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Barnawartha Solar Farm and Energy Storage

DRAFT ENVIRONMENTAL MANAGEMENT PLAN

Barnawartha Pty Ltd

Revision 2

7 July 2022

ARP Australian Solar Pty. ltd

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Document control record

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1 Introduction

1.1 Project Background

Aurecon Australasia Pty Ltd (Aurecon) was commissioned by ARP Australian Solar Pty Ltd (ARP) and Wirsol Energy to conduct the necessary environmental assessments to support the preparation and lodgement of a planning permit application for the development of a renewable energy facility. This included the development of a Draft Environmental Management Plan (EMP).

The project entity is known as Barnawartha Solar Pty Ltd. Wirsol Energy are co-developing the Barnawartha Solar Farm and Energy Storage (the Project) with ARP Australia Solar (ARP).

The Project includes the development of a ~64 Megawatt (MW) Alternating Current (AC) Solar Farm and accompanying ~64 MW battery storage facility project located 4 kilometres (km) northeast of Barnawartha in northern Victoria. The Project consists of the following key components:

- A 64 MW AC Solar Energy and Energy Storage Facility and ancillary uses:
  - A Utility Installation (64 MW battery storage, underground cabling, inverters, substations)
  - Panels will be fitted on a single axis tracker system moving east to west during the day. All mounting will be pile driven, reducing the need for concrete
  - No. ~148,000 solar panels of ~600Wp each
- Number of inverters will be confirmed during grid connection process
- The transmission line will be above ground and to the east of Lady Franklin Road will utilise existing overhead poles within the road reserve. The eastern portion of the transmission line route (east of Lady Franklin Road) will require new poles and lines on land immediately south of the road reserve, within an existing Wodonga City Council easement. The overhead powerlines will connect (via) to the substation to the east for connection into the National Electricity Grid
- Associated buildings and works (access tracks, construction compounds, worker office and amenities buildings)
- Security and safety fencing
- Site parking, internal access roads and drainage
- Temporary construction compound and lay down area

This EMP was developed following the completion of desktop and field-based environmental assessments and determines the management measures required to address the significant environmental aspects of the project in the construction and operation phases.

1.2 Purpose and objectives

This Environmental Management Plan (EMP) is required to support a Planning Permit application in accordance with VPP Clause 53.13 Renewable energy facilities. This EMP describes how the Project might impact on human health, amenity, and the environment. It sets out control measures and responsibilities for implementing these measures that detail how those impacts will be avoided, minimised, and/or managed so that they are environmentally acceptable.

This EMP includes the following:

- Description of the project, including key construction and operational activities;
- Roles and responsibilities for the project;
- Relevant legislation and policy requirements;

- Monitoring, auditing, and reporting processes to ensure continual improvement over the lifecycle of the Project;
- Risk register that details significant environmental risks to the environment and measures to address significant project risks and opportunities.

1.3 Project Location

The subject site comprises approximately 131.57 hectares (ha) of land, located at 49 Hermitage Road, Barnawartha (see Figure 1-1). The site is located 20 km west of the regional city of Wodonga and approximately 4 km northeast of the Barnawartha township. The site sits either side of Hermitage Road and is bound by Murray Valley Highway on the northern boundary and Baxter-Whelans Road on the southern boundary. The land parcel is generally flat terrain.

The overhead cable route is proposed to exit the land at the southeasternmost point, and follow Baxter-Whelans Road in an east-west orientation to the Barnawartha Sub Station, located approximately 2.5 km to the east of the Project area. The Project site is located within a Farming Zone, and is bordered on the northern side by a Transport Zone - Schdule 2 - Principal road network (TRZ2) under the Indigo Planning Scheme. Various other farming uses surround the site.

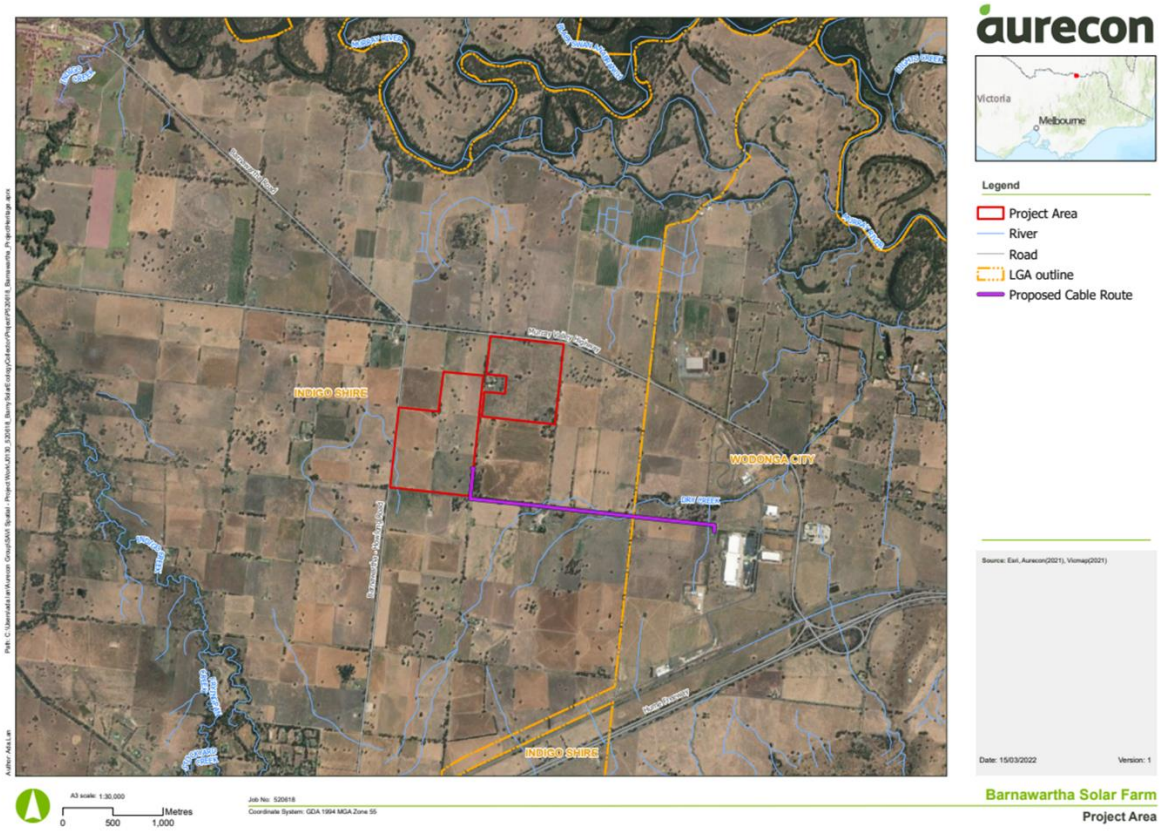

Figure 1-1: Site location

1.4 Proponent

The Project entity is known as Barnawartha Solar Pty Ltd. Wirsol Energy are co-developing the Project with ARP.

Wirsol Energy is behind one of the largest solar and battery projects in Victoria so far, Gannawarra Solar Farm in north west Victoria which it co-developed with Edify Energy.

Wirsol Energy is a long-term owner and developer of a portfolio of more than 700MW projects across Australia. They currently have a 400MW portfolio of completed projects including Wemen, Clermont, Whitsunday, Hamilton, and Gannawarra Solar Farms and have recently delivered the 149MW Glenrowan West Solar Farm in Glenrowan, Victoria. Our vision is to continue to develop out a portfolio

of inclusive Renewable Energy Power Stations to support the decarbonisation of Australia and the rest of the globe.

ARP has been developing utility scale renewable energy projects since 2013 and is passionate about driving a cleaner and more sustainable future. They work with communities to ensure projects are tailored to suit the local environment and deliver clean renewable energy.

ARP and Wirsol will be engaging third party operators to construct (Contractor) and operate (Operator) the proposed facility. The Contractor and Operator will have responsibilities under this EMP, or develop their own subsequent environmental management plans that are aligned with this EMP.

1.5 Assumptions and limitations

The following assumptions and limitations apply to this document:

- This document has been developed to support a Planning Permit application in accordance with VPP Clause 53.13 Renewable energy facilities. Changes may be required to address:
  - Specific Contractor (once appointed) environmental systems and processes under which they operate;
  - Any design and construction changes (e.g. changes during detailed design to the layout and/or construction methodologies).
- This CEMP does not include Site Environmental Implementation Plans, as these are to be developed by the Contractor delivering the works. These plans include site-specific environmental control measures to be implemented, including drawings. These 'live' plans should be updated regularly to reflect current construction staging, and include:
  - Location and scope of works and site activities;
  - Environmental values and/or features (such as protected trees, heritage structures, cultural heritage sites, sensitive receptors, waterways, etc.) requiring environmental controls;
  - Environmental controls, including drawing showing where these will be installed (e.g. tree protection zones, erosion and sediment control measures, no-go zones, sensitive receptors, etc.)

2 Construction activities

2.1 Construction details

The methodology, program and timing of the construction works are currently indicative and are dependent upon planning approvals. It is anticipated that the construction activities will take place over a 12- to 18-month timeframe and occur in two main phases.

Construction will include the following activities, which may be conducted in a different order than listed:

- Site mobilisation and preparatory civil works;
- Road access improvements;
- Installation of perimeter fencing around the Project area;
- Site preparation, including temporary construction offices, temporary compound facilities, parking areas, laydown areas, and service connections;
- Minor earthworks involving minor grading and trimming, construction of internal site access tracks, installation of erosion and sediment controls, and installation of firebreaks around the perimeter of the Project area;
- Installation of arrays and associated electrical infrastructure;
- Delivery of PV modules, trackers, electrical conduits, and balance of equipment;
- Installation of piles for the structural support of the individual trackers;
- Fixing of modules and trackers;
- Positioning of junction boxes, inverters and transformers;
- Connection of required cabling;
- Construction of the transmission line;
- Grid connection;
- Commissioning;
- Restoration and demobilisation;
- Restorative work;
- Landscape planting;
- Demobilisation.

2.2 Traffic and site access

Site access for heavy construction vehicles is proposed from Hermitage Road via Baxter-Whelans Road from the east. The preferred delivery movements during construction are to arrive at the proposed solar energy facility via Hermitage Road via Baxter-Wheelan Road, Logic Boulevard and Murray Valley Highway, off the Hume Freeway.

During operational phase, staff access routes to the proposed solar energy facility will therefore be via the Murray Valley Highway to Hermitage Road or via the Hume Freeway then Barnawartha – Howlong Road and then Baxter-Whelans Road to access the site entrances on Hermitage Road.

2.3 Site office and laydown

The location of the laydown area and construction site office is shown in Appendix A. It is anticipated that the construction site facilities area will include the following facilities, however this will be determined prior to construction commencing:

- Site amenities (site shed, toilet facilities, etc.);
- Above ground fuel storage tanks;
- Waste and recyclable receptacles;
- Parking spaces;
- Laydown areas.

2.4 Perimeter fence and security

A suitable security fence will follow the perimeter of the Project area to ensure safety and reduce the risk of theft or vandalism. Lighting design will be high efficiency and used minimally when not required. The perimeter fence will make provision to keep out both small and large animals.

Rodent prevention measures will also be employed to avoid damage to wiring and other necessary plant equipment.

2.5 Equipment deliveries

The principal material being delivered during construction will include solar panels, inverters, transformers, framing systems, and materials for internal road construction.

2.6 Construction hours

Construction activities will occur between the hours of 7am and 6pm Monday to Friday and 7am to 1pm on Saturdays, in accordance with EPA Publication 1834 Civil construction, building and demolition guide.

No construction activities will occur outside these hours, on Sundays, or on Public Holidays, except in nominated exceptional circumstances, including:

- **Low-noise impact works**: these are inherently quiet or unobtrusive, for example, manual painting, internal fit-outs, and cabling. Low-noise works do not have intrusive characteristics such as impulsive noise or tonal movement alarms.
- **Managed-impact works**: works where the noise emissions are managed through actions specified in a Noise and Vibration Management Plan (may be part of a broader environmental management plan), to minimise impacts on sensitive receivers.
- **Unavoidable works**: works which pose an unacceptable risk to life or property or a major traffic hazard and can be justified. Includes an activity which has commenced but cannot be stopped. You will need to demonstrate that planned unavoidable works cannot be reasonably moved to normal work hours.

3 Operation activities

The solar farm is anticipated to be operational for a period of up to 40 years. During this time the Project will be operated and maintained by an Operator who will ensure the Project is maintained safely and to a standard which is fit-for-purpose. As the solar farm can be operated remotely, the number of staff required at site is likely to be minimal.

Staff will be required to attend the site periodically to conduct inspections, undertake scheduled maintenance and to respond to any faults or equipment failure and on-site activities are likely to include the following:

- PV module cleaning with high pressure water. No detergent or cleaning additive is permitted. Water will be provided either by the rainwater tanks or mains supply;
- Dry brush cleaning of the power stations across the site to remove dust;
- Routine inspections of equipment;
- Replacement of modules and repair of inverters as required; and
- Greasing gear mechanisms on the tracker motors.

Required maintenance will generally only involve light vehicles transporting the staff to and from site. From time to time there may be requirements for major repairs (e.g. replacing inverters and transformers) and although larger vehicles may be required at these times, this work would be undertaken with specialist support.

In addition to the routine equipment maintenance, other environmental aspects requiring monitoring and control, include the following:

- Management of pest animal infestations (e.g. rabbits, foxes, feral dogs, and cats);
- Weed management through regular spraying. The frequency will be determined by the contractor;
- Regular monitoring of ground cover to minimise potential for sediment laden run-off leaving the site;
- Managing fuel loads as a bushfire prevention measure.

4 Roles and responsibilities

4.1 Key personnel

The key staff and associated environmental responsibilities are outlined in Table 4-1 below.

Table 4-1: Staff roles and responsibilities

Key Staff / Contact	Responsibilities
Site General Manager (**GM**) [Contact details to be added once known]	▪ Provide clear expectations and guidelines for environmental performance ▪ Monitor the implementation of the EMP and Project approval conditions ▪ Ensure resources are provided to implement the ARP and Wirsol EMS (environmental management system) ▪ Review of the Owner environmental policy if required
Environment Representative (**ER**) – [Contact details to be added once known]	▪ Maintain register of legal and other regulatory requirements ▪ Maintain environmental aspects register ▪ Review environmental objectives, targets and management strategies ▪ Implement all procedures and processes identified in this EMP ▪ Ensure all personnel undertaking works on site attend a site induction and understand their obligations as specified in this EMP ▪ Undertake at least weekly inspections of work activities, including completion of a Weekly Inspection Checklist ▪ Complete monthly internal compliance audits ▪ Liaise with stakeholders, including regulatory agencies and the community ▪ Maintain all documentation required by this EMP ▪ Constantly monitor adherence to the environmental management practices as required by this EMP ▪ Conduct investigations of any incident or complaint that occurs and implement appropriate corrective actions ▪ Ensure any non-conformance and improvement opportunities are correctly implemented within a prescribed timeframe and closed out ▪ Ensure incident, non-conformance and complaints registers are maintained up to date ▪ Report any incidents requiring reporting to the Authorising Authority to the Owner

Project Manager (Construction) **(PM) –** [Contact details to be added once known]	▪ Work collaboratively with the Environment Representative in ensuring construction activities are undertaken in accordance with the requirements of the EMP ▪ Management representative for implementation of the environmental management system ▪ Oversee environmental management and risk on the Project ▪ Monitoring performance and consolidated reporting of progress against project KPIs during construction ▪ Implementing measures for environmental competence, training and awareness for all Project staff and contractors ▪ Work collaboratively with the Environment Representative in ensuring construction activities are undertaken in accordance with the requirements of the EMP
Project Construction Manager (**PCM**) – [Contact details to be added once known]	▪ Supervision of all construction activities ▪ Monitoring compliance of construction activities with conditions of Project approvals and the EMP ▪ Prepares for the implementation of the EMS once the Project enters operation ▪ Establishes measures for emergency preparedness and response
Site Operation Manager (**SOM**) - [Contact details to be added once known]	▪ Supervision of all operational activities ▪ Monitoring compliance of activities with conditions of Project approvals, O&M manuals and the EMP ▪ Implements environmental management system and processes ▪ Establishes measures for emergency preparedness and response
All other site personnel and subcontractors	▪ Undertake a general and environmental site induction ▪ Comply with the requirements of the EMP ▪ Report any environmental incidents

4.2 Training and inductions

4.2.1 Site induction

Prior to working on-site, all personnel and subcontractors will attend an environmental induction as part of the site general induction. Staff and contractors will also undertake any job specific training relevant to their role, as well as individuals who have responsibilities relating to specific environmental issues such as noise or dust reduction.

The Environment Representative, or delegate, will prepare and deliver the site general induction. The induction will address a range of issues, including but not limited to:

- Purpose, objectives and key issues outlined in the EMP;
- Legal requirements, including due diligence and duty of care, and consequences of infringements;
- Environmental responsibilities;
- Conditions of licences, permits and approvals;
- Traffic requirements from Traffic Management Plan (TMP) communicating important safety information and any regulatory or permitting requirements;

- Significant environmental issues and areas of the site, including identification of boundaries for vegetation clearance, weed and pest control, location of refuse bins, dust control, refuelling and maintenance of vehicles, plant and equipment;
- Environmental management techniques for key environmental risks (soil and water, waste and recycling, air quality etc.);
- Incident avoidance, management, emergency plans, and response;
- Reporting process for environmental harm/incidents;
- Protection and maintenance of environmental controls.

4.2.2 Toolbox talks

Toolbox Talks will help to ensure that relevant information is communicated to the workforce on a regular basis, most likely on a weekly basis. Toolbox Talks will be prepared and delivered by the Project Construction Manager and safety representatives. The content of Toolbox Talks training sessions will depend on the nature of the work being performed by the EPC Contractor and subcontractors.

4.2.3 Training records

A Training Register will be maintained. This will include the following records:

- Records of attendance of toolbox talks, inductions and awareness training (where required);
- Record of specific environmental training where relevant training is provided.

4.3 Operational phase

The selected contractor will have appropriate environmental systems in place to manage routine maintenance and operations activities. This EMP and the associated subplans provide the minimum requirements for appropriately managing the site during the operational phase.

As with the construction phase, staff working on site will undergo a site induction and Toolbox Talk. Pre-start meetings will be required in the event that maintenance activities require a large number of staff.

The site induction for the operation phase is expected to be similar to that of the construction phase induction and would outline the environmental responsibilities for all staff working on the site.

5 Legal and policy requirements

5.1 Applicable environmental legislation

Key legislative and planning requirements for the environmental management of the Project are listed below (but not limited to):

5.1.1 Commonwealth legislation

- *Aboriginal and Torres Strait Islander Heritage Protection Act 1984*
- *Environment Protection and Biodiversity (EPBC) Act 1999*
  - *Environment Protection and Biodiversity Conservation Regulations 2000*
- *National Environmental Protection (Assessment of Site Contamination) Measure 1999*

5.1.2 Victorian legislation

- *Aboriginal Heritage Act 2006*
  - Aboriginal Heritage Regulations 2018
- *Catchment and Land Protection Act 1994*
- *Dangerous Goods Act 1985*
  - Dangerous Goods (Storage and Handling) Regulations 2000
- *Environment Protection Act 2017*
  - Environment Protection Regulations 2021
  - General Environmental Duty
  - Environmental Reference Standard
- *Flora and Fauna Guarantee Act 1988*
  - Flora and Fauna Guarantee Regulations 2020
- *Heritage Act 2017*
- *Pollution of Waters by Oils and Noxious Substances Act 1986*
- *Planning and Environment Act 1987*
- *Wildlife Act 1975*
- *Water Act 1989*

5.1.3 Guidance Documents

- Applying the Flood Provisions in Planning Schemes (DELWP, 2015)
- Guidelines for the removal, destruction or lopping of native vegetation (DELWP, 2017)
- Guidelines for Development in Flood Affected Areas (DELWP, 2019)
- Guidelines for Renewable Energy Installations (State of Victoria Country Fire Authority, 2019)
- Country Fire Authority: Guidelines for Renewable Energy Installations (CFA, 2021)
- Australian Standard AS 1055 Acoustics – Description and measurement of environmental noise

- EPA Victoria Publication 1834: Civil Construction, Building and Demolition (CCBDG), 2020
- EPA Victoria Publication 1893: Erosion, sediment and dust: treatment train
- EPA Victoria Publication 1826.4: Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues (Noise Protocol)
- EPA Victoria Publication 1894: Managing soil disturbance
- EPA Victoria Publication 1895: Managing stockpiles
- EPA Victoria Publication 1896: Working within or adjacent to waterways
- EPA Victoria Publication 1897: Managing truck and other vehicle movement

6 Reporting and compliance

6.1 Construction phase

6.1.1 Weekly inspections

Inspections will be conducted by the Environment Representative on a weekly basis to assess the adequacy and effectiveness of the environmental controls.

A standard Weekly Inspection Checklist will be completed during the inspection and will be held in an on-site file available for review on request. A Weekly Inspection Checklist is included in Appendix B.

The Environment Representative will maintain copies of the approved EMP (and any relevant sub-plans) on site at all times. Procedures shall be established to produce and maintain Project records that provide objective evidence of the implementation and effectiveness of the EMP.

6.1.2 Monthly compliance audits

The Environment Representative will conduct monthly compliance audits against all requirements of the EMP (and sub-plans) and record results in the Monthly Compliance Report. The Monthly Compliance Report will include, but not be limited to, the following:

- Assessment on the implementation and maintenance of controls, procedures, and documents as per the requirements of the EMP;
- Confirmation that all actions are completed and signed off, or in the process of being completed;
- Confirmation that all reporting requirements, incident investigations and incident close-outs occur in accordance with the EMP;
- Confirmation that there are no outstanding follow-up actions that are yet to be closed off.

A copy of the Monthly Compliance Report will be supplied to the General Manager.

6.1.3 Environmental incidents and complaints

When an environmental incident is detected or a substantiated complaint is received, appropriate action shall be taken immediately to minimise any further impact. Corrective action is to be implemented and an assessment conducted to determine what, if any, preventative action can be taken to prevent an incident of similar nature reoccurring.

All environmental incidents/complaints will be reported to the Construction Project Manager as soon as possible for any incident causing environmental harm.

Initially, a verbal notification is appropriate, however, this is to be followed within 24 hours by an Incident Report and Corrective Action Report.

In the event of a significant incident, the Environment Representative, in consultation with the Construction Project Manager, will report the environmental incident to the General Manager.

The content of the incident report should include:

- Details of the incident;
- Investigations undertaken;
- Impacts identified;
- Corrective actions adopted.

All site personnel have a responsibility to contact the Environment Representative if any environmental incidents are detected during construction and operation.

6.1.4 Incident reporting

Any environmental incident will be recorded in the Environmental Incidents Register which will be maintained throughout the construction period. The register will include details on:

- the date, time, and duration of the incident;
- clarify whether there was material harm to the environment;
- detail the nature of the incident;
- climatic conditions;
- the location of the incident;
- pollutants involved;
- circumstances in which the incident occurred;
- corrective action taken;
- External notification (if required) under the general environmental duty (GED) related to the *Environment Protection Act 2017*.

Any non-compliances/incidents will be addressed and improvement opportunities will be correctly implemented within a prescribed timeframe and closed out. A non-compliance register, resulting from the monthly compliance audits and other third-party audit will be maintained during construction and operation of the Project.

6.1.5 Communication and complaint resolution

Barnawartha Solar Pty Ltd will establish procedures for managing both internal and external communication regarding environmental management and performance of the Project. Barnawartha Solar Pty Ltd will be responsible for any external communications with Regulatory Authorities.

Barnawartha Solar Pty Ltd will, upon notification and details of any complaint received by the Owner, immediately investigate the cause of the complaint and identify actions required to avoid a recurrence. This investigation and reporting back to the Owner will be completed within 14 days of the notification and will be fully documented. A complaints register will be maintained during construction and operation of the project.

Signage which provides the contact details for the appropriate site contacts will be displayed at the site entrance prior to construction commencing.

6.2 Operational phase

The selected contractor will be required to have appropriate systems in place to address the prevention and management of any environmental incidents or complaints. This EMP outlines the minimum requirements for appropriately taking actions to minimise the chances of incidents and complaints, and their subsequent management if they occur.

7 Environmental management

7.1 Existing environment

The site lies within the Victorian Riverina Bioregion which is characterised by flat to gently undulating landscapes on recent unconsolidated sediments, with evidence of former stream channels and wide floodplain areas associated with major river systems and prior streams.

Alluvium deposits from the Cainozoic period gave rise to the red brown earths and texture contrast soils (Chromosols and Sodosols) which dominate the Riverine Plain. The vegetation is dominated by Plains Grassy Woodland, Plains Grassland, Pine Box Woodland/Riverina Plains Grassy Woodland Mosaic, Riverine Grassy Woodland/Riverine Sedgy Forest/Wetland Mosaic, Plains Grassy Woodland/Gilgai Plains Woodland/Wetland Mosaic, Grassy Woodland, and Wetland Formation ecosystems.

The Victorian Riverina bioregion is associated with the eight river basin tributaries of the Murray River draining north, west and south west from the Great Dividing Range of eastern Australia. However, some rivers, such as the Avoca, drain internally into a series of terminal lakes and wetlands. The Murray River is located approximately 1.5km north of the proposal at its closest point.

7.2 Site values and constraints

The following site environment and heritage values/ constraints have been identified through the impact assessment phase.

Table 7-1: Environmental values and constraints

Environmental Aspect	Description of value or constraint
Agriculture	Limited impacts are anticipated on agricultural values.
Ecology	Native vegetation is present within the proposed solar farm layout and has been avoided where possible. Approval is sought for removal of native vegetation where it cannot be avoided. Native vegetation is present along Baxter-Whelan Road where there is a proposed cable route and has been avoided.
Historic heritage	There are no historic heritage places located within the Project area. It is highly unlikely that historic heritage elements will be impacted or unearthed during Project construction works.
Indigenous Heritage	There are no known values or constraints within the proposed solar farm layout; however, there is potential for unidentified heritage to exist where the cable route intersects the waterway.
Land use	The surrounding area is generally rural in nature with limited noise from existing commerce or industry. Values include agricultural production, various densities of rural residential activity and tourism and they contain abundant and significant environmental and landscape value.
Social and Community	The site and surrounds are characterised by rural farming uses. The nearest residential sensitive receptors are located approximately 1000 m from the centre of the Site.
Surface Water	The site is located within the Central Murray catchment and the key water uses are irrigated agriculture, urban water supply, stock, domestic and environmental water. Local waterways in the surrounding areas include the Murray River to the North, Dry Creek to the South-east and Indigo Creek to the west. The area is not in an area impacted by riverine flooding.

7.3 Environmental Risk Register

This section identifies the relevant environmental risks to human health amenity and the environment. Section 2.3 outlines the mitigation and management measures to address the risks identified in the table below.

Management objectives and actions for each environmental impact are outlined in the sections below along with relevant performance criteria for the Project. Should the performance criteria fail to be met, corrective actions are included to assist with rectifying issues so that performance criteria can be subsequently met.

Table 7-2: Environmental Risk Register

Environmental Aspect	Activity Risk	Phase that EMP applies	Environmental Impact	Initial Risk Rating	Relevant EMP Section	Residual Risk Rating
Air Quality	Dust from construction activities	Construction	Impacts to sensitive receptors, including residential amenity and native fauna.	Moderate	Refer to Section 7.4.3	Low
Emergency Response	Environmental impacts during emergency	Both	Environmental impacts during an emergency	Moderate	Refer to Section 7.4.10	Low
Fire Management	Fuel load management / site operation	Both	Increased risk of bushfires	Moderate	Refer to Section 7.4.4	Low
Flora and Fauna	Earthworks / clearing and grubbing	Construction	Loss or degradation of biodiversity/ and habitat	Low	Refer to Section 7.4.5	Moderate
Hazardous substances	Storage and handling of fuels, oils and other chemicals	Construction	Spills, leaks or other discharges of hazardous substances impacting on environmental values of land or water	Moderate	Refer to Section 7.4.2, 7.4.8 and 7.4.1	Low
Heritage	Earthworks / clearing and grubbing	Construction	Damage or loss of heritage values	Low	Refer to Section 7.4.6	Low
Lighting	Temporary site lighting	Construction	Impacts to sensitive receptors, including residential amenity and native fauna.	Low	Refer to Section 7.4.10	Low
Noise and vibration	Operation of plant and equipment	Construction	Impacts to sensitive receptors, including residential amenity and native fauna.	Moderate	Refer to Section 7.4.7	Low

Environmental Aspect	Activity Risk	Phase that EMP applies	Environmental Impact	Initial Risk Rating	Relevant EMP Section	Residual Risk Rating
Security	All project activities	Both	Impacts to human health and/ or property	Low	Refer to Section 7.4.10	Low
Social and community	All project activities	Construction	Impacts on amenity values, including traffic, noise, lighting, landscape values and access.	Moderate	Refer to Section 7.4.10	Low
Soils, erosion, and sediment	Stormwater runoff from project areas	Construction	Impacts to the environmental values of land and water	Moderate	Refer to Section 7.4.1	Low
Surface Water	Stormwater runoff from project areas	Construction	Impacts to the environmental values of waterways	Moderate	Refer to Section 7.4.2 and Section 7.4.1	Low
Traffic and access	Impacts on local traffic from changes in vehicle movements	Construction	Impacts to local traffic, access and amenity.	Moderate	Section 7.4.9	Low
Waste Management	Waste generated from construction activities and site workers	Construction	Impacts to the environmental values of land and water	Low	Section 7.4.8	Low
Weed and pest management	Earthworks / Clearing and grubbing	Both	Loss or degradation of biodiversity/ and habitat	Moderate	Section 7.4.5	Low

7.4 Control Measures

7.4.1 Soils, erosion and sediment

Table 7-3: Control measures to manage impacts from soils, erosion and sediment

Potential environment aspect/impact	Management Objective	Action	Phase to be implemented	Party responsible	Reporting
Disturbance of soil	Maintain the quality of land and soils to protect ecological values	▪ Ground disturbance minimised by utilising designated tracks established for the Project.	Construction Operation	PCM and ER	PCM to undertake daily inspections EM to incorporate into weekly inspections
		▪ All earthworks shall be restricted to only those which are shown on the approved plans as required for building and/or access.	Construction	PCM and ER	PCM to undertake daily inspections
Soil erosion and sedimentation entering watercourses after vegetation removal	Adopt erosion controls to minimise the erosion potential of the site	▪ Provide sediment and erosion controls to manage exposed soil surfaces and/or stockpiles and prevent sediment discharge into retained vegetation and drainage lines. ▪ All site personnel will be taught to recognise erosion and sediment and water quality concerns and understand what needs to be done and who needs to be contacted in the event of an erosion and sediment control failure. ▪ All site personnel have a responsibility to contact the ER if any erosion and sediment control failures are identified or when maintenance is required. ▪ Ensure that any excess soil is not placed in adjacent vegetation and remains within the proposed clearance footprint.	Construction	PCM and ER	EM to include sedimentation controls in weekly inspections and monthly compliance audits EM to provide details in the Monthly Report

Potential environment aspect/impact	Management Objective	Action	Phase to be implemented	Party responsible	Reporting
Soil erosion and sedimentation entering watercourses after vegetation removal	Minimise chance of accidental water pollution through chemical spills (e.g. Diesel and hydraulic oil) or off site transport of eroded sediment during construction	▪ Locate construction carpark, laydown areas and construction site compounds away from drainage pathways and waterways where possible. ▪ Identify 'no go' zones and restricted access and haul routes. ▪ Manage waste spills on site to prevent soil contamination with the use of spill kits and user training. ▪ Store materials and hazardous substances in accordance with AS1940-2004: The storage and handling of flammable and combustible liquids. ▪ Spill kits will be located on site commensurate with the type and quantity of chemicals used/kept on site. ▪ All waste generated on site will be appropriately handled and disposed of off-site at an appropriately licenced facility. ▪ Restock spill kits when items are used to clean spills. ▪ Safety data sheets will be kept on site for all applicable materials.	Construction	PCM and ER	Details of spills to be included in the Monthly Report by the ER No-go zones to be includes in Environmental weekly inspection

7.4.1.1 Performance criteria

- All erosion and sediment control measures will be installed in accordance with the requirements as detailed in the Best Practice Erosion and Sediment Control (IECA 2008) manual
- Water quality objectives (refer Section **Error! Reference source not found.** below) are to be achieved through the implementation of the recommended erosion and sediment controls.

7.4.1.2 Corrective actions

- Maintenance records for erosion and sediment control and effectiveness of the erosion and sediment control measures should be reviewed
- Any non-conformances to be reported to the CPM and ER as soon as practical or within 24 hours.
- An Incident Report Form shall be filled out if any non-conformances are found.
- All non-conformances shall be corrected within 24 hours, and strategies implemented to reduce the likelihood of the incident occurring again.

7.4.1.3 Applicable legislation

- *Environment Protection Act 2017*
  - Environment Protection Regulations 2021
  - General Environmental Duty
  - Environmental Reference Standard
- *Water Act 1989*

7.4.1.4 Additional guidance material

- Best Practice Erosion and Sediment Control (IECA 2008) manual
- EPA Victoria Publication 1834: Civil Construction, Building and Demolition (CCBDG), 2020
- EPA Victoria Publication 1893: Erosion, sediment and dust: treatment train
- EPA Victoria Publication 1894: Managing soil disturbance
- EPA Victoria Publication 1895: Managing stockpiles
- EPA Victoria Publication 1896: Working within or adjacent to waterways
- EPA Victoria Publication 1897: Managing truck and other vehicle movement

7.4.2 Water quality

Table 7-4 Control measures to manage impacts to water quality

Water quality measures **Table notes:** ASP = All site personnel, ER = Environment Representative, PM = Project Manager, PCM = Project Construction Manager, GM = General Manager					
Potential environment aspect/impact	**Management Objective**	**Action**	**Phase to be implemented**	**Party responsible**	**Reporting**
Soil erosion and sedimentation entering watercourses after vegetation removal	Manage surface water so that existing uses, including environmental are protected	▪ Implementation of standard industry practice for sediment and erosion management using hay baling, temporary sediment traps, dust generation management and bunding of stockpiles.	Construction Operation	PCM and ER	Prior to construction
		▪ Revegetation of disturbed areas as soon as practicable to support erosion control.	Construction Operation	PCM and ER	Weekly environmental inspection
		▪ Locate stockpiles away from watercourses, drainage lines and trafficked areas.	Construction	PCM and ER	Weekly environmental inspection
		▪ Rainfall runoff from undeveloped portions of the site allowed to flow to the natural low points and swales where it has historically evaporated/infiltrated.	Construction Operation	PCM and ER	Weekly environmental inspection
		▪ Water quality samples shall be taken if potential contaminants are believed to have left the site boundary.	Construction	PCM and ER	As required and sampling reports provided
Inadequate fuel and chemical storage and usage areas allowing runoff to watercourses and/or to groundwater	Ensure that human health and safety and the environment is not adversely affected	▪ Minimise the quantity of chemicals stored at the Project site.	Construction Operation	PCM and ER	Weekly environmental inspection
		▪ All hazardous materials (E.g. chemicals) required at the Project site to be stored on a bunded impervious base. The capacity of all bunds will accord with that required by the EPA guidelines.	Construction Operation	PCM and ER	Weekly environmental inspection
		▪ Chemical storage, bunding handling and emergency response procedures developed in accordance EPA Victoria Publication 1698: Liquid storage and handling guidelines	Construction Operation	PCM and ER	Weekly environmental inspection

7.4.2.1 Performance criteria

- All erosion and sediment control measures will be installed in accordance with the requirements as detailed in the Best Practice Erosion and Sediment Control (IECA 2008) manual.
- Water quality objectives are to be achieved through the implementation of the recommended erosion and sediment controls.

7.4.2.2 Corrective actions

- Maintenance records for erosion and sediment control and effectiveness of the erosion and sediment control measures should be reviewed.
- Any non-conformances to be reported to the CPM and ER as soon as practical or within 24 hours.
- An Incident Report Form shall be filled out if any non-conformances are found.
- All non-conformances shall be corrected within 24 hours, and strategies implemented to reduce the likelihood of the incident occurring again.

7.4.2.3 Applicable legislation

- *Environment Protection Act 2017*
  - *Environment Protection Regulations 2021*
  - General Environmental Duty
  - Environmental Reference Standard
- *Water Act 1989*

7.4.2.4 Additional guidance material

- AS 1940-2004 Storage and handling of flammable and combustible liquids
- EPA Victoria Publication 1698: Liquid storage and handling guidelines
- EPA Victoria Publication 1834: Civil Construction, Building and Demolition (CCBDG), 2020
- EPA Victoria Publication 1894: Managing soil disturbance
- EPA Victoria Publication 1895: Managing stockpiles
- EPA Victoria Publication 1896: Working within or adjacent to waterways

7.4.3 Air quality and dust

Table 7-5 Control measures to manage impacts to air quality

Air quality measures **Table notes:** ASP = All site personnel, ER = Environment Representative, PM = Project Manager, PCM = Project Construction Manager, GM = General Manager					
Potential environment aspect/impact	**Management Objective**	**Action**	**Phase to be implemented**	**Party responsible**	**Reporting**
Reduction in air quality due to increase in dust creation	Maintain air quality to protect the environment, human health and amenity	▪ Use of water sprays or wetting agent on unpaved roads and other exposed areas where considered necessary, particularly during dry or windy conditions. ▪ Employees will be encouraged to report and request dust suppression should dust become generated by the works.	Construction Operation	PCM and ER	EM to inspect daily EM to include in Weekly environmental inspection
		▪ Windbreaks, silt fences and water sprays to be used where appropriate on exposed areas to reduce wind-generated dust.	Construction	PCM and ER	EM to include in Weekly environmental inspection
		▪ Speed limits managed in accordance with traffic management plans and site conditions to minimise wheel generated dust.	Construction Operation	PCM and ER	EM to inspect daily EM to include in environmental inspection
		▪ Minimise vegetation clearance, clearing in stages and stabilisation of cleared areas by regular light watering or use of matting or coarse material to minimise soil transport by wind. ▪ Managing of stockpiles through stabilisation, light water and the use of covers.	Construction	PCM and ER	EM to include in Weekly environmental inspection

Air quality measures **Table notes:** ASP = All site personnel, ER = Environment Representative, PM = Project Manager, PCM = Project Construction Manager, GM = General Manager					
Potential environment aspect/impact	**Management Objective**	**Action**	**Phase to be implemented**	**Party responsible**	**Reporting**
Reduction in air quality due to increase in dust creation	Maintain air quality to protect the environment, human health and amenity	▪ Minimising the lifting height of the loader bucket when transferring soil or rubble from front-end loaders to trucks and controlling its unloading speed to reduce wind borne dust. ▪ Controlling the speed of dumping form tip trucks. ▪ Covering or stabilising materials during transport into and within the construction site. ▪ Preventing soil form leaving the site via traffic movement to prevent the creation of dust in dry conditions. ▪ Minimising wheel generated dust by watering roadways. ▪ Vehicles will be maintained as per scheduled servicing requirements.	Construction	PCM and ER	EM to include in Weekly environmental inspection
		▪ Where dust becomes an issue, dust sampling and monitoring activities will be conducted within 14 days of the receipt of the air quality complaint. ▪ The results of the investigation and the actions taken to 'close out' the complaint to the complainant will be provided in a report.	Construction	PCM and ER	Investigation report as required.

7.4.3.1 Performance criteria

- Vehicle speed limits successfully minimise dust.
- Vehicles will be maintained as per scheduled servicing requirements.
- No complaints related to air quality and dust.

7.4.3.2 Corrective actions

- Should a dust complaint be received, the cause of the complaint will be investigated through consultation with the complainant. Within 14 days of the receipt of the air quality complaint, report the results of the investigation and the actions taken to 'close out' the complaint to the complainant.
- An Incident Report Form report form will be filled out if any non-conformances are found.
- All non-conformances shall be reported within 24 hours, and strategies implemented to reduce the likelihood of the incident occurring again.

7.4.3.3 Applicable legislation

- *Environment Protection Act 2017*
  - *Environment Protection Regulations 2021*
  - General Environmental Duty
  - Environmental Reference Standard

7.4.3.4 Additional guidance material

- EPA Victoria Publication 1834: Civil Construction, Building and Demolition (CCBDG), 2020
- EPA Victoria Publication 1893: Erosion, sediment and dust: treatment train
- EPA Victoria Publication 1894: Managing soil disturbance
- EPA Victoria Publication 1895: Managing stockpiles
- EPA Victoria Publication 1897: Managing truck and other vehicle movement

7.4.4 Fire Management

Table 7-6 Control measures to manage bushfire risk

Air quality measures **Table notes:** ASP = All site personnel, ER = Environment Representative, PM = Project Manager, PCM = Project Construction Manager, GM = General Manager					
Potential environment aspect/impact	**Management Objective**	**Action**	**Phase to be implemented**	**Party responsible**	**Reporting**
Reduction bushfire risk ignition	Minimise risk of fire ignition	▪ Do not conduct hot works on total fire ban days	Construction Operation	PM and GM	EM to inspect daily (on total fire ban days) EM to include in Weekly environmental inspection
		▪ The site will be "no smoking" with the exception of designated smoking areas that will be kept free from combustible material. ▪ Keep site clear of combustibles and away from potential ignition sources. ▪ Compliance with various requirements including the storage of dangerous goods.	Construction Operation	PM and GM	EM to inspect daily EM to include in Weekly environmental inspection
Reduction bushfire risk impacts	Fire management measures that adequately minimise the risks associated with bushfires	▪ Maintain an appropriate firebreak around the perimeter of the facility as follows: – When adjacent landscaping/screening vegetation is <20 metres wide, the firebreak must be at least 10m wide. – When adjacent landscaping/screening vegetation is >20 metres wide, a risk management process must be conducted to determine the appropriate fire break area. ▪ Firefighting water supply must be provided at the facility to allow adequate response from firefighting personnel	Construction Operation	PM and GM	EM to include in Weekly environmental inspection

7.4.4.1 Performance criteria

- No ignitions of fires from site activities
- Fire management measures that adequately minimise the risks associated with bushfires

7.4.4.2 Corrective actions

- An Incident Report Form report form will be filled out if any non-conformances are found.
- All non-conformances shall be reported within 24 hours, and strategies implemented to reduce the likelihood of the incident occurring again.

7.4.4.3 Applicable legislation

- *Country Fire Authority Act 1958*
- *Victorian Occupational Health and Safety Act 2004*
- *Dangerous Goods (Storage and Handling) Act 1985*

7.4.4.4 Additional guidance material

- Country Fire Authority (2021) - Guidelines for Renewable Energy Installations

7.4.5 Flora and fauna

Table 7-7: Control measures to manage impacts to flora and fauna

Flora and fauna control measures **Table notes:** ASP = All site personnel, ER = Environment Representative, PM = Project Manager, PCM = Project Construction Manager, GM = General Manager					
Potential environment impact	**Management Objective**	**Action**	**Phase to be implemented**	**Party responsible**	**Reporting**
Land clearing impacting on flora and fauna populations	Minimise vegetation clearance	▪ Clearance of native vegetation to be approved before works and be in accordance with the Guidelines for the removal, destruction or lopping of native vegetation (DELWP, 2017)	Construction	PD	As required
		▪ Extent of disturbance should be delineated using coloured flagging prior to the commencement of works, accurately marking out the limits of the work zone and vegetation to be retained.	Construction	PCM and ER	EM to include in Weekly environmental inspection
		▪ Where no impacts are planned to ecological values (E.g. native vegetation/ habitat, these areas should be protected as No Go Zones. Appropriate fencing / delineation should be erected prior to works and maintained throughout the project to identify these areas and prevent access.	Construction	PCM and ER	EM to include in Weekly environmental inspection
		▪ Trees to be retained within the vicinity of works (within 20m) must be protected in accordance with AS4970-2009 Protection of Trees on Development Sites.	Construction	PCM and ER	As required
		▪ Vegetation to be retained on site wherever practicable, with progressive rehabilitation of disturbed areas. Vegetation should be placed either directly on disturbed areas to reduce erosion or stockpiled for later use or treated as specified in the conditions of the permit. Rehabilitation will include use of locally indigenous species and the use of existing seedbank from stockpiled material where practicable.	Construction Operation	PCM and ER	EM to include in Monthly Report

Flora and fauna control measures **Table notes:** ASP = All site personnel, ER = Environment Representative, PM = Project Manager, PCM = Project Construction Manager, GM = General Manager					
Potential environment impact	**Management Objective**	**Action**	**Phase to be implemented**	**Party responsible**	**Reporting**
		▪ Stockpiled disturbed vegetation should be away from streams/creeks/large drainage lines.	Construction	PCM and ER	EM to include in Weekly environmental inspection
Land clearing impacting on flora and fauna populations	Minimise vegetation clearance and ensure clearance is offset by long-term actions that deliver a significant environmental benefit	▪ Supervision and/or auditing of clearance to ensure no unauthorised clearance occurs.	Construction	PCM and ER	EM to include in Weekly environmental inspection
		▪ Contractor shall inform the personnel carrying out the disturbance activity of the location of protected areas such as flora, fauna and heritage areas.	Construction	PCM and ER	EM during induction
		▪ Engage a suitably qualified wildlife handler to inspect all trees approved for removal to determine presence and/or suitability for nesting fauna. This is particularly relevant to hollow-bearing trees. ▪ At the time of approved tree removal, a suitably qualified wildlife handler should be onsite to undertake salvage and translocation of any nesting fauna. This is likely to be a condition of any permit for tree removal.	Construction	PCM and ER	As required
Land clearing impacting on flora and fauna populations	Maintain representation, diversity, viability and ecological function of flora and fauna	▪ Weed hygiene practices such as cleaning of plant, equipment and vehicles before and after access to known areas infested with weeds will be implemented.	Construction Operation	PCM	EM to include in Monthly Report
		▪ Maintain and monitor Project site for weed outbreaks.	Construction Operation	PCM and ER	EM to include in Monthly Report
		▪ Enforce speed limits on Project site to reduce likelihood of fauna strike.	Construction Operation	PCM an ER	EM to include in Monthly Report

Flora and fauna control measures **Table notes:** ASP = All site personnel, ER = Environment Representative, PM = Project Manager, PCM = Project Construction Manager, GM = General Manager					
Potential environment impact	**Management Objective**	**Action**	**Phase to be implemented**	**Party responsible**	**Reporting**
		▪ Determine the need for pre-clearance surveys by a suitably qualified person to relocate any fauna prior to removal of trees.	Construction	PCM and ER	EM to include in Monthly Report As required
Land clearing impacting on flora and fauna populations	Maintain the quality of land and soils to protect ecological values	▪ Restriction of vegetation clearance to the project footprint and undertaking progressive rehabilitation where practicable.	Construction Operation	PCM and ER	EM to include in Weekly environmental inspection
		▪ Following the completion of construction works on-site, any tracks and disturbed areas (excluding those used for ongoing access and maintenance) must be rehabilitated and bare areas re-vegetated as soon as possible, taking advantage of natural rainfall, which is mostly between May and September. If bare areas are still present at the end of spring, they must be temporarily protected and stabilised by geotextile matting or other suitable methods, until they can be effectively re-vegetated.	Construction	PCM and ER	EM to include in Monthly Report
Land clearing impacting on flora and fauna populations by encroachment of weeds	Weed management	▪ A Weed Management Plan may be required where this activity is undertaken and shall be put in place for any topsoil contaminated with weeds, prior to disturbance activities and stripping.	Construction	PD and ER	To be developed if required
		▪ Ensure that any machinery arriving on site be inspected for any foreign soil or plant matter/weed material and be washed down before entering the work site. ▪ Weeds should be controlled within the work area according to the requirements of the *Catchment and Land Protection Act 1994.* ▪ All noxious weeds which are cleared as part of the project must be disposed of appropriately.	Construction	PD and ER	EM to include in Weekly environmental inspection

Flora and fauna control measures **Table notes:** ASP = All site personnel, ER = Environment Representative, PM = Project Manager, PCM = Project Construction Manager, GM = General Manager					
Potential environment impact	**Management Objective**	**Action**	**Phase to be implemented**	**Party responsible**	**Reporting**
Encroachment of weeds	Weed management	▪ Regular monitoring of vegetation cover ▪ Weeds will be controlled within the work area according to the requirements of the *Catchment and Land Protection Act 1994.* ▪ Report suspected outbreaks of declared weed species	Operation	PD and ER	EM to include in Monthly Report
Land clearing impacting on flora and fauna populations	Vegetation Clearing - construction	▪ It is recommended that an experienced and licensed wildlife carer and/or ecologist would be present on site during tree and shrub removal/clearance (open woodland vegetation community) to capture and relocate fauna that may be encountered. ▪ Remove habitat as carefully as possible to avoid injury to any fauna still remaining in trees. Use equipment that would allow large trees to be lowered to the ground with minimal impact (e.g. claw extension on an excavator). ▪ Any identified hollow bearing trees to be removed would need to be nudged and/or knocked before felling to allow any fauna to escape.	Construction	PM and ER and ecologist if determined necessary	As required
Land clearing impacting on flora and fauna populations	Vegetation Clearing – Pre-construction	▪ Minimise impacts to fauna by conducting staged removal of large trees and providing time and space for fauna to leave the work area. ▪ Maintain high animal welfare standards by engaging a suitably qualified ecologist or fauna rescue carer during all vegetation clearance activity. ▪ Any fauna trapped within the project area following the installation of the perimeter fence should be captured and relocated with the assistance of an experienced and licensed wildlife carer.	Prior to construction	PM and ER and ecologist if determined necessary	As required

Flora and fauna control measures **Table notes:** ASP = All site personnel, ER = Environment Representative, PM = Project Manager, PCM = Project Construction Manager, GM = General Manager					
Potential environment impact	**Management Objective**	**Action**	**Phase to be implemented**	**Party responsible**	**Reporting**
Fauna entrapment in deep excavations	Fauna management	▪ Limit the time that excavations (trenches, pits or holes) are left open. ▪ If excavations are left open overnight or for an extended period, they are to be checked for native fauna each morning and evening by staff and if required the trapped fauna is to is to be removed. This may require the use of an ecologist or fauna handler.	Construction	PM and ER and ecologist if determined necessary	EM to include in Weekly environmental inspection
Infestations of pest animals	Pest fauna management	The perimeter fence would be designed to minimise the likelihood of feral animals entering the site, however in addition to this this the focus should also be on reducing pest animal impacts rather than removing pest animals. This can be achieved by ensuring that: ▪ Implementing waste management measures to avoid increased abundance of pests and opportunistic native fauna. ▪ All waste receptacles have secured lids to deter scavengers. ▪ All waste food is removed from site or stored in secured bins. ▪ Areas likely to provide shelter should be regularly monitored for infestations and animals removed appropriately.	Construction and Operation	PM and ER	EM to include in Weekly environmental inspection during construction and monthly reporting during operation

7.4.5.1 Performance criteria

- No loss of retained vegetation outside of Project area.
- Vegetation clearance should be confined to areas for cabling trenches, access tracks, steel pile holes and the installation of the transmission lines.
- No new declared weeds or pests introduced.
- Minimise injuries and deaths to native fauna.

7.4.5.2 Corrective actions

- If additional declared weeds are identified, further investigations and control measures will be implemented.
- Natural regeneration or assisted rehabilitation within the retained remnant vegetation in the Project area.
- Consider alternative treatments for weeds and/or pests in consultation with Port Augusta Council.
- Any native fauna injured as part of the works shall be transported to an appropriate carer.
- All non-conformances shall be corrected as soon as possible and strategies implemented to reduce the likelihood of the incident occurring again.
- An Incident Report Form and or an Accident Report Form will be filled out if any non-conformances are found (e.g. over clearing) or if wildlife is injured.

7.4.5.3 Applicable legislation

- *Catchment and Land Protection Act 1994*
- *Environment Protection and Biodiversity Conservation Act 1999*
- *Environment Protection Act 2017*
  - *Environment Protection Regulations 2021*
  - General Environmental Duty
  - Environmental Reference Standard
- *Flora and Fauna Guarantee Act 1988*
- *Planning and Environment Act 1987*
- *Wildlife Act 1975*

7.4.5.4 Additional guidance material

- AS4970-2009 Protection of Trees on Development Sites
- DELWP (2017) Guidelines for the removal, destruction or lopping of native vegetation (DELWP, 2017)
- EPA Victoria Publication 1834: Civil Construction, Building and Demolition (CCBDG), 2020
- EPA Victoria Publication 1894: Managing soil disturbance
- EPA Victoria Publication 1896: Working within or adjacent to waterways

7.4.6 Heritage management measures

Table 7-8: Control measures to manage impacts to heritage

Heritage management measure **Table notes:** ASP = All site personnel, ER = Environment Representative, PM = Project Manager, PCM = Project Construction Manager, GM = General Manager					
Potential environment impact	**Management Objective**	**Action**	**Phase to be implemented**	**Party responsible**	**Reporting**
Destruction or damage to a heritage item	Prevent unauthorised disturbance to Aboriginal or Non-Aboriginal heritage	▪ If any heritage places/items are identified during project establishment, relocate Project infrastructure where feasible.	Construction	PD	Part of detailed design
	Staff Training and induction	▪ All project staff will be trained regarding the location and identification of items/areas of potential Aboriginal heritage significance and procedures to follow prior to work commencing.	Construction Operation	PCM and ER	Induction and training register
	Stop works procedure for heritage sites / unexpected finds	In the event that unknown Indigenous or Historical heritage sites are uncovered during construction, the procedure is as follows: ▪ Stop works – stop all works in the vicinity of the site and no further disturbance of the site will be made ▪ Restrict access – access to the site will be restricted to protect the site ▪ Notify ARP and Wirsol (ARP and Wirsol to notify any relevant external authorities) ▪ Manage the site and ongoing access – determine the appropriate course of action in consultation with the relevant authorities and resume works when it is appropriate to do so.	Construction	PCM and ER	EM to include in Monthly Report As required
	Prevent unauthorised disturbance to Aboriginal or Non-Aboriginal heritage	▪ Provide training in the form of inductions to all Project personnel on Aboriginal heritage sites and objects, protection measures and unexpected finds procedures before they begin work on site. ▪ Provide the Aboriginal cultural heritage induction to all personnel throughout the course of the Project.	Construction Operation	PCM and ER	Induction and training register

Heritage management measure **Table notes:** ASP = All site personnel, ER = Environment Representative, PM = Project Manager, PCM = Project Construction Manager, GM = General Manager					
Potential environment impact	**Management Objective**	**Action**	**Phase to be implemented**	**Party responsible**	**Reporting**
		▪ Any further assessment must be undertaken prior to ground disturbing activities occurring within the changed boundary.	Construction Operation	PCM and ER	Inspection / assessment report
	Minimisation of ground disturbance	▪ Ground surface disturbance from construction activities must be minimised as much as practicable to avoid increased need for collection and relocation of isolated stone artefacts. Minimisation of ground disturbance will be particularly relevant within 20 m of any drainage line.	Construction	PCM and ER	As required
	Communication	▪ Communications between all parties must remain open and available and any changes in contact details must be communicated to other parties immediately.	Construction	PCM and ER	As required

7.4.6.1 Performance criteria

- Project works shall remain within the project boundary.
- No impacts to known items of heritage.

7.4.6.2 Corrective actions

- If additional Aboriginal or non-Aboriginal heritage items are identified, further investigations and control measures will be implemented.
- If additional historical heritage items are identified, further investigations and control measures will be implemented.
- All non-conformances shall be corrected as soon as possible and strategies implemented to reduce the likelihood of the incident occurring again.
- An Incident Report Form will be filled out if any non-conformances are found and an investigation undertaken.

7.4.6.3 Applicable legislation

- *Aboriginal and Torres Strait Islander Heritage Protection Act 1984*
- *Environment Protection and Biodiversity Conservation Act 1999*
- *Aboriginal Heritage Act 2006*
- *Heritage Act 2017*

7.4.7 Noise and vibration

Table 7-9: Control measures to manage impacts from noise and vibration

Noise and vibration management measures **Table notes:** ASP = All site personnel, ER = Environment Representative, PM = Project Manager, PCM = Project Construction Manager, GM = General Manage					
Potential environment impact	**Management Objective**	**Action**	**Phase to be implemented**	**Party responsible**	**Reporting**
Disturbance of the amenity of the local area	Manage noise and vibration generation to protect the environment, human health and amenity	■ Construction will not occur at outside of normal working hours, unless prior approval is obtained.	Construction	PCM	PM to notify adjacent tenants EM to include in Monthly Report
		■ Equipment will be shut off or throttled down whenever not in use.	Construction Operation	PCM	Weekly environmental inspection
		■ Noise reduction devices such as mufflers will be fitted to all plant and will operate effectively.	Construction Operation	PCM	Weekly environmental inspection
		■ Noise equipment or processes should be located so that their impact on neighbouring premises is minimised.	Construction Operation	PCM	Weekly environmental inspection
		■ Equipment should not be operated if maintenance or repairs would eliminate or significantly reduce a characteristic of noise resulting from its operation that is audible at noise-affected premises.	Construction Operation	PCM	Weekly environmental inspection
		■ Handling of materials and operating of equipment should be undertaken so as to minimise impact noise.	Construction	PCM	Weekly environmental inspection
Disturbance of the amenity of the local area	Manage noise and vibration generation to protect the environment, human health and amenity	■ Off-site or other alternative processes that eliminate or lessen resulting noise should be used where practicable.	Construction Operation	PCM	Weekly environmental inspection EM to include in Monthly Report

Noise and vibration management measures **Table notes:** ASP = All site personnel, ER = Environment Representative, PM = Project Manager, PCM = Project Construction Manager, GM = General Manage					
Potential environment impact	**Management Objective**	**Action**	**Phase to be implemented**	**Party responsible**	**Reporting**
	Communication	■ Adequate notice must be provided to the surrounding community of the proposed construction activities generating noise (typically no less than 2 weeks prior to the works). This should include the anticipated working hours and estimated duration of the works.	Construction Operation	EM and PCM	As required

7.4.7.1 Performance criteria

- No substantiated complaints received relating to noise
- Operation noise levels should not exceed maximum permissible noise levels identified the following table.

Table 7-10: Operational Noise Levels

Land use category	Noise levels not to exceed in dB(A)*		
	Day	Evening	Night
Rural Living	46	41	36

7.4.7.2 Corrective actions

- Should a noise complaint be received, the cause of the complaint will be investigated through consultation with the complainant. Within seven days of the receipt of the noise complaint, report the results of the investigation and the actions taken to 'close out' the complaint to the complainant.
- Incident forms to be filled out and all non-conformances shall be corrected as soon as possible and strategies implemented to reduce the likelihood of incident occurring again.

7.4.7.3 Applicable legislation

- *Environment Protection Act 2017*
  - *Environment Protection Regulations 2021*
  - General Environmental Duty
  - Environmental Reference Standard

7.4.7.4 Additional guidance material

- EPA Victoria Publication 1834: Civil Construction, Building and Demolition (CCBDG), 2020
- EPA Victoria Publication 1826.4: Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues (Noise Protocol)

7.4.8 Waste management

Table 7-11: Control measures to manage impact from waste generation

Waste management measures **Table notes:** ASP = All site personnel, ER = Environment Representative, PM = Project Manager, PCM = Project Construction Manager, GM = General Manager					
Potential environment aspect/impact	**Management Objective**	**Action**	**Phase to be implemented**	**Party responsible**	**Reporting**
Contamination of the environment as a result of uncontained construction or general waste	Implement measures to minimise waste generation, to maximise their reuse and recycling and to ensure safe and lawful disposal of all waste	▪ The induction of staff will include procedures for minimising waste for the encouraging the appropriate recycling of material. ▪ A designated equipment lay down areas will be established during construction where segregation of materials can occur ▪ Bins/skips will be located around the site to ensure efficient waste separation. ▪ Bins are emptied at fixed intervals or as soon as full and waste disposal undertaken by licensed waste contractor. ▪ Maintain records of the type and quantity of waste for disposal. ▪ Grey water and sewage will be removed from site by licenced contractors	Construction Operation	PCM and ER	Waste register Weekly environmental inspection
Generation of hazardous wastes from project activities		▪ All wastes must be adequately classified as per EPA Victoria Publication 1827.2: Waste Assessment Classification Protocol ▪ Where waste soil is known or reasonably expected to contain potential contaminants, it must be classified in accordance with EPA Victoria Publication 1828.2: Waste Disposal Categories – Characterises and Thresholds ▪ Hazardous materials waste (eg contaminated soil, asbestos waste, contaminated materials) must be disposed an appropriately licenced EPA facility or lawful place	Construction	PCM and ER	Waste register Weekly environmental inspection

7.4.8.1 Performance criteria

- Recycling bins to be located on site.
- Waste Register to be kept up to date.
- Recording a high level of compliance with recycling of recyclable material.
- Maximising reuse.
- Nil or low levels of litter.

7.4.8.2 Corrective actions

- Incident Report Forms to be filled out if any non-conformances are found.
- All non-conformances shall be corrected as soon as possible and strategies implemented to reduce the likelihood of the incident occurring again.

7.4.8.3 Applicable legislation

- National Environment Protection (Assessment of Site Contamination) Measure 1999 (the ASC NEPM)
- *Environment Protection Act 2017*
  - *Environment Protection Regulations 2021*
  - General Environmental Duty
  - Environmental Reference Standard

7.4.8.4 Additional guidance material

- EPA Victoria Publication 1834: Civil Construction, Building and Demolition (CCBDG), 2020
- EPA Victoria Publication 1827.2: Waste Assessment Classification Protocol
- EPA Victoria Publication 1828.2: Waste Disposal Categories – Characterises and Thresholds

7.4.9 Traffic management

Table 7-12: Control measures to manage impacts from traffic

Traffic management measures **Table notes:** ASP = All site personnel, ER = Environment Representative, PM = Project Manager, PCM = Project Construction Manager, GM = General Manager					
Potential environment aspect/impact	**Management Objective**	**Action**	**Phase to be implemented**	**Party responsible**	**Reporting**
Impacts to local population and increased traffic volumes on the local roads	Ensure that impacts to amenity are reduced as low as reasonably practicable	▪ Prepare a Construction Traffic Management Plan ('CTMP') or Traffic Management Plan ('TMP') for the life cycle of the project. ▪ Slow moving, heavy equipment deliveries scheduled to occur outside peak traffic periods.	Construction	PCM	Traffic Management Plan
	Communication with local population	▪ Management of the construction programme to reduce peak traffic generation to minimise traffic delay to the public.	Construction	PCM	Traffic Management Plan
	Experienced traffic coordinators	▪ Use of accredited traffic controllers to manage intersection priority during equipment deliveries.	Construction	PCM	Traffic Management Plan
Damage to local roads due to movements of oversize vehicles	Preconstruction audit of road conditions	▪ Conduct an audit of road conditions along the nominated access routes prior to the commencement of construction. A post construction condition audit will be undertaken to determine any remedial action required to repair nominated access routes degraded as a result of Project related construction traffic.	Construction	PCM	Traffic Management Plan
		▪			
		▪ No parking on Vic Roads or Local council roads will be required as there is sufficient space within the Project site for construction vehicle parking and marshalling.	Construction Operation	PCM	Weekly environmental inspection

Traffic management measures **Table notes:** ASP = All site personnel, ER = Environment Representative, PM = Project Manager, PCM = Project Construction Manager, GM = General Manager					
Potential environment aspect/impact	**Management Objective**	**Action**	**Phase to be implemented**	**Party responsible**	**Reporting**
Damage to local roads due to movements of oversize vehicles	Preconstruction audit of road conditions	Regular communications shall be held prior to the commencement of construction until the conclusion of construction, between representatives of VicRoads, This communication shall include the following traffic management and maintenance items: ▪ Vehicle permit requirements (if applicable) ▪ Planned VicRoads / Council maintenance activities ▪ Community events ▪ Road signage and safety including 'way-finding' signs and temporary speed restrictions ▪ Culvert load capacities ▪ Any other particular issues that may arise during construction.	Construction	PCM	EM to include in monthly report
Accidents causing injury or property damage by transport of components	Safety	▪ Implementation of an incident reporting system for the implementation of traffic improvement measures.	Construction Operation	PCM	Traffic Management Plan
Accidents causing injury or property damage by transport of components	Safety	▪ Driving to the existing road conditions shall apply at all times and vehicles shall be followed at a safe distance in accordance with Australian Road Rules and guidelines.	Construction	Delivery contractor	Traffic Management Plan

Traffic management measures **Table notes:** ASP = All site personnel, ER = Environment Representative, PM = Project Manager, PCM = Project Construction Manager, GM = General Manager					
Potential environment aspect/impact	**Management Objective**	**Action**	**Phase to be implemented**	**Party responsible**	**Reporting**
Accidents causing injury or property damage by transport of components	Safety	▪ Overtaking is not encouraged on the nominated access routes. If a driver is in a situation where they are required to overtake a vehicle then it is the driver's responsibility to ensure it is safe to do so and will not put any passengers, drivers or other road users at risk. Caution shall be used when operating around school buses and stationary vehicles.	Construction	Delivery contractor	Traffic Management Plan
		▪ Exhaust brakes, or air brakes, shall be minimised by oversized or overmass on local roads within the proposed access routes (i.e. the Council owned roads).	Construction	Delivery contractor	Traffic Management Plan
		▪ Drivers on the site shall be fit for work and abide by their licensing requirements and any additional requirements provided at the site induction.	Construction	Delivery contractor	Traffic Management Plan
		▪ Any vehicle accident or collision, including collisions with native fauna, involving construction vehicles shall be reported to PCM and the Proponent as well as to the police in accordance with the road rules.	Construction	Delivery contractor	Traffic Management Plan
		▪ Oversized and overmass vehicle access to the subject site will only occur via the nominated access routes.	Construction	PCM and Delivery contractor	Traffic Management Plan
		▪ Deliveries to the subject site will only occur on week days.	Construction	PCM and Delivery contractor	Weekly inspections

Traffic management measures **Table notes:** ASP = All site personnel, ER = Environment Representative, PM = Project Manager, PCM = Project Construction Manager, GM = General Manager					
Potential environment aspect/impact	**Management Objective**	**Action**	**Phase to be implemented**	**Party responsible**	**Reporting**
Damage to local roads due to movements of oversize vehicles	Audit of road conditions	▪ The Owner shall inspect the road condition of unsealed roads (identified in the Traffic Management Plan) following adverse weather events. Any issues shall be reported to Council and a log of occurrences shall be maintained including photos and any remediation. In consultation with the Council, the Owner will either restrict construction movements or recommend that the road be closed if unsafe road conditions result due to severe weather conditions.	Construction	PCM and Delivery contractor	As required
	Training	▪ Through site inductions, all personnel shall be made aware that the posted speed limit is the maximum speed for safe driving in ideal circumstances. This speed should be adjusted where conditions dictate. The safe operating speeds for oversized and over mass vehicles should be adhered to at all times as dictated by the vehicle type operating manual.	Construction	PCM and Delivery contractor	Induction and training register
General traffic issues	Communication	▪ During times of increased heavy and oversized vehicle movements, discussion will take place between the Owner, DPTI and Council during the regular communications to determine whether any temporary speed restrictions should be implemented.	Construction	PCM and Delivery contractor	As required
	Communication	▪ The Owner and all contractors shall ensure that clear communication protocols are in place for communication between drivers (heavy and light vehicles). This protocol shall be described as part of the site induction. ▪ The Owner and their contractors shall communicate any proposed changes to traffic management practices to DPT and/or Council at the regular meetings.	Construction	PCM and Delivery contractor	As required Induction and training register

Traffic management measures **Table notes:** ASP = All site personnel, ER = Environment Representative, PM = Project Manager, PCM = Project Construction Manager, GM = General Manager					
Potential environment aspect/impact	**Management Objective**	**Action**	**Phase to be implemented**	**Party responsible**	**Reporting**
	Signage	▪ Signage shall be provided where necessary to direct construction traffic along the approved transport routes to access the subject site. The specific location of any way-finding signage will be determined prior to construction in accordance with safety and regulatory requirements. Locations of the signage are to be provided by the Owner or its contractor and discussed with DPTI and Council if any changes occur. These temporary 'wayfinding' signs shall be installed in accordance with AS1742.	Construction	PCM and Delivery contractor	As required
		▪ When work is being undertaken on the council roads, traffic management signage should be in place according to AS1742.3.	Construction	PCM and Delivery contractor	As required
	Survey	▪ A follow up survey of overhead services will be undertaken prior to the first movements of oversized vehicles.	Construction	PCM and Delivery contractor	As required
	Communication	The operators of oversized vehicles shall survey the routes to be used and obtain relevant clearances from the local utility or private companies where required, including (but not limited to): ▪ SA Power Networks ▪ ElectraNet ▪ Optus ▪ Telstra ▪ BHP.	Construction	PCM and Delivery contractor	As required
		▪ On weekends where there is a race meeting scheduled this will be communicated during construction pre-starts to ensure the construction teams are aware of the additional traffic around the racecourse.	Construction	PCM and Delivery contractor	As required

Traffic management measures **Table notes:** ASP = All site personnel, ER = Environment Representative, PM = Project Manager, PCM = Project Construction Manager, GM = General Manager					
Potential environment aspect/impact	**Management Objective**	**Action**	**Phase to be implemented**	**Party responsible**	**Reporting**
	Upgrades	■ All necessary upgrades to the local road network as specified in the Traffic Management Plan shall be completed prior to the commencement of construction.	Construction	PCM and Delivery contractor	As required

7.4.9.1 Performance criteria

- No substantiated complaints received relating to traffic.
- No traffic related incidents.

7.4.9.2 Corrective actions

- Delivery scheduling to be re-assessed to avoid impacts to traffic.
- Incident Report Form and / or Accident Report forms to be filled out if any non-conformances are found.
- All non-conformances shall be corrected as soon as possible and strategies implemented to reduce the likelihood of the incident occurring again.

7.4.9.3 Applicable legislation

- *Road Safety Act 1989*
- *Road Management Act 2004*

7.4.9.4 Additional guidance material

Not applicable.

7.4.10 General management measures

Table 7-13: General control measures

General management measures **Table notes**: ASP = All site personnel, ER = Environment Representative, PM = Project Manager, PCM = Project Construction Manager, GM = General Manager					
Potential environment impact / aspect	**Management Objective**	**Action**	**Phase to be implemented**	**Party responsible**	**Reporting**
Emergency Response	Respond to appropriately emergency situations	▪ Prior to construction commencing, develop an emergency response plan in consultation with relevant stakeholders and regulatory authorities. The plan must consider measures for the prevention, mitigation, preparedness, response and recovery in emergency scenarios. ▪ An emergency response plan shall be developed for the operation of the site.	Pre-construction/ Operation	GM	As required
Site Security	Site maintained to ensure safety to public and onsite property	▪ A suitable security fence will follow the perimeter of the Project area to ensure safety and reduce the risk of theft or vandalism. Lighting design will be high efficiency and kept to the minimum when not required. The perimeter fence will make provision to keep out both small and large animals.	Construction Operation	GM	EM to include in Monthly Report
Damage to existing infrastructure	Communication	▪ All Council, utility or state-agency maintained infrastructure (i.e. roads, drains, crossovers, cabling, pipe work etc.) that is demolished, altered, removed or damaged during the construction of the project shall be reinstated to relevant authority specifications.	Construction Operation	PCM	As required

General management measures **Table notes**: ASP = All site personnel, ER = Environment Representative, PM = Project Manager, PCM = Project Construction Manager, GM = General Manager					
Potential environment impact / aspect	**Management Objective**	**Action**	**Phase to be implemented**	**Party responsible**	**Reporting**
Negative visual impacts on community	Ensure that impacts to amenity are reduced as low as reasonable practicable	▪ Where practicable, site laydown and compound areas will be established away from site boundary and away from viewpoint areas ▪ Where practicable, buildings and structures will be of muted, earthen tones. ▪ No additional signs shall be displayed upon the subject land other than those identifying the parking area access points and those shown on the approved plans. If any further signs are required these shall be the subject of separate application. ▪ Providing screening such as a fence or hedge ▪ Use of signage and sunglasses (particularly for drivers entering the solar farm).	Construction Operation	PCM	EM to include in Monthly Report
Rehabilitation Planning	Ensure that impacts after site operation are managed and environmental values of the site are maintain	▪ Prior to construction commencing, a rehabilitation plan shall be developed that includes the following – End use objective and final concept plan – Removal of plant and equipment – Landscaping and revelation activities	Pre-construction	GM	As required

7.4.10.1 Performance criteria

- No complaints from the community or council.
- No unanticipated damage to infrastructure owned by others.
- Any damage to infrastructure owned by others repaired to owner's requirements and satisfaction.

7.4.10.2 Corrective actions

- All non-conformances shall be corrected within 24 hours, and strategies implemented to reduce the likelihood of the incident occurring again.

7.4.10.3 Applicable legislation

See Section **Error! Reference source not found.** for a list of applicable legislation.

Appendix A – Proposed Site Layout

Appendix B – Weekly Inspection Checklist

ENVIRONMENTAL INSPECTION CHECKLIST

This form must be completed by qualified personnel or Environmental officer in the following instances:

1. Weekly Site Inspection/Audit by HSE Supervisor or Environmental Advisor
2. Immediately prior to or
3. Following significant rainfall (>15 mm in 24 hours)

Section A – Environmental Measures

Control Measures	Y / N/ NA	Comment
General		
Is there evidence of unauthorised personnel on-site		
Are signs erect and legible		
Are all vehicles parked within designated areas		
Are access tracks adequately maintained		
Soils, erosion and sediment measures / water quality	Se	
Have sediment fences been placed and constructed in an appropriate location.		
Are they in good condition (do they need emptying, repairing)		
Are soil stockpiles placed appropriately ie not placed in adjacent vegetation, near watercourses, within project area		
Has revegetation of disturbed areas being undertaken as soon as practicable to support erosion control.		
Is there evidence of washdown of vehicles		
Air Quality		
Are there any obvious signs of excessive emissions from vehicles and machinery		
Are dust controls adequate		
Flora and Fauna		
Have the extents of disturbance being clearly delineated		
Has any unauthorised vegetation clearance occurred		
Is there evidence of weed infestation due to construction		
Has there been any native fauna interactions (fauna injury, fatalities)		
Traffic		
Are maximum speed limits being maintained		
Heritage		
Has there being an impact on existing Aboriginal heritage sites		

Control Measures	Y / N/ NA	Comment
Has there being an impact on existing non-Aboriginal heritage sites		
Noise		
Has noise suppression equipment been used on vehicles and machinery where practicable		
Waste and Hazardous Materials		
Are spill kits available and fully stocked		
Are SDS available and chemical appropriately stored		
Is waste being stored in appropriate bins (recycling vs general waste)		

Section B – Non-conformance and corrective actions

Ref #	Non-conformance	Corrective action required	Expected Completion

Section C – Other comments

Name and signature:
Work Area/s inspected:
Date:

Appendix C – Site Environmental Plans

TO BE DEVELOPED BY THE CONSTRUCITON CONTRACTOR

Important Things You Should Know About This Report

Exclusive Benefit and Reliance

- *This report has been prepared by Aurecon Australia Pty Ltd (**Aurecon**), at the request of and exclusively for the benefit and reliance of its Client*

- *This report is not a certification, warranty or guarantee. It is a report scoped in accordance with the Client's instructions, having due regard to the assumptions that Aurecon can be reasonably expected to make in accordance with sound engineering practice and exercising the obligations and the level of skill, care and attention required of it under this contract.*

Third Parties

- *It is not possible to make a proper assessment of the report without a clear understanding of the terms of engagement under which the report has to be prepared, including the scope of the instructions and directions given to and the assumptions made by the engineer/ scientist who has prepared the report.*

- *The report is a report scoped in accordance with the instructions given by or on behalf of the Client. The report may not address issues which would need to be addressed with a third party if that party's particular circumstances, requirements and experience with such reports were known and may make assumptions about matters of which a third party is not aware.*

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Limits of Investigation and Information

- *The report is also based on information provided to Aurecon by other parties. The report is provided strictly on the basis that the information that has been provided can be relied on and is accurate, complete and adequate.*

- *Aurecon takes no responsibility and disclaims all liability whatsoever for any loss or damage that the Client may suffer resulting from any conclusions based on information provided to Aurecon, except to the extent that Aurecon expressly indicates in the report that it has verified the information to its satisfaction.*

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