

# APPENDIX I TRAFFIC IMPACT ASSESSMENT

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Issued via email: [angelene.mc@nghenvironmental.com.au](mailto:angelene.mc@nghenvironmental.com.au)

Dear Angelene

## Maxwell Solar Farm – Traffic Impact Assessment

Amber has been asked to assess the traffic matters of the proposed Maxwell Solar Farm ('the proposal') located approximately 10 kilometres south of Muswellbrook, New South Wales. The proposal is located within Malabar Coal Ltd's Maxwell Infrastructure site, notably on a portion of the rehabilitated Drayton open-cut mine. The proposal is proposed to have a capacity of 25 megawatts and will supply electricity to the Maxwell Infrastructure site and/or the Maxwell Underground and/or the National Energy Market. Access to the proposal will be provided via Thomas Mitchell Drive, which connects with New England Highway to the east and Denman Road to the west, which are both under the care and management of Roads and Maritime Services (RMS).

This report has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs), and assesses the traffic impacts of the proposal.

## 1. Existing Conditions

### 1.1 Road Network

Thomas Mitchell Drive is a local road that runs in a northwest-southeast alignment between Denman Road and New England Highway. It accommodates one lane of traffic in each direction and has a sealed width of approximately 7.0 metres. It provides access to the Mt Arthur Mine, the Muswellbrook Industrial Area, and the Maxwell Infrastructure site, and has a posted speed limit of 80km/hr. The intersection of Thomas Mitchell Drive with the site access is priority controlled, with Channelised Right Turn (CHR) and Auxiliary Left Turn (AUL) turning treatments provided for vehicles turning into the site.

Denman Road is a State Arterial Road under the care and management of RMS. It runs in a northeast-southwest alignment between its continuation as Sydney Street in Muswellbrook, and its continuation as Golden Highway in Denman. It accommodates one lane of traffic in each direction and has a sealed width of approximately 7.0 metres. It has a posted speed limit of 100 km/h, reducing to 80 km/h east of Bengalla Road. The intersection of Denman Road with Thomas Mitchell Drive is priority controlled with a Give Way sign provided for vehicles exiting Thomas Mitchell Drive. An Auxiliary Left Turn (AUL) turning treatment is provided for vehicles turning into Thomas Mitchell Drive, and widening of the northbound carriageway allows northbound vehicles to pass around vehicles waiting to turn right into Thomas Mitchell Drive. Condition 47(c) of the Project Approval for the Mt Arthur Coal Mine Open Cut



Consolidation Project requires upgrading of the intersection of Denman Road and Thomas Mitchell Drive by the end of December 2019.

New England Highway is also a State Arterial Road under the care and management of RMS. It runs in a northwest-southeast alignment from Newcastle to Muswellbrook, before running in a northern alignment to its termination at the Queensland Border. Within the vicinity of the site, it typically accommodates one lane of traffic in each direction and has a sealed width of approximately 14 metres. It has a speed limit of 100km/hr. The intersection of New England Road with Thomas Mitchell Drive is a seagull intersection with a Give Way sign provided for vehicles exiting Thomas Mitchell Drive. Channelised deceleration lanes are provided for vehicles turning into Thomas Mitchell Drive, and acceleration lanes are provided for vehicles turning into New England Highway in both directions. Vehicles turning right into Thomas Mitchell Drive have priority over those turning left into Thomas Mitchell Drive, which are provided with a Give Way signed slip lane.

## 2. Future Projects

Malabar Coal Ltd (Malabar) is the sole owner of the proposal. Malabar is also progressing the approval of the Maxwell Underground Project to the south A Road Transport Assessment has been prepared by The Transport Planning Partnership (TPP) to accompany the Development Application for the Maxwell Underground Project. The TPP document includes the following:

- An assessment of the likely transport impacts of the Maxwell Underground Project on the capacity, condition, safety and efficiency of the road and rail networks, including undertaking a road safety audit; and
- A traffic analysis of major/relevant intersections impacted using SIDRA, including the intersection of Thomas Mitchell Drive with the site access, New England Highway, and Denman Road.

The Road Safety Assessment analysis within TPP's report also includes the traffic generated by the proposal and should be read in conjunction with the following assessment. (TPP's report has been referred to as the Maxwell Underground Project Report within this document.)

## 3. Traffic Generation

On average, approximately two trucks will access the proposed site per day during the construction period. The delivery trucks will predominantly be Truck and Dog vehicles, with a number of mixer trucks and Articulated Vehicles (AV as defined within AS 2890.2:2009). The AVs will occasionally be used to transport larger plant such as the PV panels. During the peak solar panel construction period, it is estimated that a total of 10 heavy vehicles will access the site per day, in addition to 50 passenger vehicles. Accordingly, the site is expected to generate approximately 20 heavy vehicle movements and 100 passenger vehicle movements per day during the peak construction period of the proposal. Table 1 summarises the traffic movements generate during the peak construction period of the proposal.

**Table 1: Traffic Generation During Peak Construction Periods**

Vehicle Type	Vehicle Movements per Day
Light Vehicles - Workforce	90
Light Vehicles - Visitors, Consultants	10
Semi-Trailer/Heavy Vehicle	16
Cranes	4
<b>Total</b>	<b>120</b>

The heavy vehicles will all access the site from Newcastle, excluding the cranes which will access the site from Muswellbrook, and light vehicles will access the site via the following locations:

- 30% Muswellbrook LGA;
- 30% Singleton LGA;
- 30% Upper Hunter;
- 10% Newcastle.

Operating traffic volumes will be significantly less than that generated during construction, with approximately 10 vehicle movements generated per day.

A detailed breakdown of the peak hour traffic movements during construction and operating times is provided within the Maxwell Underground Project Report within Section 4.1.2.

#### 4. Appropriateness of Access Roads

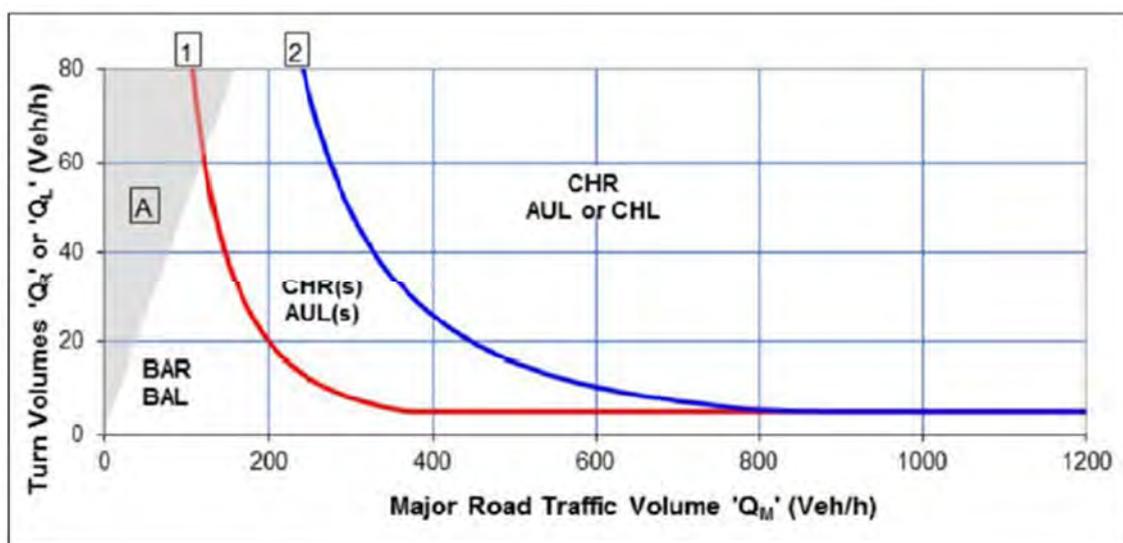
Both Denman Road and New England Highway are rated to accommodate B-Double trucks as outlined within the RMS Restricted Access Vehicles Map. Thomas Mitchell Drive services the larger vehicles that access the existing Maxwell Infrastructure site and is also rated for B-Double trucks. Therefore, the roads are able to accommodate the vehicle sizes that are proposed for the construction and operation of the proposal.

#### 5. Intersection Assessment

##### 5.1 Turning Treatment

*Austrroads Guide to Traffic Management Part 6: Intersections, Interchanges, and Crossings* specifies the turning treatments required at intersections. Figure 2.26 of the guide, shown below in Figure 1, specifies the required turn treatments on the major road at unsignalised intersections, and is provided below for a design speed of greater than or equal to 100km/hr.

Figure 1: Figure 2.26 of *Austrroads Guide to Traffic Management Part 6*



The intersections of Thomas Mitchell Drive with the site access is provided with CHR and AUL turning treatments, and the intersection of Thomas Mitchell Drive with New England Highway is provided with CHR and Channelised Left Turn (CHL) turning treatments. As the maximum required turning



treatments are currently provided at the relevant intersections no upgrades are required to the intersections.

Condition 47(c) of the Project Approval for the Mt Arthur Coal Mine Open Cut Consolidation Project requires upgrading of the intersection of Denman Road and Thomas Mitchell Drive by the end of December 2019. The planned upgrade of the intersection would be designed in accordance with current guidelines and is therefore expected to provide a safe environment for all users, but notably for drivers turning right from Thomas Mitchell Drive by reducing delays to those vehicles.

A detailed assessment of the cumulative turning volumes and required turning treatments is provided within the Maxwell Underground Project Report.

## 6. Traffic Generation

Assuming 10% of the total vehicle movements for the solar farm site occur during the peak hours, then there will be approximately 12 vehicle movements during construction in the peak hours.

Given the low level of traffic generated by the proposal, and that the traffic generation will be significantly lower during normal operations, it is concluded that the small increase in traffic will be readily accommodated by the surrounding road network and would be within the daily variation in traffic movements at the nearby intersections.

The Maxwell Underground Project Report provides a detailed SIDRA analysis of the traffic network within the vicinity of the site, including the intersections of Thomas Mitchell Drive / New England Highway and Thomas Mitchell Drive / Denman Road, and the capacity of the local and classified road network to safely and efficiently cater for the additional traffic generated by the proposal during both the construction and operational stages. The assessment also includes the cumulative traffic impact of other proposed developments in the area.

The Maxwell Underground Project Report provides an assessment of the existing road network (2018) based on traffic surveys. It also describes the expected changes to traffic conditions in the region during the construction phases of the Maxwell Underground Project (expected to be in 2020, 2026 and 2033), together with the cumulative impact of other approved and planned developments.

The performance of the key intersections for the above scenarios is provided within Section 5.2 of the Maxwell Underground Project Report, and concludes the following:

*'Table 5.2 indicates that, as for the baseline analyses (Table 4.13), the intersections are expected to operate at good levels of service with short delays and spare capacity, with the exception of the intersection of Thomas Mitchell Drive and Denman Road. As noted, this intersection is expected to be upgraded prior to the Project initial construction phase in accordance with Condition 47(c) of the Project Approval for the Mt Arthur Coal Mine Open Cut Consolidation Project. While the details of the intended design are not known, it is expected that a seagull intersection arrangement is likely, given that the right turn exit movement from Thomas Mitchell Drive is already operating close to capacity. As a guide, the forecast future evening peak hour traffic volumes with the Project during Project Year 6 have been separately assessed on the assumption that the intersection is upgraded to a similar layout as the existing intersection of Thomas Mitchell Drive and New England Highway. Under this arrangement, the level of service would be A.'*

The performance of the road midblock for the above scenarios is provided within Section 5.3 of the Maxwell Underground Project Report, and concludes the following:

*'The Project would therefore have only minor impacts on the midblock levels of service experienced by drivers on Thomas Mitchell Drive in the short to medium term. In the long-*



*term, the Project traffic would not impact levels of service on Thomas Mitchell Drive compared with those conditions expected without the Project.'*

Therefore, it is concluded that the proposal and the cumulative impacts of other developments would have minor or no impact on the midblock levels of service experienced by drivers on Thomas Mitchell Drive. The key intersections which would be used by the proposal's traffic are expected to operate at good levels of service with short delays and spare capacity without requiring upgrading, with the exception of Denman Road and Thomas Mitchell Drive intersection which is planned to be upgraded by others regardless of the proposal.

## 7. Road Safety

The road crash history outlined within the Maxwell Underground Project Report did not identify any causation factors associated with the existing road network that may be exacerbated by increased traffic demands. Further, the Road Safety Audit of existing conditions on Thomas Mitchell Drive between Denman Road and New England Highway did not highlight any particular road safety concerns regarding the basic road alignment or width characteristics of Thomas Mitchell Drive. In addition, no specific road safety issues were identified at the intersection of Thomas Mitchell Drive and the site access road.

The Road Safety Audit found one item with a high-risk rating, relating to the shared cycle and turn lane on the New England Highway approach to Thomas Mitchell Drive. Due to the high-speed environment on New England Highway, the intersection design should ideally consider the NSW best practice for crossing points at off-ramps of motorways (RTA, 2005) which includes a designated bicycle lane to the left of the left turn lane, with a designated point for the bicycle through movements to cross the left turn lane. Any improvements to meet best practice are the responsibility of RMS, being the authority responsible for New England Highway.

The majority of the medium risk items are located in the vicinity of the intersection of Thomas Mitchell Drive with Denman Road, and in the vicinity of the Muswellbrook Industrial Area. These items typically relate to a lack of road line marking and protection barriers to roadside structures that pose a risk for errant drivers. The other medium and low risk rating issues may be appropriately addressed by Muswellbrook Shire Council, being the authority responsible for Thomas Mitchell Drive, or RMS, being the authority responsible for New England Highway.

## 8. Conclusions

Amber has assessed the traffic matters of the Maxwell Solar Farm project to address the Secretary's Environmental Assessment Requirements. The assessment has been undertaken in conjunction with the Road Transport Assessment prepared by The Transport Planning Partnership for the Maxwell Underground Project, which provides a detailed traffic analysis of the cumulative projects in the area and a Road Safety Audit. The conclusions of both assessments in relation to the proposal are summarised below:

- The SIDRA analysis presented within the Maxwell Underground Project Report indicates the intersections in the vicinity of the site are expected to operate at good levels of service with short delays and spare capacity, with the exception of the intersection of Thomas Mitchell Drive and Denman Road, which is expected to be upgraded prior to the project initial construction phase in accordance with Condition 47(c) of the Project Approval for the Mt Arthur Coal Mine Open Cut Consolidation Project;
- The cumulative impact of the projects in the area would have only minor impacts on the midblock levels of service experienced by drivers on Thomas Mitchell Drive;
- The intersections of Thomas Mitchell Drive with the proposal's site access, and the New England Highway meet the design requirements of the Austroads Guidelines. The intersection of Thomas



Mitchell Drive with Denman Road is expected to meet the requirements following the intersection upgrade;

- The proposal is not expected to generate any traffic safety concerns assuming the adoption of the recommendations provided within the Road Safety Audit.

Accordingly, based on the above assessment and the findings presented in the Maxwell Underground Project Report, it is concluded that the road network is able to readily accommodate the traffic volumes generated by the proposal during both the construction and operation phase, and the development will have a minimal impact on the surrounding road environment.

A response to the traffic matters raised within the SEARs is provided within Appendix A.

If you have any questions please feel free to contact the undersigned.

Yours sincerely  
**Amber Organisation**

A handwritten signature in black ink, appearing to read 'M Willson'.

**Michael Willson**  
**Director**

Attach: Appendix A – Response to SEARs



## Appendix A

### SEARs Response



Requirements	Comments
<b>SEARs Transport Requirements</b>	
An assessment of the peak and average traffic generation, including over-dimensional vehicles and construction worker transportation.	The proposal will generate approximately 12 vehicle movements during construction in the peak hours, assuming 10% of the total vehicle movements for the site occur during the peak hours. Given the low level of traffic generated by the site, and that the traffic generation will be significantly lower during typical operation, it is concluded that the small increase in traffic will be able to be readily accommodated by the surrounding road network and would be within the daily variation in traffic movements at the nearby intersections.
An assessment of the likely transport impacts to the site access route (including Thomas Mitchell Drive, New England Highway and Denman Road), site access point, rail safety issues, any Crown land, particularly in relation to the capacity and condition of the roads.	<p>The Maxwell Underground Project Report provides a detailed SIDRA analysis of the traffic network within the vicinity of the site, including the intersections of Thomas Mitchell Drive with New England Highway, Denman Road, and the site access. The report concludes the intersections are expected to operate at good levels of service with short delays and spare capacity, with the exception of the intersection of Thomas Mitchell Drive and Denman Road, which is expected to be upgraded prior to the project's initial construction phase.</p> <p>A Road Safety Audit has been prepared as part of the Maxwell Underground Project Report, which makes a number of recommendations with regards to the condition of the roads and may be appropriately addressed by Muswellbrook Shire Council, being the authority responsible for Thomas Mitchell Drive, or RMS, being the authority responsible for New England Highway.</p>
A cumulative impact assessment of traffic from nearby developments.	The SIDRA assessment includes the cumulative traffic impacts of the nearby developments.
A description of any proposed road upgrades developed in consultation with the relevant road and rail authorities (if required).	Excluding the upgrade of Thomas Mitchell Drive and Denman Road, the results of the assessment do not require any future road upgrades.
A description of the measures that would be implemented to mitigate any transport impacts during construction.	No mitigating measures are required as part of the proposal.
<b>RMS Requirements</b>	
Assessment of all relevant vehicular traffic routes and intersections for access to / from the subject properties.	The above assessment and the Maxwell Underground Project Report suitably address the relevant traffic routes and intersections for vehicle access to the proposal.
Current traffic counts for all of the traffic routes and intersections.	Traffic surveys and recent traffic volumes/counts are presented within the Maxwell Underground Project Report for the traffic route.
The distribution on the road network of the trips generated by the proposed development. It is requested that the predicted traffic flows are shown diagrammatically to a level of detail sufficient for easy interpretation.	The number of trips generated by the proposal and the traffic distribution is detailed within Section 4.1.2 of the Maxwell Underground Project Report.



<p>Consideration of the traffic impacts on existing and proposed intersections, in particular, the intersections of Thomas Mitchell Drive / New England Highway and Thomas Mitchell Drive / Denman Road, and the capacity of the local and classified road network to safely and efficiently cater for the additional vehicular traffic generated by the proposed development during both the construction and operational stages. The traffic impact shall also include the cumulative traffic impact of other proposed developments in the area.</p>	<p>The Maxwell Underground Project Report provides a detailed SIDRA analysis of the traffic network within the vicinity of the site, including the intersections of Thomas Mitchell Drive with New England Highway, Denman Road, and the site access. The report concludes the intersections are expected to operate at good levels of service with short delays and spare capacity, with the exception of the intersection of Thomas Mitchell Drive and Denman Road, which is expected to be upgraded prior to the proposals initial construction phase. The SIDRA assessment includes the cumulative traffic impacts of the nearby developments.</p>
<p>Identify the necessary road network infrastructure upgrades that are required to maintain existing levels of service on both the local and classified road network for the development. In this regard, preliminary concept drawings shall be submitted with the EIS for any identified road infrastructure upgrades. However, it should be noted that any identified road infrastructure upgrades will need to be to the satisfaction of Roads and Maritime and Council.</p>	<p>Excluding the upgrade of Thomas Mitchell Drive and Denman Road, the results of the assessment do not require any future road upgrades.</p>
<p>Traffic analysis of any major / relevant intersections impacted, using SIDRA or similar traffic model, including:</p> <ul style="list-style-type: none"> <li>- Current traffic counts and 10 year traffic growth projections</li> <li>- With and without development scenarios</li> <li>- 95th percentile back of queue lengths</li> <li>- Delays and level of service on all legs for the relevant intersections</li> <li>- Electronic data for Roads and Maritime review.</li> </ul>	<p>The Maxwell Underground Project Report provides an assessment of the existing road network (2018) based on traffic surveys. It also describes the expected changes to traffic conditions in the region during the construction phases of the Maxwell Underground Project (expected to be in 2020, 2026 and 2033), together with the cumulative impact of other approved and planned developments. Whilst the assessment doesn't present the specific 10-year period for the proposal it is considered suitable for determining the impacts of the proposal in the future. The report provides detailed outputs of the SIDRA analysis, including; 95<sup>th</sup> percentile back of queue lengths, delays, and levels of service. The electronic data has been provided to RMS for comment.</p>
<p>Any other impacts on the regional and state road network including consideration of pedestrian, cyclist and public transport facilities and provision for service vehicles.</p>	<p>A Road Safety Audit has been prepared as part of the Maxwell Underground Project Report, which makes a number of recommendations with regards to the condition of the roads and may be appropriately addressed by Muswellbrook Shire Council, being the authority responsible for Thomas Mitchell Drive, or RMS, being the authority responsible for New England Highway.</p>
<b>Council Requirements</b>	
<p>A traffic impact assessment should be prepared in relation to the project, which investigates the effect of additional traffic movements associated with the construction, operational and decommissioning phases of the project on the local and regional road network.</p>	<p>The above assessment and the Maxwell Underground Project Report suitably address this requirement.</p>