Traffic Impact Assessment

Viewbank Solar Farm

V190240

Prepared for
ERM Melbourne

31 July 2020

Cardno

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Document Information

Prepared for	ERM Melbourne
Project Name	Viewbank Solar Farm
File Reference	V190240REP001F03.docx
Job Reference	V190240
Date	31 July 2020
Version Number	F03
Effective Date	31/07/2020
Date Approved	31/07/2020

Document History

Version	Effective Date	Description of Revision	Prepared by	Reviewed by
D01	12/05/2020	Draft	Jesse Howell	Luke Smith
F01	30/06/2020	Final	Jesse Howell	Luke Smith
F02	3/07/2020	Final	Jesse Howell	Luke Smith
F03	31/07/2020	Final (minor amendments)	Jesse Howell	Luke Smith

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Appendices

Tables

Figures

1 Introduction

Cardno has been engaged by ERM Melbourne to prepare a Traffic Impact Assessment for the development and operation of the proposed Viewbank Solar Farm project.

At the time of writing, the Viewbank Solar Farm project is expected to incorporates 172,368 solar modules, equivalent to a capacity of 75MW (AC).

This report has been prepared in collaboration between Cardno and ERM Melbourne; with some details based on a best estimate, and others advised by ERM Melbourne.

2 Subject Site

2.1 Location

The proposed Viewbank Solar Farm site is located approximately 30 kilometres west of Mooroopna / Shepperton, and 40 kilometres south-east of Echuca.

The proposed solar farm is proposed to be constructed at 90 McCague Road in Girgarre East. The subject site also borders Midland Highway to the south, McEwen Road to the west and Poole Road to the east.

The site itself extends across approximately 217 hectares of land across multiple land holdings. The site is primarily vacant and has historically been used for farming.

2.1.1 McCague Road

McCague Road is a Council road aligned in an east-west direction along the northern boundary of the site. McCague Road is aligned between at McEwen Road in the west and Kyabram-Cooma Road in the east. In the vicinity of the site, McCague Road has been constructed with a single un-sealed carriageway in the order of 5.5 metres.

A rural 100 km/h default speed limit of applies on McCague Road in the vicinity of the site.

2.1.2 Poole Road

Poole Road is a Council road aligned in a north-south direction along the eastern boundary of the site. Poole Road is aligned between at Midlands Highway to the south and Craddock Road to the north. In the vicinity of the site, Poole Road has been constructed with a single un-sealed carriageway in the order of 4.0 metres.

A rural 100 km/h default speed limit of applies on Poole Road in the vicinity of the site.

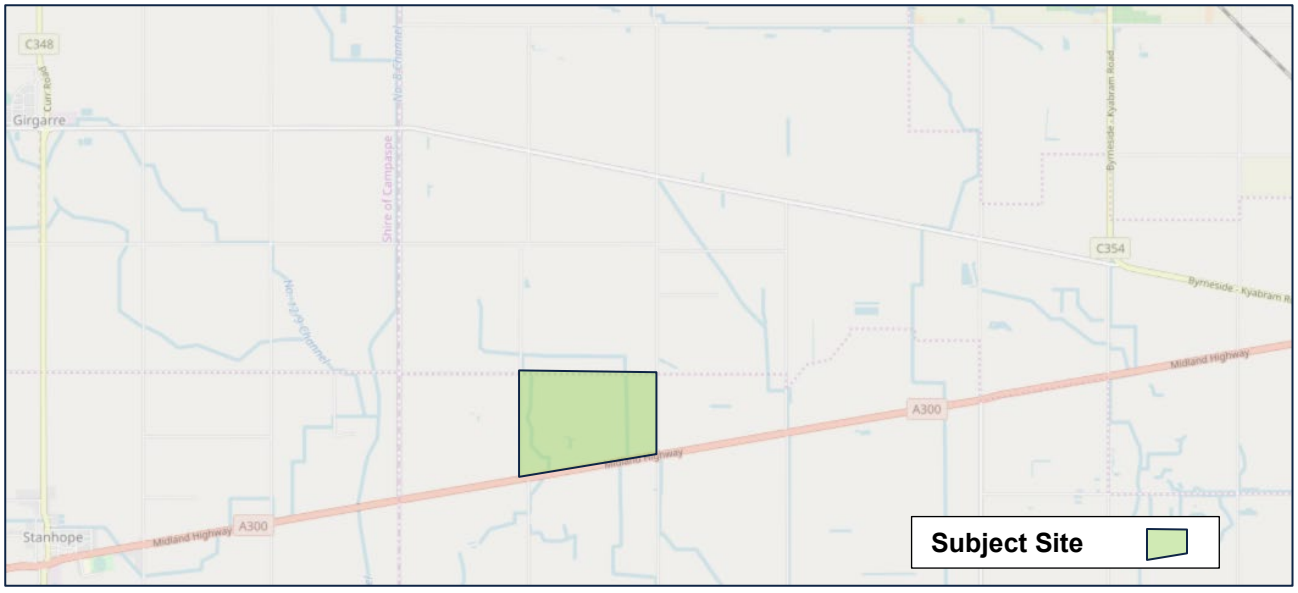
2.1.3 Midland Highway (A300)

Midland Highway is a VicRoads controlled state arterial road which extends from Bendigo (south-west) to Shepparton in the east. In the vicinity of the site, Midland Highway has been constructed with a single two-lane sealed carriageway in the order of 7.5 metres with unsealed shoulders (which vary in width).

A rural 100 km/h default speed limit of applies on Midland Highway in the vicinity of the site.

The subject site is illustrated in Figure 2-1.

Figure 2-1 Site Locality



2.2 Site Context

The topography of the site is relatively flat and featureless with vegetation generally limited to areas around the road or trees and shrubs.

An irrigation creek runs east-west through the site.

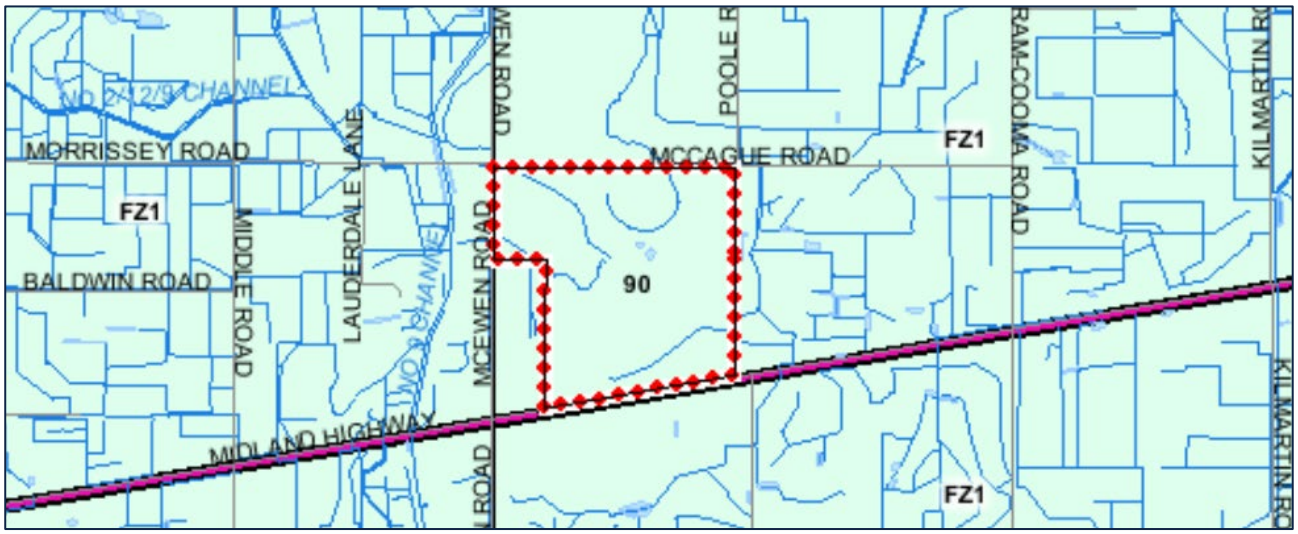
2.3 Planning Policy Context

2.3.1 Planning Context

The site sits within the Greater Shepparton local government area (LGA). All land within the site is designated as Farming Zone – Schedule 1 (FZ1), with no specific planning overlays applicable to this area of land.

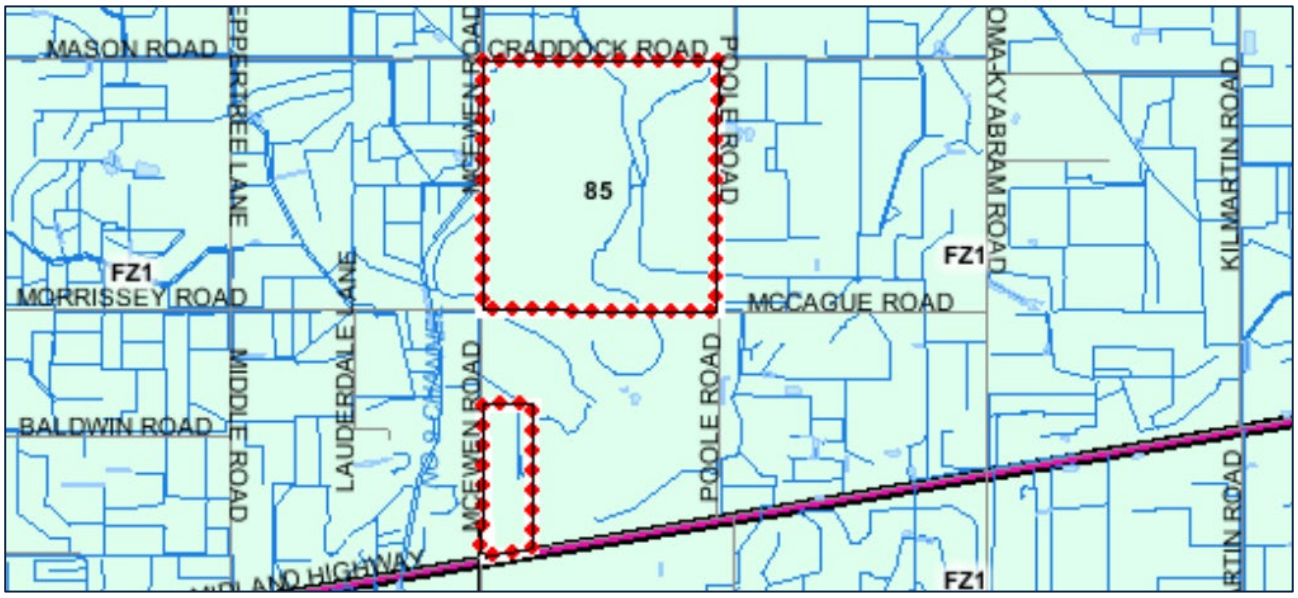
Zoning overlays that apply to both sites and surrounding areas are shown in Figure 2-2 and Figure 2-3.

Figure 2-2 Planning Zone for 90 McCague Road, Girgarre East



Source: Vicplan

Figure 2-3 Planning Zone for 85 McCague Road, Cooma



Source: Vicplan

2.3.2 Planning Framework

2.3.2.1 Clause 35.07 – Farming Zone

A Solar Farm facility is a Section 2 use within the Farming Zone, subject to meeting the requirements of Clause 53.13.

Relevant to access for the Solar Farm facility, in considering an application for use, building and works, the decision guidelines listed under 35.07-6 include:

> *How the use and development makes use of existing infrastructure and services.*

2.3.2.2 Clause 53.13 – Renewable Energy Facility (Other than wind energy facility and geothermal energy extraction)

Clause 53.13 of the Greater Shepparton Planning Scheme outlines the relevant application requirements associated with the development of a renewable energy facility (other than Wind Farm). Relevant to traffic and access matters, considerations under Clause 53.13 include:

> Assessment of the effect of traffic to be generated on roads (53.13-2).

2.4 Public Transport Network

2.4.1 Public Transport Services

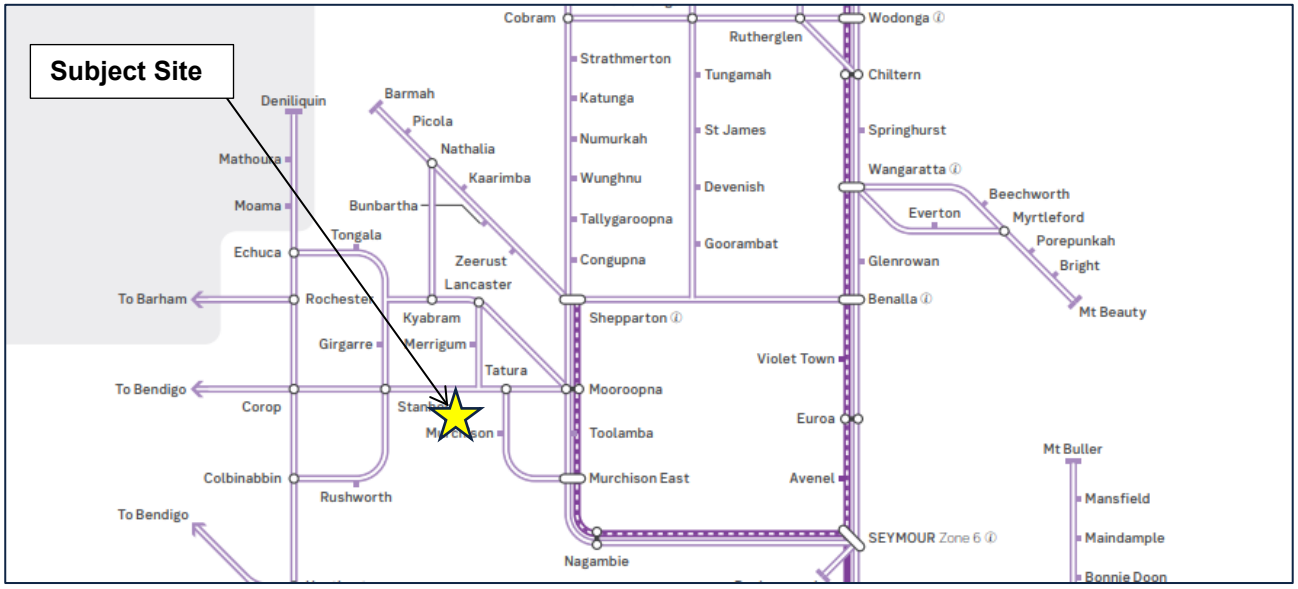
There is no dedicated public transport in the vicinity of the subject site.

V/Line services run to Shepparton/Mooroopna (approximately 30 kilometres to the west) along the Shepparton – Melbourne Line.

Tatura Railway Station and Merrigum Railway Station are both closed, with Kyabram Railway Station used only for freight trains and not for passenger services.

The subject site in context to the broader transport network is shown in Figure 2-4.

Figure 2-4 PTV – North Eastern Victoria (train and coach network)



Source – PTV Victorian Train Network Map

2.4.2 Active Transport

There is currently no dedicated-on road bicycle or pedestrian facilities in the vicinity of the subject site.

2.5 Traffic Data

2.5.1 Current Traffic Volumes

Traffic volume data obtained from Department of Transport Open Data Traffic Volume viewer indicate that current daily traffic volumes on the Midland Highway (A300) in the vicinity of the site are in the order of 2,700 vehicles per day.

A breakdown of the following daily vehicle movements is shown in Table 2-1.

Table 2-1 Annual Average Daily Traffic

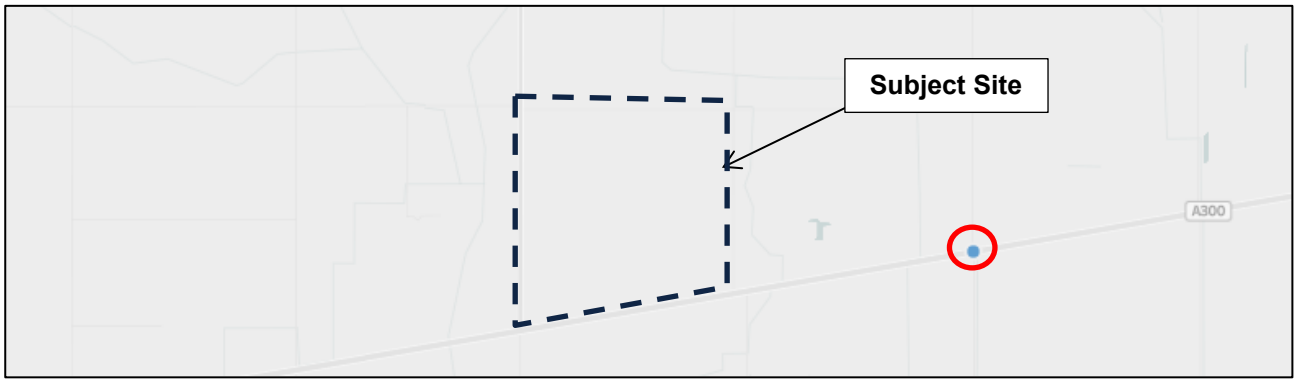
Road Name	Direction	AADT (one-way)	% Heavy Vehicles	Peak Hour Volumes*
Midland Highway (between Brand Street and Brewer Road)	Eastbound	1,400 vpd	18% (250 vpd)	140 vph
	Westbound	1,300 vpd	18% (236 vpd)	130 vph

**Peak hour volumes are assumed to be 10% of the daily AADT volumes*

2.5.2 CrashStats

VicRoads' CrashStats data provides locations and general information regarding road crashes within Victoria. An overview of the last 5 years (2014 to 2018) located within the surrounding road network is shown below in Figure 2-5.

Figure 2-5 Map of CrashStats Locations



Source – VicRoads CrashStats

An assessment of the reported crashes in the vicinity of the subject site for the period of 2014-2018 shows that:

- One (1) crashes occurred in this period; and
- The one crash was a serious injury crash, involving two (2) people.

3 Proposed Development

3.1 Viewbank Solar Farm Description

The project will consist of a solar energy facility comprising up to 172,368 solar modules. It is expected that the combined solar panels will have an expected capacity to generate approximately 76MW.

A substation is proposed to be located in the south-east corner of the site (above Midlands Highway). This substation will connect the solar farm to the electricity network, with no additional substation works proposed on-site. A BESS (Battery Energy Storage System) will also be located on site, north of the site substation.

A series of gravel access roads will provide access around the site, and to the solar modules. These will be accessed from Poole Road (major access) with an additional access point on McEwen Road (emergency access only). Approximately 6.5 kilometres of gravel access roads will be constructed, with a width in the order of four (4) metres. It is expected that all external public roads will be able to adequately cater for movements generated by the proposed development, and as such no major upgrades or improvements are being contemplated to external roads. Site access arrangement and potential upgrade works too Poole Road (if required) is further discussed in Section 5.

A dedicated car park has been proposed north of the office building with, the ability to use the internal access tracks as required. The proposed concept layout of the Viewbank Solar Farm is shown in Figure 3-1.

Figure 3-1 Indicative Site Layout

3.2 Site Access

The proposed site access points are illustrated in Figure 3-1 and discussed further below.

3.2.1 Construction Site Access

Site access during construction is proposed to be via Poole Road and is proposed to be approximately 130m north of Midland Highway. As the traffic volume along Poole Road is expected to be very low, it is unlikely that construction vehicles will queue back onto Poole Road. Further analysis will likely be completed as part of a Traffic Management Plan following confirmation of source material locations, construction methodology and schedule of works.

The proposed access is located on a straight section of road and is expected to achieve relevant sight distance requirements. Refer to Section 5.1.1 for further discussion on sight distance requirements.

3.2.2 Operational Site Access

General site access post construction will be provided along Poole Road at the original construction access and can be expected to accommodate 2 to 3 staff and approximately 4 to 6 daily movements. The additional access point on McEwen Road will be retained as an emergency access point for the site.

3.3 Construction Materials Delivery

The following sections below detail the access routes / roads for deliveries of the required typical construction materials.

3.3.1 Solar Module / Substation Components

Solar Farm componentry including solar modules, panels, substation componentry, etc. is likely to be sourced from overseas via the Port of Melbourne.

The anticipated potential haulage routes for heavy vehicles, are as follows:

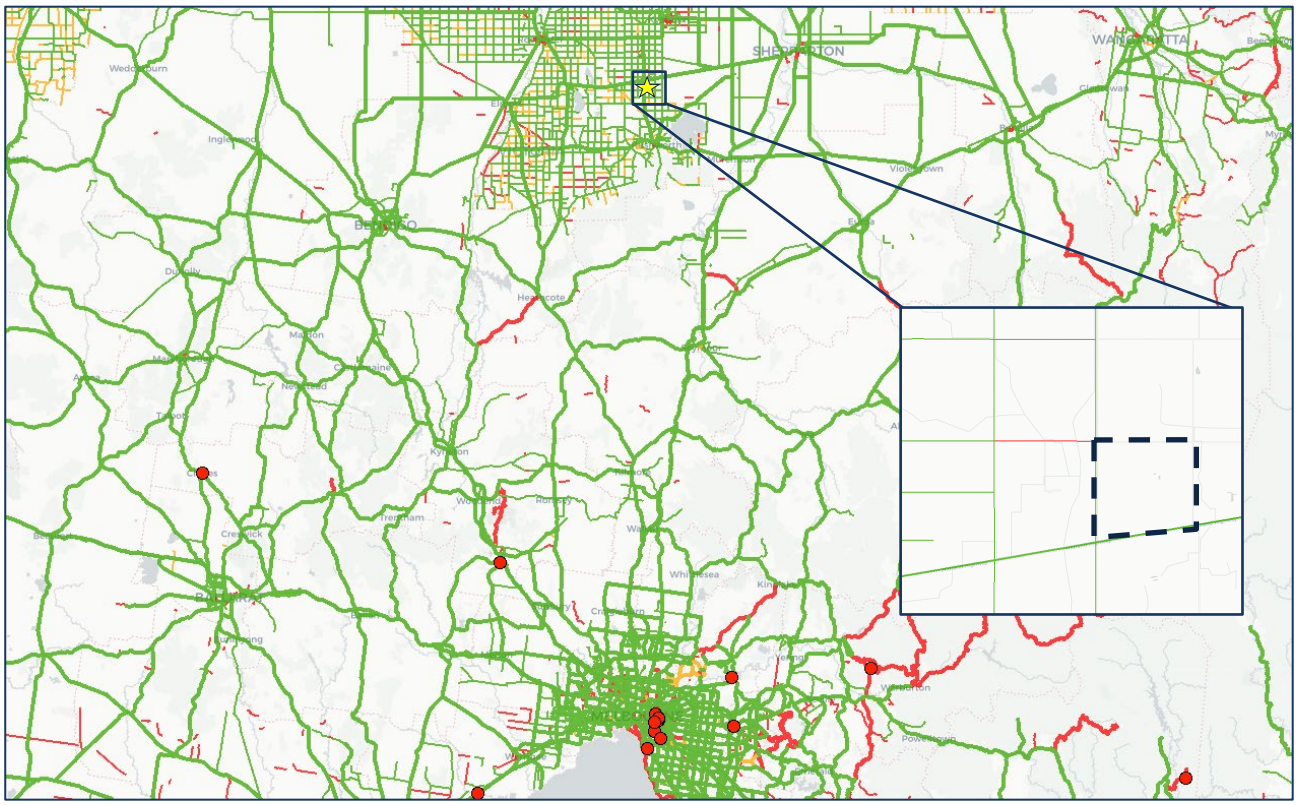
Melbourne:

Port of Melbourne, Footscray Road, West Gate Freeway, Western Ring Road, Hume Freeway, Goulburn Valley Freeway, High Road, Bendigo-Murchsion Road, Gigarre-Rushworth Road, Midland Highway, Poole Road and Site Access.

In addition, all these roads are VicRoads pre-approved B-Double routes, inclusive of the Council controlled McEwen Road. Noting that Poole Road is not, therefore additional upgrade works may be required on the short section of road from Midlands Highway to the site access.

A map of Victoria showing the currently approved B-Double network is shown on the following page in Figure 3-2.

Figure 3-2 VicRoads gazetted B-Double Network



Source – VicRoads B-Double network map

3.3.2 Coarse Aggregate and Fine Crushed Gravel

Cardno has been advised by ERM that both coarse and fine gravel for the construction of hardstand areas and access tracks is likely to be sourced from a local quarry or supplier (confirmed at a later date). They will generally access the site via Midland Highway and other local roads as required.

There is a potential for soil to be reused throughout the site to minimise external trips.

3.3.3 Water Deliveries

It is understood that dust settling water deliveries will be used during the dryer months of construction. This water will likely be sourced locally from Shepperton-Mooroopna or Stanhope via the local road network.

3.4 Construction Staff

During the delivery of the project, staff will more than likely be accommodated in Shepperton-Mooroopna (approximately 35 kilometres to the north-east) or other local towns including Stanhope or Tatura. They will access the site via Goulburn Valley Highway, Midland Highway and Poole Road.

4 Traffic Generation

4.1 Construction Phase

4.1.1 Adopted Solar Farm Delivery Timeframes

It is understood that the various work phases will potentially overlap with each other and be undertaken in tandem. It is also understood that the Solar Panel component delivery and erection is to commence reasonably soon after the completion of the initial site access works. Based on the advice from ERM, a detailed construction timeframe is still to be proposed however is likely to be constructed within 14 months. The main phases of the project are listed below:

- Site Mobilisation;
- Site Set-up / Access Roads; and
- PV Plant Delivery and Erection.

4.1.2 Material Assumptions

4.1.2.1 Access Roads and Hardstand Areas

Advice from ERM outlines that access roads and hardstand area works will comprise of:

- Approximately 16.5 kilometres of internal access gravel roads, with typical pavement widths in the order of 4 metres, and depth of 0.2 metres;
- Laydown and hardstand areas for the switch substation is proposed to be 70m by 42m; and
- Laydown and hardstand areas for the BESS is proposed to be 40m by 50m.

4.1.2.2 Substation, BESS and Solar Module Components

The solar modules will comprise the following components:

- Photovoltaic (PV) modules;
- Tracker Systems and Mounting Posts;
- Inverter Stations; and
- Cabling.

It is noted that a majority of Solar Module components will be transported to the site by shipping containers.

4.1.3 External Solar Farm Construction Traffic Generation

External traffic generated by the site will be split across two broad categories:

- General traffic generated by staff travelling to / from the site (i.e. utes, vans and private cars); and
- Other heavy vehicles (HV) which are used for the delivery of the solar panel components and construction materials such as aggregate, etc.

Indicative peak construction staff numbers of 150 (approximate) were advised by ERM. Therefore, it has conservatively been assumed that staff will access the site via private vehicle with an average occupancy of 1.5 persons per vehicle.

A summary of the estimated peak daily site traffic volumes is detailed in Table 4-1.

Table 4-1 Viewbank Solar Farm Estimated Peak Total External Vehicle Movements

Phase	Staff Movements	Heavy Vehicle Movements	Total (AADT)*
Peak (one-way traffic)	200 vpd (100 vpd)	60 vpd (30 vpd)	260 vpd (130 vpd)

**Assumes a 6 day working week during construction activities*

As detailed above, the Viewbank Solar Farm is expected to generate in the order of 260 additional daily traffic movements during the peak construction period. During peak construction 23% of the total daily traffic or 60 vehicle movements are expected to be heavy vehicle traffic; it is noted that the peak construction period will likely only be a small portion of the total construction period.

This level of traffic can be expected to be absorbed with minimal impact on the surrounding road network, particularly given the short period of time for peak construction.

4.2 Operational Phase

For the majority of time, solar farms operate with limited maintenance staff and generate minimal traffic movements. Accordingly, apart from the initial construction phase, the proposal is anticipated to have a negligible impact upon traffic on the local road network. Details of likely traffic generation during operation are as follows:

- The Viewbank Solar Farm will generally have a site manager plus two to three additional staff on-site. To conservatively assume four staff on site this would equate to approximately 8 vehicle movements (four per peak hour);
- Routine maintenance and servicing to be carried out by one or two people on an ad hoc basis. It will be assumed that the daily traffic generation will not exceed two to four vehicle movements per day (maintenance/service days only) to the local road network, with all other movements being internal to the site; and
- Occasional engineering maintenance will occur when components of the development need to be replaced, such as replacing solar modules or tracker systems. This is expected to only occur very occasionally, and will have no discernible impact on the external road network.

5 Mitigation Works

5.1 Site Access Management

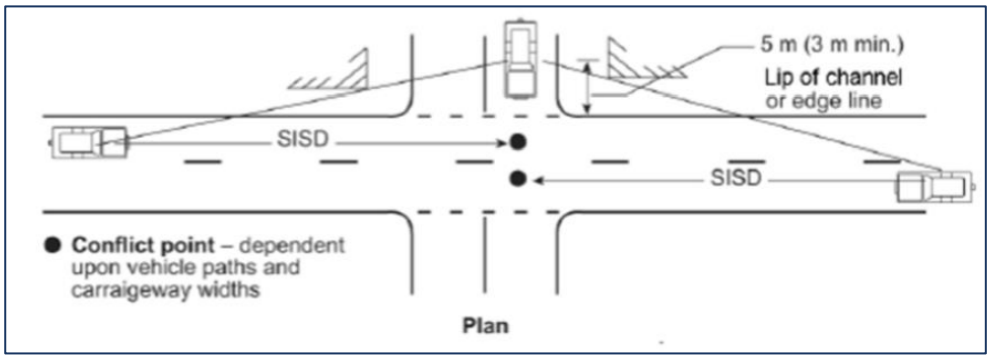
5.1.1 Site Distance Requirements

The following sets out an assessment of the proposed site access point onto Poole Road and the emergency access to McEwen Road against the relevant sections of Austroads Guide to Road Design Part 4A: "Unsignalised and Signalised Intersections" (2017).

During the construction phase, a speed limit of 60 km/h along Poole Road and McEwen Road (when required) is proposed which will minimise the risk of potential conflict between vehicles entering or exiting Viewbank Solar Farm.

The application of Safe Intersection Sight Distance (SISD) is shown in Figure 5-1 and summarised in Table 5-1.

Figure 5-1 Application of SISD



Source: Austroads Guide to Road Design Part 4A

Table 5-1 SISD Assessment

Criteria	Poole Road		McEwen Road	
	Northbound	Southbound	Northbound	Southbound
SISD (60 km/hr)*	123m	123m	123m	123m
SISD (100 km/hr)	248m	248m	248m	248m
Available Sight Distance	> 250m	Approx. 140m	> 250m	> 250m

**Speed reduced to 60km/hr near sight access during construction period*

Based on a desktop review, access to the site can be provided with appropriate sight distance requirements for speeds at 60km/hr and 100k/hr onto Poole Road and McEwen Road. Noting that the 140m available to southbound traffic on Poole Road is to Midland Highway where turning vehicles would be visible.

5.1.2 Turning Treatments

Due to the relatively short construction period and low post development volumes anticipated (as discussed in Section 4 of this report), major intersection upgrade works are not proposed or considered warranted. Minor access upgrade works can be seen in Appendix A for access to Poole Road from Midland Highway.

5.2 Construction Traffic Management

5.2.1 Post Permit Approvals

If a Planning Permit for Viewbank Solar Farm is issued, a detailed Traffic Management Plan (TMP) report can be prepared detailing how delivery and construction related vehicle movements (including Heavy Vehicle, Over Dimensional and Over Size Over Mass vehicles) may be managed to the satisfaction of Council and/or other relevant Authorities.

Any requirements to maintain road use for construction purposes will be assessed and managed to the satisfaction of Council and/or VicRoads.

5.2.2 Hours of Operation

Cardno has been advised that in order to minimise risk due to construction traffic, working hours are to be generally limited to daylight hours (6:00am – 6:00pm Monday – Sunday).

5.2.3 School Buses

Before the construction starts, local and regional schools will be consulted for current bus timetables on the relevant construction traffic routes. Suitable windows of inactivity (curfew times) will be arranged in agreement with the relevant schools and Greater Shepperton Council, which applies to both Heavy Vehicles and Over-dimensional deliveries.

5.2.4 Internal Site Management

An internal management strategy will be established within the subject site. This strategy will form part of the sites induction that will be undertaken by all personnel on-site.

The following key items are likely to be implemented:

- 20km/h speed limit on internal roads;
- Radio communication between construction vehicles available at all times;
- Flashing lights to be fitted and utilised by construction vehicles;
- All loads to be correctly restrained; and
- Warning signage to be provided in critical areas/intersection points.

6 Conclusion

In consideration of the foregoing, it is noted that:

- Access during construction is proposed to be via a new access point along Poole Road. Post construction, the Poole Road access will be used as general access to the site. The secondary access point on McEwen Road will be used as an emergency access point for the site.
- All construction materials are to be sourced externally. Aggregate for road pavement and hardstand areas is likely to be sourced locally from within the Greater Shepperton Council region, whilst the Solar Farm components are to be sourced from Melbourne (shipped from overseas);
- At the time of peak construction activity, external Solar Farm traffic will add approximately 260 vehicles movements per day (60 heavy vehicle trips);
- Having consideration for the relatively short construction periods and the classification/use of these roads, the anticipated expected traffic to be generated by the site should be reasonably accommodated with minimal impact; and
- Traffic management strategies will be implemented to minimise the impact of construction deliveries to the local traffic network and ensure that construction activities can be managed safely.

Based on this Traffic Impact Assessment, Cardno is of the opinion that the proposed Viewbank Solar Farm will have minimal impact to the operation of the existing road network.

Potential upgrade works and traffic management plans associated with construction impacts will be determined at a future stage, in consultation with VicRoads and the Greater Shepperton Council. Accordingly, a detailed Traffic Management Plan will be required at a later stage once all locations of materials and a detailed schedule of works has been completed (following any planning permit approval(s)).

APPENDIX

A

SWEPT PATH ASSESSMENT

BY: User:glenn.carey
DATE PLOTTED: 05/14/20 17:19:13
CAD File: C:\Users\glenn.carey\Desktop\V190240_Girgarre_East_Solar_Farm\Traffic\Drafting\03 Sketches\01 CAD\V190240-TR-SK-01.dgn

MIDLAND HIGHWAY

26m B-DOUBLE INGRESS SWEPT PATH

26m B-DOUBLE EGRESS SWEPT PATH

PROPOSED SOLAR FARM

PROPOSED SOLAR FARM ACCESS

WIDEN

WIDEN

POOLE ROAD

REPAIR AS REQUIRED

WIDEN ROAD TO PROVIDE FOR TRUCK PASSING AND TO SQUARE-UP SIGHT-LINES TO ONCOMING TRAFFIC

REPOSITION GIVE-WAY SIGN

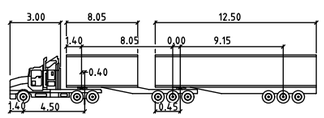
CORNER FENCE POST

MIDLAND HIGHWAY

N

VICROADS DIRECTORY 32 B9

DESIGN VEHICLES



AUSTROADS B-DOUBLE 26M

Width	:2.50 m	Lock to Lock Time	:6.0 sec
Track	:2.50 m	Steering Angle	:23.4 deg
K-to-K Turn Diam	:25.1 m	Articulating Angle	:70.0 deg

0.5m CLEARANCE LINE SHOWN
DOTTED ON ALL SWEPT PATHS

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CLIENT NAME
GIRGARRE EAST SOLAR FARM
POOLE ROAD, GIRGARRE EAST
SWEPT PATH CHECK
26m B-DOUBLE

Drawn/Check	Date	Scale	Size
GC / JH	14.05.2020	1:500	A3

Drawing Number: V190240-TR-SK-01
Revision: 1