daily ratio of 15% and 90% directional demand during peak hours for background traffic, Saraji Road and Peak Downs Mine Road experience a single direction peak hour flow of approximately 370 and 520 vehicles per hour, respectively. These volumes are significantly below the typical midblock capacity for a single lane of 900 vehicles per hour as described in *Austrroads Guide to Traffic Management Part 3: Traffic Studies and Analysis (2017)*. As such, the increased vehicle demand as a result of the Project is expected to be accommodated by existing capacity provided on these road segments.

Intersection Impact Assessment

The GTIA describes key impact years which would ordinarily form part of a TIA. GTIA defined design horizons for the site access and intersection delay are summarised in Table 13.

Table 13: GTIA Specified Design Horizons for Assessment – Intersection Impacts & Site Access

Assessment / Impact Type	Assessment / Impact Year
Access and Frontage	Year of opening of each stage including the final stage and 10 years after the year of opening of the final stage for access intersections.
Intersection Delay	Year of opening of each stage including the final stage.

Taking into consideration the Project schedule, the years are of relevance to the assessment of the site access and intersection assessments are Project Year 2 (Operations - 2022), Project Year 3 (Operations and Construction - 2023), Project Year 4 (Operations - 2024), and 10-year design horizon (2034). It is noted that during the 10-year design horizon, the Project operations will have been completed and there will be no Project related traffic expected. As such, the 10-year design horizon has not been assessed.

Site Access Location

The initial construction period of the Project includes the completion of realignment works for a section of Saraji Road, with a new site frontage to be provided along the new alignment. The Project proposes to gain vehicular access to the site along the Saraji Road realignment.

A turn warrant assessment of the proposed Project access / Saraji Road intersection has been prepared in accordance with the methodology provided in TMR's (2014) *'Road Planning and Design Manual (2nd Edition) – Volume 3: Supplement to Austroads Guide to Road Design Part 4A' (RPDM Volume 3: Part 4A)*. Results of the assessment (provided in Attachment A) conclude that turn treatments on the realigned Saraji Road of the proposed site access intersection in Project Year 4 are required to take the form of:

- Left-Turn: Basic Left Turn (BAL)
- Right-Turn: Short Channelised Right Turn (CHR[s]).

The turn warrant assessment indicates that a BAL and CHR(s) turn treatments are required at the existing Project access / Saraji Road intersection to cater for Project generated traffic. The requirements of this assessment (i.e. BAL and CHR(s) turn treatments) have not changed from the results of the 2020 TIA.

Other Intersections

An assessment of intersections proximate to the site was prepared for the selected design horizons, to identify impacted intersections (i.e. intersections where the development traffic exceeds 5% of the base traffic for any movements in the design peak periods). Table 14 details intersections where the 5% threshold was exceeded for one or more movements for both the AM and PM peak periods.

Table 14: Intersection Impact Identification

Intersection	Design Year	Impact
Saraji Road & Peak Downs Mine Road	Year 2 (2022)	Exceeds 5% threshold for 2 movements
	Year 3 (2023)	Exceeds 5% threshold for 2 movements
	Year 4 (2024)	Exceeds 5% threshold for 2 movements
Peak Downs Mine Road & Peak Downs Highway	Year 2 (2022)	Exceeds 5% threshold for 2 movement
	Year 3 (2023)	Exceeds 5% threshold for 2 movements
	Year 4 (2024)	Exceeds 5% threshold for 2 movements

Turn warrant assessments of the Saraji Road & Peak Downs Mine Road intersection and Peak Downs Mine Road & Peak Downs Highway intersection have been prepared based on Project conditions (i.e. with additional Project related traffic) in accordance with the methodology provided in the *RPDM Volume 3: Part 4A*. Results of the assessment (included at Attachment A) conclude that turn treatments on the major road of the intersections are required to take the form of:

Saraji Road & Peak Downs Mine Road (Peak Downs Mine Road approaches)

- Left-Turn: Basic Left Turn (BAL)

- Right-Turn: Basic Right Turn (BAR)

A comparison of Baseline and Project Conditions turn warrant assessments show that the required turn treatments for Saraji Road and Peak Downs Mine Road intersection do not alter as a result of the Project related traffic movements. As a result, it is not the responsibility of Vitrinite to provide additional turn treatments based on project related traffic volumes.

Peak Downs Mine Road & Peak Downs Highway (Peak Downs Highway approaches)

- Left-Turn: Short Auxiliary Left Turn (AUL[s])
- Right-Turn: Basic Right Turn (BAR).

The Peak Downs Mine Road and Peak Downs Highway intersection currently accommodates both Channelised Left Turn and Channelised Right Turn treatments, exceeding the requirements detailed in the turn warrant assessment. Therefore, no intersection upgrades are required at this intersection based on Project related traffic volumes.

Pavement Impact Assessment

The GTIA describes key impact years which would ordinarily form part of a TIA. GTIA defined design horizons for the road link capacity is summarised in Table 10.

Table 15: GTIA Specified Design Horizons for Assessment – Pavement Impacts

Assessment / Impact Type	Assessment / Impact Year
Pavements	Year of opening of each stage including the final stage. Note that mitigation of pavement impacts occurs for a period of 20 years after the opening of the final stage.

Taking into consideration the Project schedule, the years are of relevance to the assessment of the site access and intersection assessments are Project Year 2 (Operations - 2022), Project Year 3 (Operations and Construction - 2023), Project Year 4 (Operations - 2024), and Project Year 5 (Operations - 2025).

Introduction

Identification of pavement impacts to SCRs was prepared in accordance with TMR’s GTIA Practice Note for Pavement Impact Assessments (PIA) (December 2018). This process was supplemented with Marginal Cost spreadsheets, provided by TMR for the Peak Downs Highway in November 2021.

The PIA methodology compares the baseline heavy vehicle Standard Axle Repetitions (SARs) with Project generated heavy vehicle SARs for each year of the Project. Any identified Project increases of greater than 5% per year generally requires some level of contribution to offset Project impacts. Mitigation of pavement impacts occurs for a period of 20 years after the opening of the final stage. For this Project, heavy vehicle movements associated with the construction and establishment works (Project Year 1) and decommissioning (Project Year 6) have not altered from the 2020 TIA have therefore not been reassessed. It is noted that the heavy vehicle demand associated with the construction and establishment works and decommissioning do not result in any pavement impacts which exceed the 5% threshold and therefore do not correspond to any associated monetary contribution requirements.

For assessment of SCRs, this assessment has covered the entire length of the Peak Downs Highway. This is the only SCR that is expected to carry heavy vehicle movements and is therefore considered a suitable scope for the assessment.

For consideration of pavement contributions for Council controlled roads, it is understood that a separate agreement is to be formalised between Vitrinite and Isaac Regional Council.

SAR Conversion Factors

SAR conversion factors have been provided in TMR's GTIA and the PIA Practice Note. Vitrinite has indicated that the haulage will be completed by an AB Triple Road Train with a maximum haulage of 70 tonnes.

Based on the maximum haulage indicated of 70 tonnes, the loaded and unloaded SAR conversion factors have been recalculated for this assessment. The adopted SAR4 conversion factors for impact identification are as detailed in Table 16.

Table 16: SAR4 Conversion Factors

Vehicle Type	Vehicle Class	Loaded SAR4 Conversion Factor	Unloaded SAR4 Conversion Factor
Two Axle Truck	3	3.6	0.54
Semi-Trailer	9	4.9	0.51
B-Double	10	6.3	0.53
AB Triple Road Train	12	9.03 ^[1]	0.56 ^[1]

[1] SAR4 conversion factors based on modified axle arrangement to support a 70t haulage

Baseline SAR4

The Marginal Cost spreadsheet provided by TMR indicates that the Peak Downs Highway comprises of 'Granular Pavement', and as per TMR's GTIA this correlates to a 'load damage exponent' of 4 (SAR4). Baseline heavy vehicle movements and associated daily SAR4s on sealed SCR proximate to the Project are provided in Table 17.

Table 17: Baseline Traffic Volumes – Heavy Vehicle Haulage Roads

Road Name	Segment Description	Direction	Chainage Start ^[1]	Chainage End ^[1]	Background SAR4 Daily
Saraji Road	Between Peak Downs Mine Road Site Access Location	Combined	-	-	508 ^[2]
Peak Downs Mine Road	Between Peak Downs Mine Road Site Access Location	Combined	-	-	928 ^[2]
33A - Peak Downs Highway (Clermont - Nebo)	Peak Downs Hwy West of Wuthung Turnoff 65.28	Gazettal	0.0	89.1	281
		Against Gazettal	0.0	89.1	286
	33A Between Moranbah Turnoff & Dysart Turnoff	Gazettal	89.1	90.4	1,647
		Against Gazettal	89.1	90.4	1,669
	Peak Downs Hwy 150m West of Isaac River	Gazettal	90.4	101.8	1,528
		Against Gazettal	90.4	101.8	1,516
	West of Coppabella	Gazettal	101.8	128.0	1,977
		Against Gazettal	101.8	128.0	2,019
	East of Coppabella	Gazettal	128.0	149.4	1,783
		Against Gazettal	128.0	149.4	1,782
East of Bee Creek	Gazettal	149.4	163.6	2,126	

Road Name	Segment Description	Direction	Chainage Start ^[1]	Chainage End ^[1]	Background SAR4 Daily
	North of Braeside Road	Against Gazettal	149.4	163.6	2,089
		Gazettal	163.6	178.2	2,047
		Against Gazettal	163.6	178.2	2,015
33B - Peak Downs Highway (Nebo - Mackay)	Retreat Hotel Permanent Counter	Gazettal	0.0	44.8	2,052
		Against Gazettal	0.0	44.8	2,110
	Weigh in Motion Site Eton	Gazettal	44.8	62.0	2,233
		Against Gazettal	44.8	62.0	2,261
	West of Walkerston Township	Gazettal	62.0	76.0	2,747
		Against Gazettal	62.0	76.0	2,725
	East of Walkerston Cemetery	Gazettal	76.0	81.4	4,558
		Against Gazettal	76.0	81.4	4,364
	East of BSES	Gazettal	81.4	86.1	7,348
		Against Gazettal	81.4	86.1	7,596
	West of Bernborough Avenue	Gazettal	86.1	87.0	4,568
		Against Gazettal	86.1	87.0	4,658
	Bernborough Avenue - City Gates	Gazettal	87.0	87.8	4,865
		Against Gazettal	87.0	87.8	4,913

[1] Chainage based on TMR Road Asset Data 'TDistStart' and 'TDistEnd'

[2] Available data for Council controlled Saraji Road and Peak Downs Mine Road is available for 2019.

Development SAR4

The annual heavy vehicle movements for the construction, operations and decommissioning periods have been calculated based on information provided by Vitrinite.

The annual heavy vehicle movements for the initial year of operations (Year 2), the second year of operations and construction of additional infrastructure (Year 3), and subsequent years of operations (Year 4 and Year 5) are detailed in Table 18 and Table 19. The application of the anticipated annual Project heavy vehicle generation combined with the relevant SAR4 conversion factor (as shown in Table 16) is detailed in Table 20 and Table 21 and summarised for each road section in Table 22.

Table 18: Annual Project Heavy Vehicle Movements – Inbound to Site

Project Activity	Austroads Vehicle Class	Loaded Movements (veh / year)			Unloaded Movements (veh / year)		
		Offsite CHPP	Moranbah	Mackay	Offsite CHPP	Moranbah	Mackay
Year 2 Operations	Class 3	-	24	-	-	-	-
	Class 10	-	-	730	-	-	365
	Class 12	-	-	-	29,200	-	-
Year 3 Operations and Construction	Class 3	-	-	240	-	-	-
	Class 9	-	-	3,650	-	-	-
	Class 10	-	-	730	-	-	365

Project Activity	Austroads Vehicle Class	Loaded Movements (veh / year)			Unloaded Movements (veh / year)		
		Offsite CHPP	Moranbah	Mackay	Offsite CHPP	Moranbah	Mackay
	Class 12	-	-	-	29,200	-	-
Year 4 & 5 Operations	Class 3	-	24	-	-	-	-
	Class 10	-	-	730	-	-	365

Table 19: Annual Project Heavy Vehicle Movements – Outbound from Site

Project Phase	Austroads Vehicle Class	Loaded Movements (veh / year)			Unloaded Movements (veh / year)		
		Offsite CHPP	Moranbah	Mackay	CHPP	Moranbah	Mackay
Year 2 Operations	Class 3	-	-	-	-	24	-
	Class 10	-	-	365	-	-	730
	Class 12	29,200	-	-	-	-	-
Year 3 Operations and Construction	Class 3	-	-	-	-	-	240
	Class 9	-	-	-	-	-	3,650
	Class 10	-	-	365	-	-	730
	Class 12	29,200	-	-	-	-	-
Year 4 & 5 Operations	Class 3	-	-	-	-	24	-
	Class 10	-	-	365	-	-	730

Table 20: Annual Project Heavy Vehicle SAR4 – Inbound to Site

Project Phase	Austroads Vehicle Class	Loaded Movements (veh / year)			Unloaded Movements (veh / year)		
		Offsite CHPP	Moranbah	Mackay	Offsite CHPP	Moranbah	Mackay
Year 2 Operations	Class 3	-	72	-	-	-	-
	Class 10	-	-	4,599	-	-	193
	Class 12	-	-	-	8,176	-	-
Year 3 Operations and Construction	Class 3	-	-	715	-	-	-
	Class 9	-	-	17,995	-	-	-
	Class 10	-	-	4,599	-	-	2,300
	Class 12	-	-	-	8,176	-	-
Year 4 & 5 Operations	Class 3	-	72	-	-	-	-
	Class 10	-	-	4,599	-	-	193

Table 21: Annual Project Heavy Vehicle SAR4 – Outbound from site

Project Phase	Austroads Vehicle Class	Loaded Movements (veh / year)			Unloaded Movements (veh / year)		
		Offsite CHPP	Moranbah	Mackay	Offsite CHPP	Moranbah	Mackay
Year 2 Operations	Class 3	-	-	-	-	13	-
	Class 10	-	-	2,300	-	-	387

Project Phase	Austrroads Vehicle Class	Loaded Movements (veh / year)			Unloaded Movements (veh / year)		
		Offsite CHPP	Moranbah	Mackay	Offsite CHPP	Moranbah	Mackay
	Class 12	131,838	-	-	-	-	-
Year 3 Operations and Construction	Class 3	-	-	-	-	-	130
	Class 9	-	-	-	-	-	1,862
	Class 10	-	-	2,300	-	-	387
	Class 12	131,838	-	-	-	-	-
Year 4 & 5 Operations	Class 3	-	-	-	-	13	-
	Class 10	-	-	2,300	-	-	387

Table 22: Project Heavy Vehicle Annual SAR4 Loading

Road Name	Section Description	Chainage Start ^[1]	Chainage End ^[1]	Direction	Year 2	Year 3	Year 4	Year 5
Saraji Road	Between Site Access Location and Dysart	-	-	Combined ^[2]	-	-	-	-
	Between Peak Downs Mine Road Site Access Location	-	-	Combined ^[2]	287,591	308,208	7,563	7,563
Peak Downs Mine Road	Between Peak Downs Mine Road Site Access Location	-	-	Combined ^[2]	287,591	308,208	7,563	7,563
33A - Peak Downs Highway (Clermont - Nebo)	Between Moranbah Turnoff & Dysart Turnoff	89.1	90.4	Gazettal	266,375	268,354	2,699	2,699
		89.1	90.4	Against Gazettal	21,216	39,854	4,864	4,864
	Peak Downs Hwy 150m West of Isaac River	90.4	101.8	Gazettal	266,362	268,354	2,686	2,686
		90.4	101.8	Against Gazettal	21,144	39,854	4,792	4,792
	West of Coppabella (Prior to CHPP turnoff)	101.8	112.0	Gazettal	266,362	268,354	2,686	2,686
		101.8	112.0	Against Gazettal	21,144	39,854	4,792	4,792
	West of Coppabella (following CHPP turnoff)	112.0	128.0	Gazettal	2,686	4,678	2,686	2,686
		112.0	128.0	Against Gazettal	4,792	23,502	4,792	4,792
	East of Coppabella	128.0	149.4	Gazettal	2,686	4,678	2,686	2,686
		128.0	149.4	Against Gazettal	4,792	23,502	4,792	4,792
	East of Bee Creek	149.4	163.6	Gazettal	2,686	4,678	2,686	2,686
		149.4	163.6	Against Gazettal	4,792	23,502	4,792	4,792
	North of Braeside Road	163.6	178.2	Gazettal	2,686	4,678	2,686	2,686
		163.6	178.2	Against Gazettal	4,792	23,502	4,792	4,792
33B - Peak Downs Highway	Retreat Hotel Permanent Counter	0.0	44.8	Gazettal	2,686	4,678	2,686	2,686
		0.0	44.8	Against Gazettal	4,792	23,502	4,792	4,792

Road Name	Section Description	Chainage Start ^[1]	Chainage End ^[1]	Direction	Year 2	Year 3	Year 4	Year 5
(Nebo - Mackay)	Weigh in Motion Site Eton	44.8	62.0	Gazettal	2,686	4,678	2,686	2,686
		44.8	62.0	Against Gazettal	4,792	23,502	4,792	4,792
	West of Walkerston Township	62.0	76.0	Gazettal	2,686	4,678	2,686	2,686
		62.0	76.0	Against Gazettal	4,792	23,502	4,792	4,792
	East of Walkerston Cemetery	76.0	81.4	Gazettal	2,686	4,678	2,686	2,686
		76.0	81.4	Against Gazettal	4,792	23,502	4,792	4,792
	East of BSES	81.4	86.1	Gazettal	2,686	4,678	2,686	2,686
		81.4	86.1	Against Gazettal	4,792	23,502	4,792	4,792
	West of Bernborough Avenue	86.1	87.0	Gazettal	2,686	4,678	2,686	2,686
		86.1	87.0	Against Gazettal	4,792	23,502	4,792	4,792
	Bernborough Avenue - City Gates	87.0	87.8	Gazettal	2,686	4,678	2,686	2,686
		87.0	87.8	Against Gazettal	4,792	23,502	4,792	4,792

[1] Chainage based on TMR Road Asset Data 'TDistStart' and 'TDistEnd'

[2] Assessment of Council controlled roads is based on combined directional assessment due to carriageway form ('Primary Through Undivided')

Impact Identification

As per the PIA methodology, the baseline heavy vehicle SARs were compared with Project generated heavy vehicle SARs for each year of the Project. Results of this comparison are detailed in Table 23.

The results of the PIA indicate that the additional expected SAR4 loading resulting from Project related heavy vehicle movements is anticipated to exceed 5% of the baseline SAR4 for Year 2 and Year 3, when an off-site CHPP is in use.

A pavement impact is expected for council-controlled roads for the Saraji Road and Peak Downs Mine Road. It is expected that a separate agreement will be formed between Council and Vitrinite for the mitigation of these expected pavement impacts.

A pavement impact is also identified for the SCR of Peak Downs Highway Section 33A between gazettal chainages 89.1 to 90.4, 90.4 to 101.8 and 101.8 to 112, and Peak Downs Highway Section 33B between gazettal chainages 62.0 to 76.0. As this projected loading exceeds the threshold as detailed in TMR's GTIA, monetary contributions may be required for identified impacts as outlined below.

Table 23: Pavement Impact Assessment Results Summary (Impact Comparison to Existing SAR4)

Road Name	Section Description	Chainage Start ^[1]	Chainage End ^[1]	Direction	Year 2	Year 3	Year 4	Year 5
Saraji Road	Between Site Access Location and Dysart	-	-	Combined	0%	0%	0%	0%
	Between Peak Downs Mine Road Site Access Location	-	-	Combined	142%	148%	4%	3%
Peak Downs Mine Road	Between Peak Downs Mine Road	-	-	Combined	78%	81%	2%	2%

Road Name	Section Description	Chainage Start ^[1]	Chainage End ^[1]	Direction	Year 2	Year 3	Year 4	Year 5	
	Site Access Location								
33A - Peak Downs Highway (Clermont - Nebo)	Between Moranbah Turnoff & Dysart Turnoff	89.1	90.4	Gazettal	3%	4%	1%	1%	
		89.1	90.4	Against Gazettal	78%	75%	1%	1%	
	Peak Downs Hwy 150m West of Isaac River	90.4	101.8	Gazettal	5%	10%	1%	1%	
		90.4	101.8	Against Gazettal	53%	52%	1%	0%	
	West of Coppabella (Prior to CHPP turnoff)	101.8	112	Gazettal	2%	3%	0%	0%	
		101.8	112	Against Gazettal	1%	1%	1%	0%	
	West of Coppabella (following CHPP turnoff)	112	128.0	Gazettal	0%	2%	0%	0%	
		112	128.0	Against Gazettal	1%	1%	0%	0%	
	East of Coppabella	128.0	149.4	Gazettal	0%	3%	1%	1%	
		128.0	149.4	Against Gazettal	0%	0%	0%	0%	
	East of Bee Creek	149.4	163.6	Gazettal	1%	4%	1%	1%	
		149.4	163.6	Against Gazettal	1%	4%	1%	1%	
	North of Braeside Road	163.6	178.2	Gazettal	1%	1%	1%	0%	
		163.6	178.2	Against Gazettal	1%	4%	1%	1%	
	33B - Peak Downs Highway (Nebo - Mackay)	Retreat Hotel Permanent Counter	0.0	44.8	Gazettal	0%	1%	0%	0%
			0.0	44.8	Against Gazettal	0%	1%	0%	0%
		Weigh in Motion Site Eton	44.8	62.0	Gazettal	1%	3%	1%	0%
			44.8	62.0	Against Gazettal	0%	1%	0%	0%
West of Walkerston Township		62.0	76.0	Gazettal	1%	6%	1%	1%	
		62.0	76.0	Against Gazettal	0%	0%	0%	0%	
East of Walkerston Cemetery		76.0	81.4	Gazettal	1%	3%	1%	1%	
		76.0	81.4	Against Gazettal	0%	2%	0%	0%	
East of BSES		81.4	86.1	Gazettal	0%	0%	0%	0%	
		81.4	86.1	Against Gazettal	0%	0%	0%	0%	
West of Bernborough Avenue		86.1	87.0	Gazettal	1%	3%	1%	1%	
		86.1	87.0	Against Gazettal	0%	0%	0%	0%	
Bernborough Avenue - City Gates		87.0	87.8	Gazettal	0%	2%	0%	0%	
		87.0	87.8	Against Gazettal	0%	0%	0%	0%	

[1] Chainage based on TMR Road Asset Data 'TDistStart' and 'TDistEnd'

Pavement Impact Contribution – State Controlled Roads

As per the PIA methodology, contributions have been assessed based on the costing pavement type and marginal cost provided by TMR. The monetary contributions have been calculated based on the corresponding SAR4, SAR5, and SAR12 impacts consistent with the PIA methodology for the life of the project (in lieu of 20 years following the opening of the final stage).

The monetary contributions have been calculated based on the impacted road section segments of the Peak Downs Highway (section 33A and section 33B) for the years where an annual impact of greater than 5% was identified. A summary of the monetary contributions required for the given heavy vehicle generation and options proposed is provided in Table 24.

Table 24: Pavement Impact Assessment Monetary Contributions

Year	Monetary Contribution Required
Year 1 – Construction ^[1]	\$0
Year 2 – Operations	\$187,285
Year 3 – Operations and Construction	\$206,674
Year 4 – Operations	\$0
Year 5 – Operations	\$0
Year 6 – Decommission ^[1]	\$0
Total	\$393,959

[1] Project year / stage has not been reassessed as part of the 2021 TIA. Monetary contribution consistent with the 2020 TIA.

The pavement impact assessment has a calculated value for the monetary contributions based on assumptions presented herein of **\$393,959** for the life of the project. A summary of pavement contribution by road section is provided in Attachment B.

This calculation of monetary contributions has been determined independently of the 2020 TIA, and as such the summary provided in Table 24 supersedes the calculation of monetary contributions determined within the 2020 TIA (i.e. this calculation replaces the previous monetary contributions calculation and is not provided in addition to the previously determined contribution).

Vitrinite has proposed that the pavement impact contribution be confirmed after the CHPP location has been finalised. The recalculation of the pavement contribution (if required) and subsequent pavement contribution payment to TMR is proposed to occur prior to the commencement of any construction and heavy vehicle haul operations.

Summary

Based on the analysis and discussions presented within this report, the following conclusions are made:

1. Peak traffic demands for the Project are expected to occur in:
 - o 2022 (project year 2): Operations
 - o 2023 (project year 3): Operations and Constriction
 - o 2024 & 2025 (project year 4 & 5): Operations
2. Though some road links on the Peak Downs Highway are expected to have Project traffic volumes which exceed 5% of the baseline traffic volumes, the impacted road links are expected to operate well

below their theoretical capacity. Road impact mitigation works as a direct result of the project are therefore not required.

3. During Project Year 2 and Project Year 3 the forecast Project traffic is expected to result in an increase of the forecast AADT for Saraji Road (north of the site access) in the order of up to 8%, for Peak Downs Mine Road in the order of up to 6%, and for Saraji Road (south of the site access) in the order of up to 2%.
4. During Project Year 4 and Project Year 5, impacts to Council controlled road sections of Saraji Road (north and south of the site access) and Peak Downs Mine Road are expected to be in the order of 1%.
5. A turn warrant assessment indicates that BAL and CHR(s) turn treatments are required at the proposed Project access location on the Saraji Road realignment to cater for Project generated traffic for the assessment years. The requirements of this assessment have not changed from the 2020 TIA.
6. Based on the calculated development SAR's pavement impacts of greater than 5% have been identified for a number of road links on the Peak Downs Highway. A monetary contribution will likely be required to ameliorate the impact. The results of this assessment indicate that the impact correlates to a monetary contribution for state-controlled roads of \$393,959 as per GTIA methodology.
7. It is expected that an agreement will be formed between Council and Vitrinite for the mitigation of expected pavement loading on Council controlled roads.

Naturally, should you have any questions or require any further information, please do not hesitate to contact myself or Patrizia Robertson (RPEQ # 26198) on (07) 3029 5000.

Yours sincerely

GTA, NOW STANTEC



Andrew Tierney
Senior Transportation Engineer

encl.

Attachment A – Turn Warrant Assessment Results

Attachment B – Pavement Contribution Summary

Attachment A – Turn Warrant Assessment Results

Project Year 2

Site Access / Saraji Road

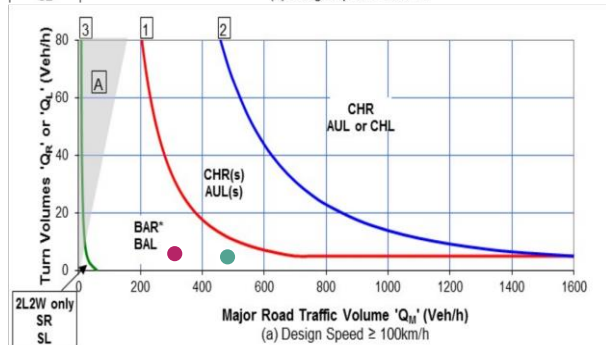
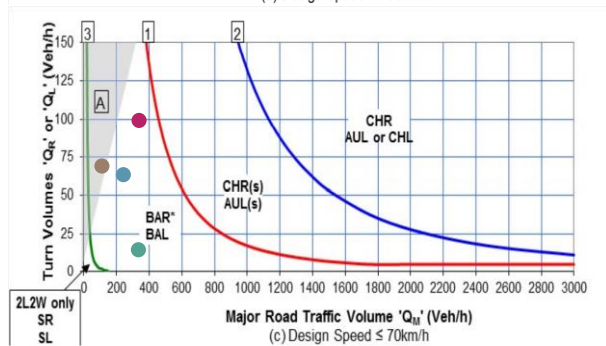
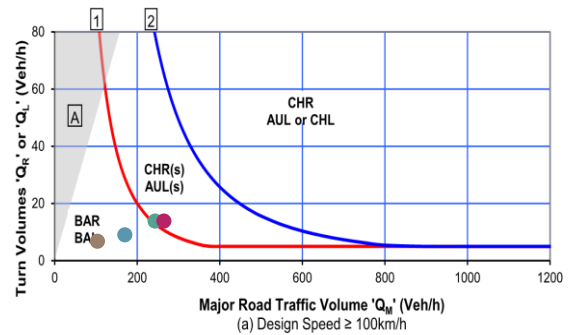
	AM Peak		PM Peak	
	Left Turn	Right Turn	Left Turn	Right Turn
Ql/r	9	14	7	14
Qm	174	247	108	268
	BAL	CHR(s)	BAL	CHR(s)

Peak Downs Mine Road / Saraji Road

	AM Peak		PM Peak	
	Left Turn	Right Turn	Left Turn	Right Turn
Ql/r	63	15	69	99
Qm	241	333	110	338
	BAL	BAR	BAL	BAR

Peak Downs Highway / Peak Downs Mine Road

	AM Peak		PM Peak	
	Left Turn	Right Turn	Left Turn	Right Turn
Ql/r	349	4	125	6
Qm	88	486	64	315
	AUL(s)	BAR	BAL	BAR



Project Year 3

Site Access / Saraji Road

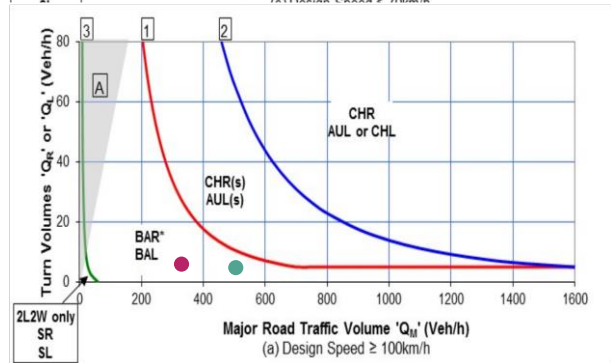
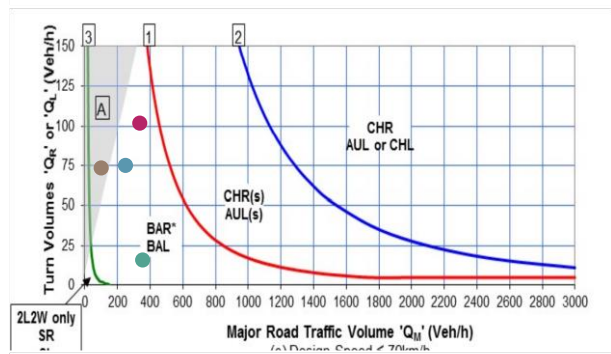
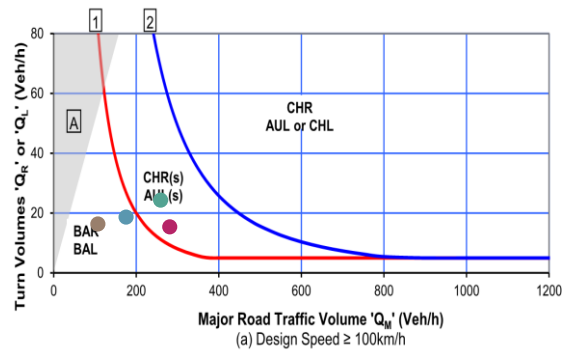
	AM Peak		PM Peak	
	Left Turn	Right Turn	Left Turn	Right Turn
Ql/r	18	24	16	15
Qm	178	262	110	284
	BAL	CHR(s)	BAL	CHR(s)

Saraji Road / Peak Downs Mine Access Road

	AM Peak		PM Peak	
	Left Turn	Right Turn	Left Turn	Right Turn
Ql/r	75	15	73	101
Qm	247	352	98	334
	BAL	BAR	BAL	BAR

Saraji Road / Peak Downs Mine Access Road

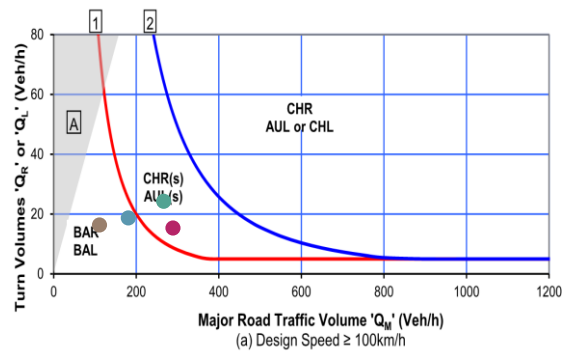
	AM Peak		PM Peak	
	Left Turn	Right Turn	Left Turn	Right Turn
Ql/r	368	5	138	6
Qm	91	508	66	333
	AUL(s)	BAR	BAL	BAR



Project Year 4

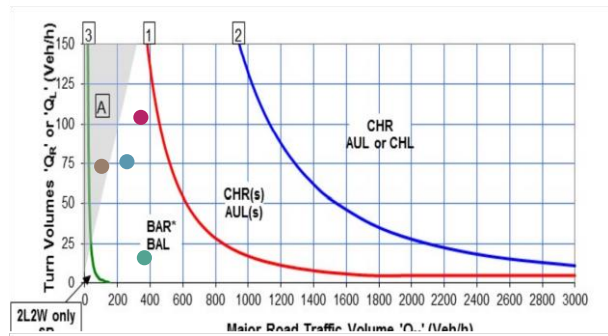
Site Access / Saraji Road

	AM Peak		PM Peak	
	Left Turn	Right Turn	Left Turn	Right Turn
Ql/r	18	24	16	15
Qm	183	269	113	291
	BAL	CHR(s)	BAL	CHR(s)



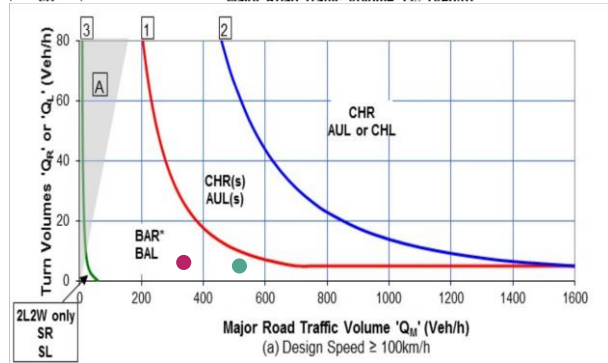
Saraji Road / Peak Downs Mine Access Road

	AM Peak		PM Peak	
	Left Turn	Right Turn	Left Turn	Right Turn
Ql/r	76	15	73	104
Qm	254	360	98	339
	BAL	BAR	BAL	BAR



Saraji Road / Peak Downs Mine Access Road

	AM Peak		PM Peak	
	Left Turn	Right Turn	Left Turn	Right Turn
Ql/r	377	5	141	6
Qm	93	521	67	341
	AUL(s)	BAR	BAL	BAR



Attachment B – Pavement Contribution Summary

Road Section	TOTAL COST FOR YEAR						Total
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	
33A-A	-	-	-	-	-	-	-
33A-B	-	\$ 10,969	\$ 11,037	-	-	-	\$ 22,005
33A-C	-	\$ 84,712	\$ 90,816	-	-	-	\$175,528
33A-D1	-	\$ 91,605	\$ 92,286	-	-	-	\$183,891
33A-D2	-	-	-	-	-	-	-
33A-E	-	-	-	-	-	-	-
33A-F	-	-	-	-	-	-	-
33A-G	-	-	-	-	-	-	-
33B-A	-	-	-	-	-	-	-
33B-B	-	-	-	-	-	-	-
33B-C	-	-	\$ 12,535	-	-	-	\$ 12,535
33B-D	-	-	-	-	-	-	-
33B-E	-	-	-	-	-	-	-
33B-H	-	-	-	-	-	-	-
Total	-	\$187,285	\$206,674	-	-	-	\$393,959