Wellington South Battery Energy Storage System

Addendum Traffic Impact Assessment

Prepared for AMPYR Energy Pty Ltd

July 2023

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AMPYR Energy Pty Ltd

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Version	Date	Prepared by	Approved by	Comments
v1	28 June 2023	Abdullah Uddin	Dr Tim Brooker	Draft
V2	14 July 2023	Abdullah Uddin	Claire Burnes	Final

Approved by

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1 Introduction

This Addendum Traffic Impact Assessment (ATIA) outlines traffic impacts and its associated mitigation measures for the proposed Wellington Battery Energy Storage System (the project). The original Traffic Impact Assessment [1](TIA) prepared by EMM in support of the Environmental Impact Statement (EIS) for the project can be found on the NSW Major Project website, located here[2].

The original TIA proposed a site access via Goolma Road, which is a Transport for NSW (TfNSW) controlled arterial road (refer to Appendix B of the original TIA). TfNSW objected to the proposed site access on traffic safety grounds. Subsequently, a number of options were examined, and an alternate site access via Twelve Mile Road was identified as the preferred by the major government stakeholders. The alternate Twelve Mile Road site access assumes that the existing road connections between Goolma Road and Twelve Mile Road will be replaced by a new connection to be located further north-east as required by the development consent for the Uungula wind farm construction stage access.

The site is located within the Dubbo Regional Council (DRC) local government area (LGA) at 6773 Goolma Road, Wuuluman. It will be located directly adjacent to the TransGrid owned Wellington Substation and is approximately 2.2 km north-east of the township of Wellington and 44 km south-east of the township of Dubbo.

The regional setting is presented in Figure 1.1 and the site and its surrounding local context is shown in Figure 1.2.

For simplicity, information has been extracted from the original TIA so that this addendum traffic impact assessment can be read as a standalone report, without cross referencing with the original TIA.

1.1 Background

AMPYR Australia Pty Ltd (AMPYR) and Shell Energy (Shell) propose to develop the Wellington Battery Energy Storage System (the project). The project involves the development of a large-scale battery energy storage system (BESS) with a discharge capacity of 500 megawatts (MW) and a storage capacity of 1,000 megawatt hours (MWh). The project also incorporates an on-site substation and connection infrastructure to facilitate transfer of energy to and from the electrical grid, and ancillary infrastructure.

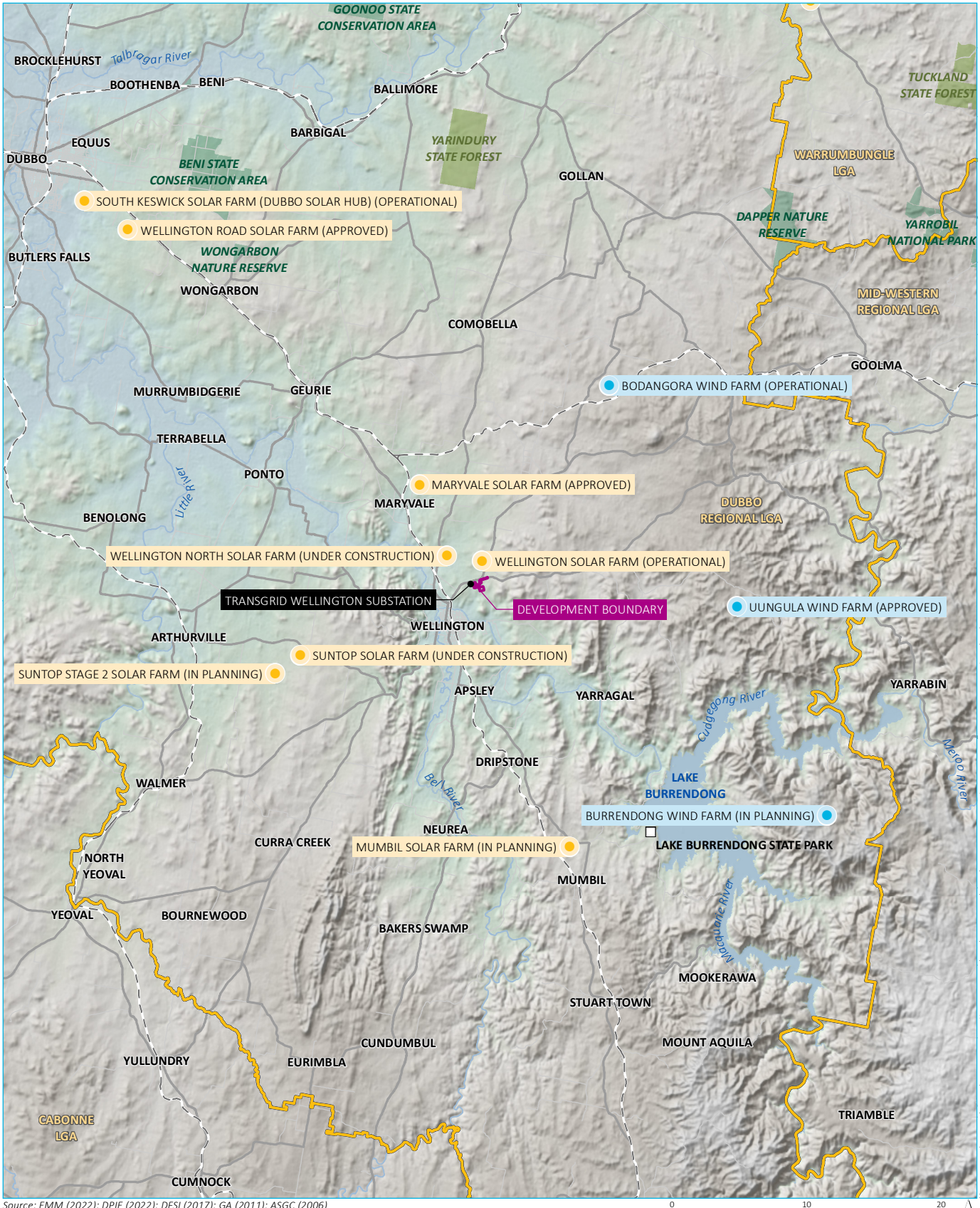
The project will be developed within privately owned land (Lot 32 DP 622471) and will incorporate either an overhead or underground transmission line and upgrade works to Wellington Substation in the adjoining TransGrid owned landholding (Lot 1 DP 1226751). Physical infrastructure associated with the BESS will occupy an area of approximately 13 ha, however during construction, the project will require a disturbance area of up to approximately 22 ha, which includes the area of the existing Wellington Substation site.

The site is located within the New South Wales (NSW) Government declared Central-West Orana Renewable Energy Zone and will complement nearby existing and proposed renewable energy generation assets in the region by smoothing out fluctuations in electricity supply from these new intermittent power sources, providing system security and other network services. In operation, the project will be one of the largest battery storage projects in NSW and will contribute to the overall storage capacity and reliability of the National Electricity Market.

This addendum TIA considers construction and operational traffic associated with the project. Construction traffic generation associated with other projects in the vicinity of the project with potential for overlapping or concurrent construction periods have also been considered as part of a cumulative construction traffic impact assessment.

[1] Report dated 18 October 2022 (version 4)

[2] //efaidnbmnnnibpcajpcglclefindmkaj/https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-27014706%2120221027T214730.891%20GMT



Source: EMM (2022); DPIE (2022); DFSI (2017); GA (2011); ASGC (2006)

0 10 20 km

GDA 1994 MGA Zone 55

N

KEY

- Development boundary
- Lake Burrendong State Park
- Rail line
- Major road
- Minor road
- River
- Named waterbody
- Local government area
- NPWS reserve
- State forest

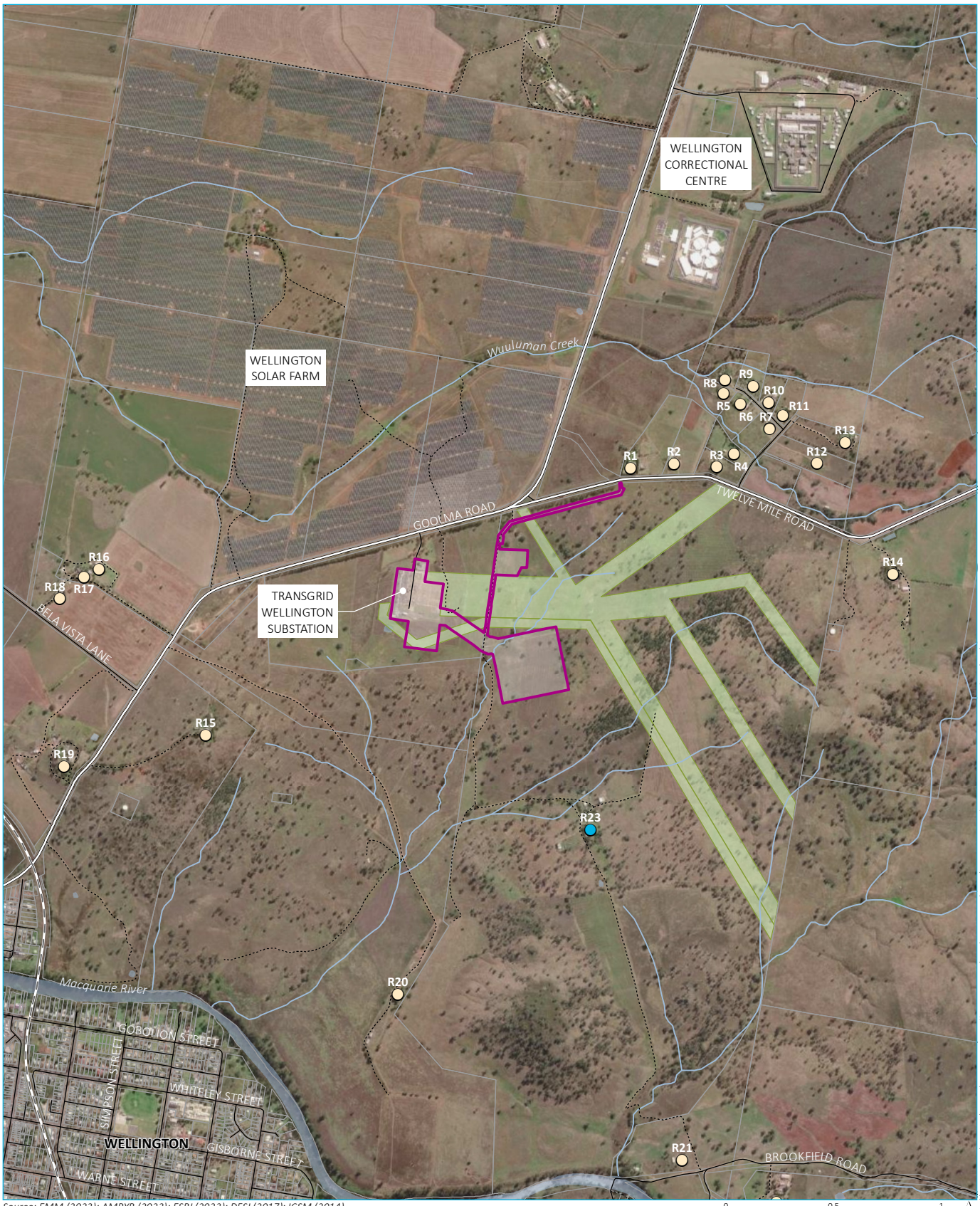
Renewable energy project

- Solar farm
- Wind farm

Regional setting

Wellington Battery Energy Storage System
Addendum traffic impact assessment
Figure 1.1

EMM
creating opportunities



Source: EMM (2023); AMPYR (2023); ESRI (2023); DFSI (2017); ICSM (2014)

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KEY

- Development boundary
- Rail line
- Major road
- Minor road
- Vehicular track
- Watercourse/drainage line
- Waterbody
- Cadastral boundary
- Freehold easement

Receivers

- Non-project residential receivers
- Project participating landowner

Local context

Wellington Battery Energy Storage System
Addendum traffic impact assessment
Figure 1.2

EMM
creating opportunities

1.2 Consultation with the stakeholders

Following exhibition of the EIS, consultation was undertaken with the Department of Planning and Environment (DPE), TfNSW and DRC regarding identified traffic safety issues in the TfNSW submission and consideration of alternate site access options, including the following:

- **Modified site access via Goolma Road** – the original concept design was modified to include longer right and left turn bays and an acceleration lane for the exiting traffic travelling westbound. TfNSW objected to this option and it has therefore not pursued.

- **Site access via Goolma Road using the existing TransGrid access** – this access was identified as a potential option for construction traffic, however limitations that prevented its use for operational traffic also eliminated it as a viable access option for all phases of the project.

- **Site access via Twelve Mile Road** – alternate access from the east of the site via the DRC controlled Twelve Mile Road was identified as a potential option, which has been supported by DPE and DRC (DRC have provided their written consent included as Appendix A). This option relies on the prior construction of the Goolma Road/Twelve Mile Road intersection realignment/upgrade works committed as part of the development consent prior to construction of Uungula Wind Farm as outlined below.

In addition to issues regarding the proposed site access, TfNSW at its letter dated 13 December 2023 sought an explanation of the traffic generation of the proposed development. EMM letter dated 9 February 2023 responded to this matter by undertaking a comparison of traffic generation of various renewable projects. No further questions have been raised from TfNSW and no amendments were made to the impact assessment as a result.

Furthermore, TfNSW also requested to undertake the sight distance assessment based posted speed limit, not the advisory speed limit. The concept plan for the Twelve Mile Road site access intersection has been prepared based on 300 m Safe Intersection Sight Distance (SISD) and a design speed of 110 km/h on the realigned Goolma Road/Twelve Mile Road for the 2.5 second drivers' reaction time.

1.3 Future road improvements

As part of the conditions of consent for the Uungula Wind Farm (SSD 6687), CWP Renewables (now Squadron Energy) is committed to undertake the following road upgrades in support of the use of Goolma Road and Twelve Mile Road for the transport of plant and equipment during construction of that project:

- the closure of the existing intersection at Goolma Road and Twelve Mile Road

- the construction of a new intersection 400 m to the north, and realignment of Twelve Mile Road to connect to the new intersection

- upgrades to Twelve Mile Road along the transport route.

The indicative design for the intersection upgrade is reproduced in Figure 1.3 and Figure 1.4. At the time of this study, the detailed design was being considered by DRC and TfNSW. It is understood that the extant section of Twelve Mile Road will ultimately be closed.

It is important to note that traffic related to this project would use the realigned Goolma Road/Twelve Mile Road intersection, meaning that the proposed site access would not be available until the new intersection is constructed.

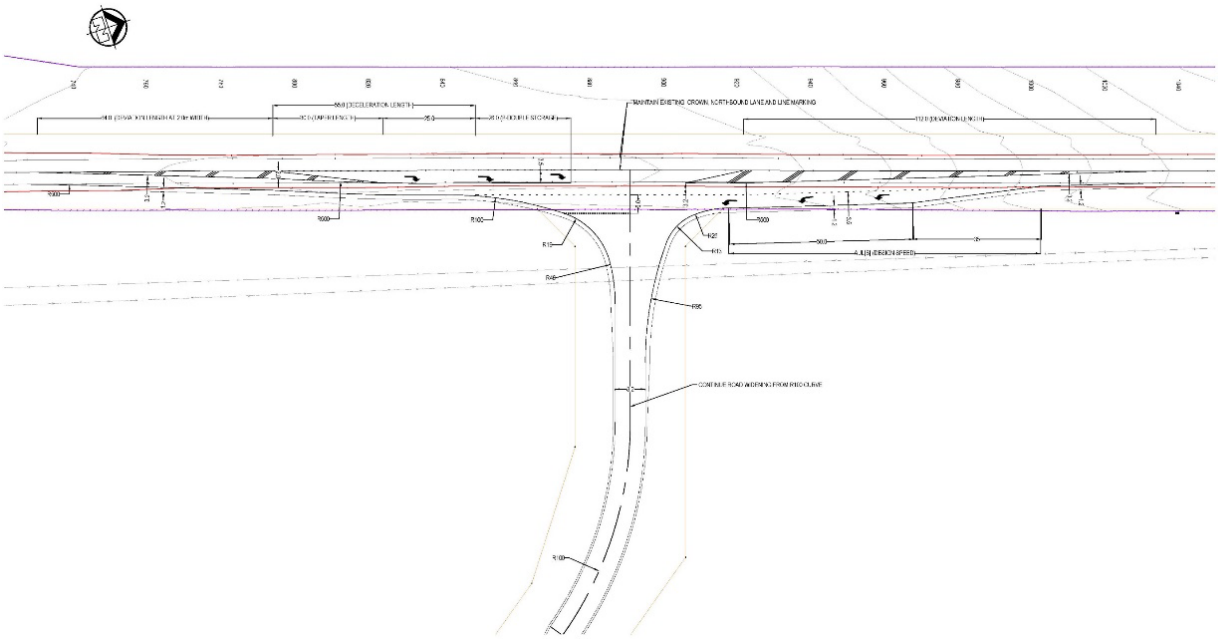
The access road from Twelve Mile Road to the Uungula Wind Farm site will be improved to facilitate the access and egress of larger trucks during construction of that project. Improvements would include gravel coverage, widening to 8 m and additional drainage, as required. The road will be maintained by Squadron Energy during operation to allow for the access and egress of maintenance and operational vehicles.

It is understood that design and planning for Uungula Wind Farm and its associated road works have been ongoing since 2021, and current information at the time of writing indicate that road upgrade construction works will commence prior to the end of 2023, and are anticipated to take approximately 5–6 months to complete.

It is noted that the relocated intersection further north will improve the site access and traffic safety for proposed construction and operations access for this project.

Source: DPIE - SSD 6687 Development Consent

Figure 1.3 Proposed location of Goolma Road/Twelve Mile Road intersection



Source: DPIE - SSD 6687 Development Consent

Figure 1.4 CWP proposed intersection design for new Goolma Road/Twelve Mile Road intersection

2 Project overview

2.1.1 Construction program

Construction is expected to commence in mid 2024 (subject to approval). The project will be constructed and commissioned in line with battery supply availability, labour and equipment availability and increasing demand in the network. This may occur in a single stage over a period of 12–18 months. Alternatively, it is considered likely that it may occur over two stages as follows:

- Stage 1 – commencement of construction mid 2024 and operations mid 2025
- Stage 2 – commencement of construction late 2025 and operation late 2026.

Construction of the project, or each stage of it, would be undertaken in four phases, as follows:

- enabling works (e.g. site establishment) – approximately 2–4 months
- construction works (civil works, structural works, and electrical works) – approximately 5–8 months
- commissioning – approximately 4–5 months
- demobilisation – approximately 1 month.

For the staged construction scenario, Stage 1 would likely include 300 MW installed discharge capacity, all civil and enabling works, installation of batteries, one transformer and switchgear and associated structural, mechanical and electrical works, and connection to the substation. Stage 2 would consist of an additional 200 MW capacity, including installation of a second transformer and associated switchgear and batteries.

Both the single and staged construction scenarios have been considered in undertaking this assessment for the project, which identified the worst case construction traffic scenario as the single stage option. Section 3.2.1 outlines the construction traffic generation associated with that scenario.

2.1.2 Construction hours

Construction hours for the project will be consistent with the *Interim Construction Noise Guideline* (DECC 2009) recommended standard construction hours for normal construction and the and *Draft Construction Noise Guideline* (EPA 2021) being, namely:

- Monday to Friday: 7:00 am to 6:00 pm
- Saturday: 8:00 am to 1:00 pm
- no works of Sunday and public holidays.

Certain activities may be required outside of the standard construction hours. These activities potentially include:

- delivery of plant and equipment for safety reasons (e.g. oversize overmass vehicles)
- commissioning and testing activities that must align with demands on the grid
- situations where agreement is reached with nearby affected receivers and local council.

2.1.3 Construction workforce

The construction phase of the project is expected to generate up to 100 construction personnel, the majority of whom are expected to be located in the Dubbo/Wellington region. Preference will be made for contractors utilising a regional workforce.

3 Traffic generation and distribution

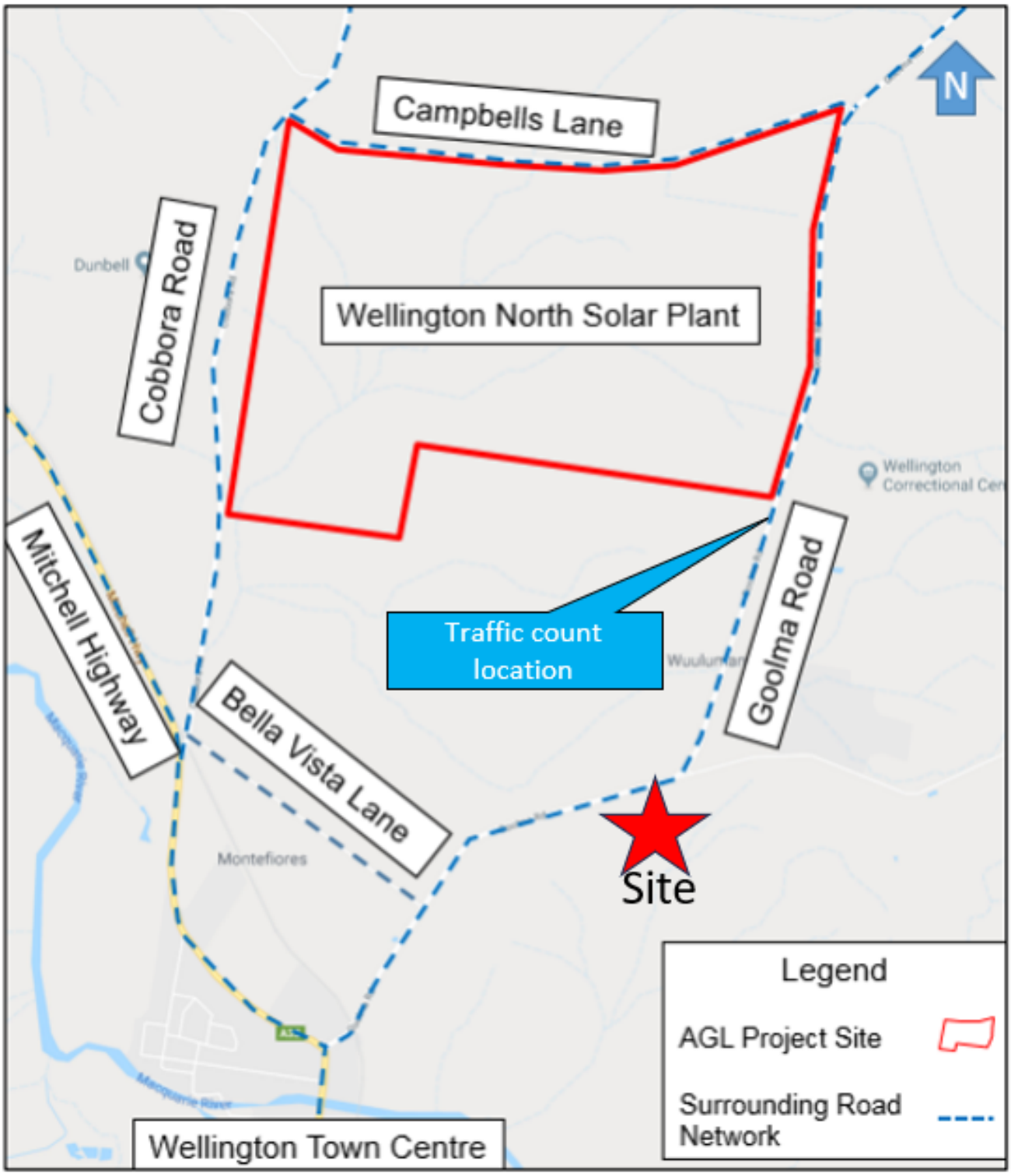
3.1 Existing traffic volumes

Traffic counts near the intersection of Goolma Road and Twelve Mile Road were obtained from Dubbo Regional Council (DRC). Tube counters were placed near the intersection, as shown in red lines in Figure 3.1. The count on Goolma Road was undertaken between the period 13 October to 19 November 2020 and the count on Twelve Mile Road was undertaken between 13 October to 26 November 2020. On Goolma Road, the AM peak hour was from 7:00 am to 8:00 am and PM peak hour was from 3:00 pm to 4:00 pm. On Twelve Mile Road, the AM peak hour was from 8:00 am to 9:00 am and PM peak hour was from 4:00 pm to 5:00 pm.

Figure 3.1 Goolma Road/Twelve Mile Road intersection

Traffic counts for Goolma Road were also obtained from Wellington North Solar Farm (WNSF) Traffic Impact Assessment (GHD, 2021). Tube counters were placed in positions shown in Figure 3.2. The seven-day tube count was conducted on Goolma Road between 28 February and 6 March 2018 (count 3 in Figure 3.2). As per WNSF traffic counts, Goolma Road AM peak hour was from 7:00 am to 8:00 am and PM peak hour was from 4:00 pm to 5:00 pm.

Traffic count data from DRC and GHD (2021) are presented in Table 3.1.



Source: (GHD, 2021)

Figure 3.2 Wellington north solar farm traffic count location on Goolma Road

Table 3.1 DRC Council and GHD traffic volumes

Description		DRC Council traffic volumes		GHD traffic volumes	
		Goolma Road	Twelve Mile Road	Goolma Road	Twelve Mile Road
Survey year		2020	2020	2018	-
Average AM Peak volume	Northbound/ eastbound	170	16	157	-
	Southbound/ westbound			44	-
Average PM Peak volume	Northbound/ eastbound	184	19	66	-
	Southbound/ westbound			135	-
Daily volume		1,939	189	2,140	-
HV %		25%	46%	18%	-

The traffic data in the above table shows that the traffic volumes on Goolma Road were approximately 10% higher in the 2018 GHD count, compared to the 2020 council count, possibly due to Covid-19 impact. The daily traffic on Goolma Road is considered to be over 2,000 vehicles per day. The PM peak volumes were slightly higher than the AM peak for the council counts but AM and PM peak volumes were similar for the GHD count.

On Twelve Mile Road, the daily volumes were less than 200 vehicles. In summary, Twelve Mile Road carried approximately one tenth of traffic to that on Goolma Road.

3.2 Baseline traffic volumes

No intersection count has been undertaken as part of this study as the DRC and GHD traffic data is considered to be sufficient to undertake an accurate traffic impact assessment.

A growth factor of 1% per annum has been applied to the 2018 GHD traffic volumes to estimate the 2023 baseline construction traffic volumes which equates to 5% linear growth for five years. For Twelve Mile Road, the following correction factor is applied to bring the volumes to 2023:

- estimate 2020 WNSF traffic volume for Goolma Road using 1% per annum growth rate
- estimate a correction factor between 2020 DRC and 2018 WNSF Goolma Road traffic volumes
- apply correction factor to 2020 Twelve Mile Road traffic volume
- apply a 1% per annum growth rate to bring the Twelve Mile Road volumes from 2020 to 2023.

The directional split in the AM and PM peak hours on Twelve Mile Road has been assumed to be the same as Goolma Road.

Baseline traffic volumes are presented in Table 3.2.

Table 3.2 2023 baseline traffic volumes

Description		Goolma Road	Twelve Mile Road
Average AM Peak volume	Northbound/eastbound	165	16
	Southbound/westbound	46	4
Average PM Peak volume	Northbound/eastbound	69	7
	Southbound/westbound	142	15
Daily volume		2,247	219
HV %		18%	46%

3.2.1 Construction traffic

The worst case construction traffic scenario is associated with a single stage construction approach for the BESS and Wellington substation upgrade works, as daily and peak hour traffic generation associated with a staged approach would be lower than that generated under the single stage scenario. Estimated construction traffic associated with the single stage construction scenario is as follows:

i Daily traffic generation

The following daily construction vehicle movements are anticipated:

- an average of up to 100 light vehicle trips per day (100 in and 100 out) during the construction works phase
- an average of up to 60 heavy vehicle trips per day (60 in and 60 out) during the construction works phase.

ii Peak hour traffic generation

The following assumptions have been made to anticipate peak hour construction vehicle movements:

- a maximum of 80 light vehicle trips during the morning and evening peak hour (80 in and 80 out)
- a maximum of 30 heavy vehicle trips during the peak hour (30 in and 30 out).

Passenger vehicles are expected to arrive at the site prior commencement of construction shifts. Peak heavy vehicle trips are expected to occur during civil and structural works, associated with the delivery of materials, plant and equipment. Deliveries of batteries and enclosures are anticipated to occur in batches.

Construction traffic movements associated with the project are presented in Table 3.3 and Figure 3.3.

Table 3.3 Construction traffic movements

Description		Goolma Road	
		Light vehicles	Heavy vehicles
AM peak (7:00 am to 8:00 am) movements	Eastbound	48	30
	Westbound	32	30
PM peak (4:00 pm to 5:00 pm) movements	Eastbound	32	30
	Westbound	48	30
Average daily movements		320	

3.3 Operational traffic

The operation of the project is expected to commence from 2025 for a period of approximately 20 years. The project will contribute to the employment of two employees during operation, primarily for scheduled maintenance. There would be up to 4 vehicle trips per day (4 in-bound and 4 out-bound), compromising:

- staff vehicles up to 3 per day (3 inbound and 3 outbound)
- up to one heavy vehicle per day for transporting replacement parts and equipment, as need basis.

The BESS would be operated remotely 24 hours a day, 7 days a week.

Operation of the upgraded Wellington substation will not result in any additional traffic movements at that facility.

Operational traffic volumes will be significantly less than the project's construction traffic. Therefore, this assessment has focused on construction traffic impacts only.

3.4 Over size over mass vehicles

There will be up to 20 Oversize Overmass (OSOM)[3] vehicles during the construction works phase. Relevant permits from the National Heavy Vehicle Regulator will be acquired for the project prior to mobilisation.

OSOM vehicle movements will occur outside of standard construction hours and are anticipated to be wholly via Sydney/Newcastle and are anticipated to travel to site via the Castlereagh Highway and Goolma Road (east) route.

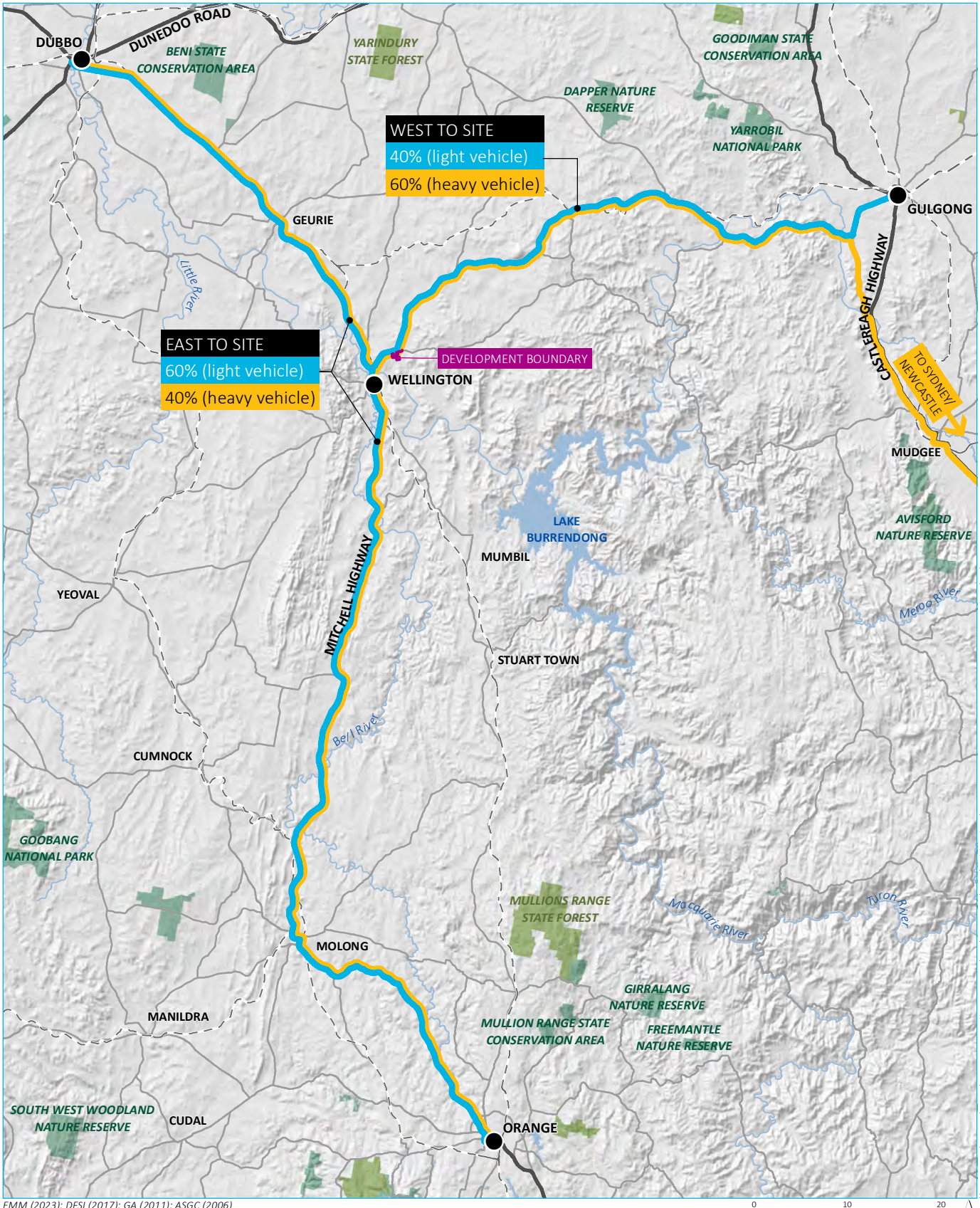
3.5 Traffic distribution

Passenger vehicles are expected to arrive at the site prior to commencement of construction shifts. Construction vehicles are anticipated to be primarily from regional centres including Dubbo/Wellington (60%) and Gulgong (40%) and are anticipated to travel to the site via the Mitchell Highway - Goolma Road (west) – realigned Twelve Mile Road; and Goolma Road (east) – realigned Twelve Mile Road, respectively.

[3] *An oversize or overmass vehicle is a heavy vehicle or combination which alone, or together with its load, exceeds prescribed mass or dimension requirements, and is a heavy vehicle carrying, or designed for the purpose of carrying, a large indivisible item (HVNL s116 (1) (c)). This does not include road trains or B-doubles, or vehicles carrying a freight container designed for multimodal transport. Examples include a prime mover and extendable trailer or a prime mover and low loader combination.*

Heavy vehicle movements, particularly those associated with the delivery of materials and equipment will generally be evenly spread throughout construction hours. Most heavy vehicles are anticipated to be from Sydney or Newcastle and surrounding regional centres (60%). Some heavy vehicles will also originate from Dubbo, Orange, and Parkes (40%). Vehicles travelling from Sydney or Newcastle are anticipated to travel to site via the Castlereagh Highway and Goolma Road (from the east), an approved B-double route. Other vehicles are anticipated to access the site via the Mitchell Highway and Goolma Road (from the west).

Traffic transport routes are presented in Figure 3.3.



EMM (2023); DFSI (2017); GA (2011); ASGC (2006)

0 10 20 km

GDA 1994 NSW Lambert

N

KEY

- Development boundary
- Rail line
- Motorway/primary road
- Arterial/subarterial road
- River
- Named waterbody
- NPWS reserve
- State forest

Transport route

- Light vehicle
- Heavy vehicle

Transport routes

Wellington Battery Energy Storage System
Addendum traffic impact assessment
Figure 3.3

EMM creating opportunities

3.6 Nearby development traffic

Development in vicinity of the project has the potential to generate cumulative traffic impacts with the project. The status of surrounding projects has been considered in Chapter 7 of the EIS.

The greatest potential for cumulative impacts of future projects and the project in relation to traffic are associated with the following two projects, which have the potential to have construction periods that overlap with the project:

- Wellington North Solar Farm (SSD 8895)
- Uungula Wind Farm (SSD 6687).

It is noted that Wellington Solar Farm (SSD 8573) is now in its commissioning/operational phase, therefore cumulative impacts associated with that project are not anticipated.

The locations of each of these developments are illustrated in Figure 3.3.

3.6.1 Wellington North Solar Farm

LSbp responded to EMM's request for information regarding its forecast traffic movements for the Wellington North Solar Farm, which is summarised in Table 3.4. The construction of WNSF commenced earlier this year and is expected to continue for a period of 18 months. The WNSF will utilise Goolma Road to access the site and the main vehicular access route is south via the Mitchell Highway and Goolma Road (GHD, 2021).

The GHD report states that there will be two OSOM vehicles during the construction period. Heavy vehicles will include vehicles related to construction activity and shuttle buses transporting staff. The remaining staff will be commuting via light vehicles. All construction traffic is expected to travel to the Goolma Road site access via the Mitchell Highway located to the south.

Based on the above consideration, Wellington North Solar Farm's forecast total and peak hourly traffic distribution is summarised below:

- ***OSOM vehicles*** (2 movements in total): 100% from the south.
- ***Heavy vehicles*** (19 movements): This includes 3 construction heavy vehicles and 16 shuttle buses. 100% from the south.
- ***Light vehicles*** (66 movements): 100% from the south.

It is noted that, dependent on timing, WNSF construction traffic movements may be impacted by the Uungula Wind Farm road realignment works.

The forecast OSOM vehicles movements are low and have not been considered in the cumulative traffic impact assessment. The remaining 85 peak hourly movements would pass through the realigned Goolma Road/Twelve Mile Road intersection once constructed. It is reasonable to assume that during the AM peak all light vehicle movements will occur north eastbound (towards the solar farm construction site) and vice versa during the PM peak.

Table 3.4 Wellington North Solar Farm construction traffic movements

Description		Goolma Road	
		Light vehicles	Heavy vehicles
Average AM peak movements	Eastbound	66	19
	Westbound	0	19
Average PM peak movements	Eastbound	0	19
	Westbound	66	19
Average daily movements		267	

3.6.2 Uungula Wind Farm

EMM approached CWP (now Squadron Energy) with a request for its recent forecast traffic movements for the Uungula Wind Farm (UWF). CWP referred to information contained in the publicly available EIS and supporting Uungula Wind Farm Project Transport Assessment (Samsa Consulting 2020). Construction activity for UWF is likely to occur over approximately 24 to 30 months with peak traffic generation for six months out of the total 24 to 30 month construction period. The forecast construction traffic movements for the wind farm are presented in Table 3.5.

Table 3.5 Uungula Wind Farm construction traffic movements

Description		Goolma Road	
		Light vehicles	Heavy vehicles
Average AM peak movements	Eastbound	100	11
	Westbound	100	10
Average PM peak movements	Eastbound	100	10
	Westbound	100	11
Average daily movements		506	

The report states OSOM vehicles will use the Goolma/Twelve Mile Road intersection to/from the west (e.g. Dubbo). Heavy vehicles and light vehicles (construction workers) will have 50%/50% split via Goolma Road from the east and west, with all vehicles using the new Goolma Road/Twelve Mile Road intersection.

Based on the above consideration, Uungula Wind Farm's traffic distribution is summarised below:

- ***OSOM vehicle*** (4 movements): 100% to from the west (via the new Goolma Road/Twelve Mile Road intersection).
- ***Heavy vehicle*** (21 movements): 50% of the traffic generation e.g. 11 movements will arrive via Goolma Road from the west (e.g. Dubbo) and the remaining 50% (10 vehicles) will arrive via Goolma Road from the east. All vehicles will use the new Goolma Road/Twelve Mile Road intersection
- ***Light vehicle*** (200 movements): 50% of the traffic generation e.g. 100 movements will arrive via Goolma Road from the west (e.g. Dubbo) and the remaining 50% (100 vehicles) will arrive via Goolma Road from the east.

As the OSOM vehicles will be escorted, these trip generation have not been considered in the cumulative traffic impact assessment. The 221 heavy and light vehicle movements would use the realigned Goolma Road/Twelve Mile Road intersection. It is reasonable to assume that during the AM peak all light vehicle movements will occur eastbound (towards the windfarm construction site) and vice versa during the PM peak.

3.7 Cumulative traffic

The cumulative traffic using Goolma Road, which is the summation of baseline traffic volumes (Table 3.2); and construction traffic movements for the project (Table 3.3), Wellington North Solar Farm (Table 3.4) and Uungula Wind Farm (Table 3.5) is presented in Table 3.6.

The location of the nearby developments is illustrated in Figure 3.4.

Table 3.6 Cumulative traffic movements

Description		Goolma Road				
		Baseline	Project Construction	Wellington North	Ungula Wind Farm	Total
AM peak movements	Eastbound	165 (16)	48 (30)	66 (19)	100 (11)	379 (76)
	Westbound	46 (4)	32 (30)	0 (19)	100 (10)	178 (63)
PM peak movements	Eastbound	69 (7)	32 (30)	0 (19)	100 (10)	201 (66)
	Westbound	142 (15)	48 (30)	66 (19)	100 (11)	356 (75)

Note: Values in brackets are heavy vehicle movements and values outside brackets are light vehicle movements.

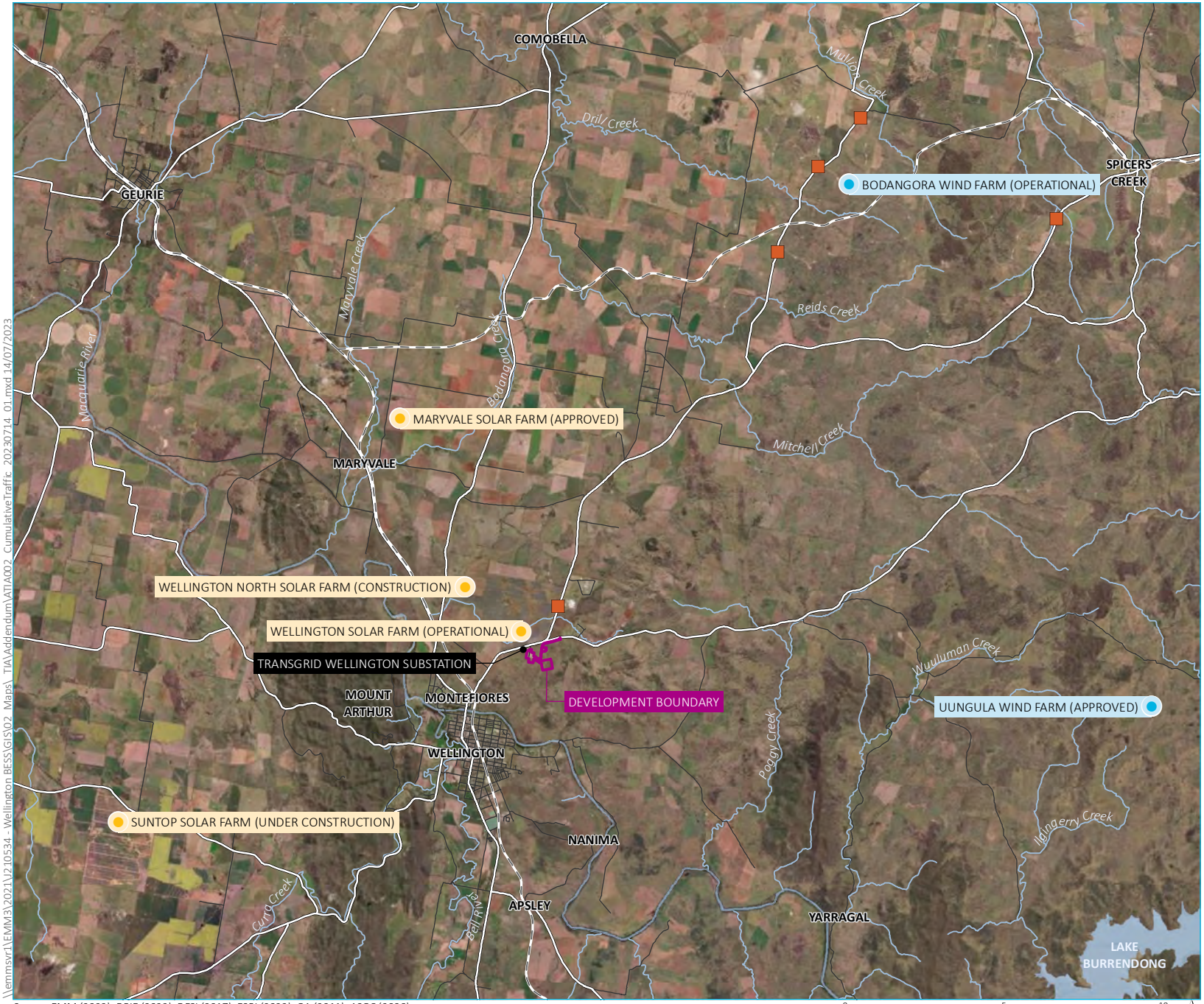
The cumulative traffic movements in this section present a worst-case scenario where peak construction stages of nearby developments are assumed to overlap with the peak construction period of the project. The above table shows that there will be highest eastbound traffic generation during the AM peak and vice versa during the PM peak, should all the projects occur simultaneously.

The traffic and transport assessments for WNSF (GHD, 2021) and UWF (Samsa Consulting, 2020) do not mention the construction start and end months/year of their respective developments. Construction of WNSF commenced in 2023, and current information at the time of writing indicates that construction of Uungula Wind Farm associated road realignment/upgrade works will commence prior to the end of 2023.

3.8 Car parking

During construction, worker vehicles will either park at the temporary laydown area (where a construction compound will be located) or at the BESS compound. No cars will park along Goolma Road or Twelve Mile Road.

A car park will be established in the vicinity of the control and office building for the parking of vehicles during operation. In accordance with Section H2 of the *Wellington Development control plan 2013*, a minimum of three spaces will be provided, one of which will be an accessible parking space. The location of the carpark will be confirmed in the detailed design.



KEY

- Development boundary
- Rail line
- Major road
- Minor road
- Named watercourse
- Named waterbody
- NPWS reserve
- State forest (refer to inset)
- Access point for operational developments

Renewable energy project

- Solar farm
- Wind farm

Source: EMM (2023); DPIE (2022); DFSI (2017); ESRI (2023); GA (2011); ASGC (2006)

0 5 10 km

GDA 1994 MGA Zone 55

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Nearby development and cumulative traffic

Wellington Battery Energy Storage System
Addendum traffic impact assessment
Figure 3.4

EMM creating opportunities

4 Impact assessment

This chapter presents the worst case traffic impact assessment scenario considered for the project in which cumulative traffic generation associated with construction of the Wellington North Solar Farm and Uungula Wind Farm developments (Section 3.6) occurs concurrently with construction of this project. This allows for a conservative assessment to determine the worst possible scenario in terms of traffic impacts due to the projects.

In addition, the worst case construction traffic scenario has been considered for the project, which is represented by a single stage construction scenario (as opposed to a staged construction scenario, whereby daily and peak hourly construction traffic generation would be significantly lower than the single stage construction scenario traffic generation).

4.1 Mid-block capacity analysis

Capacity, as defined in (HCM, 2016), is the maximum sustainable hourly rate at which persons or vehicles can reasonably be expected to traverse a point or uniform section of a lane or roadway during a given time period under the prevailing roadway, environmental, traffic and control conditions. When capacity is estimated at a mid-block section of a lane or roadway, it is referred to as mid-block capacity.

The mid-block Level of Service (LOS) on rural and urban roads is assessed based on a vehicle's average travel speed. At low traffic volumes and under ideal conditions, drivers are able to travel at their desired speed without interference. As traffic volumes increase, and as roadway, terrain and traffic conditions become less than ideal, drivers are affected by the presence of other vehicles on the road and this forms bunches in the traffic stream.

There are six levels of service, as described below in Table 4.1, from *Guide to Traffic Generating Developments* (RTA, 2002).

Table 4.1 Mid-block level of service descriptions

Level of service	Level of service description
Level of Service A	This, the top level is a condition of free flow in which individual drivers are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to manoeuvre within the traffic stream is extremely high, and the general level of comfort and convenience provided is excellent.
Level of Service B	This level is in the zone of stable flow and drivers still have reasonable freedom to select their desired speed and to manoeuvre within the traffic stream, although the general level of comfort and convenience is little less than that of the level of Service A.
Level of Service C	This service level is also in the zone of stable flow, but most drivers are restricted to some extent in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience declines noticeably at this level.
Level of Service D	This level is close to the limit of stable flow but is approaching unstable flow. All drivers are severely restricted in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience is poor, and small increases in traffic flow will generally cause operational problems.
Level of Service E	This occurs when traffic volumes are at or close to capacity and there is virtually no freedom to select desired speeds or to manoeuvre within the traffic stream. Flow is unstable and minor disturbances within the traffic stream will cause a traffic-jam.
Level of Service F	This service level is in the zone of forced flow. With it, the amount of traffic approaching the point under consideration exceeds that which can pass it. Flow break-down occurs and queuing and delays result.

4.2 Rural road capacity

Table 4.5 of *Guide to Traffic Generating Developments* (RTA, 2002) provides the two-way hourly traffic capacities (e.g. number of vehicles per hour) for two-lane roads for different LOS with a design speed of 100 km/h based on different terrain types. The capacities assume 60% of traffic is travelling in one direction and 40% is travelling in the other direction.

The capacities for each LOS transition (e.g. the combined number of vehicles travelling in both directions at where the LOS decreases) are provided in Table 4.2 for Goolma Road, assessed for rolling terrain.

Table 4.2 Roadway hourly capacity for a two-lane two-way rural road (100 km/h speed limit)

Terrain	Level of service transition	Effect of percentage of heavy vehicles (in traffic flow)						
		0%	5%	10%	15%	20%	25%	30%
Rolling	A/B*	250	210	180	155	135	120	110
	B/C	500	420	360	310	270	240	220
	C/D	920	760	650	570	510	470	450
	D/E	1370	1140	970	700	630	580	550
	E/F	2420	2000	1720	1510	1,360	1,260	1,210

Notes: *Assumed to be 50% of upper limit of B/C LOS.

Columns 20% to 30% have been extrapolated from the preceding columns.

The column for 20% heavy vehicles has been used to determine baseline Goolma Road mid-block capacity LOS in Table 4.3. Cumulative traffic mid-block capacity has been determined from 35% heavy vehicles, extrapolated from previous columns.

4.3 Rural road compliance

As the majority of project traffic will travel from the west via Goolma Road, mid-block capacity analysis has been undertaken at Goolma Road, south of the location of the new Goolma Road/Twelve Mile Road intersection. The mid-block capacity (LOS) assessment for Goolma Road is provided in Table 4.3 for the baseline and cumulative traffic scenarios.

The baseline traffic volumes are extracted from Section 3.2 and the cumulative traffic volumes are extracted from Section 3.7.

Table 4.3 Goolma Road mid-block capacity (including Ungula Wind Farm construction traffic)

Scenario	Peak hour volume	Heavy vehicle percentage	Level of Service
Baseline traffic	211 (AM)/211 (PM)	18% (AM)/18% (PM)	B/B
Cumulative traffic	510 (AM)/510 (PM)	35% (AM)/35% (PM)	D/D

The Goolma Road LOS has been determined from further extrapolations of the values presented in Table 4.2. Goolma Road is expected to operate at LOS B in the baseline traffic scenario and at LOS D in the cumulative traffic scenario.

The reduction in the LOS (by two levels) is only for the duration of the assessment period which corresponds to the period of peak construction activity for all three projects. When the combined project construction work has been completed, the LOS will return to the baseline traffic conditions.

Furthermore, this assessment has been carried out for a worst-case scenario where it is assumed that all traffic from the other nearby developments at Wellington North and Uungula, project construction traffic and baseline road network traffic would all overlap in the same morning and evening peak hours. This is considered highly unlikely, as the arrival and departure patterns of all traffic sources may not necessarily coincide.

The LOS D is considered close to the limit of stable traffic flow but is expected to be experienced during construction period only during the AM and PM peak hours. At other times of the day, the LOS would be better than D.

4.4 Warrants for BA, AU and CH Turn Movements

Intersection operations are also assessed from the combination of the peak hourly through and turning traffic movements that occur at each intersection. This determines the need for additional intersection turning lanes (eg basic, auxiliary lane and channelised) in accordance with the current intersection design standards (Austroads 2017b) *Guide to Road Design Part 4, Intersections and Crossings General* (Figure 4.1), where:

- Curve 1 (red line) represents the boundary between a basic right turn (BAR) and a channelised short right turn (CHR(S)) turn treatment and between a basic left turn (BAL) and an auxiliary short left turn (AUL(S)) turn treatment.
- Curve 2 (blue line) represents the boundary between a CHR(S) and a full length CHR treatment and between an AUL(S) and a full length AUL or CHL treatment. The choice of CHL over an AUL will depend on factors such as the need to change the give way rule in favour of other manoeuvres at the intersection and the need to define more appropriately the driving path by reducing the area of bitumen surfacing.

Figure 4.1 below contains the graphs for the selection of turn treatments on roads with a design speed greater than or equal to 100 km/h which is appropriate for high-speed rural roads.

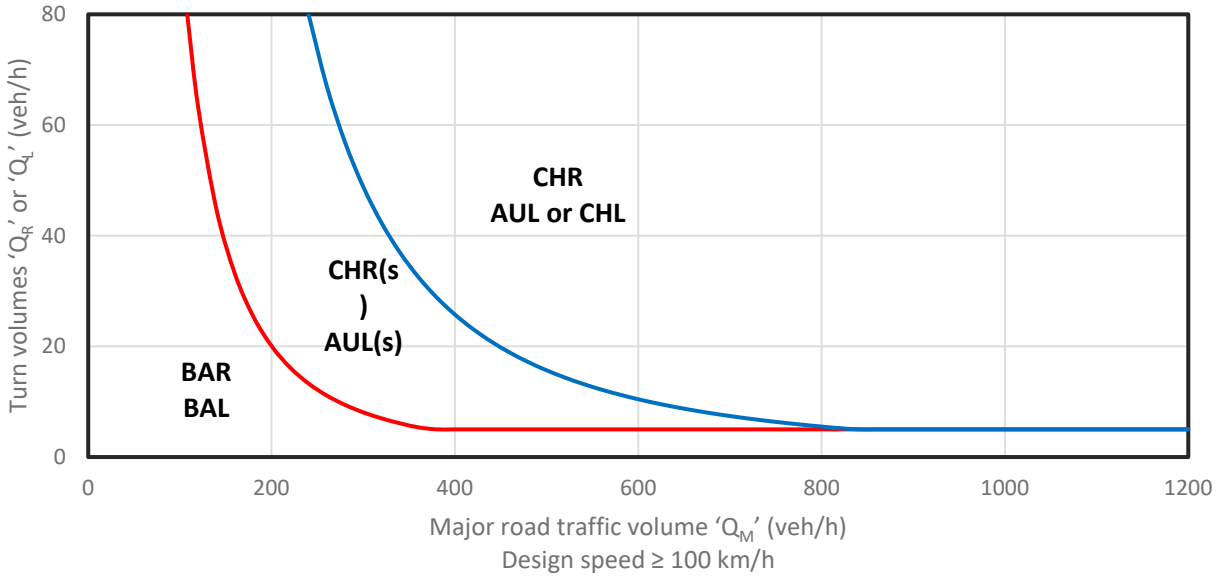


Figure 4.1 Austroads warrant design charts for rural intersection turning lanes

TfNSW recommends that intersections should be designed for a travel speed 10 km/h greater than the posted speed limit. As Twelve Mile Road has a posted speed limit of 100 km/h, the site access intersection (including any requirements for turning bays) should be designed for 110 km/h.

For a design speed of 100 km/h or greater, the requirements for additional left or right turn traffic lanes are measured from Figure 4.3.

In the analysis, it is assumed that the existing site access and the two current connections between Goolma Road and Twelve Mile Road will be closed off (Figure 4.2).

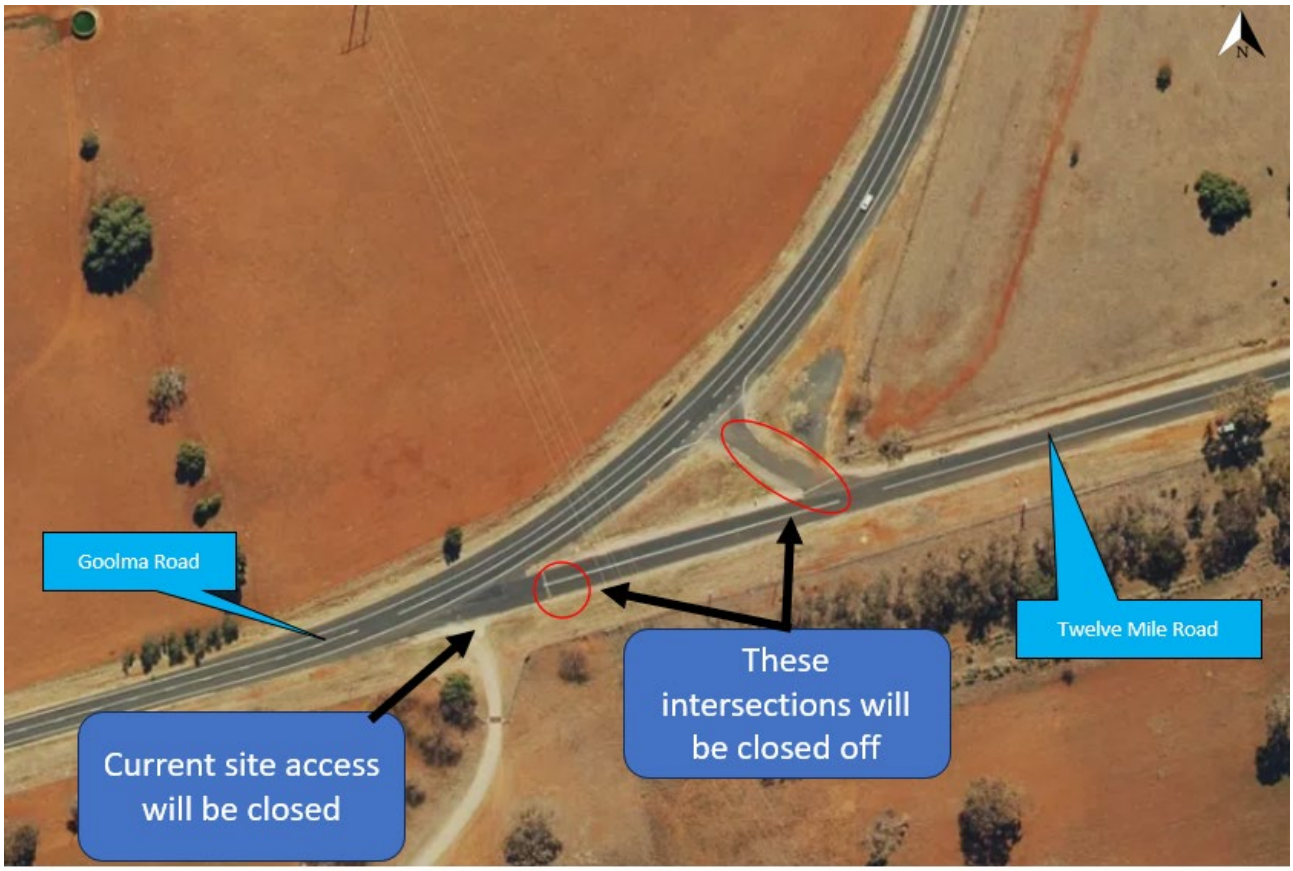


Figure 4.2 Assumptions for the traffic assessment

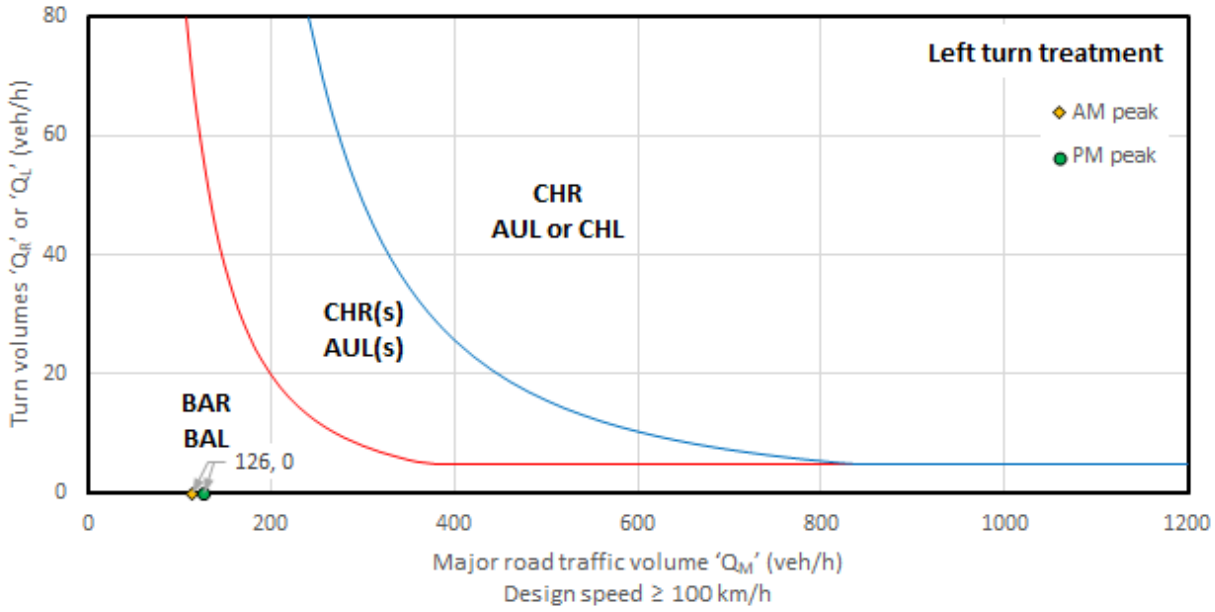
The intersection peak hourly turning traffic volumes for the warrant assessment for the cumulative traffic is summarised in Table 4.4. For the assessment, it is assumed that there is no traffic generation to the existing site. The traffic estimation in the following table is a summation of 2023 existing traffic (Table 3.2), project construction traffic (Table 3.3) and Uungula Wind Farm traffic (Table 3.5). Wellington North Solar Farm traffic is not considered as they are not assumed to travel along Twelve Mile Road. It is assumed that no traffic will travel from the east along Twelve Mile Road and turn left into the site.

Table 4.4 Intersection turn treatment warrant for realigned Twelve Mile Road/Site Access Road intersection (including Ungula Wind Farm construction traffic)

Movement	Peak hour	Major road traffic volume	Turning traffic volume	Turn treatment required
Left turn from major road	AM	4+110 =114	0	BAL
	PM	15+111 =126	0	BAL
Right turn from major road	AM	16+4+110+111 = 241	48+30 = 78	CHR (S)
	PM	7+15+110+111 = 243	32+30 = 62	CHR(S)

Based on the cumulative traffic volumes for the Twelve Mile Road/Site Access Road intersection, the following turn treatments will be required for the project construction traffic access (Figure 4.3):

- a Basic Left Turn (BAL) will be required for left turning traffic from Twelve Mile Road westbound to the site access road
- a channelised short right turn treatment CHR(S) will be required for right turning traffic from Twelve Mile Road southbound to site access road.



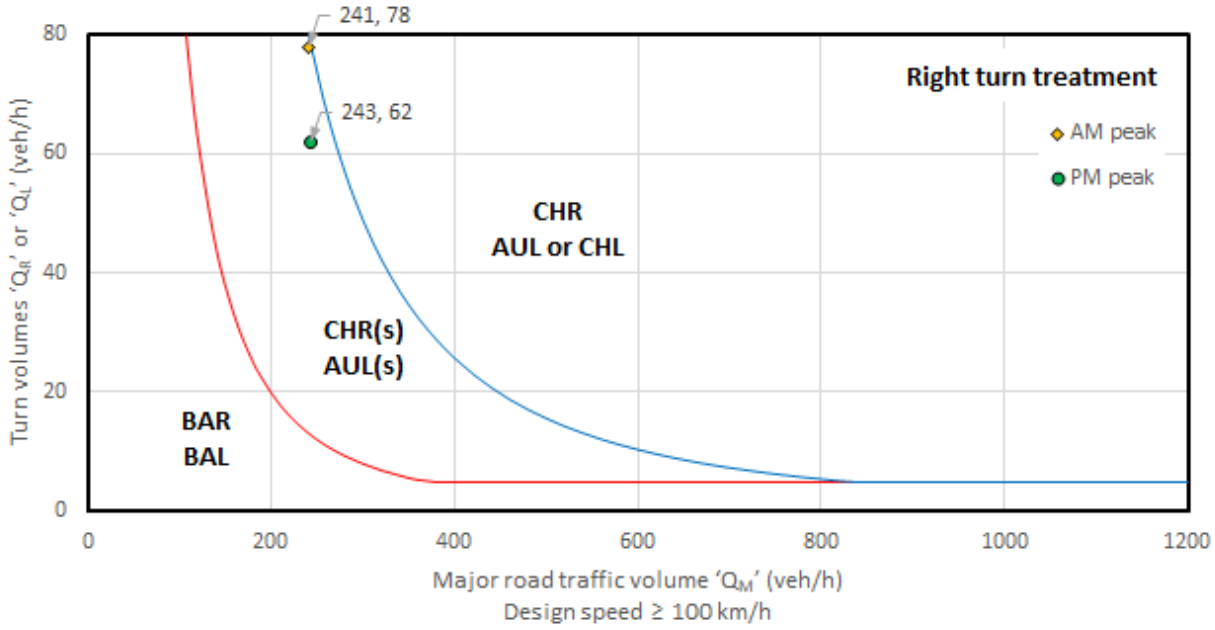


Figure 4.3 **Austroads turn treatment warrant assessment for Twelve Mile Road/Site Access intersection (including Ungula Wind Farm construction traffic)**

Based on the above analysis, a Basic Left Turn Lane (BAL) and a channelised short right turn bay (CHR(S)) will be required on realigned Twelve Mile Road at the site access intersection. The relevant concept design is described in Chapter 5 of this report.

4.5 Operation traffic impact assessment

There will be four daily trips during the operation stage of the development (three light and one heavy vehicles). These volumes are significantly lower than the construction traffic generation and are unlikely to have any noticeable impact to the adjoining road network. Therefore, detailed traffic impact assessment for a 10 year horizon is not required.

4.6 Staged construction impact assessment

As discussed in Section 2.1.1, there is a likelihood of construction of the project occurring in two stages. This may result in Stage 1 operational traffic coinciding with Stage 2 construction traffic for the duration of the Stage 2 construction.

Stage 1 operational traffic would consist of up to two staff vehicles and one heavy vehicle for maintenance activities. Stage 2 construction traffic would be reduced in comparison to Stage 1 construction, as some construction activities such as site establishment works, intersection upgrade works, and parts of construction works (civil works, structural works, and electrical works) would already be completed during Stage 1 construction.

The staged construction works would reduce the peak construction traffic movements in comparison to single stage construction scenario and is not expected to generate significant traffic impacts if coinciding with nearby development traffic.

The overlap of Stage 1 operational and Stage 2 construction traffic is unlikely to result in significant traffic impacts. However, an operational traffic management plan may be required to ensure that operational traffic and construction traffic does not compromise any traffic or pedestrian safety within the project site.

5 Concept plan

As stated in Section 1.2, the concept plan has been prepared in consultation with DPE and DRC, with in-principle support provided by DRC (refer Appendix A). The concept plan is attached in Appendix B. The concept plan shows that a 111 m long right turn bay (including taper) is provided from Twelve Mile Road to the site. The intersection geometry is determined by the swept path assessments by a 26 m B-double truck, which is the longest construction vehicle accessing the site.

As no traffic is coming from the west along Twelve Mile Road, swept path assessment has not been undertaken for left turns into the site, however, the intersection geometry is large enough for light vehicles turning left from Twelve Mile Road, should any construction worker come from the west.

It should be noted that the concept plan for the site access intersection has been prepared based on the single stage project whereby the maximum construction traffic generation will occur at the site. This is a conservative assessment. If the project proceeds in two separate stages, a shorter right turn bay may be suitable subject to further design consideration.

6 Safety assessment

6.1 Road safety assessment at the project site entrance

In accordance with *Austroads Guide to Road Design Part 4A (Unsignalised and Signalised Intersections)* (Austroads, 2017), all unsignalised T-intersections must provide adequate visibility for turning traffic safety. This is assessed in further detail below, in terms of the safe intersection sight distance (SISD) at the intersection, which varies according to the design speed of the road. Normally a design speed 10 km/h higher than the posted speed limit is used to calculate the SISD.

Twelve Mile Road has a speed limit of 100 km/h near the site access intersection. In accordance with *Austroads Guide to Road Design Part 4A (Unsignalised and Signalised Intersections)* (Austroads, 2017), for a road with design speed of 110 km/h, the minimum SISD required for a general minimum 2 second driver reaction time, is 285 m.

The sight distances on Twelve Mile Road at the site access have been estimated based on the line of sight and observation, as shown in Appendix B. The assessment shows that a minimum 300 m sight distance is achieved on both approaches from the proposed site access.

The proposed site access should not be operational until the existing two vehicular connections between Goolma Road and Twelve Mile Road are closed off.

7 Conclusion and summary

This addendum TIA has reviewed and assessed project-related construction daily and peak hour traffic volumes in consideration of the potential for staged or single phase construction, along with cumulative traffic volumes along the road network to determine whether there is sufficient road network capacity and to ensure the road network will be adequate to accommodate the additional traffic movements generated by the project.

Vehicle movements will take place primarily on Goolma Road. Construction of the project will occur in a single stage over a period of 12–18 months, or over two stages each between 12–18 months, commencing in April 2024, subject to approval. The worst case construction traffic scenario is associated with the single stage construction, which at its peak is expected to generate up to 100 construction personnel.

Construction traffic includes passenger vehicles transporting construction workers and heavy vehicles transporting project equipment. There will be an average of up to 100 passenger vehicles and 60 heavy vehicles per day, and a maximum of 80 passenger vehicles and 30 heavy vehicles during the peak hour, in the construction phase. There will be up to 20 OSOM vehicles in total during the construction phase and the relevant travel permits for these vehicles will be acquired from NHVR for the project, prior to mobilisation.

The cumulative impact assessment has considered the potential additional construction traffic associated with the Uungula Wind Farm and Wellington North Solar Farm projects (both constructed concurrently in a single stage). It is assumed that all traffic will use the realigned Goolma Road/Twelve Mile Road intersection for the cumulative scenario and no project related traffic is expected to arrive from the east along Twelve Mile Road. The impact of project-related vehicles on Goolma Road mid-block capacity and level of service has been assessed. For the cumulative traffic impact assessment scenario, the mid-block capacity of the Goolma Road section south of the new Goolma Road/Twelve Mile Road intersection, would deteriorate from LOS B to LOS D. However, this will only be during the scenario where the peak construction activity for all three projects overlaps. The level of service will return to the baseline traffic conditions once peak construction period is over.

As part of the Uungula Wind Farm development, the existing Goolma Road/Twelve Mile Road intersection will be relocated approximately 400 m to the north, which will improve traffic safety for all motorists.

Austroads intersection turn treatment warrants were conducted for left and right turning traffic from the realigned Twelve Mile Road into the proposed site access. The assessment revealed that for the cumulative traffic impact assessment including Uungula Wind Farm construction traffic, a BAL and CHR (S) type turn treatments will be required on Twelve Mile Road. The proposed site access will have adequate sight distances to the left and right along Twelve Mile Road and would meet the Austroads (2021) *Guide to Road Design.*

It should be noted that the concept plan for the site access intersection has been prepared based on the single stage project whereby the maximum construction traffic generation will occur at the site. This is a conservative assessment. If the project proceeds in two separate stages, a shorter right turn bay may be suitable subject to further design consideration. However, the proposed site access should not be operational until the existing two vehicular connections between Goolma Road and Twelve Mile Road is closed off.

References

Austroads. (2016). *Guide to Traffic Management Part 3: Traffic Studies and Analysis.*

Austroads. (2017). *Guide to Road Design Part 4A: Unsignalised & Signalised Intersections.*

GHD. (2021). *Wellington North Solar Project Development.* Traffic Impact Assessment.

HCM. (2016). *Highway Capacity Manual.*

RTA. (2002). *Guide to Traffic Generating Developments.*

Samsa Consulting. (2020). *Uungula Wind Farm Project.* Transport Assessment.

Appendix A
Stakeholder correspondences

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Abdullah Uddin

Subject: FW: Update on transport issues.

From: James Gilchrist <James.Gilchrist@planning.nsw.gov.au>
Sent: Friday, June 9, 2023 12:00 PM
To: James North <james.north@ampyrenergy.com>
Cc: Dan Couriel <daniel.couriel@dpie.nsw.gov.au>
Subject: Update on transport issues.

Hi James,

I've spoke to the assessment team and have an update for you.

As you know we needed to discuss all options you had provided with our directors to fully understand the issue and formulate our position. Considering all relevant information including construction, operation and decommissioning traffic movement, I can confirm that 'Option B' entrance will be the only acceptable entrance that sufficiently responds to traffic movement and associated environmental impacts of the development.

Moving forward I suggest Ampyr continue with the amended report to reflect 'Option B' as the entrance for the site from construction through to decommissioning.

Any questions please get in touch.

James

James Gilchrist
Case Manager
Delivery, Coordination, Digital and Insights |Planning Group |**Department of Planning and Environment**
T 02 9995 6133 | **E** james.gilchrist@planning.nsw.gov.au
4 Parramatta Square | 12 Darcy Street | Parramatta NSW 2150
www.dpie.nsw.gov.au
I work flexibly. Unless it suits you, I don't expect you to read or respond to my emails outside of your normal work hours.

Hi Apoorv, Piers,

Just so you know, DRC has given its written consent of our Twelve Mile Road entrance point design below, which follows up on approval over the phone.

Cheers,

James North | Project Manager - BESS Development
mobile +61 456 596 745
email james.north@ampyrenergy.com
AMPYR Australia Pty Ltd
38 Young Street, Sydney NSW 2000, Australia
www.ampyrenergy.com

From: Dennis Valantine <Dennis.Valantine@dubbo.nsw.gov.au>
Sent: Monday, June 5, 2023 1:11 PM
To: James North <james.north@ampyrenergy.com>
Cc: Claire Burnes <cburnes@emmconsulting.com.au>
Subject: RE: Wellington South BESS - Entrance Concept Discussion

Hi James

I concur with the proposed Twelve Mile Road / Access Road , Wuuluman – Concept intersection design as shown on Project J210534, Drg. EMM-C01,C02,C03 and C04 Rev A. dated 04/05/2023.

Please find attached some road and intersection plans from the Twelve Mile Road upgrade to the Goolma Road intersection which may be of assistance.

Regards
Dennis

Dennis Valantine
Senior Traffic Engineer
Infrastructure Strategy & Design | Dubbo Regional Council
P 02 6801 4930 | M 0418 244 350
Dennis.Valantine@dubbo.nsw.gov.au
http://dubbo.nsw.gov.au

How was your experience today? Click an icon to let us know!

We acknowledge the Wiradjuri people, the traditional custodians of the land. We pay respects to Elders past, present and emerging of the Wiradjuri Nation.

From: James North <james.north@ampyrenergy.com>
Sent: Monday, 5 June 2023 11:30 AM
To: Dennis Valantine <Dennis.Valantine@dubbo.nsw.gov.au>
Cc: Claire Burnes <cburnes@emmconsulting.com.au>
Subject: RE: Wellington South BESS - Entrance Concept Discussion

Hi Dennis,

Would you be able to confirm your team is happy with the design of the entrance point as attached and previously shared?

Cheers,

James North | Project Manager - BESS Development
mobile +61 456 596 745
email james.north@ampyrenergy.com
AMPYR Australia Pty Ltd
38 Young Street, Sydney NSW 2000, Australia
www.ampyrenergy.com

From: James North
Sent: Tuesday, May 30, 2023 2:13 PM
To: dennis.valantine@dubbo.nsw.gov.au
Cc: Claire Burnes <cburnes@emmconsulting.com.au>
Subject: RE: Wellington South BESS - Entrance Concept Discussion

Hi Dennis,

Thanks for your message a bit over a week ago. Hope you're feeling well.

I was calling regarding two items.

Firstly, I'd appreciate your email feedback regarding the entrance way drawings we sent on 12/5/23. As I understand it, your team is happy with it, just wanted to confirm via email.

Secondly, would you be available for a quick chat around the scenario we'd face if the Uungula Wind Farm doesn't go ahead? On teams would be good as I'd be able to talk you through the maps/drawings available.

Cheers,

James North | Project Manager - BESS Development
mobile +61 456 596 745
email james.north@ampyrenergy.com
AMPYR Australia Pty Ltd
38 Young Street, Sydney NSW 2000, Australia
www.ampyrenergy.com

From: James North
Sent: Friday, May 12, 2023 8:52 AM
To: dennis.valantine@dubbo.nsw.gov.au

Abdullah Uddin

From: Andrew McIntyre <Andrew.McIntyre@transport.nsw.gov.au>
Sent: Friday, 7 October 2022 2:22 PM
To: Abdullah Uddin
Cc: James North; Development West; Dennis.Valantine@dubbo.nsw.gov.au; May Patterson; Damien Pfeiffer
Subject: FW: WST21/00231/02: RE: Uungula Wind Farm - Goolma Road/ Twelve Mile Road intersection upgrade
Attachments: Appendix B - Goolma Road&SiteAccessIntersection.pdf; Appendix C - Goolma Road&TwelveMileRdIntersection.pdf; J210534_WellingtonBESS_Scoping-Report_V3.0.pdf; TfNSW Response to request for SEARS for Wellington South BESS.pdf

Dear Abdullah

Thanks for your time on the phone earlier this week.

As discussed, TfNSW's strong preference is for BESS vehicular access to be obtained from Twelve Mile Road. The proposed realigned intersection of Twelve Mile/Goolma Road will provide a safe location to enter and exit Goolma Rd. The new intersection location is on a straight alignment of road and will achieve safe intersection sight distance. If it is not possible for the BESS to obtain access to Twelve Mile Rd, we can look at the proposal put forward by EMM further, however, as discussed, TfNSW would not support the proposed intersection over lapping and/or in close proximity to the existing Twelve Mile/Goolma Rd intersection. Also as discussed, the super elevation of the curve and vertical clearance, whilst not insurmountable, present significant challenges to the design and build cost. Any changes to the existing Goolma/Twelve Mile intersection without the new realigned intersection being built, would require community consultation.

TfNSW would welcome the opportunity to review your EIS and TIA and in this regard, supports the EIS being placed on public exhibition.

Regards

Andrew McIntyre
Manager, Development Services
West Region
Transport for NSW

T 0417 431 982
E andrew.mcintyre@transport.nsw.gov.au

transport.nsw.gov.au
Level 1, 51-55 Currajong Street, Parkes

From: Andrew McIntyre
Sent: Wednesday, 28 September 2022 4:31 PM
To: Abdullah Uddin <auddin@emmconsulting.com.au>; Development West <development.west@transport.nsw.gov.au>
Cc: Claire Burnes <cburnes@emmconsulting.com.au>; May Patterson <May.Patterson@planning.nsw.gov.au>
Subject: FW: WST21/00231/02: RE: Uungula Wind Farm - Goolma Road/ Twelve Mile Road intersection upgrade

Dear Abdullah

Thanks for your email and apologies for the delay in my response.

An access intersection on Goolma Road (MR 633) at the location proposed to service the BESS is not supported by TfNSW and TfNSW would not grant its concurrence pursuant to section 138(2) of the Roads Act 1993 for the access as proposed. As previously advised, direct vehicular access to the BESS from Goolma Road is problematic due to the sight distance limitations, challenging topography and alignment and proximity to and conflict with the existing Twelve Mile Rd/Goolma Rd intersection. In this regard, TfNSW cannot be confident that safe access can be provided directly from Goolma Road without significant works potentially involving earth works and road realignment, if at all.

In this regard, TfNSW confirms that safe access can be provided to the site via the proposed realigned Twelve Mile Road and its proposed intersection with Goolma Road. Whilst this work is proposed to be undertaken by the proponent of the Uungula Wind Farm, it does not prevent another party from undertaking this work. TfNSW notes that the road reserve for the realigned Twelve Mile Road has already been secured and gazetted for road purposes by Dubbo Regional Council. As highlighted in our response to SEARs attached, The TIA submitted as part of the EIS will need to demonstrate whether the proposed intersection treatment proposed as part of the Twelve Mile Road realignment can accommodate the cumulative traffic impacts generated by all users of the Twelve Mile/Goolma Road intersection, including traffic generated by the Wellington BESS, and, include measures to ensure the intersection can accommodate additional traffic generated by the BESS.

Regards

Andrew McIntyre
Manager, Development Services
West Region
Transport for NSW

T 0417 431 982
E andrew.mcintyre@transport.nsw.gov.au

transport.nsw.gov.au
Level 1, 51-55 Currajong Street, Parkes

From: Abdullah Uddin <auddin@emmconsulting.com.au>
Sent: Friday, 23 September 2022 1:45 PM
To: Andrew McIntyre <Andrew.McIntyre@transport.nsw.gov.au>; Development West <development.west@transport.nsw.gov.au>

Cc: Claire Burnes <cburnes@emmconsulting.com.au>
Subject: FW: Uungula Wind Farm - Goolma Road/ Twelve Mile Road intersection upgrade

Good afternoon Andrew

I am following up my email below on the draft concept plans proposed as part of this project.

Unfortunately DPIE will not release the traffic report for public exhibition, until we receive feedback from TfNSW on the draft concept plans. The project is on hold for this reason which is extremely frustrating as we are trying our level best to get a response from TfNSW.

In summary (please refer to the attachments):

1. Scoping report
2. Appendix B – Goolma Road/ Site access intersection concept plan
3. Appendix C – Goolma Road/ Twelve Mile Road intersection (this will only be required if Uungula Wind Farm does not proceed).

I am happy to run though both the plans at a Teams meeting if it is convenient. Please let me know.

Reiterating my previous point, would you kindly respond to this email so that the our traffic report could be released by DPIE for public exhibition where you will get a chance to formally respond to our traffic report.

Best Regards

Abdullah Uddin
Associate Traffic Engineer | National Technical Leader - Transport
CPEng, RPEQ

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SYDNEY | Ground floor, 20 Chandos Street, St Leonards NSW 2065

From: Abdullah Uddin
Sent: Monday, 25 July 2022 3:18 PM
To: Andrew McIntyre <Andrew.McIntyre@transport.nsw.gov.au>
Cc: Claire Burnes <cburnes@emmconsulting.com.au>
Subject: FW: Uungula Wind Farm - Goolma Road/ Twelve Mile Road intersection upgrade

Good afternoon Andrew

Appendix B
Concept plan

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A1

WARNING:
UTILITY SERVICES HAVE NOT BEEN SHOWN. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ACCURATELY LOCATE AND PROTECT SERVICES WITHIN THE ROAD RESERVE OR DRAINAGE EASEMENT.

DIAL BEFORE YOU DIG www.1100.com.au

NOTE:
The CHR(s) has been designed according to standards specified in Austroads Guide to Road Design Part 4A. Distances have been taken with a design speed of 110km/h, according to Table A4.

PLAN
SCALE 1:500

FINALISATION OF THE DESIGN WILL BE BASED ON "AS EXECUTED DRAWINGS" OR DESIGN PLANS FROM THE UUNGULA PROJECT.

FOR APPROVAL

SHEET INDEX

SHEET No	DESCRIPTION	REV
EMM - C01	PROPOSED LAYOUT	A
EMM - C02	CONCEPT SWEPT PATH	A
EMM - C03	CONCEPT SISD	A
EMM - C04	CONCEPT PROPOSED INTERNAL LAYOUT PLAN	A

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Ground Floor
20 Chandos Street,
St Leonards NSW 2065

Phone # 02 9493 9500

www.emmconsulting.com.au

REV	DATE	COMMENT	DRAWN	REVIEWED
A	04/05/23	COUNCIL COMMENTS CHR(s)	C.J.	A.U.
-	21/04/23	FOR COMMENT	C.J.	A.U.

PROJECT:
GOOLMA ROAD AND TWELVE MILE ROAD, WUULUMAN - CONCEPT INTERSECTION/ACCESS DESIGNS.

DRAWING TITLE:
PROPOSED LAYOUT

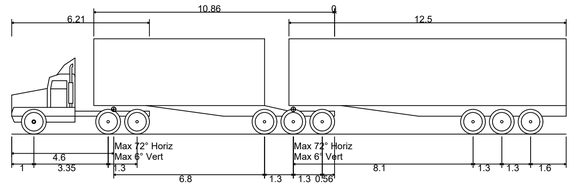
CLIENT: AMPYR Energy
DRG. #: EMM - C01
PROJECT #: J210534
SCALE: AS SHOWN

REV: A

A1

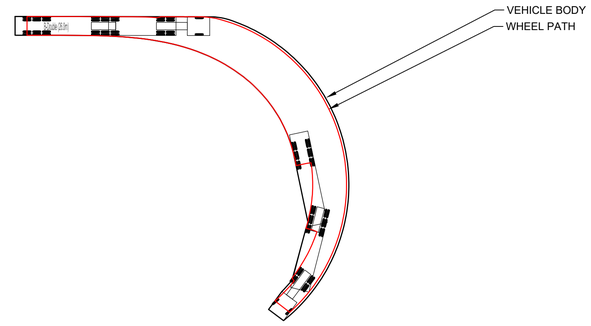
SWEPT PATH 26m B-DOUBLE

SCALE 1:400



B-Double (26.0m)

Overall Length	26.000m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.540m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	15.000m



The turning paths illustrated in this drawing have been prepared using the Autotrack vehicle modelling software in conjunction with AutoCAD. The vehicle model was prepared by Analytico Pty Ltd based upon vehicle data provided by Austroads. While this modelling represents a conservative assessment of the vehicles ability, it is not possible to account for all vehicle types/characteristics or driver ability.

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REV	DATE	COMMENT	DRAWN	REVIEWED
A	04/05/23	COUNCIL COMMENTS CHR(s)	C.J.	A.U.
-	21/04/23	FOR COMMENT	C.J.	A.U.

PROJECT:

GOOLMA ROAD AND TWELVE MILE ROAD, WUULUMAN - CONCEPT INTERSECTION/ACCESS DESIGNS.

DRAWING TITLE:

CONCEPT SWEPT PATHS

CLIENT: AMPYR Energy

DRG. #: EMM - C02

PROJECT #: J210534

SCALE: AS SHOWN

REV: A

A1

PLAN
SCALE 1:1000

LEGEND

SITE LINE SISD 300m

NOTES:
1. Design speed is 110km/h.
2. Reaction time is 2.5sec
3. SISD 300m as shown in Austroads Guide to Road Design Part 4A Table 3.2

WARNING:
UTILITY SERVICES HAVE NOT BEEN SHOWN. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ACCURATELY LOCATE AND PROTECT SERVICES WITHIN THE ROAD RESERVE OR DRAINAGE EASEMENT.

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A	04/05/23	COUNCIL COMMENTS CHR(s)	C.J.	A.U.					
-	21/04/23	FOR COMMENT	C.J.	A.U.					

PROJECT:
GOOLMA ROAD AND TWELVE MILE ROAD, WUULUMAN - CONCEPT INTERSECTION/ACCESS DESIGNS.

DRAWING TITLE:
CONCEPT SISD

CLIENT: AMPYR Energy
DRG. #: EMM - C03
PROJECT #: J210534
SCALE: AS SHOWN

REV: A

A1

PLAN
SCALE 1:1000

WARNING:
UTILITY SERVICES HAVE NOT BEEN SHOWN. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ACCURATELY LOCATE AND PROTECT SERVICES WITHIN THE ROAD RESERVE OR DRAINAGE EASEMENT.

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A	04/05/23	COUNCIL COMMENTS CHR(s)	C.J.	A.U.					
-	21/04/23	FOR COMMENT	C.J.	A.U.					

PROJECT:
GOOLMA ROAD AND TWELVE MILE ROAD, WUULUMAN - CONCEPT INTERSECTION/ACCESS DESIGNS.

DRAWING TITLE:
CONCEPT PROPOSED INTERNAL LAYOUT PLAN

CLIENT: AMPYR Energy
DRG. #: EMM - C04
PROJECT #: J210534
SCALE: AS SHOWN

REV: A

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