TRAFFIC AND PAVEMENT IMPACT ASSESSMENT STAGES 1 & 2

Dugald River Wind Farm P11295

Document control sheet

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2	16/02/2026	Cameron Currie	Capturing Desktop Scope of Limits of Traffic and Pavement Impacts
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Final Report	
Approved by: Cameron Currie	RPEQ # 6860

1. Introduction

Harrison Infrastructure Group (HIG) have been engaged to undertake an assessment on construction phase vehicular traffic of both Stage 1 and 2 of the Dugald River Wind Farm Project (DRWF) on the government controlled road networks surrounding Cloncurry and the MMG Dugald River Mine Access Road This report has been prepared to appreciate and make recommendations to manage the impact of traffic generated on both road link and intersection capacity, as well as pavement asset reduced life by loads supplying to the DRWF project.

This report follows TMR's Guide to Traffic Impact Assessment and the supporting Pavement Impact Assessment Practice Note, using information supplied by the DRWF client (EDL) and their proposed logistics contractor (Rex J Andrews "RJA"). The procurement and construction schedule, as advised by the client representatives, have been sufficient to confirm vehicle volumes, types, including over-size/over-mass configurations, and proposed routes for civil, electrical and wind infrastructure establishment, assumed materials supply quantities and requirements. This advice has been validated and adopted for impact assessment (Appendix A – Summary of haulage vehicles). The advised resources for operation and maintenance of the constructed and commissioned wind farm facility are covered in this report to consider the traffic and/or pavement impacts of phases.

The DRWF is located adjacent to the Dugald River zinc mine, approximately 60km Northwest of Cloncurry in North Western Queensland. The site is approximately 860km from the Port of Townsville by road. Stage 1 comprises the construction of eight wind turbines, and Stage 2 covers the construction of sixteen wind turbines.

The civil, electrical and wind turbine materials and facilitating plant and equipment are to be transported from Townsville, Mt Isa, local Cloncurry quarry, Brisbane, Rockhampton, Melbourne, Adelaide and possibly Newcastle. The OSOM wind turbine components are to be transported from Townsville Port via the Townsville Port Road, Bruce Highway, Hervey's Range Developmental Road, Gregory Developmental Road, Flinders Highway and the Burke Development Road. A significant quantum of the paving and concrete materials supply is intended to be sourced locally.

The existing DRM camp infrastructure and transit shuttle arrangements between the airport and accommodation are planned to be utilised. The advice received is that minimal workers will necessitate living off-site.

Construction timeframes for the project have been indicatively advised as commencing in July 2026, with Civil Construction and establishment of construction activities and progressing to Electrical the Wind Turbine delivery and erection, for an October 2027 Stage 1 commissioning.

Stage 2 will then proceed commencing in March 2028, and similarly proceed through construction activities for a September 2030 Stage 2 commissioning.

On this basis the year of assessment has been determined to be the end of the construction phase of both stages, being end of 2030.

Figure 1: Site location (www.googlemaps.com)

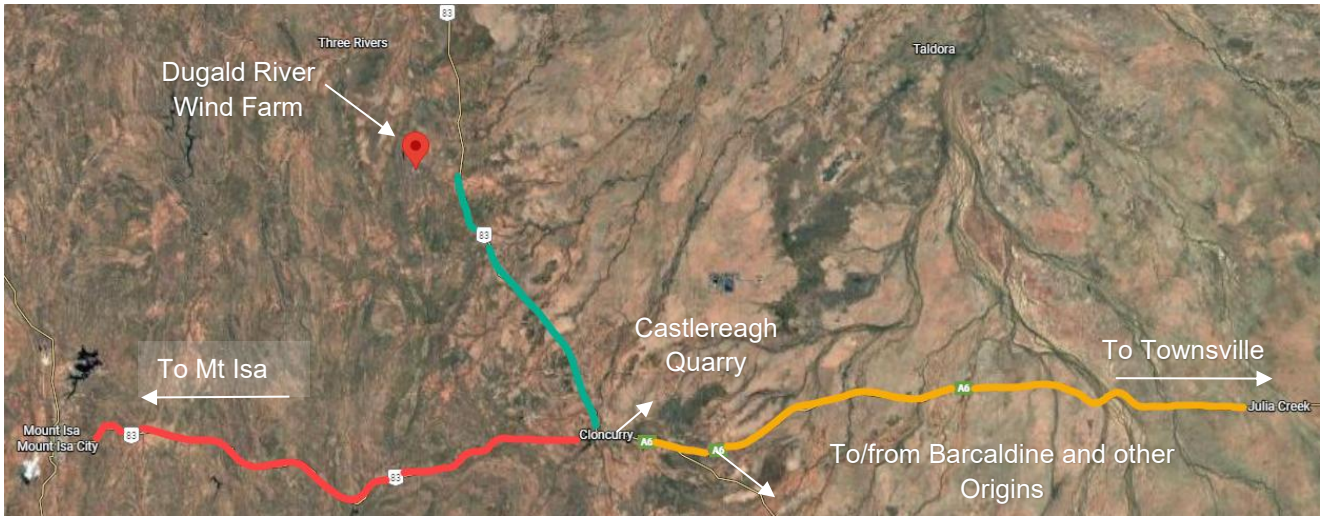


Figure 2: Site location and proposed haul routes (www.googlemaps.com)

2. Existing Road Networks and Intersections

The road network and associated intersections confirmed as haulage routes, by the client representative, for establishment and materials supply are as follows (local network in Figure 2):

- Townsville to Dugald River Wind Farm – primary OSOM route road links
  - Southern Port Road (Townsville),
  - Bruce Highway between Southern Port Road and Hervey Range Road interchange,
  - Hervey Range Developmental Road (Townsville – Battery) road link,
  - Gregory Developmental Road (Charters Towers – Battery) road link,
  - Flinders Highway (Charters Towers – Hughenden) road link,
  - Flinders Highway (Hughenden - Richmond) road link,
  - Flinders Highway (Richmond – Julia Creek) road link,
  - Flinders Highway (Julia Creek – Cloncurry) road link,
  - Andrew Daniels Drive,
  - Hensley Drive,
  - Burke Developmental Road, from Hensley Drive MMG Dugald River Mine Access Road,
- Townsville to Dugald River Wind Farm – primary OSOM route intersections
  - Hervey Range Developmental Road and Gregory Developmental Road,
  - Charters Towers Town: Flinders Highway and Gregory Developmental Road,
  - Hughenden Town Flinders Highway and Kennedy Developmental Road,
  - Richmond Town Flinders Highway with Goldring and Larsen Streets,
  - Flinders Highway/Andrew Daniels Road intersection,
  - Burke Developmental Road/Hensley Drive Intersection
  - Burke Developmental Road/MMG Dugald River Mine Access Road
- Cloncurry Vicinity Alternative Route and Local Supply/Delivery Route
  - Flinders Highway (Andrew Daniels Drive – Cloncurry) road link,
  - Barkly Highway/Burke Development Road Intersection
  - Burke Developmental Road, from Cloncurry to Hensley Drive
- Mount Isa Supply/Delivery Route
  - Barkly Highway (Cloncurry – Mount Isa),
  - Connecting to Cloncurry Alternative Route
- Central and Southern Queensland Supply/Delivery Route (including Newcastle, Melbourne and Adelaide).
  - Various origins and destinations beyond Barcaldine
  - Landsborough Highway (Barcaldine – Cloncurry)
- Cloncurry Local Quarry Materials Supply/Delivery Route
  - Ernest Henry Road and Sir Hudson Fysh Drive to Castlereagh Quarry.
  - Connecting at Hensley Drive,
  - Burke Developmental Road, from Hensley Drive to MMG Dugald River Mine Access Road,

A desktop assessment of existing link heavy vehicle volumes (deriving estimated standard axle repetitions) in comparison to calculated standard axle repetitions generated by DRWF planned loads on haul routes, confirmed the 5% threshold limit exceedance for traffic and pavement loading extended to the Hervey's Range Developmental Road. The inclusion of the Bruce Highway and Townsville Port Road sections in the route assessment through to Cloncurry, allows the analysis to confirm the limit on estimated pavement impact contributions being reported.

2.1 Townsville to Dugald River Primary Supply/Delivery Route

2.1.1 Southern Port Road (841) (Townsville)

Southern Port Road (841) is a sealed state-controlled road that starts at the Port of Townsville intersection of Archer St and Benwell Rd, to the south to intersect with the Bruce Highway (10M) intersection with Flinders Highway (14A). This report covers the section from the Port of Townsville to the Bruce Highway (10M):

- 8km in length, between the Port of Townsville and the Bruce Highway (10M):
- Average daily volumes (2024) of 1449 vehicles with 265 (18%) heavy vehicles (at Ch5.43km).
- The road is a State-Controlled Regional Road.

The formation width varies from 11m-13m along the road section.

2.1.2 Southern Port Road/Bruce Highway Intersection

The Southern Port Road (841)/Bruce Highway (10M) intersection is a signalised 4-way intersection with the following properties:

- Both the Bruce Highway (10M) and the Southern Port Road (841) are State Controlled Roads
- The Bruce Highway is signposted at 80km/h on each approach to the intersection and the Southern Port Road is signposted at 80km/hr on the approach to the intersection.
- The intersection is lit at night with good visibility in all directions and appropriate signage on all legs of the intersection
- All legs have appropriate line marking and have double white lines, with a break for the intersection and chevroning through the intersection.
- Queensland Globe crash history data shows three crashes have occurred at the intersection in the last five years:
  - 2 hospitalisation crashes in 2023
  - 1 medical treatment crash in 2021

Figure 3: Aerial photography of Southern Port Road/Bruce Highway (Queensland Globe, 2026)

Figure 4: Aerial photography of Southern Port Road/Bruce Highway (Queensland Globe, 2026)

Figure 5: Southern Port Road north-eastern approach to Bruce Highway (Google Maps, March 2023)

Figure 6: Bruce Highway north-western approach to Southern Port Road (Google Maps, March 2025)

Figure 7: Bruce Highway south-eastern approach to Southern Port Road (Google Maps, March 2025)

2.1.3 Bruce Highway between Southern Port Road and Hervey Range Road interchange

The Bruce Highway (10M) is a sealed state-controlled road that starts at the intersection of Southern Port Rd, and the Flinders Highway (14A) and runs south until it intersects the Bruce Highway (10M) where it changes to Flinders Highway (14A). This report covers the section from the Port of Townsville to the Bruce Highway (10M):

- 8km in length, between the Port of Townsville and the Bruce Highway (10M):
- Average daily volumes (2024) of 7769 vehicles with 1414 (18%) heavy vehicles (at Ch1km).
- The road is classified as a State-Controlled Regional Road.

The formation width varies from 8m-10m along the road section TMR's interim vision is a 7m bitumen seal width.

2.1.4 Bruce Highway/Hervey Range Developmental Road Interchange

The Bruce Highway/Hervey Range Developmental Road intersection is a highway interchange with the following properties:

- Both the Bruce Highway and the Hervey Range Developmental Road are State Controlled Roads
- The Bruce Highway is signposted at 100km/h on approach to the interchange exit lane, the Hervey Range Developmental Road and Bruce Highway exit lane are signposted at 70km/hr.
- The Bruce Highway exit lane splits to a signalized right-turn and a left turn lane.
- The intersection is lit at night with good visibility in all directions and appropriate signage on all legs of the intersection
- All legs have appropriate line marking.
- Queensland Globe crash history data shows three crashes have occurred at the intersection in the last five years:
    - 1 hospitalisation crash in 2020
    - 1 medical treatment crash in 2020
    - 1 minor injury crash in 2024

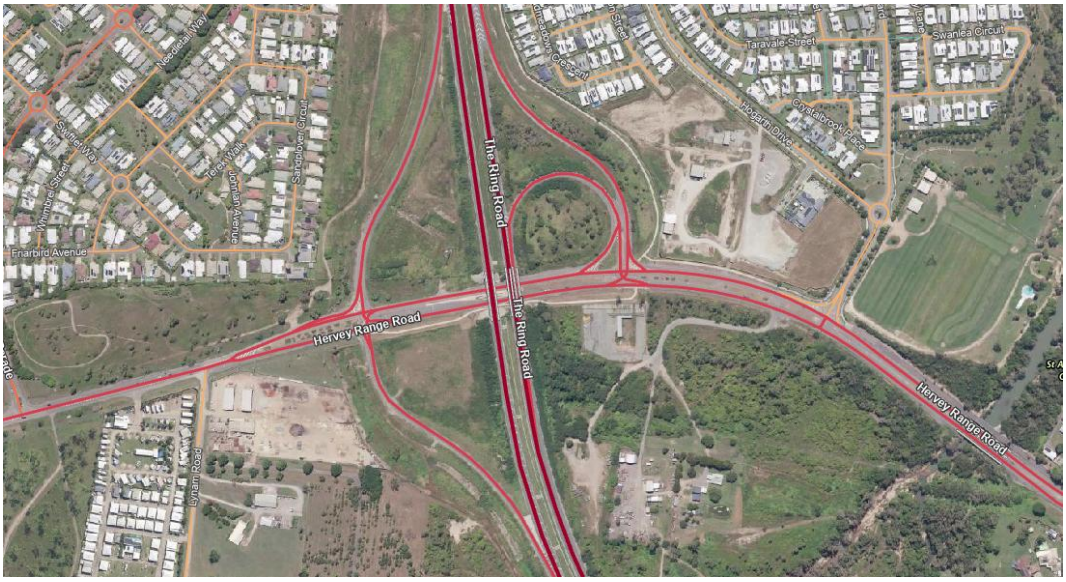


Figure 8: Aerial photography of Bruce Highway/Hervey Range Developmental Road (Queensland Globe, 2026)

Figure 9: Bruce Highway southern approach to Hervey Range Developmental Road (Google Maps, March 2025)

Figure 10: Bruce Highway exit lane southern approach to Hervey Range Developmental Road (Google Maps, March 2024)

Figure 11: Hervey Range Developmental Road eastern approach to Bruce Highway exit lane (Google Maps, March 2025)

Figure 12: Hervey Range Developmental Road western approach to Bruce Highway (Google Maps, March 2025)

2.1.5 Hervey Range Developmental Road (Townsville – Battery) road link

Hervey Range Developmental Road (83A) is a sealed state-controlled road, starting at Riverway Dr, Thuringowa Dr, and Ross River Rd intersection in Townsville and continues west to Battery. This report covers the section of road from Bruce Highway (10M) to the Gregory Developmental Road (98C):

- 121km in length, between the Bruce Highway (10M) and Gregory Developmental Road (98C):
- Average daily volumes (2024) of 4449 vehicles with 508 (11.4%) heavy vehicles (at Ch4.5km).
- The road is classified as a State-Controlled Regional Road.
- It is gazetted a Type 1 heavy vehicle route.
- It is a two-lane undivided road posted at 100km/hr for much of this section which the exception of the following:
  - The first 4kms are posted at 70km/hr and is an inner city 4 lane divided road.

Sealed full-width roadway with centre line and edge line markings along the entire road section, including WCL treatment from CH 4.0 to CH 14.1.

The formation width varies from 6m-8.5m along the road section TMR's interim vision is a 7m bitumen seal width.

- Marginal pavement costs advised by TMR for the section to the access averages 10.5c/km/SAR.
- The road features nine (9) bridges including:
  - CPL Jason Sturgess Bridge (28.8km approx.),
  - Unspecified creek (29.5km approx.),
  - Speed Creek (44.5km approx.),
  - Riley Creek (47.3km approx.),
  - Keelbottom Creek (53.9km approx.),
  - Brinagee Creek (67.2km approx.),
  - Boundary Creek West (86.3km approx.),
  - Star River (93km approx.), and
  - Burdekin River (107km approx.).

- Queensland Government Open Data Portal Road Crash Locations Dataset shows 41 crashes have occurred on the Hervey Range Developmental Road between the Bruce Highway (10M) and Gregory Developmental Road (98C) in the five years preceding 2025:
  - 3 crashes resulting in minor injury.
  - 5 crashes requiring medical treatment
  - 17 crashes requiring hospitalisation
  - 3 crashes resulting in fatalities

Figure 13: Hervey Range Developmental Road looking east between Townsville and Charters Towers (Google Maps, March 2024)

2.1.6 Hervey Range Developmental Road/Gregory Developmental Road Intersection

The Hervey Range Developmental Road/Gregory Developmental Road intersection is an unsignalised Give-way controlled T-intersection with the following properties:

- Gregory Developmental Road as the through road, and Hervey Range Developmental Road as the intersecting road. Burke Developmental Road.
- Both the Hervey Range Developmental Road and Gregory Developmental Road are State Controlled Roads
- The Hervey Range Developmental Road is signposted at 100km/h on the approach to the intersection and the Gregory Developmental Road is signposted at 80km/hr on each approach to the intersection.
- The Hervey Range Developmental Road is controlled by a Give Way sign.
- The intersection isn't lit at night with moderate visibility in all directions and appropriate signage on all legs of the intersection outside of missing speed signs.
- All legs have line marking and have broken centre lines, with a break for the intersection.
- Queensland Globe has had one recorded crash since 2025, in 2021 there was a multi-vehicle crash resulting in medical treatment.

Figure 14: Aerial photography of Hervey Range Developmental Road/Gregory Developmental Road (Queensland Globe, 2026)

Figure 15: Hervey Range Developmental Road approach to Gregory Developmental Road (Google Maps, March 2024)

Figure 16: Gregory Developmental Road southern approach to Hervey Range Developmental Road (Google Maps, March 2024)

Figure 17: Gregory Developmental Road northern approach to Hervey Range Developmental Road (Google Maps, March 2024)

2.1.7 Gregory Developmental Road (Charters Towers – Battery) road link

Gregory Developmental Road (98C) is a sealed state-controlled road that starts at the intersection of the Flinders Highway (14A&B) east side of Charters Towers and runs north until intersecting with Kennedy Developmental Road. This report covers the section of road from Flinders Highway to the intersection at Hervey Range Developmental Road (83A):

- 97.5km in length, between 14A Flinders Highway and Hervey Range Developmental Road (83A).
- Average daily volumes (2024) of 532 vehicles with 209 (39%) heavy vehicles (at Ch7.96km).
- The road is classified as a State-Controlled Regional Road.
- It is gazetted a Type 2 heavy vehicle route.
- It is a rural two-lane undivided road posted at 100km/hr for much of this section which the exception of the following:
  - The first 4.5kms leaving Charters Towers are posted at 60km/hr
  - Between Ch.4.5 and Ch. 6 is posted at 80km/hr

Sealed full width with Centre line marking and edge line marking for the entire road section.

The formation width varies from 7.2m-9m along the road section TMR's interim vision is a 7m bitumen seal width.

- Marginal pavement costs advised by TMR for the section to the access averages 10.4c/km/SAR.
- The road features seven (7) bridges including:
  - Sheep Station Creek (4.4km approx.),
  - Sandy Creek (20.3km approx.),
  - Hann Creek (24km approx.),
  - Lolworth Creek (43.6km approx.),
  - Fletcher Creek (44.8km approx.),
  - Breakneck Gully (47.4km approx.), and
  - Basalt River (85km approx.),
- Queensland Government Open Data Portal Road Crash Locations Dataset shows 27 crashes have occurred on the Gregory Developmental Road between 14A Flinders Highway and Hervey Range Developmental Road (83A) in the five years preceding 2025:
  - 3 crashes resulting in minor injury.
  - 2 crashes requiring medical treatment
  - 8 crashes requiring hospitalisation
  - 1 crash resulting in a fatality

2.1.8 Gregory Developmental Road/Flinders Highway Intersection

The Gregory Developmental Road/Flinders Highway intersection is an unsignalised Give-way controlled T-intersection with the following properties:

- Gregory Developmental Road and Flinders Highway (14A) as the through road, and Flinders Highway (14B) as the intersecting road.
- Both the Gregory Developmental Road and the Flinders Highway are State Controlled Roads
- The Gregory Developmental Road and the Flinders Highway (14A) is signposted at 80km/h on each approach to the intersection and the Flinders Highway (14B) is signposted at 70km/hr on the approach to the intersection.
- The Gregory Developmental Road and the Flinders Highway (14A) has a CHR treatment on the eastern leg for southbound traffic and CHL slip lane on the western leg for southbound traffic. The slip lane is controlled by a Give Way sign.
- The Flinders Highway (14B) is controlled by a Give Way Sign with a Give Way sign controlled left turn slip lane on to Gregory Developmental Road for westbound traffic towards Charters Towers.
- The intersection is lit at night with good visibility in all directions and appropriate signage on all legs of the intersection
- All legs have appropriate line marking and have double white lines, with a break for the intersection and chevroning through the intersection.
  - Road Crash Locations (source: Queensland Government Open Data Portal) shows three total crashes occurred in the five years preceding 2025:
    - 2 hospitalisation crashes between 2023 and 2021, and
    - 1 medical treatment crashes requiring in 2023

Figure 18: Aerial photography of Gregory Developmental Road/Flinders Highway (Queensland Globe, 2026)

Figure 19: Gregory Developmental Road northern approach to Flinders Highway (Google Maps, March 2024)

Figure 20: Flinders Highway southern approach to Flinders Highway/Gregory Developmental Road (Google Maps, March 2024)

Figure 21: Flinders Highway southern approach to Flinders Highway/Gregory Developmental Road (Google Maps, March 2024)

2.1.9 Flinders Highway (Charters Towers to Cloncurry), comprising 14A, 14B, 14C,14D and 14E

The Flinders Highway is a sealed state-controlled road, originating at Townsville and progressing west through Charters Towers and onto Hughenden, Richmond, Julia Creek and Cloncurry.

The haulage origins and axle repetitions calculated for the below road sections are developed in section 3. (See table of Loads and Configurations as advised by EDL at Appendix A.)

- 14A Flinders Highway (Townsville – Charters Towers)
  - 126km of the National Road Network.
  - Average annual daily traffic AADT (2024) 3643 vehicles with 1172 heavy vehicles (32%) Counted at Ch4.04km (Site No. 90060).
  - It is a gazetted Higher Mass Limit and Type 2 heavy vehicle route.
  - The short section of impact is Ch.122.1-126.1
  - Rural two-lane undivided road, with linemarked edge lines.
  - The formation width is partially sealed and varies from 9.0m-11.0m.
  - 110km/hr posted speed, (Townsville is 80km/h and Charters Towers is 60km/h posted speed).
  - Marginal pavement costs sourced from TMR are an average of 2.2c/km/SAR.
  - The short section of impact does not feature any bridges.
  - Road Crash Locations (source: Queensland Government Open Data Portal) shows thirty-eight total crashes occurred in the five years preceding 2025:
    - 2 fatal crashes
    - 26 hospitalisation crashes, and
    - 10 medical treatment crashes.

- 14B Flinders Highway (Charters Towers – Hughenden)
  - 247km of the National Road Network.
  - Average annual daily traffic AADT (2024) 574 vehicles with 174 heavy vehicles (30%) Counted at Ch4km.
  - It is a gazetted Higher Mass Limit and Type 2 heavy vehicle route.
  - Rural two-lane undivided road, with linemarked edge lines.
  - The formation width varies from 8.0m-9.0m.
  - 110km/hr posted speed, (towns are 80km/h posted speed).
  - Marginal pavement costs sourced from TMR are an average of 4.6c/km/SAR.
  - The thirteen bridges in the section are:

- Bafles Creek at Ch. 41.4km (width between barriers/kerbs)
- Homestead Creek at Ch. 72.5km ((width between barriers/kerbs)
- Sensible Creek at Ch. 79.2km (width between barriers/kerbs)
- Mundic Creek at Ch. 86.7km (width between barriers/kerbs)
- Campaspe Creek at Ch. 88.6km (width between barriers/kerbs)
- Granite Creek at Ch. 91.5km (width between barriers/kerbs)
- Cape River at Ch. 95.6km (width between barriers/kerbs)
- Betts Creek at Ch. 104.7km (width between barriers/kerbs)
- Over Railway at Ch. 114.3km (width between barriers/kerbs)
- Warrigul Creek at Ch. 123.5km (width between barriers/kerbs)
- Over Railway at Ch. 135.6km (width between barriers/kerbs)
- Torrens Creek at Ch. 156.3km (width between barriers/kerbs)
- Bullock Creek at Ch. 179.2km (width between barriers/kerbs)

- Road Crash Locations (source: Queensland Government Open Data Portal) shows twenty-two total crashes occurred in the five years preceding 2025:
  - 3 fatal crashes
  - 11 hospitalisation crashes
  - 6 medical treatment crashes, and
  - 2 minor injury crashes

- <u>14C Flinders Highway (Hughenden – Richmond)</u>
  - 115km of the National Road Network.
  - Average annual daily traffic AADT (2024) 423 vehicles with 182 heavy vehicles (43%) Counted at Ch17.22km (Site No.100148).
  - It is a gazetted Higher Mass Limit and Type 2 heavy vehicle route.
  - Rural two-lane undivided road, with linemarked edge lines.
  - The formation width is partially sealed and varies from 7.0m-9.0m.
  - 110km/hr posted speed, (towns are 60km/h posted speed).
  - Marginal pavement costs sourced from TMR are an average of 4.4c/km/SAR.
  - The five bridges in the section are:
    - Walker Creek at Ch. 46.4km
    - Walker Creek at Ch. 46.6km
    - Sloane Creek at Ch. 64.9km
    - Sloane Creek at Ch. 64.1km
    - Namoi Creek at Ch. 80.2km
  - Road Crash Locations (source: Queensland Government Open Data Portal) shows nine total crashes occurred in the five years preceding 2025:
    - 1 fatal crash in September 2023,
    - 6 hospitalisation crashes between May 2020 and October 2021, and
    - 2 medical treatment crashes requiring in March 2020 and May 2022

Figure 22: Flinders Highway looking west between Hughenden and Richmond (Google Maps, March 2025)

- 14D Flinders Highway (Richmond – Julia Creek)
  - 149km of the National Road Network.
  - Average annual daily traffic AADT (2024) 329 vehicles with 137 heavy vehicles (41%) Counted at Ch116.9km (Site No.100019).
  - It is a gazetted Higher Mass Limit and Type 2 heavy vehicle route.
  - Rural two-lane undivided road, with linemarked edge lines.
  - The formation width is partially sealed and varies from 7.4m-10.0m.
  - 110km/hr posted speed, (towns are 60km/h posted speed).
  - Marginal pavement costs sourced from TMR are an average of 4.7c/km/SAR.
  - The five bridges in the section are:
    - O'Connell Creek at Ch.2.6km
    - O'Connell Creek at Ch.2.8km
    - Alick Creek at Ch.105.0km
    - Julia Creek at Ch.147.2km
    - Julia Creek at Ch.147.4km
  - Road Crash Locations (source: Queensland Government Open Data Portal) shows eleven (11) total crashes occurred in the five years preceding 2025:
    - 1 fatal crash in March 2024
    - 8 hospitalisation crashes between October 2020 and November 2024
    - 2 crashes requiring medical treatment in June 2024 and August 2024
  - Rail Infrastructure and crossings on the link are:
    - Open Level Crossing (OLC) Ch0.5km (on the limits of Richmond Town
    - OLC Ch112.5km east of Julia Creek

Figure 23: Flinders Highway looking west between Richmond and Julia Creek (Google Maps, April 2023)

- 14E Flinders Highway (Julia Creek – Cloncurry)
  - 137km of the National Road Network.,
  - East of the Landsborough Intersection, Average annual daily traffic AADT (2024) 397 vehicles with 172 heavy vehicles (43%) Counted at Ch121.3km (Site No.100052).
  - West of the Landsborough Intersection, Average annual daily traffic AADT (2024) 685 vehicles with 270 heavy vehicles (40%) Counted at Ch125.9km (Site No.100052).
  - Rural two-lane undivided road, with linemarked edge lines.
  - The formation width is partially sealed and varies from 7.0m-9.0m.
  - 100km/hr posted speed between Ch36 and Ch123, otherwise 110km/hr (towns are 60km/h posted speed).
  - It is a gazetted Higher Mass Limit and Type 2 heavy vehicle route.
  - Marginal pavement costs for the sections east and west of the Landsborough Highway are an average of 5.3c to 3.8c/km/SAR.
  - The thirteen (13) bridges in the section are:
    - Eastern Creek at Ch.21km,
    - Gilliat River at Chainages: 32.7km, 32.8km,34.1km, 35km and 35.3km
    - Fullarton River at Ch. 63km
    - Scrubby Creek at Ch. 72.2km
    - Williams River at Chainages: 85km, 86.4km and 86.6km
    - Canal Creek at Ch.93.9km and Ch.94.5km
  - Road Crash Locations (source: Queensland Government Open Data Portal) shows eight (8) total crashes occurred in the five years preceding 2025:
    - 1 fatal crash in September 2023
    - 6 hospitalisation crashes between February 2020 and December 2024
    - 1 medical treatment crash in November 2020

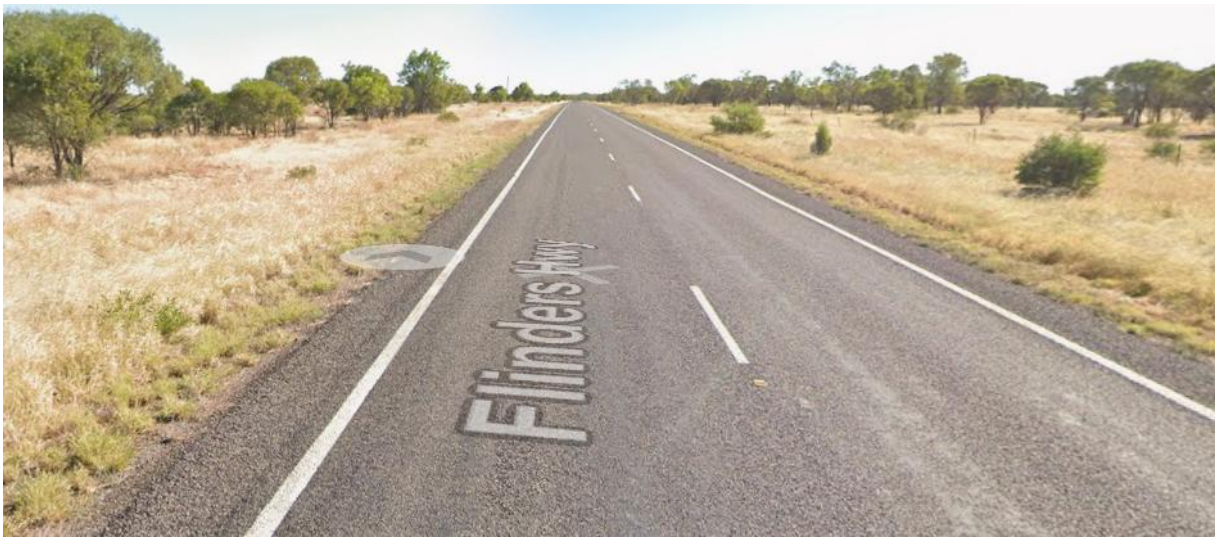


Figure 24: Flinders Highway looking west between Julia Creek and Cloncurry (Google Maps, Aug 2023)

2.1.10 Flinders Highway/Andrew Daniels Drive Intersection

The Flinders Highway/Andrew Daniels Drive intersection is an unsignalised Stop-sign-controlled T-intersection with the following properties:

- Flinders Highway is a State Controlled Road.
- Andrew Daniels Drive is a local government road.
- The through Flinders Highway intersects with Andrew Daniels Drive minor leg, being part of the Cloncurry heavy vehicle bypass, used by a significant quantum of westbound heavy vehicles.
- The Flinders Highway is signposted at 60km/h on each approach to the intersection and Andrew Daniels Drive is signposted at 60km/hr on the approach to the intersection.
- The intersection has a CHR treatment on the eastern leg and CHL slip lane on the western leg. The slip lane is controlled by a Give Way sign.
- Andrew Daniels Drive is Stop Sign controlled with no signed control on left turn slip lane.
- The intersection is lit at night, and has good visibility in all directions with appropriate signage.
- All legs have appropriate line marking and have double white lines, with a break for the intersection and chevroning through the intersection.
- There is guardrail along the outside of both left turn slip lanes.
- Traffic volumes on the Andrew Daniels leg and individual movements were not able to be sourced.
- No crashes are recorded at the intersection in Queensland Globe.

Figure 25: Aerial photography of Flinders Highway/ Andrew Daniels Drive (Queensland Globe, 2026)

Figure 26: Eastern Flinders Highway approach to Flinders Highway/Andrew Daniels Drive Intersection (Google Maps, March 2025)

Figure 27: Western Flinders Highway approach to Flinders Highway/Andrew Daniels Drive Intersection (Google Maps, Aug 2023)

Figure 28: Andrew Daniels Drive looking north from the Flinders Highway (Google Maps, March 2025)

2.1.11 Andrew Daniels Drive (Flinders Highway to Hensley Drive)

Andrew Daniels Drive forms the eastern section of the heavy vehicle bypass to the north and around Cloncurry. The Drive starts at the Flinders Highway on the eastern outskirts of Cloncurry circling to connect to Sir Hudson Fysh Drive on the northern outskirts of Cloncurry. This report covers the entire length of the road:

- 4.4km in length, between 14E Flinders Highway and Sir Hudson Fysh Drive.
- Average daily volumes could not be sourced, however are thought to be in the order of 200-250 vehicles with 50+% heavy vehicles.
- The road is controlled by Cloncurry Shire Council and is classified as an arterial road.
- It is a gazette Type 2 road train route.

- It is an urban two-lane undivided road posted at 80km/hr
- Sealed full width with Centre line marking and edge line marking the entire length.
- The road has an approximate 8m seal. Cloncurry Shire Council specification specifies a 7m bitumen seal width. The existing roads meet this specification.
  - Marginal pavement costs adopted, in the absence of Cloncurry Shire data as general value of 14c/km/SAR.
- Queensland Globe crash history data shows two crashes have occurred at intersections along the Andrew Daniels Drive:
  - 1 hospitalisation crash requiring at the Sir Hudson Fysh Drive Intersection
  - 1 medical treatment crash at the Railway Street intersection

Figure 29: Andrew Daniels Drive looking north from the Flinders Highway (Google Maps, March 2025)

2.1.12 Hensley Drive (Andrew Daniels Drive to Burke Developmental Road)

Hensley Drive forms the western part of the heavy vehicle bypass around, and to the north of Cloncurry. Hensley Drive runs west from the Sir Hudson Fysh Drive intersection until it meets the Burke Developmental Road, two kilometres north of the Barkly Highway on the western outskirts of Cloncurry. This report covers the entire length of the road:

- 2.7km in length, between Sir Hudson Fysh Drive and 89A Burke Developmental Road.
- Average daily volumes were not able to be sourced, however are thought to be in the order of 200-250 vehicles with 70+% heavy vehicles.
- The road is controlled by Cloncurry Shire Council and is classified as an arterial road.
- It is a gazetted Type 2 road train route.
- It is an semi-urban two-lane undivided road posted at 80km/hr
- Sealed full width with Centre line marking and edge line marking the entire length.
- The road has an approximate XXm seal. Cloncurry Shire Council specification specifies a 7m bitumen seal width. The existing roads meet this specification.
- There is a floodway across the Cloncurry River (1.5km approx.).
  - Marginal pavement costs adopted, in the absence of Cloncurry Shire data as general value of 14c/km/SAR.

- Queensland Globe crash history data shows three crashes have occurred at intersections along Hensley Drive:
  - 1 hospitalisation crash at the Sir Hudson Fysh Drive Intersection
  - 1 medical treatment crash at the Burke Developmental Road Intersection
  - 1 minor injury crash at approximate Ch.2.5km

Figure 30: Hensley Drive looking west towards Burke Developmental Road (Google Maps, July 2023)

2.1.13 Burke Developmental Road/Hensley Drive Intersection

The Burke Developmental Road/Hensley Road intersection is an unsignalised T-intersection controlled by a Stop sign. It has the following properties:

- Burke Developmental Road as the through road, and Hensley Drive as the intersecting minor road. Hensley Drive is part of the Cloncurry heavy vehicle bypass is used by a significant volume of heavy vehicles heading east.
- It is the intersection of a state-controlled road and a council road.
- The Burke Developmental Road is signposted at 80km/h on each approach to the intersection and Hensley Drive is also signposted at 80km/hr on the approach to the intersection.
- The Burke Developmental Road has a CHR treatment on the southern leg for traffic turning east on to Hensley Drive
- Hensley Drive is controlled by a Stop Sign and has an uncontrolled left turn slip lane on to the Burke Developmental Road for traffic turning south towards the Barkly Highway
- There is good visibility in all directions and appropriate signage on all legs of the intersection
- The intersection is lit.
- All legs have appropriate line marking and have double white lines, with a break for the intersection and chevroning through the intersection.
- Queensland Government Open Data Portal Road Crash Locations Dataset shows only one medical treatment crash occurring at the intersection in the past 5 years. Queensland Globe recorded two minor injury crashes within 200m of the intersection.

Figure 31: Aerial photography of Burke Developmental Road/Hensley Drive intersection location (www.google.com/maps, 2026)

Figure 32: Aerial photography of Burke Developmental Road/Hensley Drive intersection location (www.google.com/maps, 2026)

Figure 33: Hensley Drive approach to the Burke Developmental Road/Andrew Daniels Drive intersection (www.google.com/maps, July 2023)

Figure 34: Southern Burke Development Road approach to the Burke Development Road/Andrew Daniels Drive intersection (www.google.com/maps, 2026)

Figure 35: Northern Burke Development Road approach to the Burke Development Road/Andrew Daniels Drive intersection (www.google.com/maps, 2026)

2.1.14 Burke Developmental Road (from Hensley Drive to MMG Dugald Rive Mine Access Road)

Burke Developmental Road (89A) is a sealed state-controlled road that starts at the intersection of the Barkly Highway (15A) west of Cloncurry and runs north to Normanton. This report covers the section of road from Hensley Drive to the MMG Dugald River Mine Access Road at Ch54.:

- 56.5km in length, between 15A Barkly Highway and MMG Dugald River Mine Access Road.
- Average daily volumes (2024) of 310 vehicles with 156 (50%) heavy vehicles (at Ch7.95km).
- The road is classified as a State-Controlled Regional Road.
- It is gazetted a Type 2 heavy vehicle route.
- It is a rural two-lane undivided road posted at 100km/hr for much of this section which the exception of the following:
  - The first 2.4kms are posted at 80km/hr
  - A short section through the community of Quamby (Ch. 43.50km – 44.5km) is posted at 60km/hr and then 80km/hr up to chainage 46km.

Sealed full width with Centre line marking and edge line marking for the entire road section.

The formation width varies from 7.2m-9.6m along the road section TMR's interim vision is a 7m bitumen seal width.

- Marginal pavement costs advised by TMR for the section to the access averages 16.5c/km/SAR.
- The road features three (3) bridges including:
  - Butcher Creek (4.0km approx.),
  - Tommy Creek (19.8km approx.) and
  - Corella River (35.2km approx.).
- Queensland Government Open Data Portal Road Crash Locations Dataset shows 2 crashes have occurred on the Burke Developmental Road between Cloncurry and the MMG Dugald River Mine Access Road in the five years preceding 2025:
  - 1 crash requiring medical treatment in March 2024

- 1 crash requiring hospitalisation October 2023

Figure 36: Burke Developmental Road looking north between Cloncurry and Normanton (Google Maps, March 2025)

2.1.15 Burke Developmental Road/MMG Dugald River Mine Access Road Intersection

The Burke Development Road/DRWF access road is an unsignalised T-intersection controlled by a Stop sign. It has the following properties:

- Burke Development Road as the through road, and Access as the intersecting minor road. The intersection carries a significant volume of heavy vehicles.
- It is a high standard access intersecting a state-controlled road and mineral extraction/energy generation access road.
- The Burke Developmental Road is signposted at 100km/h on each approach to the intersection and the Access Road is also signposted at 80km/hr on the approach to the intersection.
- The Burke Developmental Road has a CHR treatment on the northern leg for traffic turning west into the access.
- The intersection is lit at night with good visibility in all directions and appropriate signage on all legs of the intersection
- All legs have appropriate line marking and have double white lines, with a break for the intersection and chevroning through the intersection.
- Queensland Government Open Data Portal Road Crash Locations Dataset shows no crash occurred at the intersection in the past 5 years.

Figure 37: Aerial photography of Burke Development Road/Dugald River Site Road intersection location (www.google.com/maps, 2026)

Figure 38: Aerial photography of Burke Development Road/Dugald River Site Road intersection location (www.google.com/maps, 2026)

Figure 39: Southern Burke Development Road approach to the Burke Development Road/Dugald River Site Road intersection (www.google.com/maps, 2026)

Figure 40: Northern Burke Development Road approach to the Burke Development Road/Dugald River Site Road intersection (www.google.com/maps, 2026)

Figure 41: Dugald River Site Road leaving the Burke Development Road/Dugald River Site Road intersection (www.google.com/maps, 2026)

2.1 Cloncurry Vicinity Alternative Route and Local Supply/Delivery Route

2.2.1 Flinders Highway (Andrew Daniels Drive – Cloncurry) road link

The Flinders Highway section has the following properties:

- 3km of the National Road Network.,
- As per above, from the Landsborough Intersection to Andrew Daniels Drive, Average annual daily traffic AADT (2024) 685 vehicles with 270 heavy vehicles (40%) Counted at Ch125.9km (Site No.100052).
- West of Andrew Daniels Drive, Average annual daily traffic AADT (2024) 3180 vehicles with 400 heavy vehicles (12.5%) Counted at Ramsay Street intersection (Site No.100035).
- Urban two-lane undivided road, with linemarked edge lines and kerb and channel, of approximately 13.0m.
- 100km/hr posted speed.
- It is a gazetted Higher Mass Limit and Type 2 heavy vehicle route.
- Marginal pavement costs varying from 2.2c to 10.2c/km/SAR.
- Road Crash Locations (source: Queensland Government Open Data Portal) shows no crashes occurred in the five years preceding 2025.

2.2.2 Barkly Highway/Burke Developmental Road Intersection

The Barkly Highway/Burke Developmental Road intersection is an unsignalised Give-way controlled T-intersection with the following properties:

- Barkly Highway as the through road, and Burke Developmental Road as the intersecting minor road. Burke Developmental Road is part of the heavy vehicle bypass around Cloncurry for most eastbound heavy vehicles.
- Both the Barkly Highway and the Burke Developmental Road are State Controlled Roads
- The Barkly Highway is signposted at 80km/h on each approach to the intersection and the Burke Developmental Road is signposted at 80km/hr on the approach to the intersection.
- The Barkly Highway has a CHR treatment on the eastern leg for northbound traffic and CHL slip lane on the western leg for northbound traffic turning north. The slip lane is controlled by a Give Way sign.
- Burke Developmental Road is controlled by a Give Way Sign with a Give Way sign controlled left turn slip lane on to the Barkly Highway for eastbound traffic towards Cloncurry.
- The intersection is lit at night with good visibility in all directions and appropriate signage on all legs of the intersection
- All legs have appropriate line marking and have double white lines, with a break for the intersection and chevroning through the intersection.
- No crashes are recorded at the intersection in Queensland Globe although there are three crashes recorded within 200m of the intersection with two requiring medical treatment and one resulting in a minor injury.

Figure 42.: Aerial photography of Barkly Highway/Burke Development Road intersection location (www.google.com/maps, 2026)

Figure 43: Aerial photography of Barkly Highway/Burke Development Road intersection location (www.google.com/maps, 2026)

Figure 44: Burke Development Road approach to Barkly Highway/Burke Development Road intersection (www.google.com/maps, 2026)

Figure 45: Eastern Barkly Highway approach to Barkly Highway/Burke Development Road intersection (www.google.com/maps, 2026)

Figure 46: Western Barkly Highway approach to Barkly Highway/Burke Development Road intersection (www.google.com/maps, 2026)

2.2.3 Burke Developmental Road (Cloncurry – Hensley Drive)

Burke Developmental Road (89A) is a sealed state-controlled road that starts at the intersection of the Barkly Highway (15A) west of Cloncurry and runs north toward Normanton. This section covers the Barkly Highway intersection to the Hensley Drive intersection:

- Approx 2km in length, and average daily volumes of 642 vehicles with 266 (41.5%) heavy vehicles (2024 at chainage 1.45km).
- The road is classified as a State-Controlled Regional Road and is a Type 2 heavy vehicle route.
- It is a rural two-lane undivided road posted at 80km/hr.
- Sealed full width with Centre line marking and edge line marking for the entire road section is predominantly 7.2m with a minimum 7m bitumen seal width desired by TMR.
  - Marginal pavement costs advised by TMR vary between 5c and 50c/km/SAR.
- Queensland Government Open Data Portal Road Crash Locations Dataset shows 2 crashes have occurred on the Burke Developmental Road between Cloncurry and Hensley Drive in the five years preceding 2025:
  - 1 hospitalisation crash requiring October 2023
  - 1 medical treatment crash requiring in March 2024

Figure 47: Burke Developmental Road looking north between Cloncurry and Normanton (Google Maps, March 2025)

2.3 Mount Isa Supply/Delivery Route, connects with Alternative Cloncurry Route

2.3.1 Barkly Highway (Cloncurry – Mount Isa)

The Barkly Highway (15) runs west from Cloncurry to the Queensland/Northern Territory Border approximately 320km northwest of Cloncurry and forms part of the National Road Network. This report covers Section 15A Cloncurry to Mount Isa:

- 120km in length, between Cloncurry and Mount Isa.
- Average daily volumes of 1065 vehicles with 40% heavy vehicles (2024 at chainage 2.05km, Site No.100021).
- The road is part of the National Road Network.

- It is a gazetted Higher Mass Limit and Type 2 heavy vehicle route.
- Rural two-lane undivided road with 100km/hr posted speed for the Cloncurry-Mount Isa section, except for 60km/h posted speed through the townships.
- White line centerline marking with edge lines for the entire section. There is a Wide Centre Line Treatment from Ch.111.5km – Ch. 114km and Audio Tactile Edge Lines from Ch. 2.3km – 114km.
- The formation width varies from 7.4m-9.0m along the road section.
- Marginal pavement costs advised by TMR vary between 2c and 9.2c/km/SAR.
- The road features numerous bridges including seven state-controlled bridges:
  - Cloncurry River Anabranch at Ch.1.0km,
  - Cloncurry River at Ch.1.5km
  - Butcher Creek at Ch.17.3km
  - Corella River at Ch.44.4km
  - Greens Creek at Ch.61.9km
  - Leichhardt River (East Branch) at Ch.87.5km
  - Gorge Creek at Ch.102.5km
- Queensland Government Open Data Portal Road Crash Locations Dataset shows 44 crashes have occurred on the Barkly Highway between Cloncurry and Mount Isa in the five years preceding 2025. Nineteen of the crashes occurred within the Mount Isa town limits:
  - 5 fatal crashes,
  - 24 hospitalisation crashes,
  - 11 medical treatment crashes, and
  - 4 minor injuries crashes resulting in

Figure 48: Barkly Highway looking east between Cloncurry and Mt Isa (Google Maps, Oct. 2023)

2.4 Central and Southern Queensland Supply/Delivery Route (including Newcastle, Melbourne and Adelaide)

2.4.1 Landsborough Highway (Kynuna – Cloncurry)

3 OLC 13H - Ch. 168.7

The Landsborough Highway starts at Morven, west of Toowoomba and Brisbane, through Barcaldine and on to Cloncurry and forms part of the National Road Network. This report covers Section 13H from Kynuna to Cloncurry to consider one of the minor supply/delivery routes for pavement impacts predominantly:

- 170km in length, between Kynuna and Cloncurry.
- Average daily volumes of 388 vehicles with 159 (41%) heavy vehicles (2024 at chainage 154km, Site No.100047).
- The road is part of the National Road Network.
- It is a gazetted Higher Mass Limit and Type 2 heavy vehicle route.
- Rural two-lane undivided road with 110km/hr posted speed, except for 60km/h posted speed through the townships.
- White line centerline marking with edge lines for the entire section. There is Audio Tactile Edge Lines from Ch. 2.3km – 114km.
- The formation width varies from 7.4m-9.0m along the road section.
- Marginal pavement costs were not received from TMR, however, on the basis of the Flinders and Barklly Highway data sets, a rate of 10c/km/SAR, has been adopted.
- The road features numerous bridges including ten state-controlled bridges:
  - Gilliat Creek at Ch.26.7km, 44.8km, 45.2km
  - McKinlay Creek at Ch. 76.1km, 76.9km
  - Fullarton River at Ch. 120.1km, 120.5km
  - Williams River at Ch. 141.9km, 148km, 149.3km
- Queensland Government Open Data Portal Road Crash Locations Dataset shows 14 crashes have occurred on the Landsborough Highway section being assessed in the five years preceding 2025:
  - 3 fatal crashes,
  - 6 hospitalisation crashes,
  - 4 medical treatment crashes, and
  - 1 minor injuries crashes resulting in

3.2 Cloncurry Local Quarry Materials Supply/Delivery Route

3.2.1 Sir Hudson Fysh Drive & Ernest Henry Road to Castlereagh Quarry

Sir Hudson Fysh Drive north of Henley Drive connects through to the Castlereagh Quarry, transitioning to Ernest Henry Drive at Aerodrome Road. This report covers the links planned use for the supply of granular materials from concrete and road pavements requirements of the project works, and is included for anticipated pavement impacts predominantly:

- 3.6km in length, north of Henley Drive and Andrew Daniels Drive.
- Average daily volumes were not able to be sourced, however are thought to be in the order of 350-400 vehicles with 50+% heavy vehicles.
- It is a gazetted Higher Mass Limit and Type 2 heavy vehicle route.
- Rural two-lane undivided road with 80km/hr posted speed, except for 60km/h posted speed through the townships.
- White line centerline marking with edge lines for the entire section.
- The formation width varies from 7.4m-9.0m along the road section.
- Marginal pavement costs adopted, in the absence of Cloncurry Shire data as general value of 14c/km/SAR.
- Queensland Government Open Data Portal Road Crash Locations Dataset shows no crash occurred at the intersection in the past 5 years.

3. Traffic Generation and Distribution

The traffic generated by the proposed Dugald River Wind Farm Stages 1 & 2 construction and operation, has been sourced from HIG's EDL client representatives, as well as indicative/likely supply and delivery locations to inform the distribution of movements and loads. The purpose of this data is to establish the likely impact on road network capacity and pavement life for the development, installation and operation of the facility. The mitigation of identified capacity requirements and/or capture of additional costs estimated to be met by the road pavement asset owners.

The light vehicle of Stage 1's construction sub-stage requirements are set out in the table below.

The regime of Stage 1's construction sub-stage requirements for supply/delivery of materials and equipment can be found at Appendix A; identifying individual establishment, materials delivery through to disestablishment of facilitating infrastructure and plant activities to and from the site.

3.1 Light Vehicle Traffic Generation

The light vehicle traffic generation is comprised of:

- Due to the remote location, workers will be fly-in/fly-out (FIFO), from regional centres.
- A conservative 14 on and 7 off work cycle is adopted, (ref: EDL supplied Construction Traffic Plan),
- MMG 52-seat capacity transit vehicles will transport a maximum site presence of 90 FIFO workers between Cloncurry airport and workers camp at the beginning and conclusion of roster periods,
- Negligible personnel will be accommodated off-site.
- No permitted access without inductions.
- Light vehicle trips associated with commissioning of plant and equipment for construction activities, are anticipated to be few.
  - For the purposes of sensitivity, a daily maximum of 30 additional visitor, cleaning, camp maintenance and food supply contractor personnel originating or destined for Cloncurry in light vehicles has been adopted.
  - Service and maintenance vehicles for parts resupply are expected to be itinerant movements, predominantly in Class 3 vehicles or Mine-Spec utilities.
  - Assuming a vehicle occupancy of 1.5 person's per vehicle, will result in 20 vehicles and 40 trips per day.
  - The peak trip times are likely to be commencement and conclusion of the 14/7 FIFO cycle, with the service vehicle movements being on demand, and with parts supply predominantly being via service trucks/utilities being on hand at airport to make repairs at site.

The table below sets out these volumes:

Personnel			Transport Assumed				Frequency period	Total Trips per work 21 day work Schedule
Class	Indicative max		Light Vehicle (1.5 - 2 person occupancy)		Coach (50-person occupancy)		2 per X period	
Mgt/Supervision	5		2		3		2 x (5.5 + 2) trips per 21 days	
Civil Works	20		2		18			
Electrical Works	15		2		13			
Wind install works	60		5		55			
Total and Staged maximum personnel	100	<90 (90% total)	11	10 (5.5)	89	80 (2)		15 / 21 days = 0.75 per day
Special Vehicle pilot/escort vehicles movements			127 pilot/escort loads, 2 pilots + 1 QPS escort per load (and return)				487 working days	127 * 3 * 2/487 = 1.5 trips per day
Presumptive additional cleaning and food supply activities	15		15 (10)		0		10 x 2 x 14 per 21 days	13.25 trips/day
Average Total for 14 day working periods							**~15.5 trips per day**	
Likely maximum Trips (+20%) for Sensitivity Analysis							**20 trips per day**	

3.2 Light Vehicle Traffic Distribution

The light vehicle distributions are as follows:

- Workers to/from Airport on Sir Hudson Fysh Drive to site are in Coaches (in reality heavy vehicles though not included in Pavement Impacts assessment) and Light Vehicles,
- Escorts/Pilots for non-standard “Special” Vehicles are distributed per the loads supported, and
- Additional Support vehicles are 67% from Mt Isa and 33% from Cloncurry

3.3 Heavy Vehicle Supply and Delivery Traffic Generation and Trip Distribution

3.2.1 Heavy Vehicle Generation

Heavy vehicle movements are haulage of materials, equipment and machinery to and from the site as advised by EDL, and set out for pavement impacts in detail in Appendix A. A summary of the Appendix A Table is set out below, by Heavy Vehicle Class, advised Origins, assumed demobilisation destinations or return locations, per table below.

Vehicle Class	Transport Vehicle Description	No. of Trip Movements	No. of Arrival SAR's	No. of Departure SAR's
1	Light Vehicles (passenger cars)	14	3.5	3.5
2	Light vehicles towing	2	0.75	0.75
3	Two Axle Truck	42	62.5	16.25
4	Three Axle Truck	264	471.25	109
5	Four Axle Truck	22	45	5.25
6	Three Axle Articulated	0	0	0
7	Four Axle Articulated	0	0	0
8	Five Axle Articulated	82	230	113
9	Six Axle Articulated (semi-trailer)	618	1523.5	387.5
10	B-Double	172	541.75	68.75
11	Double Road Train	3	12.5	1
12	Triple Road Train	2566	15075.25	744.25
Special	Configurations suited for OSOM indivisible loads	246	9141	475.25
SPV	Cranes and other Special Construction Plant Types e	20	199.5	199.5
Total		**4051**	**27306.25**	**2123.25**

Figure 49: Stage 1 Heavy Vehicle Traffic Generated

Vehicle Class	Transport Vehicle Description	No. of Trip Movements	No. of Arrival SAR's	No. of Departure SAR's
1	Light Vehicles (passenger cars)	28	7.0	7.0
2	Light vehicles towing	4	1.5	1.5
3	Two Axle Truck	84	125.0	32.4
4	Three Axle Truck	528	942.5	218.0
5	Four Axle Truck	44	90.0	10.1
6	Three Axle Articulated	0	0.0	0.0
7	Four Axle Articulated	0	0.0	0.0
8	Five Axle Articulated	164	460.0	225.9
9	Six Axle Articulated (semi-trailer)	1236	3046.7	774.9
10	B-Double	344	1083.6	137.3
11	Double Road Train	6	25.0	1.7
12	Triple Road Train	3076	18071.5	892.0
Special	Configurations suited for OSOM indivisible loads	492	18281.7	950.4
SPV	Cranes and other Special Construction Plant Types	40	399.0	399.0
Total		**6046**	**42533.5**	**3650.0**

Figure 50: Stage 2 Heavy Vehicle Traffic Generated

Total Traffic Volumes (Heavy Vehicle)		Trip frequency period	Total Trips per work 21-day work Schedule
Stg 1	Calculated heavy vehicle delivery trip movements, and pilot/escort vehicles.	4051 trips / 487 working days	8.5 trips per day
Stg 2	Calculated heavy vehicle delivery trip movements, and pilot/escort vehicles.	6046 trips / 629 working days	9.6 trips per day
	Maximum average Total for 14 day working periods	**9.6 trips per day**	
	Likely maximum Trips (+15%) for Sensitivity Analysis	**11 trips per day (convoys and pilot/escorts are not consolidated)**	

Figure 51: Total Heavy Vehicle Traffic Generated

3.2.2 Heavy Vehicle Distribution

The trip distribution was established based on the following origins, destinations, supply and delivery of materials, plant and labour to the site. For additional details see Appendix A

Routes and Returns	Origins	Townsville		Cloncurry		Castlereagh		Mt Isa	
	Destination	DRWF		DRWF		DRWF		DRWF	
Road Directions		Arrival	Departures	Arrival	Departures	Arrival	Departures	Arrival	Departures
Trips		**1,169**	**1,199**	**528**	**528**	**2,731**	**2,731**	**342**	**312**
Trips/Working Day		2	2	1	1	5	5	<1	<1
Trips of SPV and Special Configurations by Origin		**363**	**363**	**0**	**0**	**0**	**0**	**9**	**9**
Trips/Working Day		0.25	0.25	0	0	0	0	~0	~0

* Shaded Arrivals are for cross-referencing of against gazettal direction of loaded travel.

Figure 52: Trip Distribution for Origins and Destinations – Note: Working days are **Project Working Days** in this table

Routes and Returns	Origins via Barcaldine	Clarke Creek Wind Farm, Rockhampton, Brisbane, Toowoomba, Newcastle, Adelaide or Melbourne		Total from all Origins and to all Destinations	
	Destination	DRWF			
Road Directions		Arrival	Departures	Arrival	Departures
Trips by Discipline		280	280	5,049	5,049
Trips/Working Day		<1	<1	9	9
Trips of SPV and Special Configurations by Origin		**9**	**9**	**399**	**399**
Trips/Working Day		~0	~0	<1	<1

Figure 53: Trip Distribution for Origins and Destinations via Barcaldine and Total – Note: Working days are **Project Working Days** in this table

Infrastructure Discipline	Trip Totals							
	Civil BOP		EDL		Electrical BOP		Wind TSI	
Supply or Delivery Directions	Arrival	Departures	Arrival	Departures	Arrival	Departures	Arrival	Departures
Trips by Discipline	**3,366**	**3,366**	**30**	**30**	**1,131**	**1,131**	**522**	**522**
Trips/Working Day	**13**	**13**	**~0**	**~0**	**5**	**5**	**21**	**21**
Trips of SPV and Special Configurations by Discipline	**6**	**6**	**0**	**0**	**12**	**12**	**381**	**381**
Trips/Working Day	~0	~0	~0	~0	~0	~0	**1**	**1**

Figure 54: Trip Distribution by Sub-phase of Construction – Note: Working days are **Sub-Phase Working Days** in this table

4. Traffic Impacts

The background traffic volumes and construction traffic volumes for the road network are presented in various sources, including Appendix A. The total traffic volumes and daily trip movements generated a summarised below:

Mode of Transport	Transported Items	Likely maximum Additional trips/day
Light Vehicles (Classes 1-3)	Mgt/Supervision	1
	Escort/Pilots	1.75
	Additional Minor / Local Supply	17
Coach	Work Crews	0.25
Supply / Delivery	Materials, Equipment and Plant	9.5
Total Trips		**29.5**

4.1 Route/Road Link Assessments of Primary supply/delivery to DRWF Cloncurry

The light vehicles and heavy vehicle route movements on this link are estimated to be:

Road Segment	Existing Volumes (2024)		Forecast Volumes (2026-2030 1.5%/annum)		Project Daily Volumes by Vehicle Type			% Increase by Vehicle Type	
	All Vehicles (vpd)	Heavy Vehicles (vpd)	All Vehicles (vpd)	Heavy Vehicles (vpd)	All Vehicles (vpd)	Light Vehicles (vpd)	Heavy Vehicles (vpd)	All Vehicles (vpd)	Heavy Vehicles (vpd)
841	2778	613	2985.28	658.975	4	2	2	0.1%	0.3%
10M	20000	300	21500	322.5	4	2	2	0.0%	0.6%
83A	216	63	232.2	67.725	4	2	2	1.7%	3.0%
98C	267	96	287.025	103.2	4	2	2	1.4%	1.9%
14A	2982	589	3205.65	633.175	4	2	2	0.1%	0.3%
14B	714	292	767.55	313.9	4	2	2	0.5%	0.6%
14C	423	182	442	190	4	2	2	0.9%	1.1%
14D	329	137	344	143	4	2	2	1.2%	1.4%
14E (0 – 123km)	395	172	413	180	4	2	2	1.0%	1.1%
14E (Ch123 – Andrew Daniels Drive)	685	270	716	282	4.5	2	2.5	0.6%	0.9%
Andrew Daniels Drive to Sir Hudson Fysh Drive	345	190	361	198	4.5	2	2.5	1.2%	1.3%
Henley Drive to Sir Hudson Fysh Drive	240	132	251	138	13	5	8	5.2%	5.8%
Burke Development Road from Henley Drive to DRWF access	310	156	324	163	29.5	20	9.5	9.1%	5.8%

4.2 Cloncurry Alternative "Light Vehicle" Route

The light vehicles and heavy vehicle route movements on this alternate link are estimated to be:

Road Segment	Existing Volumes (2024)		Forecast Volumes (2026-2030 1.5%/annum)		Project Daily Volumes by Vehicle Type			% Increase by Vehicle Type	
	All Vehicles (vpd)	Heavy Vehicles (vpd)	All Vehicles (vpd)	Heavy Vehicles (vpd)	All Vehicles (vpd)	Light Vehicles (vpd)	Heavy Vehicles (vpd)	All Vehicles (vpd)	Heavy Vehicles (vpd)
Flinders Hwy from Andrew Daniels Drive to Scheaffe Street/15A	1,011	269	1086.83	289.175	5	5	0	0.5%	0.0%
	3,179	402	3417.43	432.15	5	5	0	0.1%	0.0%
Barkly Highway from Scheaffe Street/14E	1,391	366	1495.33	393.45	5	5	0	0.3%	0.0%
Burke Developmental Road from Barkly Highway to Henley Drive	642	266	690.15	285.95	11	10.5	0.5	1.6%	0.2%

4.3 Connections to the primary or Alternative Routes

The light and heavy vehicle route movements on these connecting links are estimated to be:

Road Segment	Existing Volumes (2024)		Forecast Volumes (2026-2030 1.5%/annum)		Project Daily Volumes by Vehicle Type			% Increase by Vehicle Type	
	All Vehicles (vpd)	Heavy Vehicles (vpd)	All Vehicles (vpd)	Heavy Vehicles (vpd)	All Vehicles (vpd)	Light Vehicles (vpd)	Heavy Vehicles (vpd)	All Vehicles (vpd)	Heavy Vehicles (vpd)
Barkly Highway to Burke Developmental Road	1,065	425	1144.88	456.875	22	21.5	0.5	1.9%	0.1%
Landsborough Highway to Flinders Highway 14E	388	159	417.1	170.925	1.5	1	0.5	0.4%	0.3%
Castlereagh Quarry via Ernest Henry Road and Sir Hudson Fysh Drive	325	130	349.375	139.75	12	1	11	3.4%	7.9%

4.4 Route(s) Intersections Assessments

The below figure is referenced in the intersection descriptions below to comment on intersection layout suitability. Noting the peak volumes of Major Road and Turn Volume legs are estimated at 10% of 50% of AADT for simplicity of calculations and presentation.

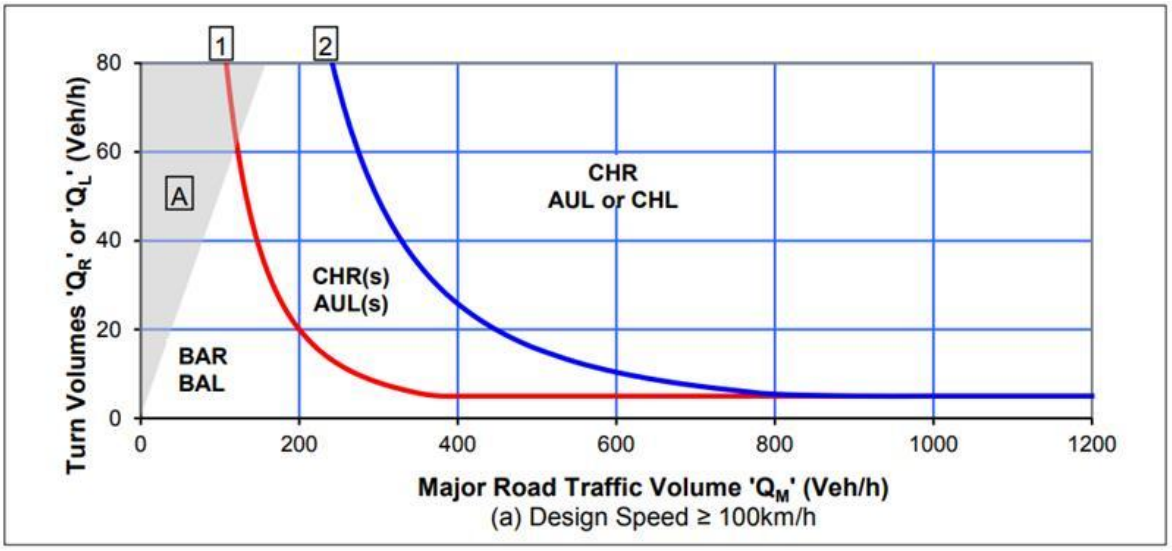


Figure 55: Turn Warrants – 100km/h

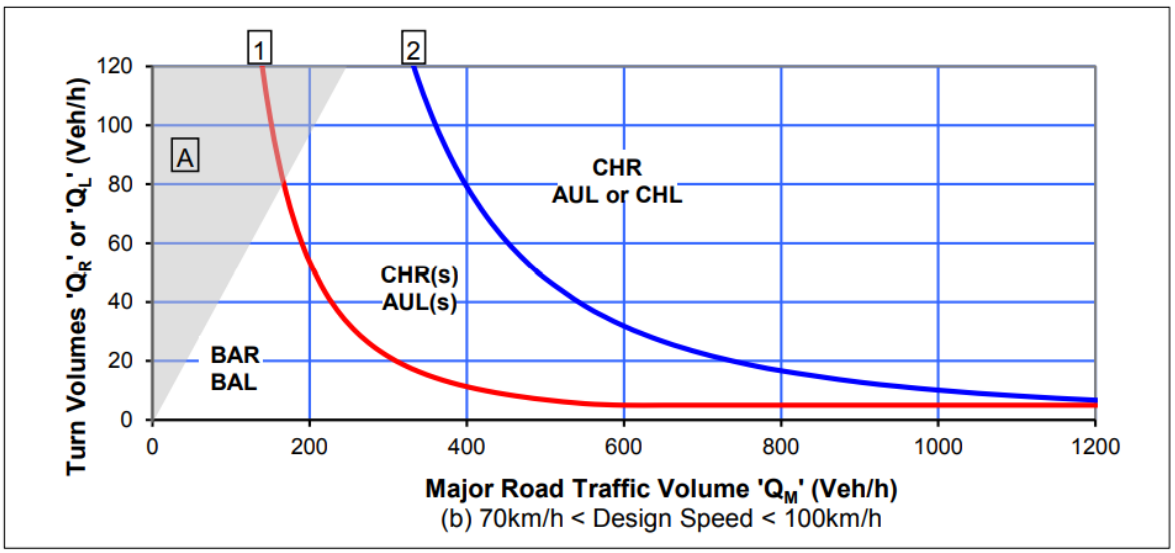


Figure 56: Turn Warrants – 80km/h

4.4.1 Flinders Highway/Andrew Daniels Drive Intersection

With no peak hour volumes available at this intersection, a basic assessment of:

- Intersection is in a 60km/hr posted speed zone,
- Andrew Daniels Drive leg has <5% increase in volumes over the project period,
- Major Road Volumes ~36 vph each way (720vpd @ 50% @ 10%)
- Turn Volumes~20 vph, of which 10vph are heavy vehicles (185vpd & 100vpd HV @ 50% @ 10%)
- The intersection is expected to continue to operate within capacity.
- swept path for left-out and right-in turn movements from/to 14E to/from Andrew Daniels Drive, are under review concurrently with this scope.

4.4.2 Burke Development Road/Henley Drive Intersection

With no peak hour volumes available at this intersection, a basic assessment of:

- Intersection is in a 80km/hr posted speed zone,
- Henley Drive leg has ~5% increase in volumes over the project period,
- Major Road Volumes ~17 vph each way (340vpd @ 50% @ 10%)
- Turn Volumes ~14 vph, of which 7vph are heavy vehicles (265vpd & 140vpd HV @ 50% @ 10%)
- The intersection is expected to continue to operate within capacity.
- swept path for left-out and right-in turn movements from/to 89A to/from Henley Drive, are under review concurrently with this scope.

4.4.3 Burke Development Road/Dugald River Site Road Intersection

With no peak hour volumes available at this intersection, a basic assessment of:

- Intersection is in a 100km/hr posted speed zone,
- Burke Developmental Road has >9% increase in volumes over the project period,
- Major Road Volumes ~17 vph each way (340vpd @ 50% @ 10%)
- Turn Volumes ~8 vph, of which 3 vph are heavy vehicles (30vpd & 10vpd HV @ 50% @ 10%)
- The intersection is expected to continue to operate within capacity.
- swept path for left-out and right-in turn movements from/to 89A to/from DRWF Access, are under review concurrently with this scope.

4.4.4 Barkly Highway and Burke Developmental Road Intersection

With no peak hour volumes available at this intersection, a basic assessment of:

- Intersection is in a 80km/hr posted speed zone,
- Legs have <5% increase in volumes over the project period,
- Major Road Volumes ~36 vph each way (720vpd @ 50% @ 10%)
- Turn Volumes ~20 vph, of which 10vph are heavy vehicles (185vpd & 100vpd HV @ 50% @ 10%)
- The intersection is expected to continue to operate within capacity.
- swept path for left-out and right-in turn movements from/to 15A to/from 89A, are under review concurrently with this scope.

4.5 Curved (Urban) Alignments independent of Intersections

See Appendix E for Impacted Swept Path works.

5. Pavement Impact Assessment

A pavement impact assessment (PIA) was undertaken on the advised DRWF construction traffic on the road network in accordance with the requirements of the *Guide to Traffic Impact Assessment Practice Note: Pavement Impact Assessment (December 2018)* including:

- Determination of existing Standard Axle Repetitions (SARs) on the road network and obtaining data from TMR on existing marginal cost rates.
- Determination of additional SARs due to the development.
- Establishing whether the increase in SARs due to the development is greater than 5% based on SAR4 (SAR 4th exponent) calculations.
- Determining an appropriate contribution for the increase in pavement wear due to the proposed development traffic on the state-controlled road network.

Detailed calculations of base and development AADT volumes, SAR4s (SAR 4th exponent) and marginal cost contributions are included in Appendix B.

The following assumptions were made:

- Growth rates:
  - The 5-year growth rates to 2024 were highly variable and ranged across links from -40% to +25%. The rate adopted unilaterally for all links is 1.5% linear per annum.
  - Per GTIA pavement impact assessments practice note, linear growth rate of 1.5% adopted.
- Where traffic data was not available, particularly on local government network, an assumed AADT has been adopted with 3.2 SAR's per vehicle adopted, as per the Practice Note.
- SAR4s were determined based on heavy vehicle class for each type of movement.
- SAR5's were of short section lengths, and inconsequential for methodology for assessment,
- SAR's for Load-Specific configurations planned for indivisible OSOM vehicle loads advised were compiled. A worked example for one of the configurations is included in Appendix C.
- Derived pavement contributions are tabulated below, and further supported in Appendix D.

The development increases SAR4s by greater than 5%on several sections of roads on the routes under review, and determined the value of contributions on these road sections, being:

Routes and Returns	Origins Destination	Townsville		Cloncurry		Castlereagh		Mt Isa	
		DRWF		DRWF		DRWF		DRWF	
Road Directions		G	AG	G	AG	AG	G	AG	G
SAR's by Origin		**32,407**	**2,022**	**2,057**	**497**	**31,905**	**1,582**	**1734**	**617**

Table 1 – Standard Axle Repetitions for Origins and Destinations

Routes and Returns	Origins via Barcaldine	Clarke Creek Wind Farm, Rockhampton, Brisbane, Toowoomba, Newcastle, Adelaide or Melbourne		Total from all Origins and to all Destinations	
	Destination	DRWF			
Road Directions		G	AG	Arriving	Departing
SAR's by Origin		**1,737**	**1,055**	**69,840**	**5,773**

Table 2 – Standard Axle Repetitions for Origins and Destinations via Barcaldine and Total

Infrastructure Discipline	SAR Totals							
	Civil BOP		EDL		Electrical BOP		Wind TSI	
Supply or Delivery Directions	Arrival	Departures	Arrival	Departures	Arrival	Departures	Arrival	Departures
SAR's by Discipline	**36,093**	**2,489**	**107**	**107**	**5,429**	**1,180**	**28,211**	**1,997**
Trips by Discipline	**3,366**	**3,366**	**30**	**30**	**1,131**	**1,131**	**522**	**522**
Working Day Trips	**6**	**6**			**1.75**	**1.75**	**2.25**	**2.25**
Trips of SPV and Special Configurations by Discipline	**2**	**2**	**0**	**0**	**4**	**4**	**381 = 127 x 3 (with pilot /escort)**	**381 = 127 x 3 (with pilot /escort)**

Table 3 – Standard Axle Repetitions by Sub-phase of Construction

Table 4 – Summary of Pavement Contributions for Construction Period

Road Name	Direction	TDist Start	TDist End	Length	Average Marginal Cost	Generated SAR (%)	Marginal Cost
TOWNSVILLE PORT ROAD	A	0	7.3	7.3	N/A	0.12%	
	G					2.46%	
BRUCE HIGHWAY (TOWNSVILLE - INGHAM)	A	0	17.5	17.5	N/A	0.04%	
	G					0.29%	
HERVEY RANGE DEVELOPMENTAL ROAD (TOWNSVILLE - BATTERY)	A	3.75	64.8	61.05	$0.10	1.75%	
	G					0.1%	
	A	64.8	124.7	59.0	$0.115	1.00%	
	G					20.90%	$223,0628
GREGORY DEVELOPMENTAL ROAD (CHARTERS TOWERS - THE LYND)	A	0	4.9	4.9	$0.07	1.70%	
	G					0.75%	
	A	4.9	97.5	97.5	$0.106	7.64%	$213,212
	G					4.00%	
FLINDERS HIGHWAY (TOWNSVILLE - CHARTERS TOWERS)	A	122.1	126.1	4.0	$0.021	0.11%	
	G					1.90%	
FLINDERS HIGHWAY (CHARTERS TOWERS - HUGHENDEN)	A	0	61.8		$0.041	0.13%	
	G					2.22%	
	A	61.8	247.3	247.3	$0.048	0.2%	
	G					5.00%	$284,770
FLINDERS HIGHWAY (HUGHENDEN - RICHMOND)	A	0	114.8	114.8	$0.044	0.35%	
	G					5.87%	$162,428
FLINDERS HIGHWAY (RICHMOND - JULIA CREEK)	A	0	149.3	149.3	$0.047	0.42%	
	G					8.71%	$228,674
FLINDERS HIGHWAY (JULIA CREEK - CLONCURRY)	A	0	134.32	134.32	$0.077	0.48%	
	G					7.65%	$219,162
Andrew Daniels Drive	A	0	4.35	4.35	$0.14	0.53%	
	G					5.10%	$20,793
Hensley Drive	A	0	2.65	2.65	$0.14	2.31%	
	G					13.55%	$25,267
BURKE DEVELOPMENTAL ROAD (CLONCURRY - NORMANTON)	A	2.1	56.5	54.4	$0.164	0.86%	
	G					23.46%	$622,047
Sir Hudson Fysh Drive/Ernest Henry Road	A	0	3.7	3.7	$0.14	19.05%	$16,527
	G					0.44%	
Total of Contributions							$2,015,941

Note:

- Yellow Highlight are assumed values from adjacent links.
- Red Highlight with Red Text are SAR's >5% or approaching 5%.
- Contribution amounts would vary significantly if:
  - An alternative quarry material supplier (to Castlereagh Quarry), for Civil Construction was pursued, or
  - The port of supply of the Wind Turbine and Tower components was to be altered.
- In either of these circumstances, an updated PIA will be required.

6. Conclusions and Recommendations

HIG have reviewed the DRWF impact on the local and state government-controlled road network.

- **Road Upgrade Requirements**
- Priority 1 works, recommended to be undertaken prior to haulage commencing include:
  - Flinders Highway – Hughenden to Cloncurry
    - No seal, pavement or formation width deficiencies for traffic volumes/capacity requirements, though
    - OSOM transport of indivisible components may require temporary work activities.
  - Andrew Daniels Drive – Flinders Highway to Sir Hudson Fysh Drive
    - No seal, pavement or formation width deficiencies for traffic volumes/capacity requirements, though
    - OSOM transport of indivisible components may require temporary work activities.
  - Henley Drive – Sir Hudson Fysh Drive to Burke Developmental Road
    - No seal, pavement or formation width deficiencies for traffic volumes/capacity requirements, though
    - OSOM transport of indivisible components may require temporary work activities.
  - Burke Developmental Road – Henley Drive to DRWF Access
    - No seal, pavement or formation width deficiencies for traffic volumes/capacity requirements, though
    - OSOM transport of indivisible components may require temporary work activities.
  - Barkly Highway – Cloncurry to Mt Isa
    - No seal, pavement or formation width deficiencies for traffic volumes/capacity requirements.
  - Landsborough Highway – Kynuna to Cloncurry
    - No seal, pavement or formation width deficiencies for traffic volumes/capacity requirements, though
    - OSOM transport of indivisible components may require temporary work activities, subject to Port of Supply of Wind Components.
  - Sir Hudson Fysh Drive & Ernest Henry Road to Andrew Daniels Drive/ Henley Drive
    - No seal, pavement or formation width deficiencies for traffic volumes/capacity requirements.

- **Intersections Upgrade Requirements**
  - Priority 1 works, implemented prior to materials haulage commencing, include:
    - Flinders Highway/Andrew Daniels Drive
      - No intersection works identified for traffic capacity requirements, though
      - OSOM transport of indivisible components may require temporary work activities.
    - Henley Drive/Burke Developmental Road:
      - No intersection works identified for traffic capacity requirements, though
      - OSOM transport of indivisible components may require temporary work activities.
    - Burke Developmental Road/Dugald River Site Road:
      - No intersection works identified for traffic capacity requirements, though
      - OSOM transport of indivisible components may require temporary work activities.
    - Barkly Highway/Burke Developmental Road:
      - No intersection works identified for traffic capacity requirements

- **Swept Path Horizontal Alignments (non-Intersection related works)**
  - Priority 1 works, implemented prior to materials haulage commencing, include:
    - See Appendix E for works planned to mitigate the swept path of the OSOM configuration vehicles

- **Pavement Impacts upgrades recommended:**
  - No works identified requiring intervention for loads to be transported.
  - The Stage 1 contribution sums are as follows:
    - The TMR / State-Controlled Road amount of $570,225, and
    - The Cloncurry Shire Road amount of $17,500,
    - A Total of $587,725 (ex-GST)
  - The combined Stage 1 and 2 contribution sums are as follows:
    - The TMR / State-Controlled Road amount of $1,953,400, and
    - The Cloncurry Shire Road amount of $62,600,
    - A Total of $2,016,000 (ex-GST)
  - Note: contributions are heavily reliant on the Civil Materials Quarry Supplier location and the Port of Supply of Wind Componentry.

Appendix A - Client Supplied Construction Traffic Plan with Volumes

Noted: Construction Traffic Plan Attached not embedded in report.

Appendix B - AADT Report from TMR Traffic Census (Qld Data Portal)

ROAD_NAME		DESCRIPTION	START Chainage	END Chainage	AADT	AADT_CLASS_2A	AADT_CLASS_2B	AADT_CLASS_2C	AADT_CLASS_2D	AADT_CLASS_2E	AADT_CLASS_2F	AADT_CLASS_2G	AADT_CLASS_2H	AADT_CLASS_2I	AADT_CLASS_2J	AADT_CLASS_2K	AADT_CLASS_2L	GROWTH_PC_1YR	GROWTH_PC_5YR	GROWTH_PC_10YR	SAR
13H	LANDSBOROUGH HIGHWAY (KYNUNA - CLONCURRY)	13H Ch 153.94 - 15.2km Sth int 14E/13H	166.18	169.18	184	83.54	26.26	19.43	3.018	1.803	1.472	3.717	1.306	5.336	3.754	9.642	24.73	-11.96	1.15	0.51	285.11
13H	LANDSBOROUGH HIGHWAY (KYNUNA - CLONCURRY)	13H Ch 153.94 - 15.2km Sth int 14E/13H	166.18	169.18	204	90.29	28.83	25.99	3.509	2.02	2.101	5.161	1.408	5.386	3.835	8.874	26.6	-4.23	1.56	0.96	312.59
14C	FLINDERS HIGHWAY (HUGHENDEN - RICHMOND)	14C Ch 17.22 - West Hughenden	0	114.829	217	99.62	24.56	28.54	2.995	1.562	7.855	1.562	1.259	8.919	4.015	10.09	26.02	2.36	-1.75	0.1	330.98
14C	FLINDERS HIGHWAY (HUGHENDEN - RICHMOND)	14C Ch 17.22 - West Hughenden	0	114.829	206	96.39	20.7	27.17	3.296	1.545	6.489	1.318	1.133	8.219	3.852	9.909	25.98	2.49	-2.31	-0.47	321.14
14D	FLINDERS HIGHWAY (RICHMOND - JULIA CREEK)	14D Ch 116.9km - Spellary Creek	0	149.31	189	93.23	18.62	23.19	2.419	1.021	1.758	4.782	1.285	7.617	3.213	8.184	23.68	13.86	-1.16	-0.4	283.76
14D	FLINDERS HIGHWAY (RICHMOND - JULIA CREEK)	14D Ch 116.9km - Spellary Creek	0	149.31	140	69.9	10.43	13.37	2.548	0.91	0.994	2.66	1.036	6.412	2.73	7.308	21.7	-18.13	-7.61	-3.9	236.87
14E	FLINDERS HIGHWAY (JULIA CREEK - CLONCURRY)	14E Ch 3.18 West of Int 14E/14D/5807	0	3.6	38	18.64	2.47	6.977	0.619	0.289	0.327	0.692	0.072	1.417	0.692	1.379	4.431		-40.59		56.81
14E	FLINDERS HIGHWAY (JULIA CREEK - CLONCURRY)	14E Ch 3.18 West of Int 14E/14D/5807	0	3.6	35	21.12	2.769	2.877	0.693	0.147	0.109	0.473	0.074	0.802	0.546	0.875	4.515		-41.69		44.39
14E	FLINDERS HIGHWAY (JULIA CREEK - CLONCURRY)	14E Ch 6.33 - 2.7km West of Int 14E/78A	3.6	24.5	199	90.98	21.73	26.98	3.502	1.493	6.846	1.353	1.134	8.716	3.801	8.358	24.1	-2.93	15.23		304.81
14E	FLINDERS HIGHWAY (JULIA CREEK - CLONCURRY)	14E Ch 6.33 - 2.7km West of Int 14E/78A	3.6	24.5	196	92.71	18.09	26.13	3.802	1.568	5.802	1.254	1.098	8.369	3.861	8.604	24.72	2.08	3.17		305.24
14E	FLINDERS HIGHWAY (JULIA CREEK - CLONCURRY)	14E Ch 125.9 - 10km East of Cloncurry	123.03	134.32	344	170.9	47.99	35.19	4.61	2.511	2.752	6.57	2.167	10.63	5.607	14.62	40.42	-8.75	-3.68		471.06
14E	FLINDERS HIGHWAY (JULIA CREEK - CLONCURRY)	14E Ch 125.9 - 10km East of Cloncurry	123.03	134.32	341	154.4	42.15	48.63	5.183	2.626	5.729	11.05	2.182	10.09	5.32	13.71	39.97	-1.73	-5.04		506.82
14E	FLINDERS HIGHWAY (JULIA CREEK - CLONCURRY)	14E Ch 134.5 - 420m East Railway Xing	134.32	136.31	524	290.4	47.06	130.9	5.764	2.463	6.812	13.83	1.886	7.808	2.463	4.192	10.43	-2.78	1.01		421.40
14E	FLINDERS HIGHWAY (JULIA CREEK - CLONCURRY)	14E Ch 134.5 - 420m East Railway Xing	134.32	136.31	487	348.8	55.47	37.94	5.406	2.386	1.705	6.526	1.851	7.354	2.24	5.065	12.27	0.62	-0.03		237.08
14E	FLINDERS HIGHWAY (JULIA CREEK - CLONCURRY)	14E Ch 136.82 Ramsay St opp St Vincent's	136.31	136.83	1617	1382	35.9	170.9	9.864	3.557	4.043	1.132	0.97	5.821	0.97	0.809	1.294	-39.87	-0.63		375.50

ROAD_NAME		DESCRIPTION	START Chainage	END Chainage	AADT	AADT_CLASS_2A	AADT_CLASS_2B	AADT_CLASS_2C	AADT_CLASS_2D	AADT_CLASS_2E	AADT_CLASS_2F	AADT_CLASS_2G	AADT_CLASS_2H	AADT_CLASS_2I	AADT_CLASS_2J	AADT_CLASS_2K	AADT_CLASS_2L	GROWTH_PC_1YR	GROWTH_PC_5YR	GROWTH_PC_10YR	SAR
14E	FLINDERS HIGHWAY (JULIA CREEK - CLONCURRY)	14E Ch 136.82 Ramsay St opp St Vincent's	136.31	136.83	1562	1320	39.21	174.2	7.654	2.655	5.311	1.25	1.093	4.998	1.093	2.499	2.187	-44.55	-1.87		389.75
15A	BARKLY HIGHWAY (CLONCURRY - MOUNT ISA)	15A Ch 1.5 East abut Cloncurry River Bdg	0	2.05	696	388.5	57.21	179.6	8.282	2.714	11.48	22.76	2.227	7.447	2.993	4.176	8.561	-1.83	1.05		539.69
15A	BARKLY HIGHWAY (CLONCURRY - MOUNT ISA)	15A Ch 1.5 East abut Cloncurry River Bdg	0	2.05	695	505.8	73.53	59.14	12.58	2.572	2.711	9.452	2.363	6.95	2.572	5.213	12.16	-1.7	1.19		301.64
15A	BARKLY HIGHWAY (CLONCURRY - MOUNT ISA)	15A WiM Site Cloncurry Ch 7.048km	2.05	114.05	543	288.4	40.02	61.79	8.905	8.905	4.561	11.02	2.715	15.42	15.8	34.7	50.77	19.6	3.29		760.64
15A	BARKLY HIGHWAY (CLONCURRY - MOUNT ISA)	15A WiM Site Cloncurry Ch 7.048km	2.05	114.05	522	274.1	37.22	60.4	10.91	7.204	4.489	10.86	2.662	14.62	14.88	32.63	52.1	19.18	2.15		751.20
89A	BURKE DEVELOPMENTAL ROAD (CLONCURRY - NORMANTON)	89A Ch 1.45 - North of Int 15A/89A	0	2.06	322	156.7	23.83	38.32	6.762	2.222	1.996	5.055	1.03	7.857	7.986	29.82	40.38	8.78	-0.96		538.54
89A	BURKE DEVELOPMENTAL ROAD (CLONCURRY - NORMANTON)	89A Ch 1.45 - North of Int 15A/89A	0	2.06	320	169	26.24	23.65	6.624	1.984	1.024	2.88	0.928	7.712	7.808	30.88	41.28	10.73	-0.57		512.39
89A	BURKE DEVELOPMENTAL ROAD (CLONCURRY - NORMANTON)	89A Ch 7.95km - Nth intersection 15A/89A	2.06	107.6	158	45.65	4.614	63.45	2.275	1.011	3.65	6.083	0.427	2.891	1.122	3.381	23.45	0	0.36	2.43	317.16
89A	BURKE DEVELOPMENTAL ROAD (CLONCURRY - NORMANTON)	89A Ch 7.95km - Nth intersection 15A/89A	2.06	107.6	152	91.76	11.99	10.62	2.037	1.338	0.456	1.353	0.319	2.873	1.398	3.359	24.49	-0.65	-1.18	1.31	210.24

Note: Yellow Highlight appear to be errors in data – not utilised.

Appendix C - Nacelle 50T Load – Vehicle Configuration and SAR Calculation

Table B-1: SAR4 Calculation Spreadsheet

Nacelle

Laden

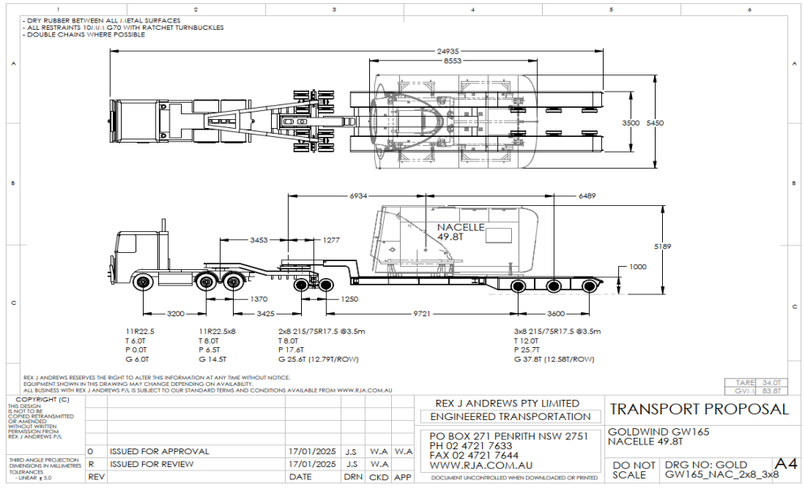
Axle No.	Distance From Previous Axle	No. Of Tyres Per axle	Tyre Width	Ground Contact Width	Axle Mass Requested	Total Gross Per Vehicle Section	Total Gross Per Vehicle Axle Group	SAR (L)	Total Gross Per Vehicle Axle Group	SAR (UL)	
1		2	279mm	2.4	6.25		6.25	1.7945065	6.25	1.7945065	
2	3.2	8	279mm	2.4	7.25	**20.75**	14.5	1.2188652	8	0.1129389	**Prime mover**
3	1.37	8	279mm	2.4	7.25						
4	3.43	8	215mm	3.5	12.85		25.7	12.028629	8	0.1129389	**2x8 Dolly**
5	1.25	8	215mm	3.5	12.85						
6	9.72	8	215mm	3.5	12.6	**63.5**					
7	1.8	8	215mm	3.5	12.6		37.8	17.429314	12	0.1770264	**3x8 Low Loader**
8	1.8	8	215mm	3.5	12.6						
						84.25					
					SAR's			**32.5**		**2.2**	

Total Length	**22.57**	**metres**
Total Gross Combination	**83.9**	**Tonnes**

Unladen

Tare Mass (T)		
6.25	Payload(T)	49.8
4	COG position(mm)	-222.5
4	trailer support length	13423
4	Trailer Wheel Comb. Payload(T)	25.72549
4	Trailer 5th Wheel Comb. Payload(T)	24.074501
4	5th wheel COG position(mm)	-1098
4	Dolly .pmover support length	4730
4	Dolly wheel comb. payload	17.6258
	P.Mover comb. Wheel Payload	6.448712
	max axle weight (for COG solver)	12.8129

Payload Mass (T)	Gross Mass (T)	Base Loads	
0	6.25	5.4	
3.224356	7.224356	13.8	
3.224356	7.224356		
8.812901	12.8129	13.8	
8.812901	12.8129		
8.575162	12.57516	18.5	
8.575162	12.57516		
8.575162	12.57516		



Mass of load	49.8

Unladen Dimensions

Width	3.5
Length	24.94
Height	4.3
Unladen Mass	34

Laden Dimensions

Width	5.45
Length	24.94
Height	5.189
Laden Mass	83.9

Payload Dimensions

Width	5.45
Length	8.553
Height	4.189

Appendix D - Pavement Impact Assessment

Table D: Pavement Impact and Contribution Assessment

Construction Traffic - Stages 1& 2 Road Name	ROAD ID	Direction	TDist Start	TDist End	Length	AADT	Existing SAR 2024	ExistingSAR 1.50% 2028	ExistingSAR 1.50% 2030	Average Marginal Cost	Existing SAR's for Project Duration 1003.75	Generated SAR	Generated SAR (%)	Marginal Cost
TOWNSVILLE PORT ROAD	841	A	0	7.3	7.3	3220	1013.95	1074.78	1107.03		1965545	2022	0.10%	
TOWNSVILLE PORT ROAD	841	G	0	7.3	7.3		813.32	862.12	887.98		1576629	32407	2.06%	
TOWNSVILLE PORT ROAD	841	A	7.3	7.8	0.5		1419.27	1504.43	1549.56		2751274	2022	0.07%	
TOWNSVILLE PORT ROAD	841	G	7.3	7.8	0.5		1058.55	1122.07	1155.73		2052019	32407	1.58%	
BRUCE HIGHWAY (TOWNSVILLE - INGHAM)	10M	A	0	2.5	2.5	20683	3095.44	3281.17	3379.60		6000546	2022	0.03%	
BRUCE HIGHWAY (TOWNSVILLE - INGHAM)	10M	G	0	2.5	2.5		3266.22	3462.19	3566.06		6331595	32407	0.51%	
BRUCE HIGHWAY (TOWNSVILLE - INGHAM)	10M	A	2.5	3.9	1.4		2270.67	2406.90	2479.11		4401708	2022	0.05%	
BRUCE HIGHWAY (TOWNSVILLE - INGHAM)	10M	G	2.5	3.9	1.4		3119.61	3306.79	3406.00		6047406	32407	0.54%	
BRUCE HIGHWAY (TOWNSVILLE - INGHAM)	10M	A	3.9	8.6	4.7		3276.62	3473.22	3577.42		6351769	2022	0.03%	
BRUCE HIGHWAY (TOWNSVILLE - INGHAM)	10M	G	3.9	8.6	4.7		4002.74	4242.91	4370.20		7759363	32407	0.42%	
BRUCE HIGHWAY (TOWNSVILLE - INGHAM)	10M	A	8.6	10.3	1.7		3179.77	3370.55	3471.67		6164015	2022	0.03%	
BRUCE HIGHWAY (TOWNSVILLE - INGHAM)	10M	G	8.6	10.3	1.7		3844.19	4074.84	4197.08		7451995	32407	0.43%	
BRUCE HIGHWAY (TOWNSVILLE - INGHAM)	10M	A	10.3	12	1.7		3500.37	3710.40	3821.71		6785512	2022	0.03%	
BRUCE HIGHWAY (TOWNSVILLE - INGHAM)	10M	G	10.3	12	1.7		6819.23	7228.38	7445.24		13219149	32407	0.25%	
BRUCE HIGHWAY (TOWNSVILLE - INGHAM)	10M	A	12	12.8	0.8		2978.98	3157.72	3252.46		5774792	2022	0.04%	
BRUCE HIGHWAY (TOWNSVILLE - INGHAM)	10M	G	12	12.8	0.8		4063.89	4307.73	4436.96		7877900	32407	0.41%	
BRUCE HIGHWAY (TOWNSVILLE - INGHAM)	10M	A	12.8	14	1.2		2629.15	2786.90	2870.51		5096637	2022	0.04%	
BRUCE HIGHWAY (TOWNSVILLE - INGHAM)	10M	G	12.8	14	1.2		1934.62	2050.70	2112.22		3750284	32407	0.86%	
BRUCE HIGHWAY (TOWNSVILLE - INGHAM)	10M	A	14	16.5	2.5		4779.89	5066.69	5218.69		9265871	2022	0.02%	
BRUCE HIGHWAY (TOWNSVILLE - INGHAM)	10M	G	14	16.5	2.5		2280.40	2417.22	2489.74		4420575	32407	0.73%	
BRUCE HIGHWAY (TOWNSVILLE - INGHAM)	10M	A	16.5	17.5	1		1641.10	1739.57	1791.75		3181291	2022	0.06%	
BRUCE HIGHWAY (TOWNSVILLE - INGHAM)	10M	G	16.5	17.5	1		1695.76	1797.51	1851.43		3287248	32407	0.99%	
HERVEY RANGE DEVELOPMENTAL ROAD (TOWNSVILLE - BATTERY)	83A	A	4.5	9.8	5.3	=M32	1260.80	1336.45	1376.54	$0.058	2444074	2022	0.08%	
HERVEY RANGE DEVELOPMENTAL ROAD (TOWNSVILLE - BATTERY)	83A	G	4.5	9.8	5.3		963.20	1020.99	1051.62	$0.058	1867173	32407	1.74%	
HERVEY RANGE DEVELOPMENTAL ROAD (TOWNSVILLE - BATTERY)	83A	A	9.8	13.8	4		1308.80	1387.33	1428.95	$0.057	2537122	2022	0.08%	
HERVEY RANGE DEVELOPMENTAL ROAD (TOWNSVILLE - BATTERY)	83A	G	9.8	13.8	4		2336.00	2476.16	2550.44	$0.057	4528360	32407	0.72%	
HERVEY RANGE DEVELOPMENTAL ROAD (TOWNSVILLE - BATTERY)	83A	A	13.8	16.9	3.1		755.20	800.51	824.53	$0.029	1463963	2022	0.14%	
HERVEY RANGE DEVELOPMENTAL ROAD (TOWNSVILLE - BATTERY)	83A	G	13.8	16.9	3.1		764.80	810.69	835.01	$0.029	1482573	32407	2.19%	
HERVEY RANGE DEVELOPMENTAL ROAD (TOWNSVILLE - BATTERY)	83A	A	16.9	32	15.1		595.20	630.91	649.84	$0.085	1153801	2022	0.18%	
HERVEY RANGE DEVELOPMENTAL ROAD (TOWNSVILLE - BATTERY)	83A	G	16.9	32	15.1		540.80	573.25	590.45	$0.085	1048346	32407	3.09%	
HERVEY RANGE DEVELOPMENTAL ROAD (TOWNSVILLE - BATTERY)	83A	A	32	64.8	32.8		448.00	474.88	489.13	$0.125	868453	2022	0.23%	
HERVEY RANGE DEVELOPMENTAL ROAD (TOWNSVILLE - BATTERY)	83A	G	32	64.8	32.8		492.80	522.37	538.04	$0.125	955298	32407	3.39%	
HERVEY RANGE DEVELOPMENTAL ROAD (TOWNSVILLE - BATTERY)	83A	A	64.8	124.7	59.9		124.80	132.29	136.26	$0.115	241926	2022	0.84%	
HERVEY RANGE DEVELOPMENTAL ROAD (TOWNSVILLE - BATTERY)	83A	G	64.8	124.7	59.9		80.00	84.80	87.34	$0.115	155081	32407	20.90%	$223,062
GREGORY DEVELOPMENTAL ROAD (CHARTERS TOWERS - THE LYND)	98C	A	0	3.4	3.4	1691	1072.00	1136.32	1170.41	$0.062	2078083	22279	1.07%	
GREGORY DEVELOPMENTAL ROAD (CHARTERS TOWERS - THE LYND)	98C	G	0	3.4	3.4		1110.40	1177.02	1212.33	$0.062	2152522	12150	0.56%	
GREGORY DEVELOPMENTAL ROAD (CHARTERS TOWERS - THE LYND)	98C	A	3.4	4.9	1.5		1219.20	1292.35	1331.12	$0.088	2363432	22279	0.94%	
GREGORY DEVELOPMENTAL ROAD (CHARTERS TOWERS - THE LYND)	98C	G	3.4	4.9	1.5		1228.80	1302.53	1341.60	$0.088	2382042	12150	0.51%	
GREGORY DEVELOPMENTAL ROAD (CHARTERS TOWERS - THE LYND)	98C	A	4.9	7.9	3		380.80	403.65	415.76	$0.071	738185	22279	3.02%	
GREGORY DEVELOPMENTAL ROAD (CHARTERS TOWERS - THE LYND)	98C	G	4.9	7.9	3		534.40	566.46	583.46	$0.071	1035940	12150	1.17%	
GREGORY DEVELOPMENTAL ROAD (CHARTERS TOWERS - THE LYND)	98C	A	7.9	97.5	89.6		150.40	159.42	164.21	$0.107	291552	22279	7.64%	$213,212
GREGORY DEVELOPMENTAL ROAD (CHARTERS TOWERS - THE LYND)	98C	G	7.9	97.5	89.6		156.80	166.21	171.19	$0.107	303958	12150	4.00%	
FLINDERS HIGHWAY (TOWNSVILLE - CHARTERS TOWERS)	14A	A	122.1	124.9	2.8	2783	1072.00	1136.32	1170.41	$0.020	2078083	2022	0.10%	
FLINDERS HIGHWAY (TOWNSVILLE - CHARTERS TOWERS)	14A	G	122.1	124.9	2.8		787.20	834.43	859.46	$0.020	1525995	32407	2.12%	
FLINDERS HIGHWAY (TOWNSVILLE - CHARTERS TOWERS)	14A	A	124.9	126.1	1.2		896.00	949.76	978.25	$0.023	1736905	2022	0.12%	
FLINDERS HIGHWAY (TOWNSVILLE - CHARTERS TOWERS)	14A	G	124.9	126.1	1.2		992.00	1051.52	1083.07	$0.023	1923002	32407	1.69%	
FLINDERS HIGHWAY (CHARTERS TOWERS - HUGHENDEN)	14B	A	0	3.5	3.5	649	1283.20	1360.19	1401.00	$0.057	2487497	2022	0.08%	
FLINDERS HIGHWAY (CHARTERS TOWERS - HUGHENDEN)	14B	G	0	3.5	3.5		1161.60	1231.30	1268.23	$0.057	2251774	32407	1.44%	
FLINDERS HIGHWAY (CHARTERS TOWERS - HUGHENDEN)	14B	A	3.5	61.8	58.3		579.20	613.95	632.37	$0.040	1122785	2022	0.18%	
FLINDERS HIGHWAY (CHARTERS TOWERS - HUGHENDEN)	14B	G	3.5	61.8	58.3		556.80	590.21	607.91	$0.040	1079363	32407	3.00%	
FLINDERS HIGHWAY (CHARTERS TOWERS - HUGHENDEN)	14B	A	61.8	139.7	77.9		496.00	525.76	541.53	$0.058	961501	2022	0.21%	
FLINDERS HIGHWAY (CHARTERS TOWERS - HUGHENDEN)	14B	G	61.8	139.7	77.9		313.60	332.42	342.39	$0.058	607917	32407	5.33%	$146,344

Construction Traffic - Stages 1& 2 Road Name	ROAD ID	Direction	TDist Start	TDist End	Length	AADT	Existing SAR 2024	ExistingSAR 1.50% 2028	ExistingSAR 1.50% 2030	Average Marginal Cost	Existing SAR's for Project Duration 1003.75	Generated SAR	Generated SAR (%)	Marginal Cost
FLINDERS HIGHWAY (CHARTERS TOWERS - HUGHENDEN)	14B	A	139.7	244.8	105.1		352.00	373.12	384.31	$0.041	682356	2022	0.30%	
FLINDERS HIGHWAY (CHARTERS TOWERS - HUGHENDEN)	14B	G	139.7	244.8	105.1		364.80	386.69	398.29	$0.041	707169	32407	4.58%	$138,426
FLINDERS HIGHWAY (CHARTERS TOWERS - HUGHENDEN)	14B	A	244.8	247.3	2.5		438.40	464.70	478.65	$0.051	849843	2022	0.24%	
FLINDERS HIGHWAY (CHARTERS TOWERS - HUGHENDEN)	14B	G	244.8	247.3	2.5		499.20	529.15	545.03	$0.051	967704	32407	3.35%	
FLINDERS HIGHWAY (HUGHENDEN - RICHMOND)	14C	A	0	114.8	114.8	423	297.60	315.46	324.92	$0.044	576901	2022	0.35%	
FLINDERS HIGHWAY (HUGHENDEN - RICHMOND)	14C	G	0	114.8	114.8		284.80	301.89	310.94	$0.044	552088	32407	5.87%	$162,428
FLINDERS HIGHWAY (RICHMOND - JULIA CREEK)	14D	A	0	149.3	149.3	329	246.40	261.18	269.02	$0.047	477649	2022	0.42%	
FLINDERS HIGHWAY (RICHMOND - JULIA CREEK)	14D	G	0	149.3	149.3		192.00	203.52	209.63	$0.047	372194	32407	8.71%	$228,674
FLINDERS HIGHWAY (JULIA CREEK - CLONCURRY)	14E	A	0	0	0	393	275.20	291.71	300.46	$0.077	533478	2022	0.38%	
FLINDERS HIGHWAY (JULIA CREEK - CLONCURRY)	14E	G	0	0	0		272.00	288.32	296.97	$0.077	527275	32407	6.15%	$8,973
FLINDERS HIGHWAY (JULIA CREEK - CLONCURRY)	14E	0	0	0	0		275.20	291.71	300.46	$0.032	533478	2022	0.38%	
FLINDERS HIGHWAY (JULIA CREEK - CLONCURRY)	14E	0	0	0	0		272.00	288.32	296.97	$0.032	527275	32407	6.15%	$21,536
FLINDERS HIGHWAY (JULIA CREEK - CLONCURRY)	14E	0	0	0	0		230.40	244.22	251.55	$0.056	446633	2022	0.45%	
FLINDERS HIGHWAY (JULIA CREEK - CLONCURRY)	14E	0	0	0	0		256.00	271.36	279.50	$0.056	496259	34144	6.88%	$188,652
FLINDERS HIGHWAY (JULIA CREEK - CLONCURRY)	14E	0	0	0	0	685	400.00	424.00	436.72	$0.034	775404	3077	0.40%	
FLINDERS HIGHWAY (JULIA CREEK - CLONCURRY)	14E	0	0	0	0		460.80	488.45	503.10	$0.034	893266	34144	3.82%	
Andrew Daniels Drive		A	0	4.35	4.35	343	300.00	318.00	327.54	$0.140	581553	3077	0.53%	
Andrew Daniels Drive		G	0	4.35	4.35		345.60	366.34	377.33	$0.140	669949	34144	5.10%	$20,793
Hensley Drive		A	0	2.65	2.65	238	115.20	122.11	125.78	$0.140	223316	5156	2.31%	
Hensley Drive		G	0	2.65	2.65		259.20	274.75	282.99	$0.140	502462	68106	13.55%	$25,267
BURKE DEVELOPMENTAL ROAD (CLONCURRY - NORMANTON)	89A	0	2.1	56.5	54.4	476	345.60	366.34	377.33	$0.164	669949	5773	0.86%	
BURKE DEVELOPMENTAL ROAD (CLONCURRY - NORMANTON)	89A	0	2.1	56.5	54.4		153.60	162.82	167.70	$0.164	297755	69840	23.46%	$622,047
Sir Hudson Fysh Drive/Ernest Henry Road		A	0	3.7	3.7	322	86.40	91.58	94.33	$0.140	167487	31905	19.05%	$16,527
Sir Hudson Fysh Drive/Ernest Henry Road		G	0	3.7	3.7		184.80	195.89	201.76	$0.140	358237	1582	0.44%	
LANDSBOROUGH HIGHWAY (KYNUNA - CLONCURRY)	13H	A	0	166.1	166.1	294	156.01	165.37	170.33	$0.100	302427	1055	0.35%	
LANDSBOROUGH HIGHWAY (KYNUNA - CLONCURRY)	13H	G	0	166.1	166.1		293.78	311.40	320.75	$0.100	569489	1737	0.30%	
LANDSBOROUGH HIGHWAY (KYNUNA - CLONCURRY)	13H	A	166.1	169.2	3.1		285.11	302.21	311.28	$0.100	552684	1055	0.19%	
LANDSBOROUGH HIGHWAY (KYNUNA - CLONCURRY)	13H	G	166.1	169.2	3.1		312.59	331.34	341.29	$0.100	605958	1737	0.29%	
FLINDERS HIGHWAY (JULIA CREEK - CLONCURRY)	14E	0	0	136.83	136.83	2095	636.80	675.01	695.26	$0.049	1234443	0	0.00%	
FLINDERS HIGHWAY (JULIA CREEK - CLONCURRY)	14E	0	0	136.83	136.83		649.60	688.58	709.23	$0.049	1259256	0	0.00%	
BARKLY HIGHWAY (CLONCURRY - MOUNT ISA)	15A	0	0	2.05	2.05	1391	800.00	848.00	873.44	$0.057	1550808	0	0.00%	
BARKLY HIGHWAY (CLONCURRY - MOUNT ISA)	15A	0	0	2.05	2.05		371.20	393.47	405.28	$0.057	719575	0	0.00%	
BURKE DEVELOPMENTAL ROAD (CLONCURRY - NORMANTON)	89A	A	0	2.1	2.1	642	451.20	478.27	492.62	$0.306	874656	0	0.00%	
BURKE DEVELOPMENTAL ROAD (CLONCURRY - NORMANTON)	89A	G	0	2.1	2.1		400.00	424.00	436.72	$0.306	775404	0	0.00%	
BARKLY HIGHWAY (CLONCURRY - MOUNT ISA)	15A	0	2.05	114.05	112	1068	1283.20	1360.19	1401.00	$0.042	2487497	0	0.00%	
BARKLY HIGHWAY (CLONCURRY - MOUNT ISA)	15A	0	2.05	114.05	112		1161.60	1231.30	1268.23	$0.042	2251774	0	0.00%	
														$2,015,941

Note:

- Yellow Highlight are assumed values from adjacent links.
- Red Highlight with Red Text are SAR's >5% or approaching 5%.
- Contribution amounts would vary significantly if:
  - An alternative quarry material supplier (to Castlereagh Quarry), for Civil Construction was pursued, or
  - The port of supply of the Wind Turbine and Tower components was to be altered.
- In either of these circumstances, an updated PIA will be required.

Appendix E – Modification Works Schedule

Route Assessment Details					Proposed Modification Scope										
Site No	Location	Movement			Design Set Reference	OSOM Swept Path(s)		Proposed Modification Scope Summary							
		From	Onto	Direction		Critical Design Vehicle	Additional Design Vehicle(s)	Modification Works Identified	Modification Works Scope Overview	Vegetation Clearing	Road Furniture	Earthworks	Pavements	Drainage	Electrical & Lighting
12	South Townsville	Benwell Rd	At Boundary St	Thru	C-G0001 & C-R12701	Blade	Generator	Yes	Road Signage and/or Veg Clearing only	Yes	Yes	No	No	No	No
13	Stuart	Southern Port Rd	At Heleen Downs Rd	Thru	C-G0001 & C-R13701	Blade	T1 Tower	No	No work required	No	No	No	No	No	No
14	Stuart	Southern Port Rd	At Bruce Hwy	Thru	C-G0001 & C-R14701	Blade		No	No work required	No	No	No	No	No	No
19	Queenton	Flinders Hwy	At New Queen Rd	Thru	C-G0001 & C-R19701	Blade		No	No work required	No	No	No	No	No	No
20	Queenton	Flinders Hwy	At Rail Overpass	Thru	C-G0001 & C-R20701	Blade	Generator	No	No work required Extreme caution required to ensure clearance to narrow bridge peirs.	No	No	No	No	No	No
21	Queenton	Flinders Hwy	At Sayers St	Thru	C-G0001 & C-R20701	Blade		No	No work required	No	No	No	No	No	No
22	Queenton	Flinders Hwy	At Millchester Rd	Thru	C-G0001 & C-R22701	Blade		No	No work required	No	No	No	No	No	No
23	Queenton	Flinders Hwy	At Armstrong Rd	Thru	C-G0001 & C-R23701	Blade		Yes	Civil & Signage Plus - Concrete median and kerb modifications	No	Yes	Yes	Yes	No	No
24	Black Jack	Flinders Hwy	At Rail Crossing	Thru	C-G0001 & C-R24701	Blade		TBC No	No work anticipated. Vertical grade to be assessed	No	No	No	TBC	No	No
25	Hughenden	Flinders Hwy	At Rail Crossing	Thru	C-G0001 & C-R25701	Blade		TBC No	No work anticipated. Vertical grade to be assessed	No	No	No	TBC	No	No
26	Hughenden	Flinders Hwy	At Rail Crossing	Thru	C-G0001 & C-R26701	T7 Tower		TBC No	No work anticipated. Vertical grade to be assessed	No	No	No	TBC	No	No
27	Hughenden	Flinders Hwy	At Rail Crossing	Thru	C-G0001 & C-R27701	T7 Tower		TBC No	No work anticipated. Vertical grade to be assessed	No	No	No	TBC	No	No
28	Hughenden	Flinders Hwy	At Stansfield St	Left	C-G0001 & C-G28001	Blade		Yes	Civil and Electrical - Concrete median and kerb modifications and raise/relocate Lighting poles	No	Yes	Yes	Yes	No	Yes
29	Hughenden	Flinders Hwy	Haul Rd	Left	C-G0001 & C-R29701	Blade		No	No work required	No	No	No	No	No	No
30	Hughenden	Haul Rd	At Disused Rail Line	Thru	C-G0001 & C-R31701	Blade		Yes	Civil & Signage - Vertical Regrading of existing unsleaed road	No	No	Yes	Yes	No	No
31	Hughenden	Haul Rd	Kennedy Developmental Rd	Right	C-G0001 & C-R31701	Blade		Yes	Civil & Signage Plus - pavement modifications and drainage	No	Yes	Yes	Yes	Yes	No

Route Assessment Details					Proposed Modification Scope										
Site No	Location	Movement			Design Set Reference	OSOM Swept Path(s)		Proposed Modification Scope Summary							
		From	Onto	Direction		Critical Design Vehicle	Additional Design Vehicle(s)	Modification Works Identified	Modification Works Scope Overview	Vegetation Clearing	Road Furniture	Earthworks	Pavements	Drainage	Electrical & Lighting
32	Hughenden	Kennedy Developmental Rd	At Rail Crossing	Thru	C-G0001 & C-R31701	Blade		TBC No	No work anticipated. Vertical grade to be assessed	No	No	No	TBC	No	No
33	Hughenden	Kennedy Developmental Rd	McLaren St	Left	C-G0001 & C-R33701	Blade	T1 Tower	Yes	Electrical only - raise power lines anticipated. Clearance to be assessed.	No	No	No	No	No	Yes - By others
34	Hughenden	McLaren St	Saleyards Rd	Right	C-G0001 & C-R34701	Blade		Yes	Civil & Signage Plus - pavement modifications and drainage. Raise/relocate power lines	No	Yes	Yes	Yes	Yes	Yes - By others
35	Hughenden	Saleyards Rd	Flinders Hwy	Left	C-G0001 & C-R35701	Blade	T1 Tower	Yes	Civil and Electrical - pavement widening/hardstand and raise/relocate power lines	No	Yes	Yes	Yes	No	Yes - By others
36	Richmond	Flinders Hwy	Flinders Hwy	Left	C-G0001 & C-R36701	T1 Tower		Yes	Electrical only - raise power lines anticipated. Clearance to be assessed.	No	No	No	No	No	Yes - By others
37	Richmond	Flinders Hwy	At Rail Crossing	Thru	C-G0001 & C-R37701	Blade		TBC No	No work anticipated. Vertical grade to be assessed	No	No	No	TBC	No	No
38	Richmond	Flinders Hwy	Burke St	Left	C-G0001 & C-R38701	Blade		Yes	Civil & Signage - pavement widening/hardstand. May need Culvert under it.	Yes	Yes	Yes	Yes	No	No
39	Richmond	Burke St	At Rail Crossing	Thru	C-G0001 & C-R38701	Blade		TBC No	No work anticipated. Vertical grade to be assessed	No	No	No	TBC	No	No
40	Richmond	Burke St	To Saleyards	Right	C-G0001, C-R40701 & C-R40702	Blade	T1 Tower	Yes	Civil & Signage Plus - pavement modifications and drainage	No	No	Yes	Yes	Yes	No
41	Richmond	Saleyards	Jim Maguire Rd	Left	C-G0001 & C-R41701	Blade		No	No work required	No	No	No	No	No	No
42	Richmond	Jim Maguire Rd	Flinders Hwy	Left	C-G0001 & C-R42701	Blade		Yes	Road Signage and/or Veg Clearing only	No	Yes	No	No	No	No
43	Julia Creek	Flinders Hwy	At Rail Crossing	Thru	C-G0001 & C-R43701	Blade		TBC No	No work anticipated. Vertical grade to be assessed	No	No	No	TBC	No	No
44	Julia Creek	Flinders Hwy	Goldring St	Left	C-G0001 & C-R44701	Blade		Yes	Road Signage and/or Veg Clearing only	Yes	Yes	No	No	No	No
45	Julia Creek	Goldring St	Flinders Hwy	Left	C-G0001 & C-R45701	Blade		Yes	Road Signage and/or Veg Clearing only	No	Yes	No	No	No	No
46	Julia Creek	Flinders Hwy	Floodway's to 35.50km	Thru	C-G0001 & C-R46701 to C-R46709	Blade		TBC Yes	Civil & Signage Plus work anticipates. Vertical grade to be assessed	TBC	TBC	TBC	TBC	TBC	No
47	Julia Creek	Flinders Hwy	Crest	Thru	No Imagery available	Blade		TBC No	No work anticipated. Vertical grade to be assessed	No	No	No	TBC	No	No

Route Assessment Details					Proposed Modification Scope										
Site No	Location	Movement			Design Set Reference	OSOM Swept Path(s)		Proposed Modification Scope Summary							
		From	Onto	Direction		Critical Design Vehicle	Additional Design Vehicle(s)	Modification Works Identified	Modification Works Scope Overview	Vegetation Clearing	Road Furniture	Earthworks	Pavements	Drainage	Electrical & Lighting
48	Cloncurry	Flinders Hwy	Crest	Thru	No Imagery available	Blade		TBC No	No work anticipated. Vertical grade to be assessed	No	No	No	TBC	No	No
49	Cloncurry	Flinders Hwy	Andrew Daniels Dr	Right	C-G0001 & C-R49701	Blade		Yes	Road Signage and/or Veg Clearing only	No	Yes	No	No	No	No
50	Cloncurry	Hensley Dr	Burke Developmental Rd	Right	C-G0001 & C-R50701	Blade		Yes	Civil & Signage Plus - pavement modifications and drainage	No	Yes	Yes	Yes	No	Yes
51	Cloncurry	Burke Developmental Rd	At Tommy Creek	Bypass	C-G0001 & C-R51701	Blade	T7 Tower	Yes	Civil & Signage Plus - pavement modifications and drainage	Yes	Yes	Yes	Yes	Yes	No
52	Cloncurry	Burke Developmental Rd	Dugald River Site Rd	Left	C-G0001, C-R52701 & C-R52702	Blade		Yes	Road Signage and/or Veg Clearing only	Yes	Yes	No	No	No	No
53	Stuart	Southern Port Rd	At Bruce Hwy	Right	C-G0001 & C-R53701	T7 Tower		TBC Yes	Civil & Signage Plus anticipated. Clearance to Traffic Signal Mast Arm to be assessed.	No	TBC	No	No	No	TBC
54	Cluden	Bruce Hwy	At Lakeside Dr	Thru	C-G0001 & C-R54701	T7 Tower		TBC Yes	Civil & Signage Plus anticipated. Clearance to Traffic Signal Mast Arm to be assessed.	No	TBC	No	TBC	No	TBC
55	Cluden	Bruce Hwy	At Stuart Dr	Thru	C-G0001 & C-R55701	T7 Tower		TBC No	No work anticipated. Clearance to Traffic Signal Mast Arm to be assessed.	No	No	No	No	No	TBC
56	Annandale	Bruce Hwy	At Melton Black Dr	Thru	C-G0001 & C-R56701	T7 Tower		TBC No	No work anticipated. Clearance to Traffic Signal Mast Arm to be assessed.	No	No	No	No	No	TBC
57	Annandale	Bruce Hwy	Overhead Gantry	Thru	C-G0001 & C-R57701	T7 Tower		TBC Yes	Road Signage - raise/relocate anticipated (potential sidetrack option). Clearance to overhead gantry to be assessed.	No	TBC	TBC	TBC	No	No
58	Douglas	Bruce Hwy	To Angus Smith Dr	Left	C-G0001 & C-G58701	T7 Tower		Yes	Civil & Signage Plus - pavement modifications and drainage	Yes	Yes	Yes	Yes	Yes	No
59	Douglas	Angus Smith Dr	At Riverside Blvd	Thru	C-G0001 & C-G58701	T7 Tower		No	No work required	No	No	No	No	No	No
60	Douglas	Bruce Hwy	Overhead VMS	Thru	C-G0001 & C-G60701	T7 Tower		No	No work required Caution required to ensure clearance to overhead VMS.	No	No	No	No	No	No
61	Bohle Plains	Bruce Hwy (Exit)	Hervey Range Rd	Left	C-G0001 & C-G61701	T7 Tower		Yes	Civil & Signage - pavement widening/hardstand	Yes	Yes	Yes	Yes	No	No
62	Hervey Range	Hervey Range Rd	27km-33km	Thru	C-G0001 & C-G62701 to C-R62708	T7 Tower		Yes	Road Signage and/or Veg Clearing only	Yes	No	No	No	No	No

Route Assessment Details					Proposed Modification Scope										
Site No	Location	Movement			Design Set Reference	OSOM Swept Path(s)		Proposed Modification Scope Summary							
		From	Onto	Direction		Critical Design Vehicle	Additional Design Vehicle(s)	Modification Works Identified	Modification Works Scope Overview	Vegetation Clearing	Road Furniture	Earthworks	Pavements	Drainage	Electrical & Lighting
63	Basalt	Hervey Range Rd	Gregory Developmental Rd	Left	C-G0001 & C-G63701	T7 Tower	T1 Tower	Yes	Electrical only - raise power lines anticipated. Clearance to be assessed.	No	No	No	No	No	Yes - By others
64	Richmond Hill	Gregory Developmental Rd	Gregory Developmental Rd	Left	C-G0001 & C-G64701	T7 Tower	T1 Tower	Yes	Electrical only - raise power lines anticipated. Clearance to be assessed.	No	No	No	No	No	Yes - By others
65	Queenton	Gregory Developmental Rd	Flinders Hwy	Right	C-G0001 & C-G65701	T7 Tower		No	No work required	No	No	No	No	No	No
66	Queenton	Flinders Hwy	New Queen Rd	Right	C-G0001 & C-G66701	T7 Tower	T1 Tower	Yes	Electrical only - raise power lines anticipated. Clearance to be assessed.	No	No	No	No	No	Yes - By others
67	Queenton	New Queen Rd	Enterprise Rd	Thru	C-G0001 & C-G67701	T7 Tower	T1 Tower	Yes	Electrical only - raise power lines anticipated. Clearance to be assessed.	No	No	No	No	No	Yes - By others
68	Queenton	Enterprise Rd	Millchester Rd	Left	C-G0001 & C-G68701	T7 Tower	T1 Tower	Yes	Electrical only - raise power lines anticipated. Clearance to be assessed.	No	No	No	No	No	Yes - By others
69	Queenton	Millchester Rd	At Rail Crossing	Thru	C-G0001 & C-G68701	T7 Tower	T1 Tower	Yes	Electrical only - raise power lines anticipated. Clearance to be assessed.	No	No	No	No	No	Yes - By others
70	Queenton	Millchester Rd	Victory St	Right	C-G0001 & C-G68701	T7 Tower	T1 Tower	Yes	Electrical only - raise power lines anticipated. Clearance to be assessed.	No	No	No	No	No	Yes - By others
71	Queenton	Victory St	Flinders Hwy	Right	C-G0001 & C-R68701	T7 Tower	T1 Tower	Yes	Electrical only - raise power lines anticipated. Clearance to be assessed.	No	No	No	No	No	Yes - By others
72	Dugald River	Dugald River Site Rd	0km-4.7km	Thru	C-G0001, C-R72708 to C-R72714	Blade		Yes	Road Signage and/or Veg Clearing only	Yes	No	No	No	No	No