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surveying – irrigation – environmental – planning

BARCALDINE REGIONAL COUNCIL

DIGITALLY STAMPED

APPROVED PLAN

Development Application: Minor Change to Development Approval (dated 15 June 2018) for Development Permit for Material Change of Use – Community Oriented Activity (Public Utility—Grid Connect Solar Photovoltaic Array) and Development Permit for Reconfiguring a Lot—Subdivision (1 Lot into 2 Lots)

Lot and Plan: Lot 73 on SP297047 and Lot 74 on SP297047

Referred to in Council's Decision Notice

Approval Date: 29 November 2021

Application Number: DA-142122



Dunblane Solar Farm Barcaldine

Decommissioning plan

John Hill, YD Projects

PO Box 1441 Coorparoo DC QLD 4151

June 2021

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1 Introduction

Dunblane Solar Farm in Barcaldine has commenced operation to produce electricity for Queensland's energy requirements. As part of lifecycle asset management and to inform stakeholders including local council, Dunblane Solar Farm recognises the need for a decommissioning plan to facilitate the cessation of operations at the farm.

1.1 Purpose and Scope of document

Dunblane solar farm recognises that it has an obligation to manage the decommissioning process at the property. This document is prepared to satisfy this obligation and to inform the shut down and decommissioning of the plant at the end of its working life.

2 Location and site plan

Dunblane solar farm is located in Barcaldine, Queensland.

Site address is 175 Barcaldine Aramac Road, Barcaldine Qld 4725.

The Site has development approval under DA 121617-1 through Barcaldine City Council. The installation of solar panel arrays and site works including water storage provision have been carried out in accordance with the development application. Figure 1 displays the site and some of the works completed to date.



Figure 1: Dunblane Solar Farm

3 Background to Decommissioning:

Due to the changing nature of the solar industry it is difficult to predict with any confidence when and how decommissioning of Dunblane Solar Farm will occur. The most significant piece of infrastructure on the solar farm is the solar panels themselves. These have an expected lifecycle of 30 - 40 years but can start to deteriorate and lose efficiency before that time. Assuming that the panels remain operative for their full expected life cycles it would then be a commercial decision, in consultation with the appropriate government authorities, whether to continue producing energy at the site and how to proceed. The physical connection to the electricity grid is very costly so it may be that rather than losing the investment in that connection asset, that new solar technology would be installed at the site at the end of the current solar panel's lifecycles. Solar technology is rapidly evolving so another possible scenario for Dunblane Solar Farm could be that the current panels be replaced, before their full lifecycle, by emerging technologies. It may be more energy efficient and commercially viable to replace obsolete panels with future technology but again, this is difficult to predict. If necessary, a condition of consent may be imposed that requires a detailed decommissioning plan to be prepared and approved immediately prior to the event. Regardless of the timeframe, when the farm ceases operation, Dunblane Solar Farm is committed to restoring the site to its intended purpose before construction commenced. The remediation of the Dunblane Solar farm will return the site to agricultural production.

4 Solar Farm components

The main components of the Dunblane Solar Farm include:

- Solar panels and tracking system
- Foundations and steel piles
- Transformers and inverters
- Electrical cabling and conduits
- Perimeter fencing, site access and internal roads

5 Lifecycle of the product and Triggering events

Project decommissioning may be triggered by events, such as the Project reaching the end of its operational life or future business failure of owners before the end of the asset lifecycle.

The expected lifetime of a utility-scale solar panel is approximately 30-40 years with an opportunity for a project lifetime of 50 years or more with equipment replacement and repowering. Depending on market conditions and project viability, the solar arrays may be retrofitted with updated components (e.g., panels, frame, tracking system, etc.) to extend the life of the project. In the event that the modules are not retrofitted, or at the end of the Project's useful life, the panels and associated components will be decommissioned and removed from the Project site.

Components of the solar facility that have resale value may be sold in the wholesale market. Components with no resale value will be salvaged and sold as scrap for recycling or disposed of at an approved offsite licensed solid waste disposal facility (landfill).

6 Decommissioning Risk

As noted, decommissioning activities can be triggered by other events during the course of the project's lifecycle. It is important, however, to realize that the probability of an event that would lead to abandonment or long-term interruption is extremely low during the first 15 to 20 years of the Project life. Accordingly, the risk of decommissioning the Project is extremely low during this time frame. The reasons why the risk to decommission the Project is extremely low in the early phases of the Project include, but are not limited to:

- Most critical solar components have original equipment manufacturer (OEM) warranties with terms in excess of five years that include labor and parts. Warranties give customers a form of insurance if the purchased product or service does not adhere to quality standards. These warranties assure the project owner, financing parties, and other stakeholders, that equipment will perform as expected which minimizes the risk of a decommissioning event. Average warranty lengths for critical solar components range from 5 to 10 years, with production warranties on solar panels extending to 20 to 25 years.
- Solar projects consist of many networked components designed to convert solar radiation into electrical energy. The failure of any single component will not result in a substantial reduction of energy generation that could lead to a decommissioning event.
- The replacement costs of solar components will typically decline over time, and accordingly, costs to replace failed or damaged equipment after lapsed OEM warranties will not create large financial hurdles for the Project.
- Solar power is an increasingly popular form of renewable energy around the world and as an alternative to the burning of fossil fuels, solar ranks alongside wind and hydropower as essential energy options for the future of the planet. Solar also offers the additional benefit of being easier to build, operate and decommission with minimal environmental risks. Recent rises in popularity and use can be linked to lower installation and operation costs and it is expected that this pattern will continue into the future, further reducing the risk of a decommissioning event.
- The cost of decommissioning has been estimated by an external company (Appendix 2) and Dunblane Solar Farm commits to financing these costs upon decommissioning.
- A bond for decommissioning from the electricity grid has been paid to Ergon energy (See 10 – Decommissioning from the electricity grid).

7 Decommissioning sequence

Decommissioning activities will begin within six months of the Project ceasing operation and are anticipated to be completed in twelve months. Monitoring and site restoration may extend beyond this period to ensure successful revegetation and rehabilitation. The anticipated sequence of decommissioning and removal is described below; however, overlap of activities is expected.

- Reinforce access roads, if needed, and prepare site for component removal
- Install temporary fencing and best management practices (BMPs) to protect sensitive resources
- De-energize solar arrays
- Remove panels and dismantle racking for recovery / disposal
- Remove structural foundations
- Remove inverters and transformers
- Remove electrical cables and conduits
- Remove access and internal roads (if requested by landowner) and grade site
- De-compact subsoils (if required), restore and revegetate (if desired by landowner at the time of decommissioning) disturbed land to pre-construction conditions to the extent practicable

8 Decommissioning cost

See Appendix 2 “Remediation Estimate” outlining expected costs associated with decommissioning of Dunblane Solar Farm

9 Land use and environment

The proposed solar facility is located on land historically used for agricultural purposes. Before commencement of construction vegetation was limited to a very small number of native shrubs and some weed species. The land had been extensively cleared for agriculture and the parcel in question had been cleared of trees. The terrain is relatively flat. Areas of the Project that were previously utilized for agricultural purposes will at minimum be restored to their preconstruction condition and land use. Areas will be revegetated in consultation with the new landowners, local government and in compliance with regulations in place at the time of decommissioning. This will include taking advice from environmental specialists regarding reintroducing species native to the area and taking steps such as revegetating native buffer zones to minimise invasion by weed species.

Project areas that have been excavated and back filled will be re-graded. Disturbed areas will be seeded with appropriate vegetation in consultation with council and community groups. The storm water holding pond at the southern end of the site will be filled by pushing the raised bunks into the void. Work will be completed to comply with the conditions agreed upon in this Decommissioning plan and in accordance with other federal, state and local regulations in effect at the time of decommissioning.

Surface water conditions at the Project site will be reassessed prior to the decommissioning phase. Dunblane Solar Farm will obtain the required water quality permits, if needed, before decommissioning of the Project. Construction storm water permits will also be obtained, and a Stormwater Pollution Prevention Plan will be prepared describing the protection needed to reflect conditions present at the time of decommissioning. These plans may include: construction entrances, temporary seeding, permanent seeding, mulching (in non-agricultural areas), erosion control matting, silt fences, filter berms and filter socks. The site Stormwater Management plan outlines mitigation strategies for minimizing corrosion and soil migration so these items are expected to be minimal but any noted scouring and corrosion or significant shifting of soils caused by changed stormwater conditions due to site assets will be remediated and returned to pre-construction conditions.

10 Decommissioning from the Electricity Grid

As part of the network connection agreement with Ergon energy, Dunblane solar farm has paid a decommissioning bond of \$76,583 (See Appendix 1) to provide assurance that upon decommissioning, monetary provisions have been put aside to cover the cost of safely disconnecting the site from the network grid.

11 Appendix 1

TAX INVOICE



ERGON ENERGY CORPORATION LIMITED
 ABN: 50 087 646 062

Invoice: 10201027
Customer: 149219
Date Issued: 24/11/17
Payment Terms: 30 days NET
Payment Due: 24 December 2017

ENTERED

TO: Dunblane Solar Pty Ltd
 P O Box 6316
 QUEANBEYANE EAST NSW 2620

ABN 29 613 550 100

Total Pages: 1
Page Number: 1 of 1

Item	QTY	Unit	Unit Price	Amount	GST	Amount + GST
Dunblane SF Project Security						
Customer Reference: WR1106355						
Removal				76,583.00	0.00	76,583.00
Security to be held for removal of connection assets on termination of the connection agreement and for 3 months advance of Network Charges						
TOTAL AMOUNT DUE:						<u>76,583.00</u>
				Includes GST of:	0.00	

paid 4/12/17

Payment Options:

NOTE: This account cannot be paid at Australia Post

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Biller Code: 97048
Ref: 0201 0270

Telephone & Internet Banking – BPAY®
 Contact your bank or financial institution to make this payment from your cheque, savings, debit, credit card or transaction account. More info: www.bpay.com.au

Direct Deposit

BSB: 064-710 CBA ROCKHAMPTON
Account: 00001233 ERGON ENERGY CORPORATION
Ref: 10201027 Advise payment to accountsreceivable@ergon.com.au

If paying by cheque, please detach this section and return with your payment to:

Ergon Energy Corporation Limited
 PO Box 308
 ROCKHAMPTON QLD 4700
 Ph: 07 4932 7155 Fax: 07 4932 7123
 accountsreceivable@ergon.com.au

Invoice: 10201027
Customer: 149219
Name: Dunblane Solar Pty Ltd
Amount Due: 76,583.00

SS

12 Appendix 2



REMEDICATION Estimate



DUNBLANE SOLAR FARM
Aramac Hwy, Barcaldine Qld 4725



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Introduction

This document outlines the proposed remediation works to be completed end of project life at Dunblane Solar Farm. The project will have a footprint of approximately ten hectares. The project's design life of forty years. Remediation works will return the site to agricultural production.

This estimate is subject to assessment of a detailed proposal from Dunblane Solar Farm Pty Ltd at end of design life.

Contractor

Meralli Projects Pty Ltd

www.meralliprojects.com.au

Location

The Dunblane Solar Farm is located on the Aramac Hwy (Barcaldine, Qld) and is approximately 4km north of Barcaldine Qld.



Scope of Works

The following table outlines the proposed order of remediation works.

Stage	Works	Description
1	High Voltage (HV)	Remove network grid connection
2	DC Array Electrics	Disconnect and remove DC sub-array components
3	Modules	Uninstall and remove modules
4	Frame and fixings	Uninstall and remove frame and fixings
5	Other equipment	Uninstall and/or remove fire safety equipment, pest control equipment, security monitoring equipment
6	Fence	Uninstall and remove security fence and fixings including signage
7	Material Handling	All materials and recyclables delivered to suitable facilities

Notes

NB All electrical remediation work to be carried out by appropriately qualified electrician/s.



Costings

Remediation as per scope of works, including:	
<ul style="list-style-type: none"> • labour costs • specialised contractors (e.g. HV accredited electrician) • specialised machinery hire • transport of recyclables and waste 	\$524984.00
Estimated value of recyclable materials.	(\$365000.00)
Sub Total (excluding GST)	\$159,984.00
GST	\$15,998.40
Total (including GST)	\$175,982.40

Notes

Remediation costs are minimised due to the comparatively lightweight design of the project. In addition to this almost 100% of the materials used in the project can be recovered and repurposed or recycled, offsetting the cost of remediation.



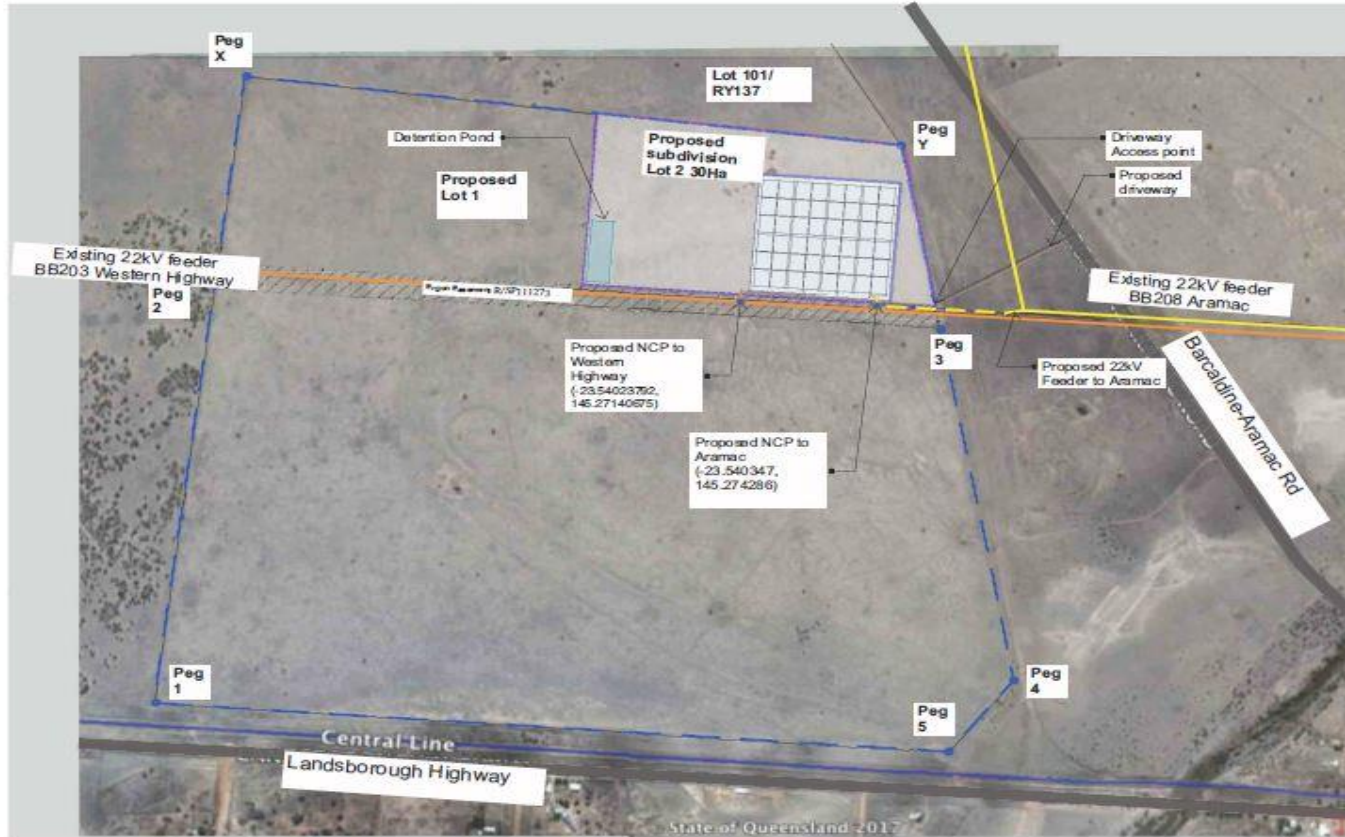
Work Health and Safety

Work Health and Safety concerns are minimised due to the low profile and lightweight design of the project. All remediation works are to be carried out in accordance with current Work Health and Safety guidelines.

Conclusion

The remediation of the Dunblane Solar farm will return the site to agricultural production. The expectations of the owner and social obligations will be met by maximising the repurposing and recycling of decommissioned components while complying with all relevant regulatory requirements. The financial cost of remediation will be offset by the repurposing and recycling of decommissioned components.

Appendix 3



YD Projects

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Project / Part Number:
YD-0916-DUN
Description
Dunblane Solar Farm

Version:
July 7, 2017
Approval date:
July 5, 2017

Drawn By:
AWW
Approved by:
RLM

Client:
Lot 72/SP136851
Dunblane Solar Farm

Designed By:
YD Projects

Status:
FOR APPROVAL / QUOTATION

Notes:
SCALE 1:10000 A3

Lot overview

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