Battery Energy Storage Facility

9010 Mitchell Highway, Apsley NSW

Traffic Impact Assessment Report

Client:

ACEnergy Pty Ltd

Project No. 210278

FINAL4 Report – 30/05/2022

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EXECUTIVE SUMMARY

Trafficworks has been engaged by ACEnergy Pty Ltd to undertake a Traffic Impact Assessment (TIA) for the proposed battery energy storage facility at 9010 Mitchell Highway in Apsley. This report is to accompany a state significant Development Application (DA) for the above development across part of the land known as Lot 3 of DP1012686.

The subject site falls within a Primary Production Zone (RU1) and forms part of the Dubbo Regional Council (the Council). The site is bounded by the Mitchell Highway, located within an Infrastructure Zone (SP2: classified road) to the west and farming land within the surrounding areas.

The development is proposed to have direct access to the Mitchell Highway. Access to the site from Mitchell Highway will be restricted to left-in / left-out.

The proposed development in Apsley involves constructing a battery energy storage facility which is state significant development due to the project having a capital investment value exceeding $30 million.

Based on the information provided it is understood that the peak traffic generation from the development is likely to occur during the construction phase. Therefore, the TIA was conducted primarily focussing on the construction phase of the development.

A TIA was undertaken to:

- estimate the traffic generation and distribution to/from the proposed development
- determine the suitability of the existing access
- determine the likely traffic impacts on the existing road network
- identify any necessary mitigation works.

It has been identified that the proposed development:

- would not adversely affect traffic conditions on the adjacent road network if the recommendations in this report are implemented
- would generally comply with the relevant traffic requirements set out in Austroads and the Council Planning Scheme.

A summary of the site and the proposed development is shown below.

Address	9010 Mitchell Highway, Apsley NSW
Existing zoning	Primary Production Zone (RU1)
Proposed development	Electricity Generating Works (Battery energy storage facility)
Road network	Mitchell Highway • 100 km/h speed limit • carries approximately 2,180 vehicles per day

Recommendation	• **Recommendation 1:** a traffic management plan be implemented on the Mitchell Highway that includes reducing the speed limit at the site access intersection with the Mitchell Highway to 80 km/h during the peak construction phase. • **Recommendation 2:** the access point should be constructed generally in accordance with Figure 7.4 of the Austroads Guide to Road Design Part 4, for rural property access for articulated vehicles.

Referenced documents

References used in the preparation of this report include the following:

- RTA *Guide to Traffic Generating Developments, Version 2.2, October 2002*
- Austroads:
    - *Guide to Road Design Part 3: Geometric Design, 2017*
    - *Guide to Road Design - Part 4A: Unsignalised and Signalised Intersections, 2017*
- VicRoads Supplement to:
    - *Austroads Guide to Road Design Part 3: Geometric Design, 2016*
- NSW government Transport Roads & Maritime Services, Supplement to Austroads Guide to Road Design Part 3: Geometric Design 2016 Version 2.2

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1. INTRODUCTION

Trafficworks has been engaged by ACEnergy Pty Ltd to undertake a Traffic Impact Assessment (TIA) for the proposed Battery Energy Storage Facility at 9010 Mitchell Highway in Apsley. This report is to accompany a state significant Development Application (DA) for the above development across part of the land known as Lot 3 of DP1012686.

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2. EXISTING CONDITIONS

2.1 Subject site

The subject site is located approximately 10 km south of Wellington and, approximately 60 km southeast of Dubbo town centre. It falls within a Primary Production Zone (RU1) and forms part of the Dubbo Regional Council (the Council). The site comprises land in use for primary production and is bounded by the Mitchell Highway to the west (located within an Infrastructure Zone (SP2: classified road)) and the Dubbo-Wallerawang 132 kV electricity transmission line to the east.

The locality is characterised by primary production activities with scattered residential dwellings. The Wellington Caves complex is located approximately 2.2 kilometres to the northwest. The site's location and surrounding road network are shown in Figures 1 and 2.

Figure 1: Location Plan (Source: Six Maps website)

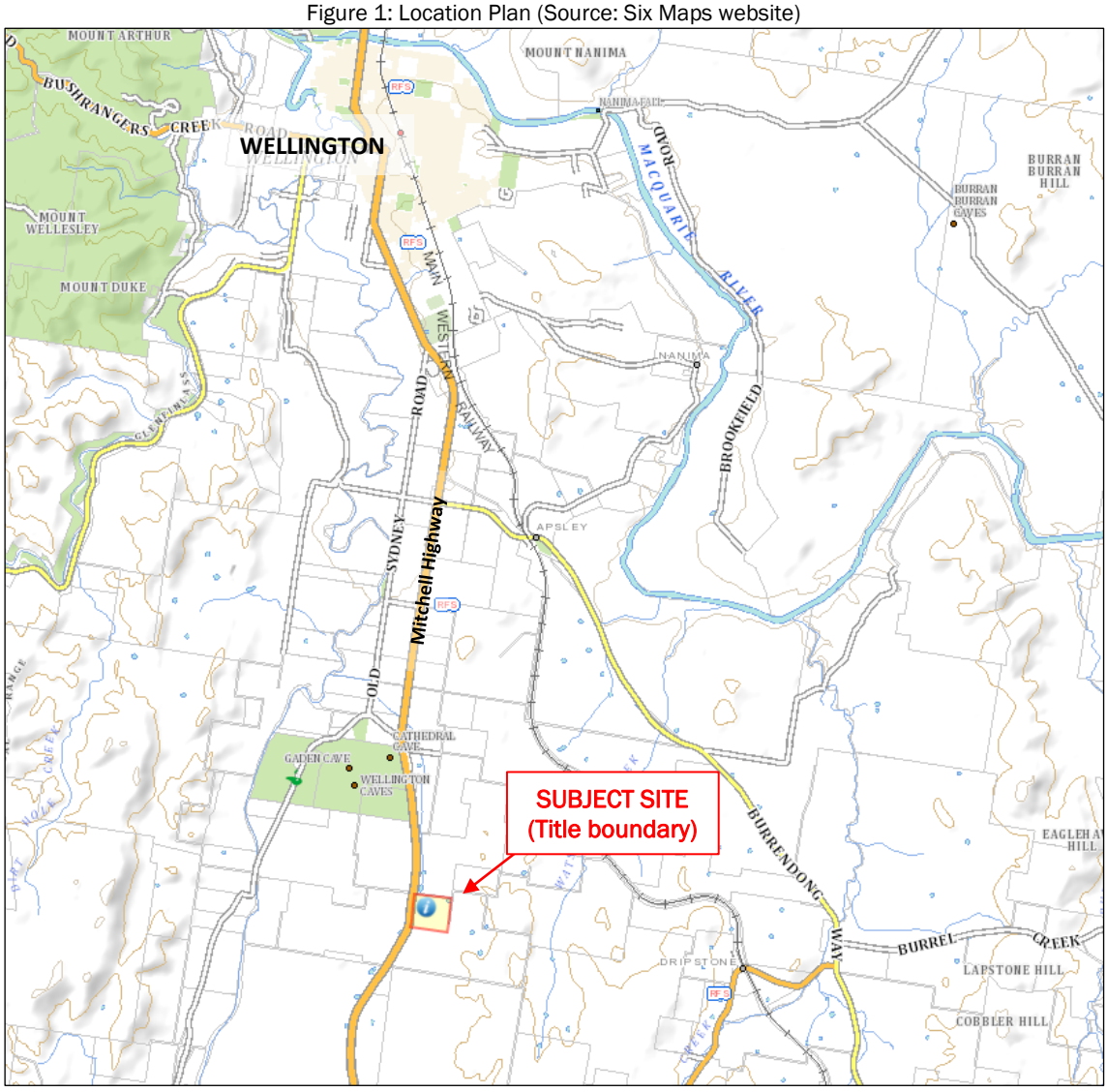
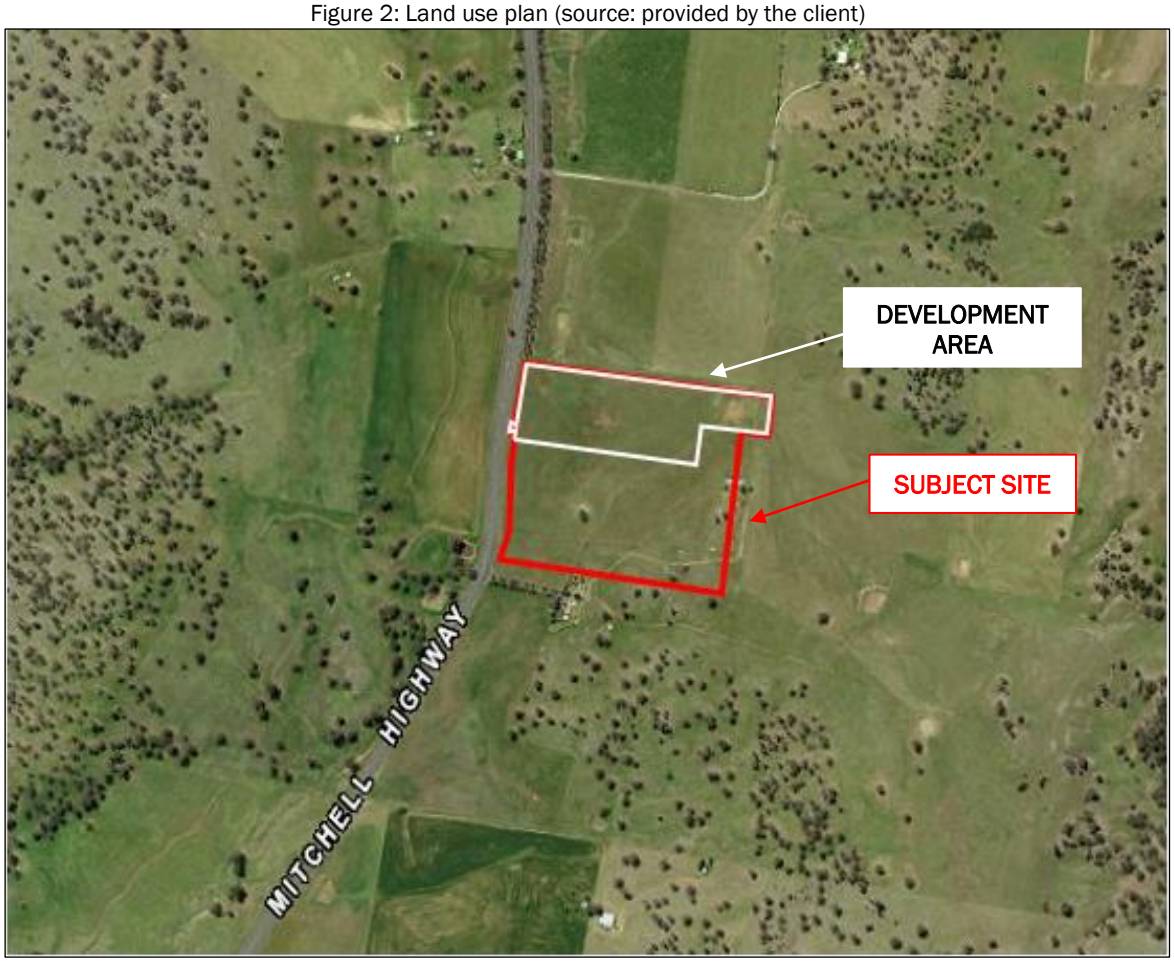


Figure 2: Land use plan (source: provided by the client)



2.2 Road network

2.2.1 Mitchell Highway (A32)

The Mitchell Highway is an arterial road managed by Transport for New South Wales (TfNSW). It is generally aligned in a northwest to southeast direction and provides a connection between the Barrier Highway to the northwest in Nyngan and Great Western Highway in Raglan to the southeast.

In the vicinity of the subject site, the Mitchell Highway is a two-way, two-lane road with sealed shoulders. There is no provision for bicycles and pedestrians along the road and a posted speed limit of 100 km/h applies along the Mitchell Highway (refer to Photos 1 and 2).

Photo 1: Mitchell Highway, looking north

Photo 2: Mitchell Highway, looking south

2.3 Traffic volumes

The TfNSW *Traffic Volume Viewer* details New South Wales traffic volumes for arterial roads. Scrutiny of the records indicates that approximately 2,180 vehicles per day (vpd) are travelling along the Mitchell Highway south of the subject site, split evenly in each direction (the year 2021).

Assuming that the peak hour volume is 10% of the daily traffic, the peak hour volume is approximately 109 vph in each direction along the Mitchell Highway. The records also indicate that there is a heavy vehicle percentage of approximately 27% of the daily traffic volume along the Mitchell Highway.

2.4 Crash history

The TfNSW *Crash and casualty statistics* database details all injury crashes on roads throughout the state. Scrutiny of these records in the last five-year period (2015 - 2019) indicate that there were two casualty crashes resulting in:

- one 'Off-road to right' crash resulting in serious injury occurred along The Mitchell Highway, north of the site in 2018
- one 'Head on' crash resulting in serious and moderate injury occurred along The Mitchell Highway, north of the site in 2019

Although there were two casualty crashes within the surrounding road network, analysis of the crash type from *the TfNSW: Definitions and notes to support road crash data* determined that no trends in crashes have been established. Hence, the roads near the subject site do not have a traffic safety problem that requires urgent remedial action.

Conclusion 1: no trends in crashes were observed within the vicinity of the subject site in the last five-year period, hence there are no traffic safety problems that require urgent remedial action.

3 PROPOSED DEVELOPMENT

3.1 Development summary

The proposed development in Apsley involves constructing a battery energy storage facility. The facility will provide a reliable power source to the local community.

The proposed facility will be un-staffed, and the period that will generate the most traffic will be the construction phase of the battery energy storage facility.

The development is proposed to have direct access to the Mitchell Highway. Access to the site from Mitchell Highway will be restricted to left-in / left-out.

3.1.1 Construction

On-site construction for the proposed battery energy storage facility is largely limited to assembly and connection of components with the typical battery energy storage system shipping containers (40 ft battery containers) readily transportable via 12.5 m rigid trucks and 19.0 m semi-trailers. For the most part, all equipment will be transported to the site via rigid trucks, with only the inverter/transformer/switching station being required to be delivered to the site by a 19 m semi-trailer.

The typical construction delivery schedule for this type of battery energy storage facility is shown in Table 1.

Table 1: Construction Delivery Schedule

Period (Months / Weeks)	Site Works
Month 1 to 2 - (weeks 1 to 8)	drainage, road and fencing works
Months 2 to 3 - (weeks 5 to 12)	cable installation Installation of concrete footings
Months 2 to 4 - (weeks 5 to 16)	delivery of battery shipping containers Installation of shipping containers (batteries)
Month 3 to 4 - (weeks 9 to 16)	Installation of the control room building electrical installation delivery of transformer and HV switchgear
Month 4 to 5 - (weeks 13 to 20)	commissioning / demobilisation

In total there is a 5-month (20 weeks) construction phase before full operation.

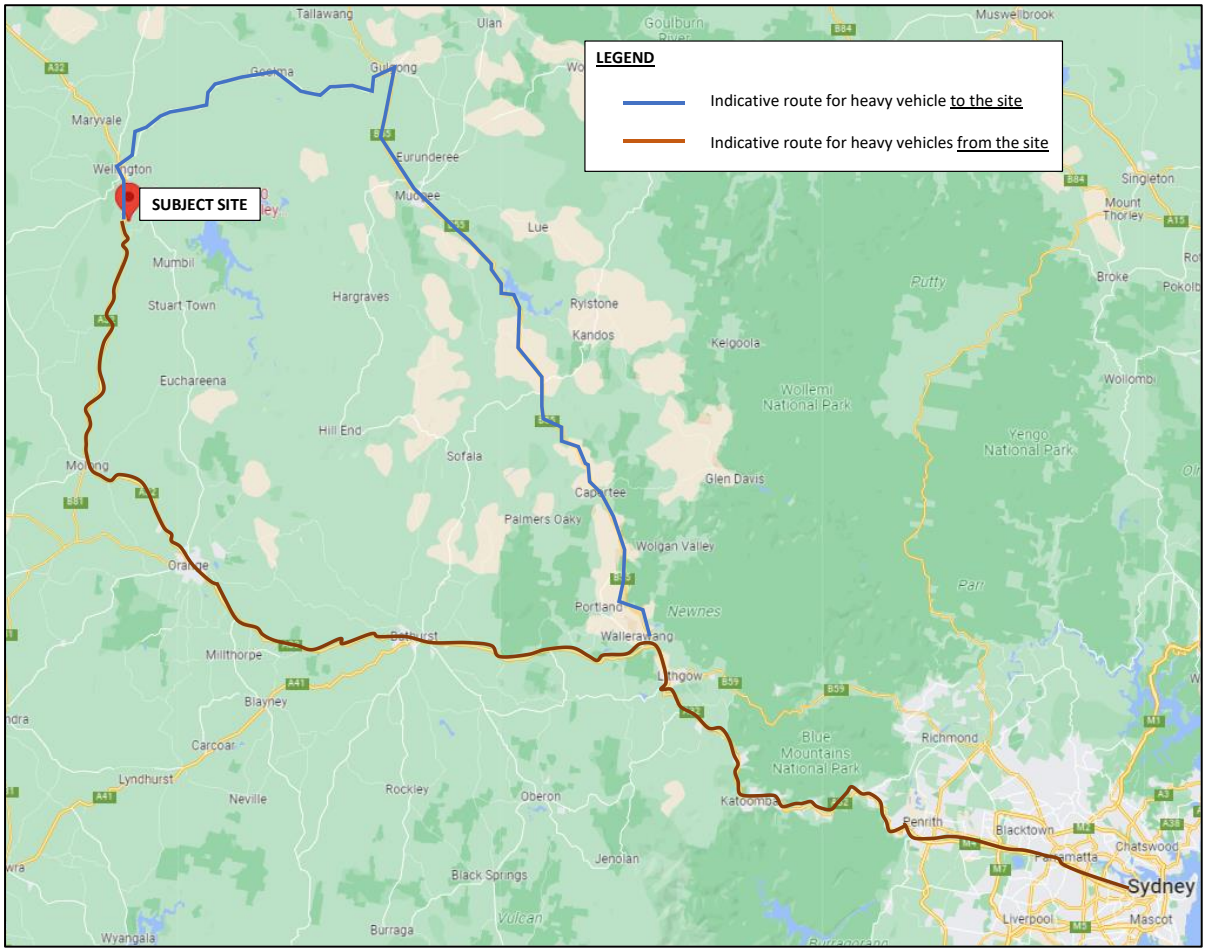
3.1.2 Heavy vehicle access to the site

It is understood that all the heavy vehicle traffic will arrive at to site from Sydney and access the site via the Mitchell Highway. Heavy vehicles will be instructed to turn left into the site by travelling along the Castlereagh Highway and enter the site from the north. It should be noted that the route is approved for B-doubles, which would make it a suitable heavy vehicle detour for arrivals.

To exit, heavy vehicles will turn left turn out onto the Mitchell Highway towards the Great Western Highway.

Figure 3 indicates the route for all heavy vehicles, travelling from Sydney.

Figure 3: Indicative route for heavy vehicles



It is expected that workers for the subject site are likely to come from the surrounding areas as follows (travel time estimate):

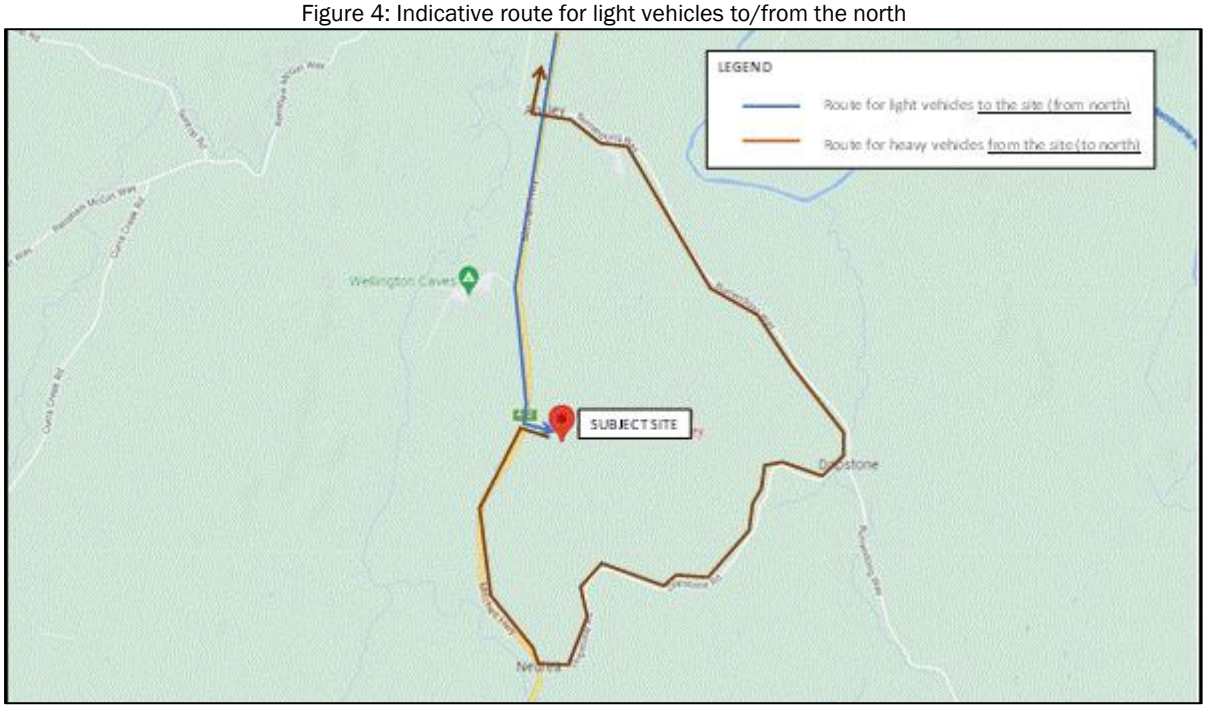
- from the north:
    - Wellington (10-minute drive)
    - Dubbo (50 minutes)
- from the south:
    - Molong (35 minutes)
    - Orange (one hour)

As the site access will be restricted to left-in/ left-out, light vehicles will access/egress the site via the following routes:

- From the north (refer to Figure 4)
    - turn left into the site from the Mitchell Highway

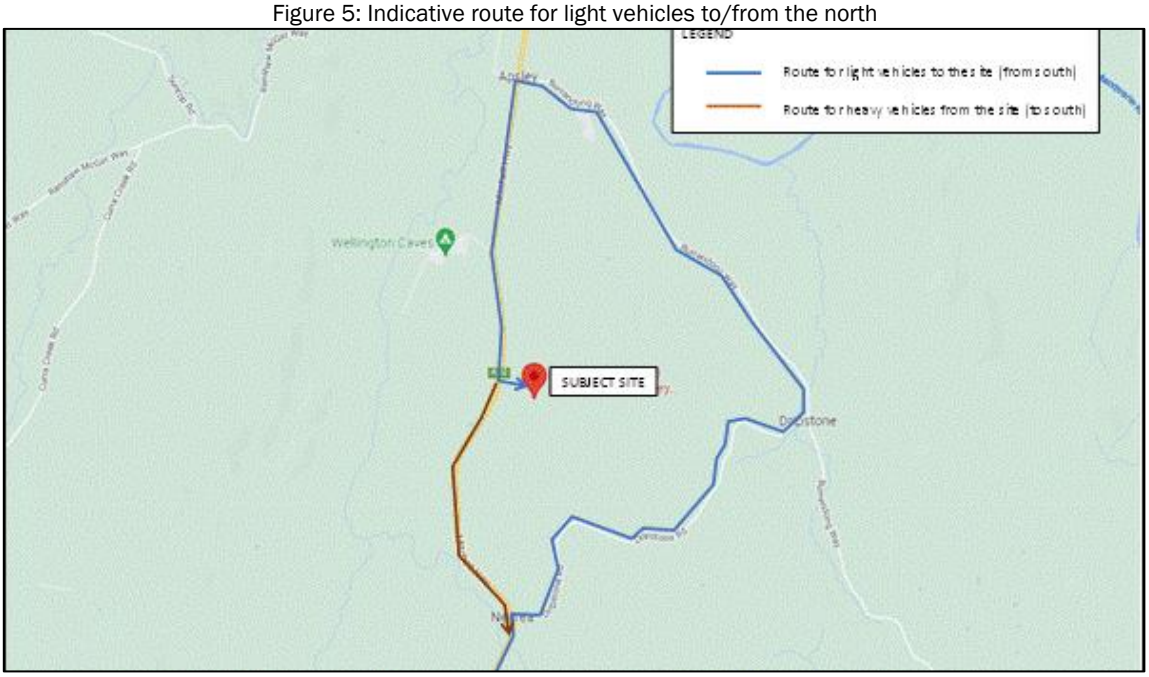
- turn left out of the site on Mitchell Highway, turn left into Dripstone Road to Burendong Way and turn right onto Mitchell Highway towards the north

Figure 4: Indicative route for light vehicles to/from the north



- From the south (refer to Figure 5)
  - turn right into Dripstone Road to Burendong Way and turn left onto Mitchell Highway and then left into the site
  - turn left out of the site onto Mitchell Highway towards the south.

Figure 5: Indicative route for light vehicles to/from the north



3.1.3 Operation / decommissioning

The proposed use is based on a thirty-year lease. Upon completion of this leasing period, if the lease is not renewed, it will be incumbent upon the operator of the facility to decommission the facility, remove all installations, and remediate the site back to its pre-existing state.

Upon approval of this application, the responsible authority may stipulate a requirement for a decommissioning and rehabilitation plan to be submitted for endorsement.

4 TRAFFIC GENERATION AND DISTRIBUTION

4.1 Traffic generation

Typically, the traffic generation for new developments is estimated using the traffic generation rates provided in the RTA Guide to Traffic Generating Developments – Version 2.2A 2002. However, the RTA Guide's traffic generation rates for battery energy storage facilities are unavailable.

Therefore, the traffic generation to/from the proposed development was estimated empirically. Traffic generation analysis was undertaken for the construction and the operational phases of the development to establish the likely peak traffic generation.

4.1.1 Construction phase traffic volumes

Based on the information provided the peak light vehicle traffic generation is likely to occur from the start of the construction phase to the completion of this phase, with a maximum traffic generation likely to occur during weeks 6 - 11. This is when 11 construction staff vehicles per day will access the site, which would result in a total daily traffic generation of 22 vpd (11 vpd arriving and 11 vpd departing at the end of the shift).

Assuming the construction work will be undertaken during normal working hours of the day, it is anticipated that 11 vehicles will be accessing the site during a given peak hour (at the start of the morning shift).

Assessment of the heavy vehicles accessing the site during the construction phase revealed that peak traffic generation is likely to occur from the start of the construction phase with a maximum number of vehicles accessing the site during weeks 7 - 15. This period includes delivery of battery shipping containers when up to eight heavy vehicles could access the site per day. This would result in a total daily traffic generation of 16 vpd (eight vpd arriving and eight vpd departing).

Assuming the construction work will be undertaken during normal working hours of the day, it is anticipated that the eight vehicles will be accessing the site outside of the peak hours of operation.

It is understood that not more than one heavy vehicle will access the site during peak hours. Therefore, the impact of heavy vehicles is considered negligible. However, conservatively for this assessment, it has been assumed that a single heavy vehicle will access the site during the AM and PM peak hours.

The heavy vehicles accessing the site are likely to be 12.5 m rigid or 19 m semi-trailers (i.e. there will be no B-double trucks) via a left turn from the Mitchell Highway. As noted above, the heavy vehicle movements (delivery of battery shipping containers) are expected to occur during weeks 7 - 15, with up to five trucks per day.

4.1.2 Operational phase traffic volumes

The proposed battery energy storage facility will have remote monitoring in real-time, allowing for constant surveillance and monitoring of the facility without the requirement for staffing on-site.

The compound contains key infrastructure that requires a high degree of security. Upon identification of any potential issues, action can be taken indirectly from the control centre or directly using chosen contractors on-site. There will be two light vehicles to attend the site every six months during the operational phase, which is for general maintenance of the site.

4.1.3 Peak traffic generation

Assessment of the likely traffic generation volumes during the construction and operational phases of the development revealed that the peak traffic generation for the site will occur during the construction phase of the development. Therefore, the TIA was undertaken to determine the traffic implications during the construction phase of the development.

Conclusion 2: The peak traffic generation is likely to occur during the construction phase of the development where 11 light vehicles (generating 22 trips per day) and eight heavy vehicles (generating 16 trips per day) will access the site on a peak construction day.

4.2 Traffic distribution

The site access will be restricted to left-in / left-out and therefore, 100% of vehicles will approach the site from the north and exit towards the south. The routes for heavy and light vehicles to access the subject site are detailed in Section 3.1.2.

4.3 Anticipated traffic volumes

Given the proposed Battery Energy Storage Facility will have peak traffic generation during the construction phase, the anticipated traffic volumes for 2021 (when the facility is under construction) are summarised in Table 2.

Table 2: Directional split of peak traffic flow

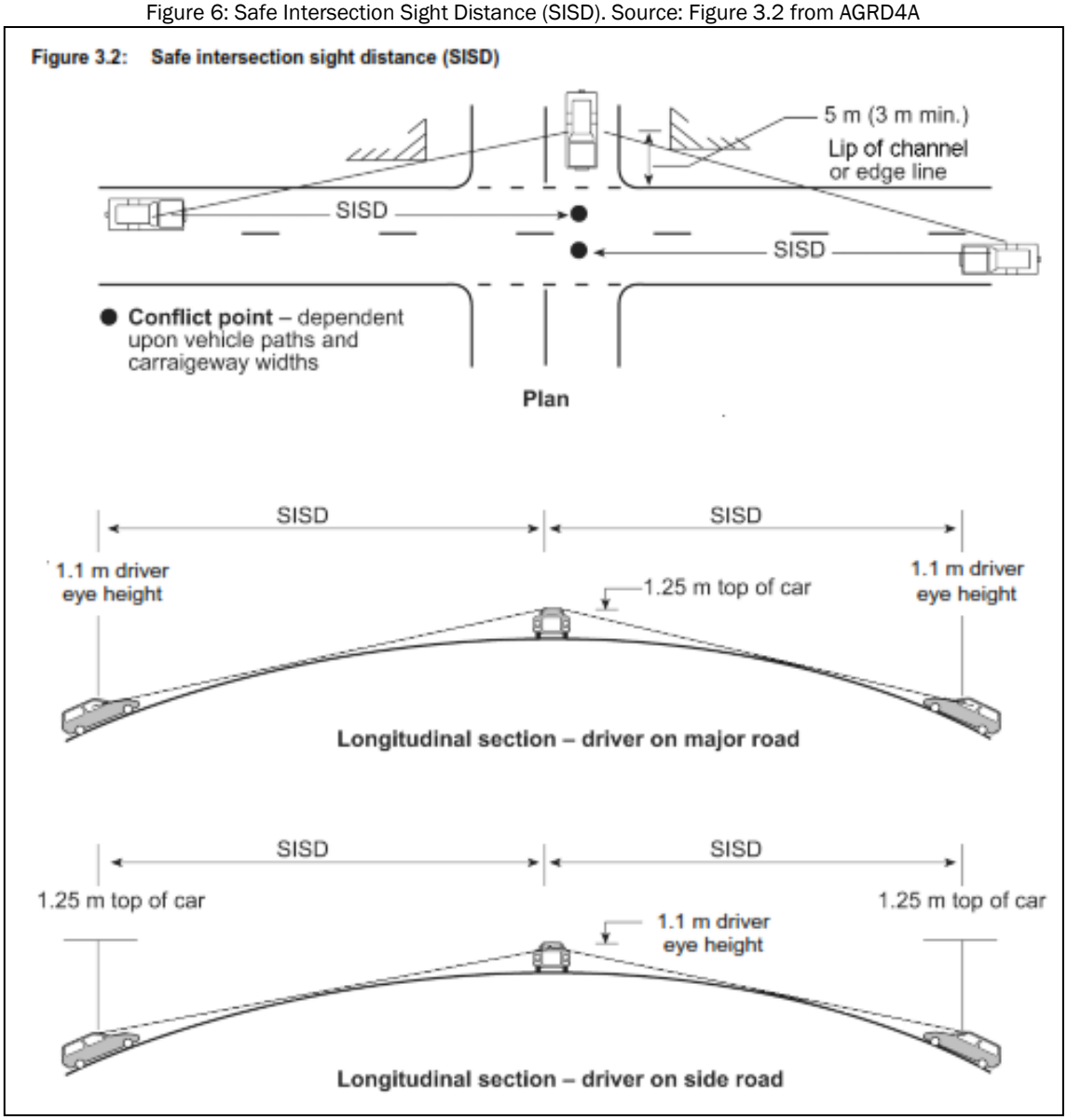
Period	Type	Left In	Right In	Left Out	Right Out	Total
AM Peak	Light	11	0	0	0	11
	Heavy	1	0	0	0	1
	TOTAL	**12**	**0**	**0**	**0**	**12**
PM Peak	Light	0	0	11	0	11
	Heavy	0	0	1	0	1
	TOTAL	**0**	**0**	**12**	**0**	**12**

5 ASSESSMENT

5.1 Sight distance

The visibility criterion normally applied to intersections is Safe Intersection Sight Distance (SISD). The minimum SISD criteria along major roads are outlined in Table 3.3 of the *Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections* (AGRD4A). This document provides information about the minimum distance that should be provided along major roads to allow sufficient distance for a driver on a major road to observe a vehicle approaching from a minor road into a collision situation (e.g. in the worst case, stalling across the traffic lanes) and to decelerate to a stop before reaching the collision point (refer Figure 6).

Figure 6: Safe Intersection Sight Distance (SISD). Source: Figure 3.2 from AGRD4A



The minimum SISD criterion specified in Table 3.2 of the AGRD4A requires clear visibility for a desirable minimum distance of 285 m, relating to the general reaction time R_T of 2 seconds and a design speed of 110 km/h (design speed = posted speed + 10km/h).

SISD for trucks should also be considered. Based on the NSW Supplement to Austroads Guide to Road Design Part 3 a reaction time of 2.0 seconds is to be used for a design speed of 100 km/h. Trucks' 85th percentile operating speed is typically the posted speed limit applied. Using the SISD criterion specified in section 3.2.2 of the AGRD4A with a 3 second observation time, the SISD for trucks equates to be 274 m for a 100 km/h design speed.

It appears that a crest is located to the north of the site's access location. SISD and SSD assessments have been undertaken to determine the appropriate location of the site access where sightlines are not restricted. Therefore, the longitudinal formation grade of the Mitchell Highway along the subject site's road frontage requires no grade corrections and the minimum SISD criterion for vehicular access to the subject site is shown in Table 3.

Table 3: SISD values for cars and trucks at design speeds of 100 km/h and 110 km/h

Design Vehicle	Design Speed (km/h)	Desirable SISD (m)
Car	110	285
Truck	100	303

Clear sightlines of at least 303 m are available at the proposed gate access location (Photos 3 and 4).

Photo 3: Looking north along The Mitchell Highway adjacent to the subject site

Sight distance plans were prepared for the proposed access location and are included in Attachment A.

Photo 4: Looking south along The Mitchell Highway adjacent to the subject site

Conclusion 3: Safe Intersection Sight Distance requirements are satisfied for the proposed subject site access location.

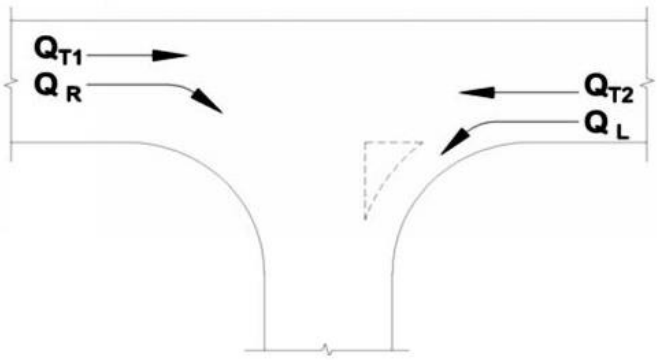
5.2 Turn provisions

The traffic turning from major roads into minor roads should not delay through traffic. Turn treatments from major roads into minor roads at sign-controlled intersections are generally provided for the safe and efficient operation of the intersection.

The anticipated traffic volumes during the peak hour (outlined in Table 2) were used to determine the turning warrants at key intersections near the subject site. The formulas are shown in Figure 3.26 from the Austroads Guide to Traffic Management – Part 6 (AGTM6), reproduced in Figure 7, were used to determine the major road volume (Q_M). The results were then applied to Figure 3.25 of the Austroads Guide to Traffic Management – Part 6 (AGTM6) (reproduced in Figure 8) to determine the turning warrants for the intersections.

Turn lane assessments were undertaken at the Mitchell Highway and the site access intersection.

Figure 7: Formulas used to determine the major road traffic



Road type	Turn type	Splitter island	Q_M (veh/h)
Two-lane two-way	Right	No	= $Q_{T1} + Q_{T2} + Q_L$
		Yes	= $Q_{T1} + Q_{T2}$
	Left	Yes or no	= Q_{T2}
Four-lane two-way	Right	No	= 50% x $Q_{T1} + Q_{T2} + Q_L$
		Yes	= 50% x $Q_{T1} + Q_{T2}$
	Left	Yes or no	= 50% x Q_{T2}
Six-lane two-way	Right	No	= 33% x $Q_{T1} + Q_{T2} + Q_L$
		Yes	= 33% x $Q_{T1} + Q_{T2}$
	Left	Yes or no	= 33% x Q_{T2}

Source: TMR (2016a).

5.2.1 Mitchell Highway/site access intersection

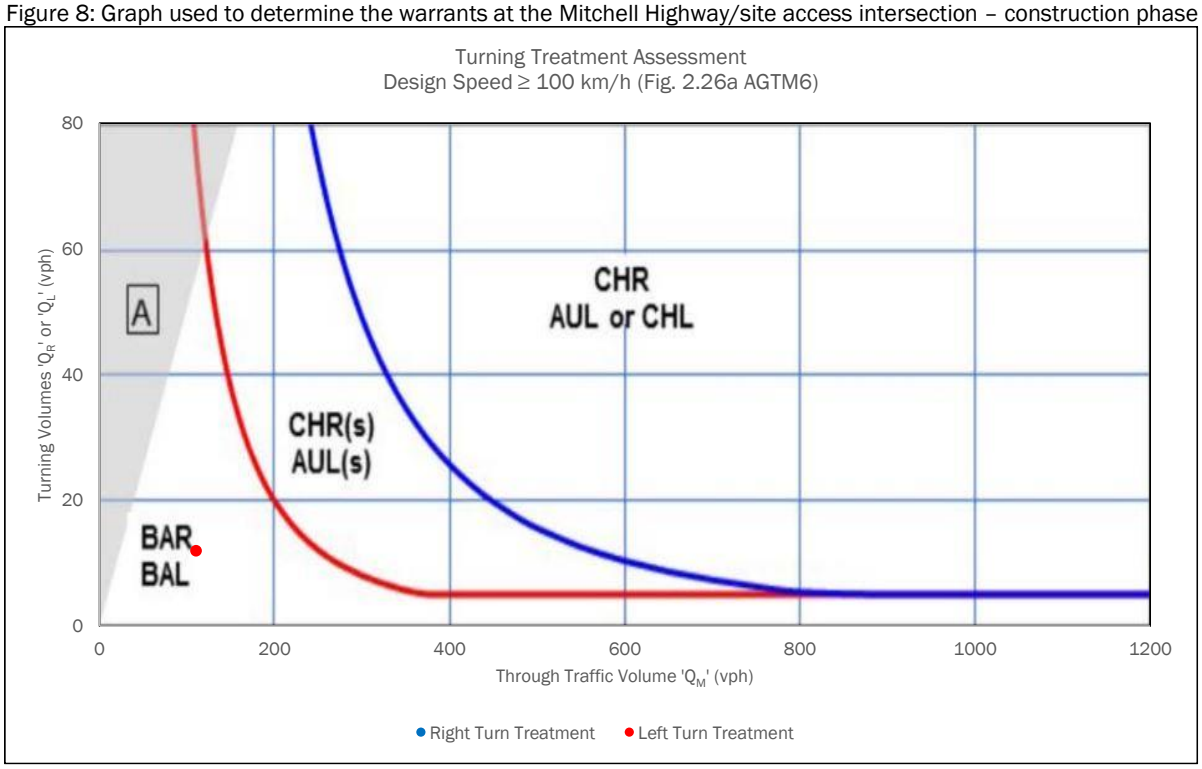
A turning treatment assessment was undertaken for all vehicles at the Mitchell Highway/site access intersection to determine the turning warrants. Noting that the site access will be restricted to left-in / left-out, the turn warrants for left-turning vehicles have been assessed.

Refer to Table 4 and Figure 8 for the construction phase turn warrants assessment.

Table 4: Turn warrants at the Mitchell Highway/site access intersection – construction phase

Major	Minor Road	Peak Period	Left Turn Q_L (vph)	Through Q_T (vph)		Q_M Left Turn
Mitchell Highway	Site access	AM	5	Q_{T1}	110	110
				Q_{T2}	110	
		PM	0	Q_{T1}	110	0
				Q_{T2}	110	

Figure 8: Graph used to determine the warrants at the Mitchell Highway/site access intersection – construction phase



The assessment revealed that the Mitchell Highway/site access intersection warrants a rural Basic Left (BAL) type treatment.

Due to the low turning volumes, it is expected that the safety and operation of the Mitchell Highway at the subject site access can be maintained should the access be constructed generally in accordance with the Rural Property Access for Articulated Vehicles, refer to Section 5.3.

Furthermore, given the construction phase of the development is only likely to occur within five months, it is considered onerous to construct a rural Basic Left (BAL) type treatment at the development access to the Mitchell Highway. An alternative form of traffic management procedure should be considered to reduce the safety implications at the intersection during the construction phase of the development (i.e. developing a traffic management plan that could include reducing the speed limit at the site access intersection with the Mitchell Highway to 80 km/h during the peak construction phase).

Conclusion 4: no turn lane treatments are required at the Mitchell Highway/site access intersection for the construction phase of the development.

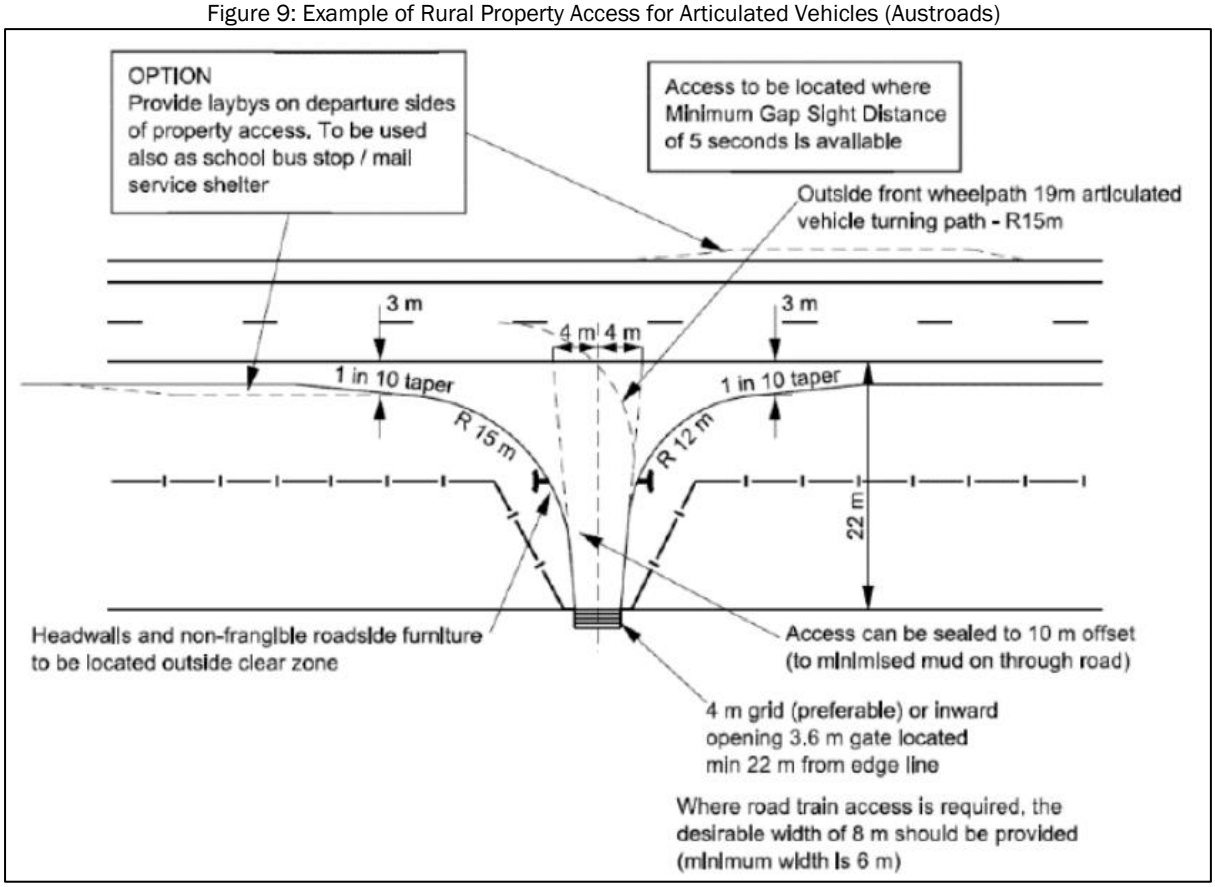
Conclusion 5: consider the introduction of a traffic management plan that includes reducing the speed limit at the site access intersection with the Mitchell Highway to 80 km/h during the peak construction phase.

Recommendation 1: a traffic management plan be implemented on the Mitchell Highway that includes reducing the speed limit at the site access intersection with the Mitchell Highway to 80 km/h during the peak construction phase.

5.3 Access location & operation

It is our understanding that the proposed access point with the Mitchell Highway will be provided at a width of 12.5 m to cater for the swept paths of the largest delivery vehicles. The access point should be constructed as per Figure 7.4 in Austroads Guide to Road Design Part 4: Intersections and Crossings which is shown below in Figure 9.

Figure 9: Example of Rural Property Access for Articulated Vehicles (Austroads)



Recommendation 2: the access point should be constructed generally in accordance with Figure 7.4 of the Austroads Guide to Road Design Part 4, for rural property access for articulated vehicles.

5.4 Site security

The proposed development is likely to include the installation of site security to restrict access to authorised vehicles only. This will involve the provision of security gates being installed at the proposed access to the Mitchell Highway.

Should the development include security gates they should be installed to cater for all queuing vehicles. It is indicated that only one truck is expected to queue at any time. If the gate for the site access was set back 20 m from the edge of the Mitchell Highway this would allow for a 19 m semi-trailer waiting for clearance to enter the subject site.

The fencing of the subject site is approximately 20 m from the edge of the formation of the Mitchell Highway, therefore the setback will provide the minimum required to store one heavy vehicle clear of the traffic lane.

Conclusion 6: the setback of the security fencing for the subject site will provide the minimum 20 m required to allow storage of a 19 m semi-trailer clear of the traffic lane on the Mitchell Highway.

5.5 Parking

The RTA Guide provides car parking rates for new developments. However, the parking requirement for solar energy storage facilities is currently unavailable. Therefore, the car parking demand for the proposed development was estimated empirically.

As discussed in Section 4 of the report, during the construction phase of the development approximately eight light vehicles are likely to access the site. Assuming all eight vehicles will be at the site at the same time, the subject site will have a car parking demand of eight spaces during the construction phase of the development.

The proposed development does indicate the provision of a formal off-street car parking area (approximately 40.0 m x 10.0 m area) for the development. Furthermore, it is noted that should more parking be required, the site currently has enough space to accommodate any additional car parking demand for the proposed development. The designated car parking area will ensure safe operation of the site and employee safety, particularly during peak construction.

Conclusion 7: the car parking demand for the site during the construction phase of the development is likely to be eight spaces and the car parking demand for the site during the operational phase of the development is likely to be one space.

Conclusion 8: the car parking demand can be accommodated within the subject site using the designated formal off-street car parking area.

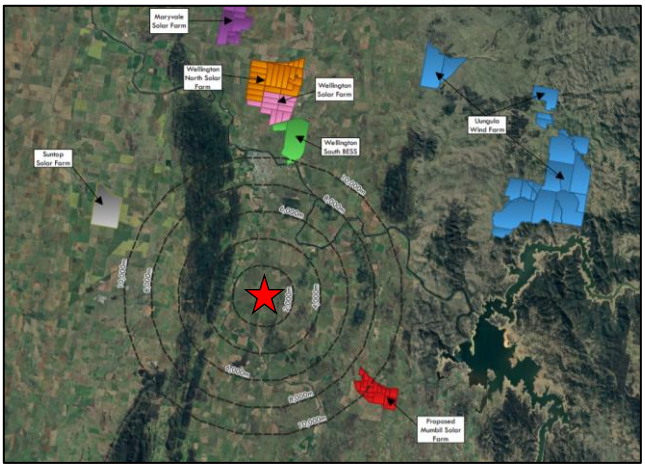
6 RESPONSE TO SEARs

A Planning Secretary's environmental assessment requirements (SEARs) dated 3 March 2022 were received about the proposed Battery Energy Storage Facility. The letter detailed items for consideration from various agencies.

The relevant SEARs comments and Trafficworks responses are detailed in Table 5.

Table 5: Response to SEARs comments

SEARs comment	Trafficworks response
Council	
(3) Access and Traffic *It is noted that the Scoping Report - 6.9 Access and Traffic, states that a Traffic Impact Assessment will be provided as part of the EIS. The proposed access to the site is proposed to be via the existing driveway at (Lot 2) 9010 Mitchell Highway, Apsley. The highway is 100km/hr zone, undulating and not straight (reducing sight-lines).* *The council notes that the highway in this location is the responsibility of Transport for NSW, but it is recommended that further discussions take place between the parties.*	This report assesses the traffic impact of the proposed battery energy storage facility. Trafficworks is not aware of any further discussions between Council and Transport for NSW.
TfNSW	
A Traffic Impact Assessment (TIA) is required to be prepared in accordance with Austroads Guide to Traffic Management Part 12, the Roads and Maritime Supplements to Austroads and the RTA Guide to Traffic Generating Developments. The TIA is to address the following:	
Detailed plans identifying the proposed location of any:	
Project-related infrastructure within and outside of the project boundary.	The proposed development is summarised in this report (refer to **Section 3.1**).
Transmission line infrastructure, or any other project-related structures, within a road reserve. Include demarcation of local and classified road reserves. Section 2.2 of the scoping report states the proposed connecting electricity transmission line will cross the unconstructed crown road reserve. Crown Roads are managed by the Department of Primary, Industry & Environment (DPIE). Written concurrence/support from DPIE for the use of the identified Crown Road, and any associated works is required.	Approval will be sought from DPIE before the works associated with the transmission line infrastructure.

SEARs comment	Trafficworks response
Permanent or temporary connection/access to classified roads.	The access point should be constructed generally in accordance with Figure 7.4 of the Austroads Guide to Road Design Part 4, for rural property access for articulated vehicles as discussed in this report (refer to **Section 5.3**).
Cumulative impacts:	
Identify and assess the implications of road and rail projects including the projects identified in section 6.14 of the scoping report, which will potentially be occurring simultaneously with the scheduling of the OSOM movements along the proposed OSOM routes.	The major projects identified are located approximately 10 km or more from the subject site as shown below.  The projects are mostly to the north of Wellington and would have minimal overlap with traffic generated by the subject site. The project to the south of Wellington (Mumbil Solar Farm) will be accessed via Burrendong Way and there would be minimal overlap with traffic generated by the subject site.
An assessment should be undertaken as a part of the EIS and TIA to identify the projects that will have overlapping construction periods and assess the cumulative traffic impacts with emphasis on the following:	
The cumulative impacts from traffic generated from the construction workforces in terms of the routes, access, AM/PM peaks where there is overlap with other projects	It is not known what projects will be under construction at the same time as the subject site. It is anticipated that traffic associated with surrounding projects will take alternative routes to the traffic accessing the subject site, as the majority are to the north of Wellington. Therefore, the cumulative impact of traffic generated by the subject site is anticipated to be negligible.

SEARs comment	Trafficworks response
The cumulative impacts of heavy vehicle movements in terms of AM/PM peaks and routes where there is an overlap with other projects	It is anticipated that most heavy vehicles servicing these major projects will approach the sites from Sydney from the heavy vehicle routes outlined in **Section 3.1.2**, with minimal overlap. As discussed in this report, it is anticipated that at peak construction times up to eight heavy vehicles will access the subject site per day or up to one heavy vehicle per hour. The truck volumes associated with the site will be low and it is anticipated that the traffic generated at the site will have minimal impact on surrounding projects (refer to **Section 3.1.2**),
Heavy vehicle and OSOM routes	
Identify all OSOM routes for each potential transport route highlighted in Section 6.9 of the scoping report dated January 2022.	The heavy vehicles accessing the site are likely to be 12.5 m rigid or 19 m semi-trailers, there will be no B-double or Over-size/Over-mass (OSOM) vehicles. All the heavy vehicle traffic will arrive at the site from Sydney and access the site via the Mitchell Highway from the north to turn left into the site. Heavy vehicle access to the site is discussed in this report (refer to **Section 3.1.2**).
National Heavy Vehicle Regulator (NHVR) approved routes identified on the Restricted Access Maps (RAV MAP) are to be used for the heavy vehicle routes for the proposed development	The heavy vehicles accessing the site are likely to be 12.5 m rigid or 19 m semi-trailers, there will be no restricted access vehicles, like B-double or Over-size/Over-mass (OSOM) vehicles used for this development.
The TIA is required to include details on the number of OSOM movements, the intended time for OSOM movements to occur and identify the location of rest areas required along the OSOM routes	The heavy vehicles accessing the site are likely to be 12.5 m rigid or 19 m semi-trailers, there will be no restricted access vehicles, like B-double or Over-size/Over-mass (OSOM) vehicles used for this development.
Flooding events and the implications to the OSOM and heavy vehicle routes should be considered within the TIA given the proximity of the development to the Bell River	In the event of flooding, the site manager will contact the delivery vehicles and instruct them to take alternative routes to access the site. The heavy vehicles accessing the site are likely to be 12.5 m rigid or 19 m semi-trailers, there will be no restricted access vehicles, like B-double or Over-size/Over-mass (OSOM) vehicles used for this development.
Project schedule:	
Hours and days of work, several shifts and start and end times.	The proposed construction work hours are as follows: • Monday to Friday = 7:00 am – 6:00 pm • Saturday = 8:00 am – 1:00 pm • Sundays and Public Holidays = No construction work to take place.

SEARs comment	Trafficworks response
Phases and stages of the project, including construction, operation and decommissioning.	The construction stages are provided in this report. The decommissioning of the site will be subject to a decommissioning and rehabilitation plan to the satisfaction of the responsible authority (refer to **Section 3.1.1**).
Traffic volumes:	
Existing background traffic	The existing traffic volumes are provided in this report (refer to **Section 2.3**).
Project-related traffic for each phase or stage of the project.	The traffic volumes for the construction, operation and peak phases of the proposal are provided in this report (refer to **Section 4.1**).
Projected cumulative traffic at the commencement of operation, and a 10-year horizon post-commencement	During the operational phase, the site will generate minimal traffic with two light vehicles attending the site every six months for general maintenance. The decommissioning of the site will be subject to a decommissioning and rehabilitation plan to the satisfaction of the responsible authority.
Traffic characteristics:	
Number and ratio of heavy vehicles to light vehicles	The light and heavy vehicles generated at the site are provided in this report (refer to **Section 4.1**).
Peak times for existing traffic	The peak time for existing traffic is anticipated to occur during typical commuter AM (i.e. 7 – 9 am) and PM peak hours (4 – 6 pm).
Peak times for project-related traffic including commuter periods	The traffic generation during peak times is provided in this report (refer to **Section 4.2**).
Proposed hours for transportation and haulage	The proposed construction work hours are as follows: • Monday to Friday = 7:00 am – 6:00 pm • Saturday = 8:00 am – 1:00 pm • Sundays and Public Holidays = No construction work to take place.
Interactions between existing and project-related traffic	The proposed construction work hours are as follows: • Monday to Friday = 7:00 am – 6:00 pm • Saturday = 8:00 am – 1:00 pm • Sundays and Public Holidays = No construction work to take place.
Inclusion of the traffic generated from ancillary components such as haulage from quarries to the project site, transmission lines etc	This report has assessed the traffic generated for the proposed development (refer to **Section 4**).

SEARs comment	Trafficworks response
The origins, destinations and routes for:	
Commuter (employee and contractor) light vehicles and pool vehicles	The routes to access the site for staff are provided in this report (refer to **Section 3.1.2**).
Heavy (haulage) vehicles.	The route to access the site for heavy vehicles is provided in this report (refer to **Section 3.1.2**).
Oversize and over mass vehicles	The heavy vehicles accessing the site are likely to be 12.5 m rigid or 19 m semi-trailers, there will be no restricted access vehicles, like B-double or Over-size/Over-mass (OSOM) vehicles used for this development.
Road safety assessment of key haulage route/s	
The impact of traffic generation on the public road network and measures employed to ensure traffic efficiency and road safety during construction, operation and decommissioning of the project.	The traffic generated during each stage of the development is discussed in this report (refer to **Section 4.1**). The impact of the development of traffic on the existing road network is discussed in this report (refer to **Section 5.2**).
The need for improvements to the road network, and the improvements proposed such as road widening and intersection treatments, to cater for and mitigate the impact of project-related traffic	The impact of the development of traffic on the existing road network is discussed in the report (refer to **Section 5.2**).
Proposed road facilities, access and intersection treatments are to be identified and be in accordance with Austroads Guide to Road Design including the provision of Safe Intersection Sight Distance (SISD).	An assessment of the Safe Intersection Sight Distance (SISD) at the proposed site access is provided in this report (refer to **Section 5.1**). The access location and required treatments for the access are discussed in this report (refer to **Section 5.2** and **Section 5.3**).
Local climate conditions that may affect road safety during the life of the project (e.g. fog, wet and dry weather, icy road conditions).	The project team are not aware of any climate conditions specific to the area that may affect road safety,
The layout of the internal road network, parking facilities and infrastructure.	Car parking is discussed in this report (refer to **Section 5.5**). It is noted that should more parking be required, the site has enough space to accommodate any additional car parking demand for the proposed development.
Impact on rail corridors and level crossings detailing any proposed interface treatments.	The proposal is anticipated to have a negligible impact on rail corridors and level crossings due to the low traffic generated at the site.

SEARs comment	Trafficworks response
Impact on public transport (public and school bus routes) and consideration for alternative transport modes such as walking and cycling.	The proposal is anticipated to have a negligible impact on public transport due to the low traffic generated at the site. To mitigate the risk to school bus routes, heavy vehicle access to the site could be restricted during school pick-up and drop-off (8:00 am to 9:30 am and 2:30 pm to 4:00 pm).
Identification and assessment of potential impacts of the project, lighting, visual, noise, dust and drainage on the function and integrity of all affected public roads.	The proposal is anticipated to have a negligible impact on the surrounding public roads. A dilapidation assessment and report could be undertaken before construction works occur to assess the conditions of the surrounding public roads. If required, the roads should then be repaired following completion of the construction period to return the roads to an equivalent standard.
Controls for transport and use of any dangerous goods in accordance with State Environmental Planning Policy No. 33 – Hazardous and Offensive Development, the Australian Dangerous Goods Code and Australian Standard 4452 Storage and Handling of Toxic Substances.	If there is a requirement to transport dangerous goods this will be detailed in the Traffic Management Plan.

7 CONCLUSION

A TIA was undertaken for the proposed Battery Energy Storage Facility in Apsley. The following conclusions were made in the assessment.

- no trends in crashes were observed within the vicinity of the subject site in the last five-year period, hence there are no traffic safety problems that require urgent remedial action
- the peak traffic generation is likely to occur during the construction phase of the development where 11 light vehicles and eight heavy vehicles are estimated to access the site on a peak construction day
- Safe Intersection Sight Distance requirements would be satisfied for the proposed subject site access location
- no turn lane treatments are required at the Mitchell Highway/site access intersection for the construction phase of the development
- consider the introduction of a traffic management plan that includes reducing the speed limit at the site access intersection with the Mitchell Highway to 80 km/h during the peak construction phase.
- the setback of the security fencing for the subject site will provide the minimum 20 m required to allow storage of a 19 m semi-trailer clear of the traffic lane on the Mitchell Highway
- the car parking demand for the site during the construction phase of the development is likely to be eight spaces and the car parking demand for the site during the operational phase of the development is likely to be one space
- the car parking demand can be accommodated within the subject site using the designated formal off-street car parking area.

The key recommendations of the TIA are summarised below.

- **Recommendation 1:** a traffic management plan be implemented on the Mitchell Highway that includes reducing the speed limit at the site access intersection with the Mitchell Highway to 80 km/h during the peak construction phase
- **Recommendation 2:** the access point should be constructed generally in accordance with Figure 7.4 of the Austroads Guide to Road Design Part 4, for rural property access for articulated vehicles.

The proposed development would not adversely impact the safety or operation of the surrounding road network, provided the recommended mitigation works are undertaken.

ATTACHMENT A – SIGHT DISTANCE PLANS

Figure A1: Sight distance check plans – SISD Car and Truck, driver on a major road

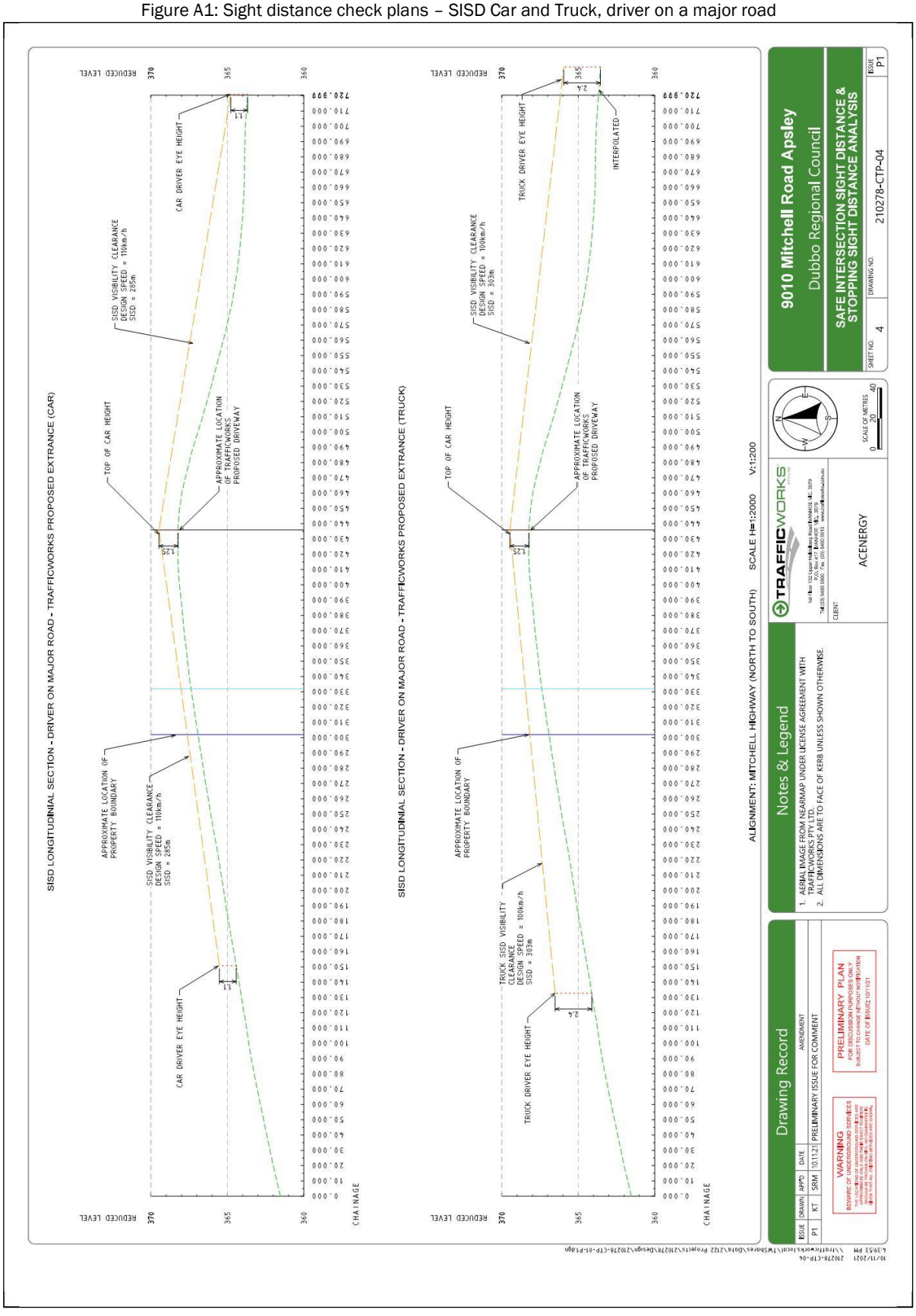


Figure A2: Sight distance check plans – SISD Car and Truck, driver on a minor road

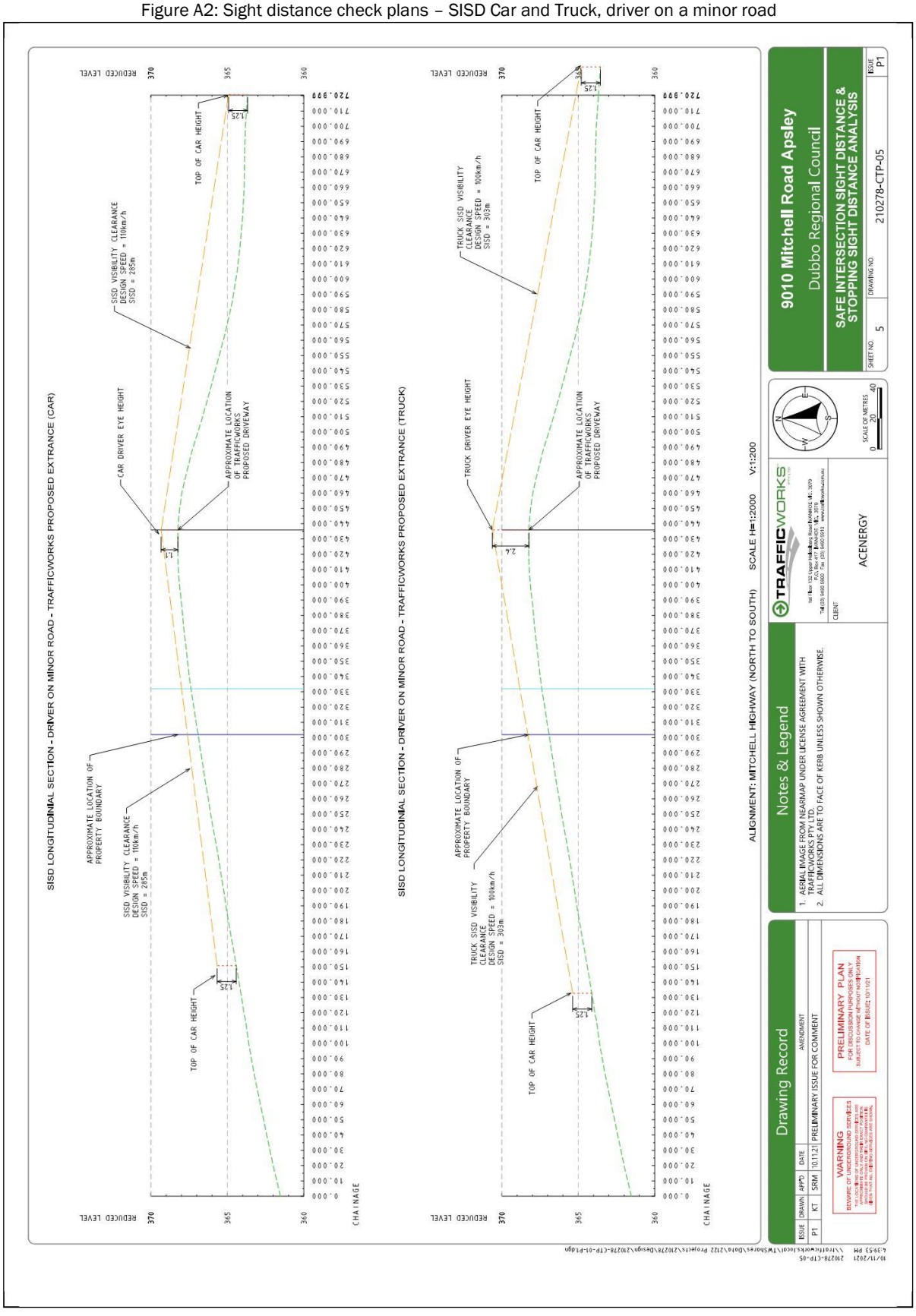
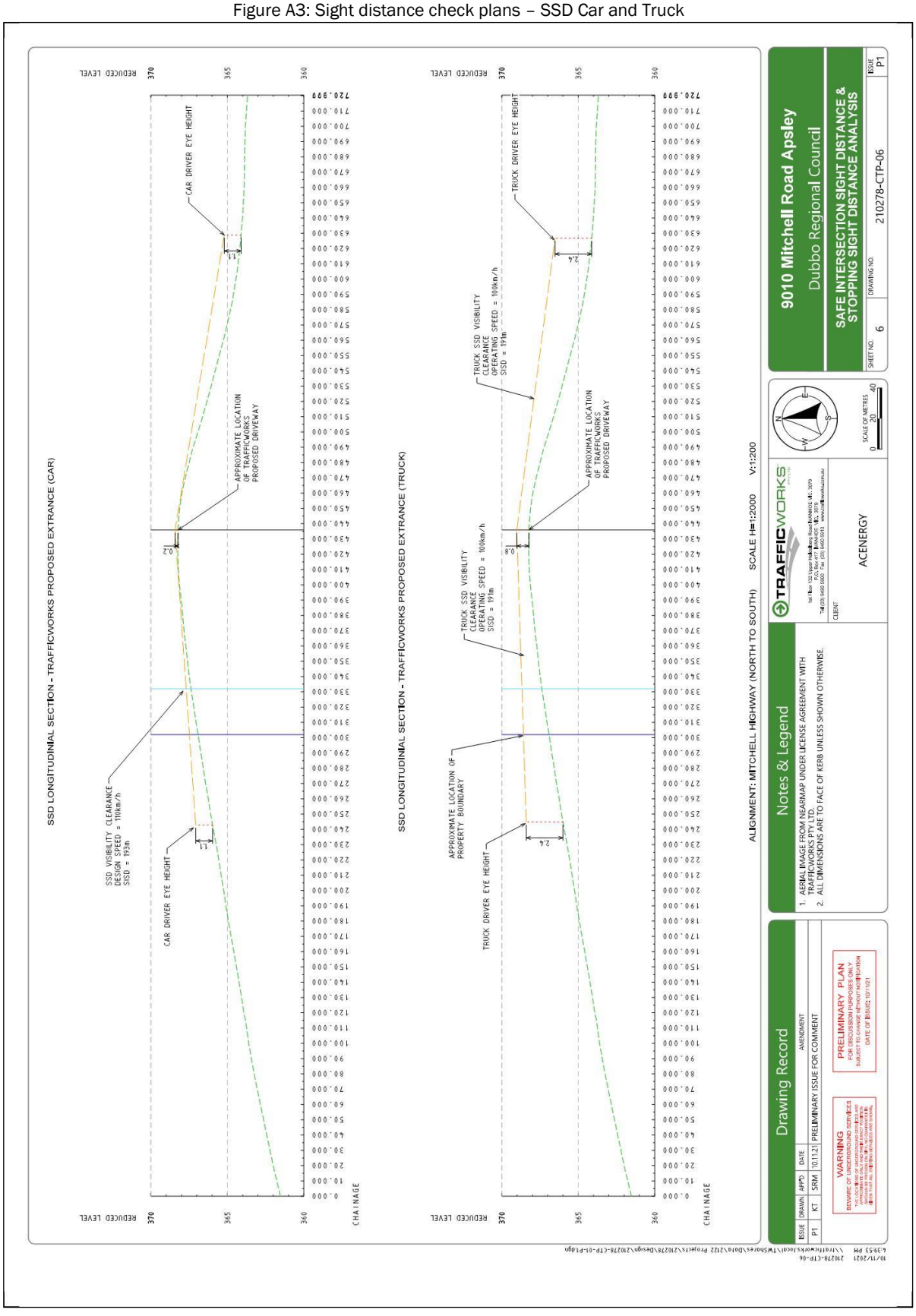


Figure A3: Sight distance check plans – SSD Car and Truck



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