

SITE REHABILITATION AND END USE PLAN

August 2016



YARRANLEA SOLAR

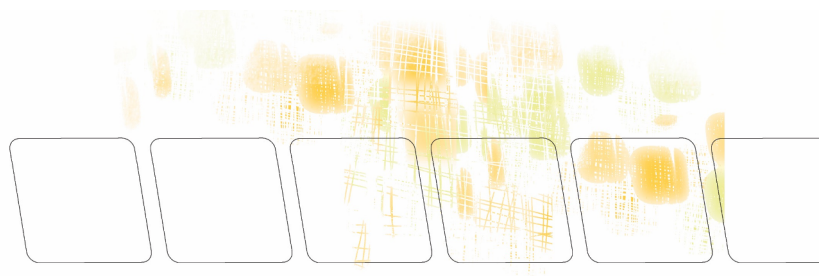
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1. Introduction

1.1 Background

Yarranlea Solar Pty. Ltd. is proposing to construct, own and operate a photovoltaic (PV) solar generating facility (the Project) of up to 100 megawatts (MW) of electricity, located on up to 250 hectares on land located at 538 and 752 Yarranlea Road, Yarranlea, Qld. The subject land can be further identified as lots 3347 on A341649, 2 on RP18249, 2 on A34925, 2 on RP7475.

Yarranlea Solar Pty. Ltd. is seeking from Toowoomba Regional Council a Development Permit for Material Change of Use and Reconfiguration of a Lot (Division of Land by Agreement) to permit the establishment and operations of the PV Solar project. The project would be developed in phases and may also be decommissioned in phases at the end of its useful operational life.

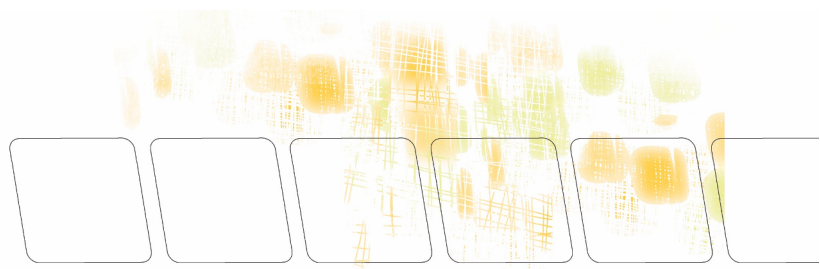
The current use of the site is for Agricultural activities, specifically the dryland farming of a range of crops including Cereals, legumes and Cotton. Toowoomba Regional Council have requested further information in respect of the end use and rehabilitation of the site following cessation of operations. The terms of the land owner agreement for this project for see the use as a PV Solar facility for up to 61 years, which provides allowance for a 12month construction period.

The proposed development is indicated on icubed consulting drawing 15-282-A01 in Appendix A.

1.2 Objectives

The objectives of this Plan are to describe how project infrastructure will be removed after operations cease, and to establish the methodology by which the post-development soil conditions at the project site are capable of being returned to agricultural activities consistent with the present use. This plan outlines the following aspects;

- Identifies the final agricultural land use following cessation of the Solar PV Generation use;
- Provides a description of the development process and how it will be integrated with rehabilitation;
- Identifies a benchmark analogue site that is used to determine realistic performance criteria for rehabilitation efforts;
- Adopts performance criteria for rehabilitation efforts;
- Includes an Action Plan, with timing for remedial works such as, structure removal, removal of imported materials such as gravel, any soil erosion, drainage, and vegetation cover works, along with weed and pest animal control activities required to meet the adopted rehabilitation performance criteria;
- Outlines a program for monitoring rehabilitation success using appropriate indicators; and
- Includes an end-use Property Management Map, depicting the contents of the Plan.



2. Location

The proposed sites are located at 538 and 752 Yarranlea Road, Yarranlea. The subject land can be further identified as lots 3347 on A341649, 2 on RP18249, 2 on A34925, 2 on RP7475. The site is accessible from Pittsworth Tummaville Road. The site is graded from the east to the west at approximately 1.0%, and has a series of existing soil conservation diversion bunds across the site.

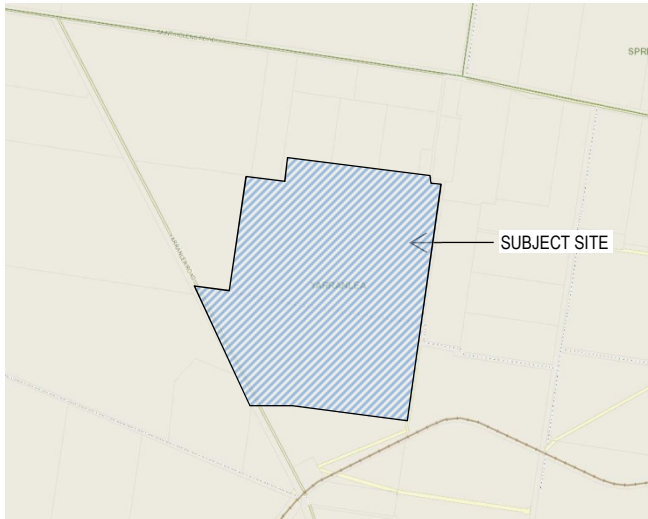
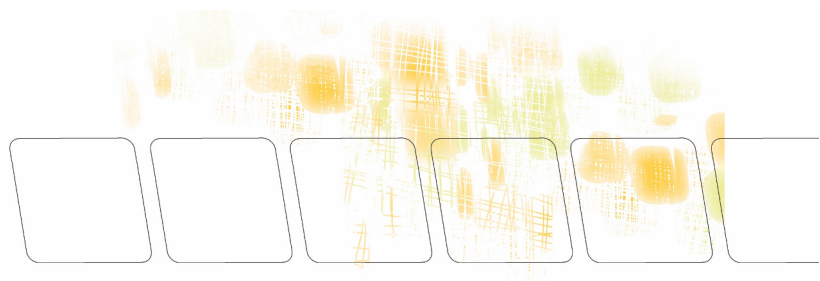


Figure 1: Locality Plan, (2016, Copyright Near Map) – Not to scale, generally indicative only.
Source: Near Map



Figure 2: Aerial Photo, (2016, Copyright Near Map) – Not to scale, generally indicative only.
Source: Near Map



3. Present and Final Land Uses

The current use of the site is for Agricultural activities, specifically the dryland farming of a range of crops including Cereals, legumes and Cotton. The final, post-development use proposes to return the site to a condition to allow for its present use, subject to the specific economic and environmental conditions at the time that project operations cease.

The topography of the site is relatively flat, with the available topographic data indicating that there is a minor variation of approximately twenty metres across the site (ranging from 432m AHD to 412m AHD). The site relatively flat, with existing slopes of up to two percent and falls trending from the South-East to North-West direction. Historical agricultural activities have heavily modified the landscape and includes soil conservation contour banks that limit erosion of the site during fallowing periods of up to six months between crops. The slope of the site and contour banks will be maintained and integrated into the development.

4. Solar PV Equipment

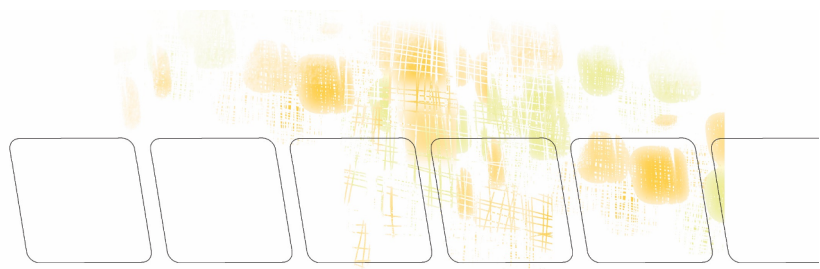
The proposed PV Facility has been designed in a similar manner to other utility scale solar facilities constructed in Australia and abroad. It comprises of a number of interlinked and integral components for the operation of the equipment and generation of electricity from solar radiation. These components include: solar modules, steel mounts for the modules, electrical transformers and inverters, electrical wiring, telecommunication equipment and electrical control enclosures. It is also likely that the PV Facility will include a battery/electrical storage enclosure, which would include batteries.

The panels utilised in the facility are similar to those used for domestic power generation purposes and will be supported on steel frames. The frames may operate under a sophisticated solar tracking system to increase power generation through tracking the movement of the sun. The electricity generated will be converted from Direct Current, (DC) to Alternating Current, (AC), using in field inverters and Step up Transformers taking the voltage to 33kilovolts, (kV). An underground reticulation system will be used to collect the power to an internal substation which will transform the power voltage to 110 kV, compatible with the nearby Ergon Energy transmission infrastructure. Power will be connected to the grid, approximately 600m from the Southern boundary of the development area using either an underground or Overhead transmission line within the Yarranlea Road Reserve and terminating at the existing Ergon Substation.

The solar panel arrays will be surrounded by informal grassed internal access ways which are designed to provide access to the inverter/transformer equipment pads located at the centre of the array blocks. A gravel access track shall be provided to the perimeter of the stage 1 block and the block comprising stages 2 to 4. This shall act as a fire break and will be accessed from the Western end of Yarranlea-Murlaggen Road. This track shall be located inside of a 2.4m high Chain Wire Security fence which is essential to ensure that health and safety commitments are met, with project site, substation, and other areas requiring controlled access appropriately restricted to private access during construction and operations.

The facility will be managed from a control building, located adjacent to the substation which will include formalised staff and visitor parking, accessed off Yarranlea-Murlaggen Road. This compound will also house an electrical switchroom and battery storage building. The access driveway and parking shall comprise a bitumen sealed surface.

The PV Facility has been designed in such as manner as to minimise the extent of civil works required to occur on the site. All existing overland drainage flow paths are to be maintained. No formalised internal roads are to be provided between panels and the level of sealing required has been kept to a minimum. The existing soil will be retained and re-seeded with an appropriate blend of pasture grass and legume species, to provide vegetation coverage over the site. Grasses will be maintained through periodic slashing and potential grazing opportunities.



5. Operational Life

The terms of the land owner agreement for this project provides allowance for a 12 month construction period and foresees the use as a PV Solar facility for up to 60 years. During this period it is anticipated that the PV modules may be replaced, however the primary plant and electrical infrastructure would be suitable for this intended project life.

The facility consists of numerous recyclable materials, including glass, semiconductor material, steel, concrete, wood, aluminium, copper, and plastics. When the facility reaches the end of its operational life, the component parts will be dismantled and recycled. The facility will be dismantled and removed using minimal impact conventional construction equipment and recycled or disposed of safely in accordance with all applicable laws and regulations at the time of decommissioning.

6. Decommissioning and Rehabilitation Actions

Decommissioning, reclamation, and restoration activities will adhere to the requirements of appropriate governing authorities. The reclamation and restoration process comprises removal of above ground structures; removal of below ground foundations and infrastructure; and restoration of topsoil, re-vegetation, and seeding. Appropriate temporary erosion and sedimentation control practices will be used during the reclamation phase of the Project. The control practices will be inspected on a regular basis to ensure their function.

6.1 Timing of Removal

Reclamation of each phase of the Project will begin within six (6) months the cessation of operations in association with the project's final power contract. The duration of infrastructure removal is estimated to be 6 months, followed by a soil reclamation and crop planting phase which will occur over a further 6 month period, depending upon the summer or winter cropping schedule.

6.2 Retention of Infrastructure

Certain aspects of the development may be retained by mutual agreement with the landowner at the time of decommissioning as they may be of value to the ongoing agricultural activities at this location. This may include but not be limited to;

- Site Fencing
- Vegetation Buffer to a portion of the development area
- Operations and Maintenance Building and the Battery Storage building, including the crossover and parking area, which would be repurposed for storage of agricultural equipment.
- Established Pasture Grasses, should the land owner at the time, propose grazing of the land with stock as opposed to dryland farming.

Council would be notified in writing in the event that any of these elements are to be retained, including a copy of the agreement with the landowner at the time of decommissioning.

6.3 Decommissioning and Removal Procedure

Typically, the reclamation of the Project proceeds in reverse order of the installation;

- The Solar PV facility will be disconnected from the utility power grid at the substation gantry.
- Solar PV modules will be disconnected, collected, and either shipped to another project, salvaged, or submitted to a collection and recycling program.



- Aboveground and underground electrical connection and distribution cables that are no longer deemed necessary by Ergon Energy Corporation will be removed and recycled off-site by an approved recycling facility.
- Solar PV module racking system will be removed and recycled off-site by an approved metals recycler.
- Electrical and electronic devices, including transformers and inverters will be removed and recycled off-site by an approved recycler.
- Concrete foundations will be removed and recycled off-site by a concrete recycler.
- Fencing will be removed and recycled off-site by an approved recycler, unless it is requested to be retained by mutual agreement with the landowner.
- Vegetation buffer will be cleared, grubbed, mulched, composed and respread on site to increase the organic matter in the soil structure.
- Removal of the Operations Building and Battery Storage building by an approved demolition contractor, unless it is requested to be retained by mutual agreement with the landowner.
- Gravel pavement material to the perimeter access tracks will be recovered and recycled as general fill at an approved location.
- Areas subject to plant compaction such as access tracks, substation and vegetated buffer will be deep ripped and nourished using the composed organic matter from the removed vegetation buffer.
- Pasture grasses will be eliminated using glyphosate, (unless the landowner instructs otherwise), and the land cultivated and allowed to lay fallow prior to establishment of cropping activities.

6.4 Removal of Electrical Equipment, Solar PV Modules and Infrastructure

Above ground electrical wiring, equipment on the inverter pads and the interconnection transformer pads, and other associated equipment will be removed as part of decommissioning. Prior to commencing electrical equipment removal activities, the system will be de-energised and all the external electrical lines feeding into or out of the project will be disconnected. The electrical components comprising the inverter pads and interconnection transformer pad will be salvaged and placed in appropriate shipping containers and secured in a truck transport trailer for shipment to the next location where it be will be reused or recycled. The equipment on the inverter pads include inverters, combiners, low voltage switch gear and medium voltage transformers. The equipment on the interconnection transformer pad includes medium and high voltage switchgear and a high voltage transformer. All of the equipment is modular and easily disassembled for removal.

The electrical connectors to each panel will be unfastened along with the combiner boxes and disconnect switches and the bolts and fasteners attaching each module to the racks will be removed. Each module will be removed from the rack and placed in secure transport crates and placed into a trailer for storage and ultimately for transportation to the next location where it be will be reused or recycled. The bolts and reusable fasteners will be saved for reuse also.

Once the solar modules have been removed, the racks will be disassembled and the piers supporting the racks removed. These components will require a tracked excavator to extract the beams by pulling them out vertically. The racks and pipe metals will be recovered and transported to a metal recycler for reuse. Underground electrical equipment, including electrical wiring, will be extracted and removed from the site. The wiring is either copper or aluminium (depending on the function/location) encapsulated in an insulating plastic material. Electrical materials consist primarily of recyclable commodities.

Unless the landowner requests that the buildings be repurposed for agricultural use the O&M and battery storage buildings would be disassembled, and recycled or disposed of offsite. Concrete pads supporting inverters, transformers, and O&M buildings will be removed. All fences and gates will be maintained at all times until the equipment decommissioning and removal process is complete and the area is ready to be demobilised. Unless the landowner requests that they remain, the fence and gates will be removed and all materials recycled to the greatest extent possible. The area will be thoroughly cleaned and all debris removed.

Gravel pavement material to the perimeter access tracks will be recovered and recycled as general fill at an approved location. Unless the landowner requests that they remain, the Vegetation buffer will be cleared, grubbed, mulched, composed and respread on site to increase the organic matter in the soil structure.



6.5 Use and Removal of Hazardous Material

Relatively small quantities of hazardous materials would be used during project construction and operation. Materials of concern that would be used during construction and operation include gasoline, diesel fuel, transformer cooling oil and sulfur hexafluoride.

Hazardous and non-hazardous wastes that are likely to be generated from the project construction and operation at the Project include waste motor oils, used transformers and transformer oil, waste hydraulic fluids, and waste solvents and adhesives. During decommissioning activities, minor spills and leaks of hazardous materials from vehicles or equipment could also occur. All wastes would be required to be handled, stored, transported and disposed of according to appropriate state and federal laws, ordinances, regulations, and standards. Fuels, lubricants, and other materials would not be stored on the Project site, and the proposed project applicant would not maintain an inventory of any hazardous materials on the project site. Project operations would not generate hazardous wastes.

On-site transformers would be filled with oil at the manufacturing company and subsequently checked in four-year intervals for integrity. Oils used would be 98 percent plant seed based. All oils, lubricants, and spent filters would be collected and removed for recycling at the time of replacement and decommissioning.

6.6 Reinstatement of Agricultural Use

Following removal of all solar equipment and related infrastructure, the site will undergo a series of steps to ensure successful return to agricultural use, that existed prior to development of the Solar PV facility. Portions of the site subject to compaction, such as access tracks, substation and the vegetated buffer will be deep ripped to a depth of 600mm and nourished using the composed organic matter from the removed vegetation buffer.

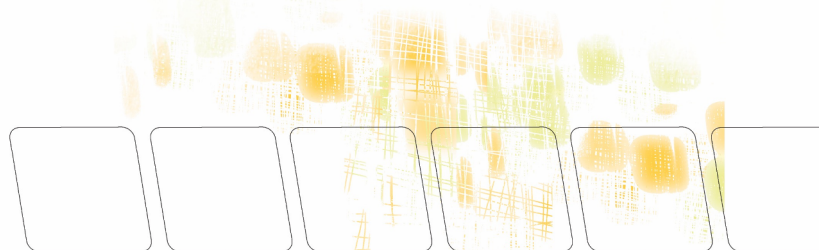
In the event that the landholder at the time intends to use the area for grazing of stock, the disturbed areas will be rehabilitated, by establishing pasture grasses consistent with the mix of grasses that will be planted over the majority of the site as part of the establishment of the Solar PV facility.

In the event that the site is returned to dryland cropping of the range of cereals, legumes and cotton as is the case prior to development, then Pasture grasses that had been established on the site will be eliminated using glyphosate and the land cultivated and allowed to lay fallow prior to establishment of cropping activities.

7. Rehabilitation Performance Criteria

The site rehabilitation activities shall be deemed successful if the following criteria are achieved;

- Decommission of solar farm occurs in one stage;
- All aboveground infrastructure is removed from the site and recycled or disposed of in an appropriate manner in accordance with all laws governing at the time of reclamation, with minimal disturbance to the land;
- All belowground infrastructure is removed to a minimum depth of 1 metre and reinstated so that subsoil material (>300mm deep) is not placed on the infilled land surface; or as approved by local authorities at the time of reclamation;
- After soil conditioning an appropriate dry-land cover crop is capable of being maintained on the site for one cropping season, subject to drought or other extenuating circumstances at the time of decommissioning.



8. Appendix A – Site Layout Plan

