

Urban Planning Report – Material Change of Use & Reconfigure a Lot
538 and 752 Yarranlea Road, Yarranlea

within
Toowoomba Regional Council

for

YARRANLEA SOLAR PTY LTD



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STATEMENT OF LIMITATION

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1. Executive Summary

SITE DETAILS	
ADDRESS	538 and 752 Yarranlea Road, Yarranlea
LOT ON PLAN	3347/A341649, 2/RP18249, 2/RP7475, 2/A34925
SITE AREA	301.847ha
LAND OWNERS	CAMERON ANDREW SAAL
LOCAL AUTHORITY	Toowoomba Regional Council
RELEVANT PLANNING SCHEME	Toowoomba Regional Planning Scheme v10 (20May2016)
ZONE	Rural
APPLICABLE PLANNING SCHEME CODES	Rural Zone Code Rural Uses Code Environmental Standards Code Integrated Water Cycle Management Code Landscaping Code Transport, Access and Parking Code Works and Services Code Reconfiguring a Lot Code
DEVELOPMENT PROPOSAL DETAILS	
REFERRALS	Dept.State Government, Infrastructure, and Planning
APPLICATION TYPE	Material Change of Use Reconfigure a Lot – Subdivision by Lease greater than 10 years
DEFINED USES	Renewable Energy Facility
LEVEL OF ASSESSMENT	Impact Assessable
CURRENT USE	Agricultural Activities
PROPOSAL	Renewable Energy Facility (100MW) Six (6) Leases greater than 10 years
PUBLIC NOTIFICATION	Required
GROSS FLOOR AREA	301.847ha
NUMBER OF CARPARKS	4
APPLICANT	Yarranlea Solar Pty Ltd
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2. Introduction

2.1 Proposal Summary

This town planning report has been prepared to accompany a development application for a Material Change of Use - Renewable Energy Facility (100MW) and Reconfigure a Lot – Six (6) Leases over 10 years, for Yarranlea Solar Pty Ltd over land located at 538 and 752 Yarranlea Road, Yarranlea. The subject land can be further identified as Lots 3347/A341649, 2/RP18249, 2/RP7475, 2/A34925. The site is currently used for Agricultural Activities and is zoned under the current Toowoomba Regional Planning Scheme v10 (20May2016) as Rural.

The proposed development will comprise of a Renewable Energy Facility (100MW) under lease arrangement, and will be completed in four (4) stages. Below is a brief synopsis of development that will occur on site.

Table 1 - Development Synopsis

Stage 1	Description	Usage / Location	Area
Substation			
	Solar Panels	Collection of light from sun	100ha (40MW) approx
	Control Room	Operation of PowerStation	76m ²
	Battery Store	Storage of Electricity	368m ²
	Capacitor Banks	Within internal substation	-
	Switch Room	Within internal substation	124m ²
	Back Up Generator (B.U.G)	Generator	12m ²
	Transformer	Conversion of Power	-
	Invertors	Central to solar arrays	207m ²
		Subtotal	100.0787ha
Removed			
	Shed	Agricultural purposes	117m ²
		Subtotal	117m²
Miscellaneous			
	Landscaping	Full perimeter of Stage 1	-
	Access Track	Full perimeter of Stage 1	-
	Stormwater Drainage	Next to internal substation	-
		Total Area Increased by	100.0670m²

Stage 2	Description	Usage / Location	Area
Substation			
	Solar Panels	Collection of light from sun	50ha (20MW) approx
	Invertors	Central to solar arrays	103m ²
		Subtotal	50.0103ha
Removed			
	Landscaping	Murlaggen Road	-
		Subtotal	-
Miscellaneous			
	Landscaping	Full perimeter of Stages 2 to 4 excluding Murlaggen Road	-
	Access Track	Full perimeter of Stages 2 to 4	-
		Total Area Increased by	50.0103ha



Stage 3	Description	Usage / Location	Area
Substation			
	Solar Panels	Collection of light from sun	50ha (20MW) approx
	Invertors	Central to solar arrays	103m ²
		Subtotal	50.0103ha
		Total Area Increased by	50.0103ha

Stage 4	Description	Usage / Location	Area
Substation			
	Solar Panels	Collection of light from sun	50ha (20MW) approx
	Invertors	Central to solar arrays	103m ²
		Subtotal	50.0103ha
Removed			
	Landscaping	Murlaggen Road	-
	House and Sheds	Agricultural purposes	636m ²
		Subtotal	636m²
Miscellaneous			
	Shed	Agricultural purposes	650m ²
		Subtotal	650m²
		Total Area Increased by	50.0117ha

The proposal generally complies with the planning criteria outlined by the Toowoomba Regional Council and the relevant primary and secondary codes associated with the Toowoomba Regional Planning Scheme v10 (20May2016). The proposed development has been identified as Impact Assessable and will therefore require public notification.

This report will furthermore provide information on the site and application details; an overview of the proposed development and details on how the proposed development will comply with the planning criteria associated with the Toowoomba Regional Planning Scheme v10 (20May2016). Supporting material is provided in addition to this report to offer further details on engineering, planning, environmental, and proposal plans. This report should be read in conjunction with the attached Appendices.

3. Site Description and Context

3.1 Subject Site

The site is located at 538 and 752 Yarranlea Road, Yarranlea and is made up of four (4) individual land parcels ranging in size from 19 to 199 hectares which encompass a total area of 301.847ha. The subject lots are situated approximately 10km West of Pittsworth and 45km SouthWest of Toowoomba City within the jurisdiction of Toowoomba Regional Council. Refer to Figures 1 to 4.

Yarranlea Road is a two way bitumen sealed road that borders the Western perimeter of the subject lots, and is a primary transportation route that connects with the Gore Highway 4km to the South. Refer to Figure 5. Yarranlea Murlaggen Road divides the subject lots East-West and contains an unsealed local rural road that intersects with Yarranlea Road to the West. Refer to Figures 6 to 8. Two unnamed roads partially adjoin the Western and Southern property boundaries of the subject lots, and are unformed local access roads.

Structures on the land include a residential dwelling and two (2) sheds used for farming practices on Lot 2 A34925, and another farming shed straddling the common property boundary of Lot 3347 A341649 and Lot 2 RP18249. Refer to Figure 9.

Farming practices are evident over the land with cropping extending to all parts of the subject lots except where vegetation is centrally over Lot 2 RP7475. Refer to Figures 4, 10 to 12. Scattered vegetation aligns the perimeter of the subject lots within road reserves.

Topography of the land generally adheres to an undulating landscape with stormwater flowing in a northeast direction over the subject lots. Natural drainage lines have been altered as a result of the agricultural practices to the permitter of the subject lots, as can be clearly seen along the Northern boundary of Lot 2 A34925. Refer to Appendix A and Figure 13 and 14.

Below are aerial photographs of the subject site as per its current built form context. Refer to Figures 1 and 2.



Figure 1 - Aerial photo showing locality of subject site
Source: Google Maps, 2016

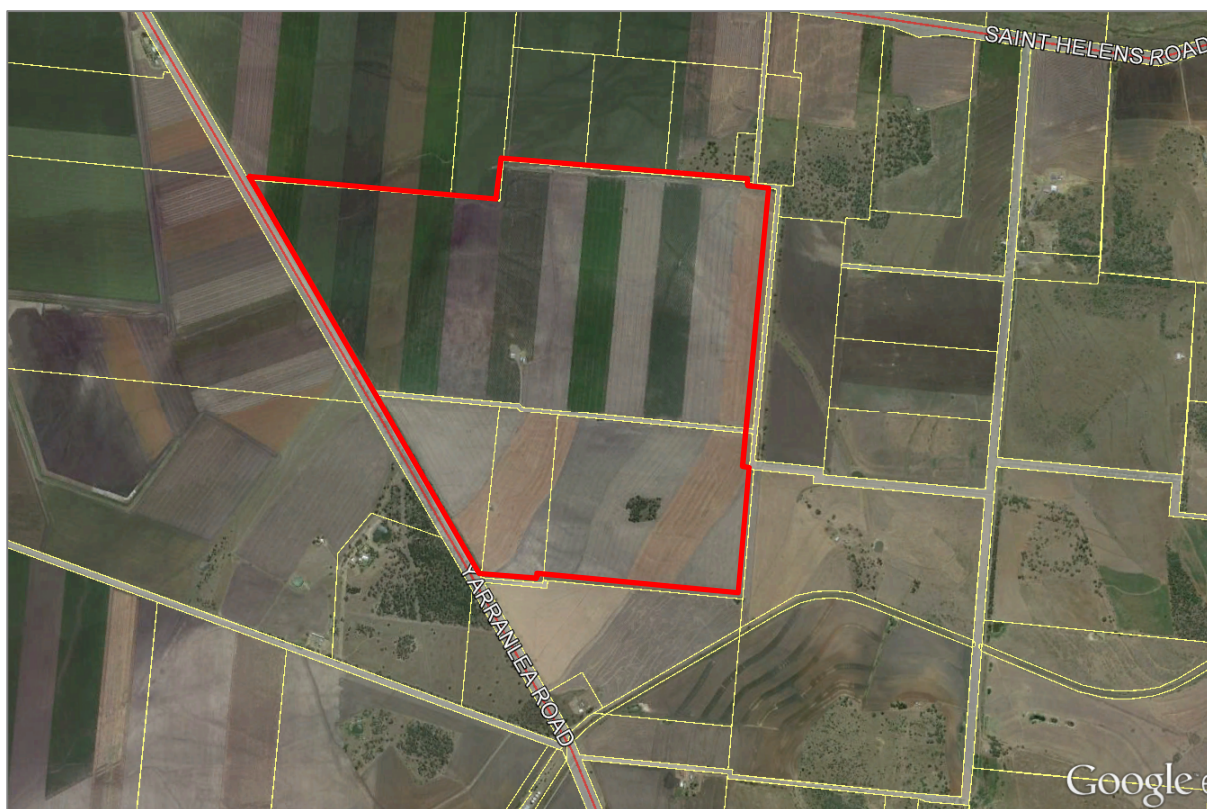


Figure 2 - Aerial photo showing subject site
Source: Google Maps, 2016



Figure 3 – View of proposed Solar Farm from SW corner of subject lot on Yarranlea Road looking NE
Source: Site Visit, June 2016



Figure 4 – View of proposed Stage 1 Solar Farm from SW corner of subject lots on Yarranlea Road looking East
Source: Site Visit, June 2016



Figure 5 –Yarranlea Road looking Northwards – Subject lots bordering the right side of road
Source: Site Visit, June 2016



Figure 6 –Yarranlea Road and Murlaggen Road intersection looking Northwards
Source: Site Visit, June 2016



Figure 7 – Murlaggen Road intersection with Yarranlea Road looking Eastwards
Source: Site Visit, June 2016



Figure 8 – Murlaggen Road heading East from Yarranlea Road
Source: Site Visit, June 2016



Figure 9 – Residential Dwelling and Two (2) Sheds on Lot 2 A34925
Source: Site Visit, June 2016



Figure 10 – Vegetation stand within Lot 2 RP7475
Source: Site Visit, June 2016



Figure 11 – Vegetation stand within Lot 2 RP7475
Source: Site Visit, June 2016



Figure 12 – Vegetation stand within Lot 2 RP7475
Source: Site Visit, June 2016



Figure 13 – Drainage channel on northern property boundary of Lot 2 A34925
Source: Site Visit, June 2016



Figure 14 – Drainage channel on northern property boundary of Lot 2 A34925
Source: Site Visit, June 2016

3.2 Surrounding Land Uses

Development in the locality predominately consists of rural agricultural activities, with cropping being the predominate use. Large fields surround scattered residential dwellings and vegetation throughout the locality with the nearest urban centre being Pittsworth 10km away from the subject lands. Refer to Figure 1.

A brief description of the surrounding land uses has been provided below.

Table 2 - Surrounding Land Uses Summary

East	Rural Lots – Zoned Rural, and utilised for cropping purposes with scattered residential and agricultural buildings with some dense vegetation in parts
West	Rural Lots – Zoned Rural, and utilised for cropping purposes with scattered residential and agricultural buildings with some scattered vegetation
North	Rural Lots – Zoned Rural, and utilised for cropping purposes with scattered residential and agricultural buildings with some scattered vegetation
South	Rural Lots – Zoned Rural, and utilised for cropping purposes with scattered residential and agricultural buildings with some scattered vegetation. An electricity substation is within 1km South of the subject site. Refer to Figure 15.

The proposed use is designed to complement the existing rural character of this locality with appropriate measures to mitigate impacts as outlined in further sections of this report.



Figure 15 – Ergon Electricity Sub Station as viewed from Yarranlea Road
Source: Site Visit, June 2016



Figure 16 - Map of Surrounding Land Uses
Source: Toowoomba Regional Council, 2016

3.3 Site Characteristics

Located within a rural zone, the following characteristics are typical of a land used for agricultural purposes.

3.3.1 Access

As discussed in section 3.1 the subject land is partially bordered by roads, whether formed or not. Primary access is gained directly from Yarranlea Murlaggen Road to service the existing farm house on Lot 2 A34925. No other formal access points have been made from any of the other roads, which is not atypical farming practice.

Access to Yarranlea Road via the Gore Highway intersection allows for vehicles to turn without impediment of traffic and with good shoulder pavement, as illustrated in Figures 17 to 19.



Figure 17 – Intersection of Yarranlea Road and the Gore Highway south of subject site
Source: Site Visit, June 2016



Figure 18 – Gore Highway at intersection of Yarranlea Road, looking Westwards
Source: Site Visit, June 2016



Figure 19 – Gore Highway at intersection of Yarranlea Road, looking Eastwards
Source: Site Visit, June 2016

3.3.1 Services

Stormwater/Sewer/ Water:

The subject lots are not connected to any formal stormwater, or reticulated sewer and water networks. Furthermore, no formal systems exist within a relatively comfortable distance to service any of the lands. Stormwater appears to drain over the site following the contours of the land and into an existing drainage channel on the northern property boundary of Lot 2 A34925, before discharging into the existing drainage / waterway that conveys sheets flowing water back across this Lot before exiting onto Yarranlea Road in a south-easterly direction. Refer to Appendix A and Figure 20 and 21 for location of Council and State Government identified waterways within subject land.

Electricity:

Electricity infrastructure aligns Yarranlea Road, along the full length of the subject lands. Another private connection splits from this line and traverses Lot 2 RP18249 and adjoining Lot 2 RP120604 to provide power to the existing farm house on Lot 2 A34925. Electricity from the existing substation to the south of the subject lots has a connecting powerline that straddles the western boundary of Lot 2 RP7475.

Telecommunications:

Telecommunication infrastructure aligns Yarranlea Road, along the full length of Lot 2 A34925 before crossing the road reserve and travelling along Yarranlea Murlaggen Road to service the existing farm house on this allotment.

Other:

Fibre Optical Cabling Infrastructure aligns the Millmerran Branch train line south of the subject lands.

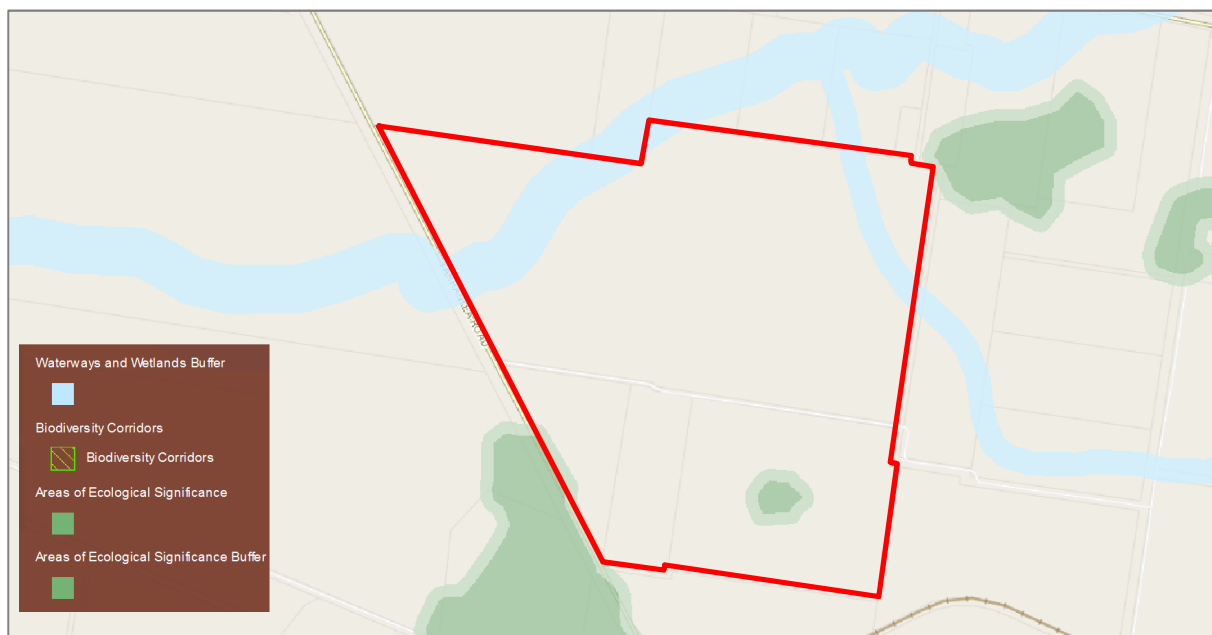


Figure 20 – Local Government identified vegetation and waterways over subject lands
Source: Toowoomba Regional Council, 2016



The land is predominately clear of any vegetation apart from a small section centrally located within Lot 2 RP7475, which is identified as being of local and state significance. The details of this assessment as contained in Appendix H, and are also illustrated in Figures 20 and 22.



Subsequently, approval was obtained on the 15th June 2016 from the Department of Natural Resources and Mines (DNRM) to a Property Map of Assessable Vegetation (PMAV) over Lot 2 RP7475. Under the PMAV the vegetation within this lot has been reclassified as being Category X which allows regulated vegetation identified in Figure 22 to be cleared separate to this MCU/ROL application. Refer to Appendix I for details on the PMAV granted and Figure 23 for extract of certified PMAV.

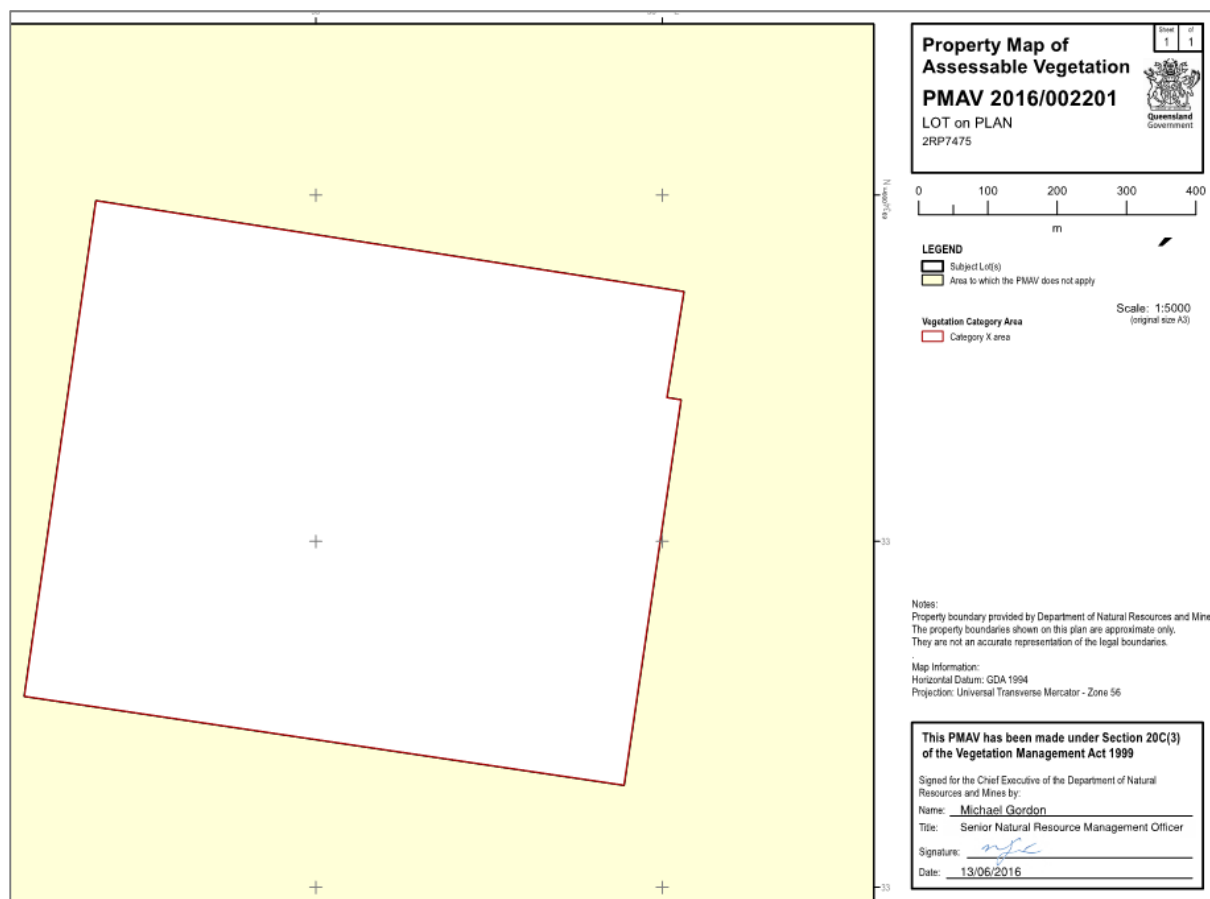


Figure 23 – Property Map of Assessable Vegetation within Lot 2 RP7475 of subject site
Source: State Government (DNRM), 2016

3.4 Pre-Lodgement Advice

The applicant met with officers from Toowoomba Regional Council and the Department of State Development, Infrastructure and Planning to discuss the proposed development.

Department of State Development, Infrastructure and Planning advised the following as a result of their meeting held on the 9th February 2016, the minutes of which are attached in Appendix D;

- State significant vegetation, being Category B, was identified on the subject site.
- Recommendation to apply for a PMAV to verify the extent and species of this vegetation.
- Any application to remove Category B vegetation will need to demonstrate how the impacts of the development have been avoided and minimised.



Toowoomba Regional Council advised the following as a result of their meeting held on the 9th February 2016, whose detailed minutes are attached in Appendix D;

- Consideration to be given to incorporate minor agricultural uses to maintain the rural intent of the properties
- Details about solar panel dimensions and separation distances
- Conflicts with planning criteria specifying rural purpose must be addressed
- Stormwater management plan is required, including details on how natural overland flows / waterways have been changed onsite as a consequence of agricultural use
- Traffic Impact Statement is required
- Details on addressing earthworks onsite
- RPEQ certification required for all design drawing submitted
- Conceptual landscape plan is required
- Stormwater Management Plan is required
- Noise and air quality impact reports are not required
- Ecological Assessment of the remnant vegetation onsite is required

4. Application Details

4.1 Proposed Development

Brisbane based Yarranlea Solar Pty Ltd has been established to develop a Utility Scale Photovoltaic Solar resource (Solar Farm) 45km West of the inland City of Toowoomba. On completion the project will generate up to 100MW of renewable energy from approximately 400,000 solar panels, which is sufficient to supply electricity to approximately 26,000 homes within Toowoomba City. Operation of the power plant over 30 years will avoid the need to burn approximately 2.7 million tonnes of coal.

Details of the proposed solar farm development are outlined in the following sections.

4.1.1 Proposed Use

It is proposed to retain part of the subject allotments for agricultural purposes, whilst allowing for the majority of lots to be utilised as a 100MW Solar Farm (Stages 1 to 4). Refer to Appendix A.

The retention of agricultural activities onsite will enable the continuity of a rural link to fulfil the intent of the locality. This use is largely confined to the balance area within the north-west corner of the subject lands, although use of animals to reduce ground cover within the solar farm itself is a consideration for future practices by the applicant. Within the balance area it is proposed to locate a new farming shed, a gravel hardstand area and bore filling point to service the continued agricultural use of this land. These are to be located on the southeast corner of the balance area. Refer to Appendix A for more details.

The proposed solar farm is spread over the majority of the subject site, and will occur in four (4) stages as shown in Appendix A. Renewable resource activities within a rural setting are fast becoming a familiar use, with several solar farms approved within Queensland over the last few years. Typically these uses are located near existing transmission infrastructure and appear to generally acceptable for the rural locality given the low level of impacts once operations commence. These are discussed in latter sections of this report.

A solar farms purpose is to collect solar radiation and convert this energy into electricity that can then be transferred to other parts of the community for consumption via the existing (fixed) electricity network. To do this a solar farm typically comprises of several interlinked and integral components include: solar modules, steel mounts for the modules, electrical transformers and inverters, electrical wiring, telecommunication equipment and electrical control enclosures. This solar farm will also include a battery/electrical storage component to store surplus power generated during the day to be released over night, or during periods of high demand.

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 are aligned north-south and operate under a solar tracking system to increase power generation through tracking the movement of the sun from East to West. 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 650m from the southern boundary of the development area using underground transmission line/s within the Yarranlea Road reserve and terminating at the existing Ergon Substation. Further permits, separate to this application may be required for this infrastructure.

The detailed design of the PV system for this project is currently in progress and the most recent technology available indicates that approximately 350,000 cutting edge Passive Emitter Rear Contact, (PERC) Mono Silicone 355Wp modules will deliver the required capacity. The modules will be mounted on single axis tilting racks, supported on a mono pole system, with a single pole installed at approximately 7.6m centres along the length of the tables. The Yarranlea Solar installation will require some 46,000 support posts and a video of the tracking technology which may be used can be found at <https://youtu.be/S3op85PwN1w?t=45s>. The layout of the racking system has been clarified on drawing 15-282-A05.

Preliminary geotechnical investigation of the site has been completed and is included in Appendix N of this report. Key observations in this report indicate that the site comprises silty clay soils overlying a weathered basalt rock basement. The clay profiles range from 2.7m to greater than 4.5m and, from a structural perspective are ideally suited for a driven steel pile. This type of foundation requires no drilling or concrete, rather the support posts discussed above are driven into the ground, using conventional piling methods to a depth of between 2.5 – 3.0m, resulting in insignificant ground disturbance. As indicated in the previously submitted site rehabilitation and end use plan, (Appendix H), the piles for the module racking system will be extracted, by reversing the installation process.

The containerised inverter stations located within the PV field will also be founded on driven piles, similar to the module mounting frames, and will also result in minimal ground disturbance.

Collection, storage and distribution of the electricity generated from the solar farm occurs in the southwest corner of the subject site, and consists of an internal substation, battery storage, control room, and B.U.G. (backup generator). Management of the solar farm will be from the proposed control building which will include bitumen sealed carpark to accommodate staff and visitor parking for up to four (4) vehicles, and can be accessed directly from Yarranlea Road. Access to the battery store, B.U.G. and substation is also gained from this point.

When installing infrastructure, it can be conditioned that any excavated soil material is to be reinstated so that subsoil material (>300mm deep) is not placed on the infilled land surface. This will remove any concerns regarding returning the land back to its agricultural cropping activities.

4.1.2 Staging

The development is to be staged in four (4) parts, to enable the orderly construction of the onsite operations. It should be noted that completion of all four (4) stages together is a consideration of the applicant should the need arise.

Timing of this staged development is critical as the proposed use can take many years to be completed, and the roll over timeframe provisions in *SPA2009* would be hard to realise given that there are few related approvals for this use, particularly in the later stages. Thus, a development approval will need to be valid for 10 years ie;

- Stage 1 – 6 years
- Stage 2 – 8 years
- Stage 3 – 10 years

Stage 1

Stage 1 is to be completed within 6 years of development approval.

Lease A, B and C are to be created over Lots 2 RP7475, Lot 2 RP18249 and Lot 3347 A341649. Use of the balance land not directly occupied by Lease A, B and C will continue to be used for agricultural practices.

The single farming shed straddling Lot 3847 A341649 and Lot 2 RP18249 is to be removed.

Existing electricity infrastructure within Easement A RP152970 may be retained without further change, however relocation options with Ergon Energy Corporation are being considered.

Removal of existing vegetation stand within Lot 2 RP7475, subject to obtaining clearing permit for the translocation of Belson's Panic (grass species). Refer to ecological report recommendations in Appendix H, PMAV in Appendix I, and section 4.1.11 of this report for further details.

A construction laydown area is to be established near the main site entrance and a second area at the intersection of Murlaggan and Yarranlea Roads on Lot 2 A34925, and equipment mobilised to the site. The site is then cleared, grubbed, graded, and compacted, with the on-site informal access tracks staked and established. These internal access tracks are designed to provide access to the inverter/transformers equipment pads located at the centre of a block of solar panel arrays. A gravel access track wide enough for a single vehicle shall be provided around the perimeter of Stage 1. It will be treated to create a durable, dust minimising surface, and will also act as a fire break that can be accessed from the internal substation area. Security fencing and landscaping will align the full perimeter of Stage 1 as illustrated in Appendix A. Landscaping along the full length of Murlaggan Road if Stage 1 is completed with conjunction with one or more of the other stages.

Construction of the internal substation would incorporate a number of concrete foundations for the electrical plant including the main transformer, Neutral Earth Transformer, Reactive Plant, Switch Room, Operations and Maintenance Building and Battery Storage Building. A further two (2) 110kV connection lines from the internal substation to the existing Ergon substation will be constructed within the Yarranlea Road reserve.

A new vehicle crossover from Yarranlea Road to Lot 3847 A341649 will be created that is bitumen sealed as shown in Appendix A. The new carparking space servicing the solar farm will also be bitumen sealed with the provision of four (4) carparking spaces. The internal area of the new substation is to be laid with gravel for ease of maintenance by vehicles when needed.

Solar panels will cover approximately 100ha and are to be installed in arrays consisting of linear strings of mounted modules organised into blocks of approximately two megawatts (2MW) capacity, generally as shown in Appendix A. The solar panels are to be positioned 1.2 metres above ground level and mounted on monopole structures. These monopole structures are connected in strings of approximately 100 metres, with a 5.7 metre gap between centres. The monopole structures will be supported by steel screw piles, or steel driven piles or FRP Composite Driven Piles, to a depth of between 2 – 3 metres below the existing ground surface level. These foundations **do not require concrete footings, and are removed in the same manner as they are installed to enable the land to be restored to cultivated agricultural activities.**

Each solar panel 'block' is to include a central skid mounted inverter/transformer station that will convert the power from direct current (DC) energy into grid-compatible alternating current (AC) energy. Foundations for the inverter stations shall be similar screw pile, or driven pile technology to the solar panel supports, and are removable at the end of the projects life. A medium voltage collector system (33kV) will be installed by direct burying to a depth of 1.0 metre below ground level. At the end of the project the cables will be recovered for metal recycling.

Stage 2

Stage 2 is to be completed within 8 years of development approval.

Lease D is to be created over part of Lot 2 A34925. Use of the balance land not directly occupied by Leases A to D will continue to be used for agricultural practices.

The existing construction laydown area at the intersection of Murlaggan and Yarranlea Roads on Lot 2 A34925 is to be utilised for mobilised of equipment to the site. The area within this stage is to be graded, and compacted, with the on-site informal access tracks staked and established. These internal access tracks are designed to

provide access to the inverter/transformers equipment pads located at the centre of a block of solar panel arrays. A gravel access track wide enough for a single vehicle shall be provided around the perimeter of Stage 2 to 4. It will be treated to create a durable, dust minimising surface, and will also act as a fire break that can be accessed from Murlaggan Road. Security fencing and landscaping will also align the full perimeter of Stage 2 to 4 as illustrated in Appendix A.

Solar panels will cover approximately 50ha and are to be installed in arrays consisting of linear strings of mounted modules organised into blocks of approximately two megawatts (2MW) capacity generally as shown in Appendix A. The solar panels are to be positioned 1.2 metres above ground level and mounted on monopole structures. These monopole structures are connected in strings of approximately 100 metres, with a 5.7 metre gap between centres. The monopole structures will be supported by steel screw piles, or steel driven piles or FRP Composite Drive Piles, to a depth of between 2 – 3 metres below the existing ground surface level. These foundations **do not require concrete footings, and are removed in the same manner as they are installed to enable the land to be restored to cultivated agricultural activities.**

Each solar panel 'block' is to include a central skid mounted inverter/transformer station that will convert the power from direct current (DC) energy into grid-compatible alternating current (AC) energy. Foundations for the inverter stations shall be similar screw pile, or driven pile technology to the solar panel supports, and are removable at the end of the projects life. A medium voltage collector system (33kV) will be installed by direct burying to a depth of 1.0 metre below ground level. At the end of the project the cables will be recovered for metal recycling.

Stage 3

Stage 3 is to be completed within 10 years of development approval.

Lease E is to be created over part of Lot 2 A34925. Use of the balance land not directly occupied by Leases A to E will continue to be used for agricultural practices.

The existing construction laydown area at the intersection of Murlaggan and Yarranlea Roads on Lot 2 A34925 is to be utilised for mobilised of equipment to the site. The area within this stage is to be graded, and compacted, with the on-site informal roadway access tracks staked and established. These internal access tracks are designed to provide access to the inverter/transformers equipment pads located at the centre of a block of solar panel arrays.

Solar panels will cover approximately 50ha and are to be installed in arrays consisting of linear strings of mounted modules organised into blocks of approximately two megawatts (2MW) capacity generally as shown in Appendix A. The solar panels are to be positioned 1.2 metres above ground level and mounted on monopole structures. These monopole structures are connected in strings of approximately 100 metres, with a 5.7 metre gap between centres. The monopole structures will be supported by steel screw piles, or steel driven piles or FRP Composite Drive Piles, to a depth of between 2 – 3 metres below the existing ground surface level. These foundations **do not require concrete footings, and are removed in the same manner as they are installed to enable the land to be restored to cultivated agricultural activities.**

Each solar panel 'block' is to include a central skid mounted inverter/transformer station that will convert the power from direct current (DC) energy into grid-compatible alternating current (AC) energy. Foundations for the inverter stations shall be similar screw pile, or driven pile technology to the solar panel supports, and are removable at the end of the projects life. A medium voltage collector system (33kV) will be installed by direct

burying to a depth of 1.0 metre below ground level. At the end of the project the cables will be recovered for metal recycling.

Stage 4

Stage 4 is to be completed within 10 years of development approval.

Lease F is to be created over part of Lot 2 A34925. Use of the balance land not directly occupied by Leases A to F will continue to be used for agricultural practices.

The single farming house and sheds are to be removed, and a new farming shed (18 x 36 x 6m), bore and gravel hardstand to be created in the balance area of the subject site after the completion of solar farm works as illustrated in Appendix A.

The existing construction laydown area at the intersection of Murlaggan and Yarranlea Roads on Lot 2 A34925 is to be utilised for mobilised of equipment to the site. The area within this stage is to be graded, and compacted, with the on-site informal roadway access tracks staked and established. These internal access tracks are designed to provide access to the inverter/transformers equipment pads located at the centre of a block of solar panel arrays.

Solar panels will cover approximately 50ha and are to be installed in arrays consisting of linear strings of mounted modules organised into blocks of approximately two megawatts (2MW) capacity generally as shown in Appendix A. The solar panels are to be positioned 1.2 metres above ground level and mounted on monopole structures. These monopole structures are connected in strings of approximately 100 metres, with a 5.7 metre gap between centres. The monopole structures will be supported by steel screw piles, or steel driven piles or FRP Composite Drive Piles, to a depth of between 2 – 3 metres below the existing ground surface level. These foundations *do not require concrete footings, and are removed in the same manner as they are installed to enable the land to be restored to cultivated agricultural activities.*

Each solar panel 'block' is to include a central skid mounted inverter/transformer station that will convert the power from direct current (DC) energy into grid-compatible alternating current (AC) energy. Foundations for the inverter stations shall be similar screw pile, or driven pile technology to the solar panel supports, and are removable at the end of the projects life. A medium voltage collector system (33kV) will be installed by direct burying to a depth of 1.0 metre below ground level. At the end of the project the cables will be recovered for metal recycling.

Decommissioning Solar Farm

It is intended that the facility *will be decommissioned in one stage* and will have minimal impact as the development components do not require substantial disturbance to the landscape. *None of the approved solar farms in Toowoomba Region Council's jurisdiction (Bulli Creek and Oakey) has been conditioned for bonding of remediation works, nor have any similar renewable energy facilities approved by the state and other local government been subject to this commercial imposition. Furthermore, removal of site infrastructure and rehabilitation is a legal obligation of the proponent under both the terms of the lease agreement with the landowners and the Development Approval for the project. Thus, no bonding of works is required for end of life remediation.*

Within the substation, all buildings and equipment are above ground and will be removed on decommissioning as detailed in the previously submitted site rehabilitation and end use plan. This area and some buildings may be repurposed as storage areas for agricultural equipment as part of future practices, by agreement with the landowner. Similarly, vegetation and fencing is to be removed and the areas rehabilitated unless the landowner requests that these elements are retained.

Refer to attached decommission report for more details on this aspect in Appendix S.

4.1.3 Proposed Location

The proximity of existing transmission infrastructure is a key factor in the siting of renewable energy facilities such as Wind and PV Solar farms. This is based on the economics of using this existing infrastructure to create distributed generation within the grid, rather than centralised generation close to the fuel source as is the case with fossil fuel powered thermal generation. Careful siting of renewable energy facilities not only reduces the initial capital costs of transmission infrastructure it also reduces the electrical losses as power is transported to the demand centres. This ultimately results in the Lowest Cost of Energy for all consumers as we move to alternative, low carbon energy sources.

It should be noted that the potential for widespread development of utility scale PV projects in this area, is unlikely without construction of new transmission lines connecting to the Toowoomba City load point. The existing transmission capacity and local power demand are such that no more than 100MW of generation is viable at this location.

It is acknowledged that the solar farm is located within the Darling Downs Region which has some of the State's best agricultural land that produced over \$1.5 billion in revenue from cropping alone. The proposed solar farm will temporarily take out of production 0.0106% of land currently under cropping production in this region, which is considered significantly small. It is argued that there is 1,844,499 hectares of cropping land yet to be realised, thus ensuring that the temporary removal of this land from agricultural production will not cause a significant impact to the regions ability to provide sufficient cropping for the needs of the wider community. Furthermore, only part of the land below 415m AHD is known to have highly fertile soils (Waco soils) and the majority of this is within the balance area to be retaining for cropping. With the proposed pasture grasses in place, the land is essentially capable of being returned to cropping in the future without significant cost. Refer to latter sections of report for details.

In conclusion, the solar farm is co-located in a rural area predominately due to the location of an existing substation with capacity to supply electricity to the wider community that need this resource. The solar farm will not degrade the agricultural quality of soil underneath the panels, which is currently good for cropping but is not the best soil in the region. Its temporary removal from agricultural production does not impact on the regions overall ability to provide sufficient food. The panel movements allows for pasture grasses to grow, which in turn retains the quality of the soil for the return of intensive agricultural practices in the future once the solar farm is decommissioned.

4.1.4 Car Parking

Car parking will generally be in accordance with the intent of Table 9.4.6:3 of the Transport, Access and Parking Code in Toowoomba Regional Planning Scheme v10 (20May2016).

Carparking spaces for the proposed development under these provisions does not have a mandatory number required.

Four (4) carparking spaces are provide, including one (1) carparking space for persons with disabilities.

These are located towards the front of the main entrance to the site, outside the control room building to assist visitors and staff with visual interpretation of the built form layout.

4.1.5 Hours of Operation

The operations onsite will occur;

- Monday to Sunday, 24hours

4.1.6 Staffing

There are to be approximately 3 employees working on the site at any one time once solar farm operations commence onsite.

4.1.7 Access

A new vehicle crossover is proposed from Yarranlea Road to Lot 3847 A341649 to directly service the internal substation and main operational part of the solar farm. This access will be bitumen sealed, and will otherwise be designed in accordance with Councils requirements.

Access to the solar farm arrays is via the substation entrance for Stage 1, or Murlaggen Road for Stages 2 to 4. Given that the main access to Stage 1 is frequently utilised, this is proposed to be bitumen sealed. The access points from Murlaggen Road to Stages 2 to 4 are to be informal and gravel as they are infrequently utilised.

No upgrade of any external road is proposed given that a gravel graded road is sufficient for construction and the ongoing operations/maintenance of the site which will be largely restricted to single light vehicles, being a SRV or occasional MRV, to enable a technician to service and maintain the solar panels.

Internal access tracks are also provided to accommodate single light vehicles traversing the perimeter of Stage 1 and Stages 2 to 4. These tracks are to be designed with a gravel surface, and dust suppression measures will be enacted as part of ongoing operations of the site.

Informal access aisles surround the solar panel arrays. These are grassed and are designed to provide access to the inverter/transformer equipment pads located at the centre of the array blocks.

It is expected that the construction phase of this project will require the use of heavy equipment, however once operational, only light vehicles with the occasional MRV are anticipated to service the use.

It is noted that Yarranlea Road has a level railway crossing south of the subject site, before the Gore Highway intersection. Refer to Figures 24 and 25. Given the low level of traffic anticipated for this development, the impact to the railway infrastructure safety and efficiency is not compromised. Refer to Appendix C for more details.



Figure 24 – Intersection of Yarranlea Road with Railway line, heading northwards to subject lots
Source: Site Visit, June 2016



Figure 25 – Intersection of Yarranlea Road with Railway line, heading southwards away from subject lots
Source: Site Visit, June 2016

4.1.8 Site Cover

The proposed development's total site coverage (provided that the solar panels are horizontal to the surface) is approximately 77.1316ha, which is 26% of the subject site, if viewed from a birds eye.

The reality is much different, in that the solar panels rotate allowing water to penetrate into the ground surface below. Hence the total impervious surface for this development is 6.3553ha or 2% of the site which is a reasonable expectation within this rural locality.

4.1.9 Solar Panels Built Form

At three (3) meters in height, the solar panels are smaller than a 1 storey building and are to be aligned in rows following the contours of the land to give a smooth visual appearance over the landscape, which is reminiscent of the row features found elsewhere in the rural locality such as cropping and wineries landscapes.

The rows of solar panels are broken into distances of 4 to 7 meters from each other, and are further separated into block of arrays by tracks which added articulation to the waving formation of the solar panel rows.

It should be noted that solar panels do not significantly vary in their colour, finish or materials. Examples of what solar panels look like are found in figures 27-30 of this report. Refer to photomontages in Appendix J for further look and feel of solar panels from three different viewpoints.

4.1.10 Solar Panels Glint / Glare

There is a perceived issue of glint and glare surrounding the reflectivity of the proposed PV solar panels, causing possible distractions to motorists, aircraft and eye damage.

The proposed solar panels are Poly-Crystalline which are designed to maximise absorption of the sun's light by direct conversion to electricity. The modules used in this development will absorb approximately 82-90% of the light received and have been designed using two anti-reflective coatings.

The level of glare and reflectance from the solar panels is considerably lower than the typical rural environment as can be seen in Figure 26.

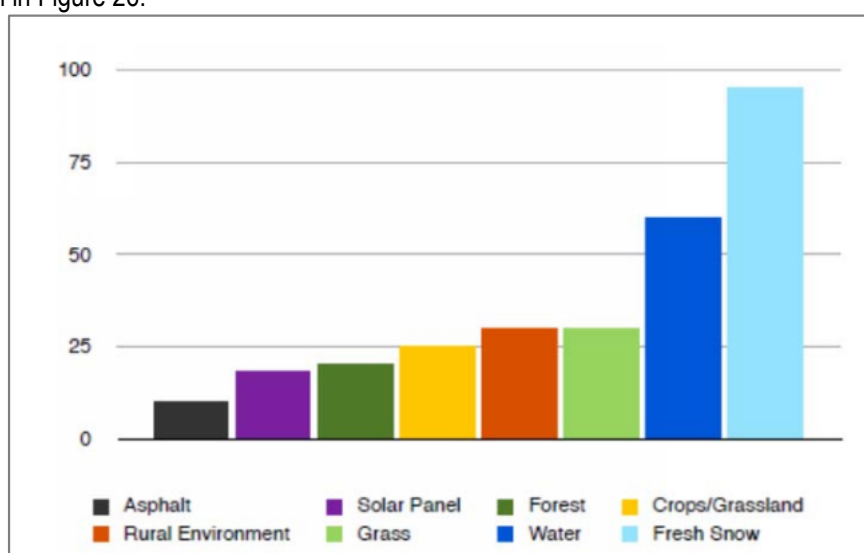


Figure 26 – Comparison of reflection level for different surfaces

Source: Solar Choice, www.solarchoice.net.au/blog/solar-panels-near-airports-glare-issue, 2013

Furthermore, solar panels have been installed close to a number of airports throughout the world, including Australia's Adelaide Airport, Singapore's Changi Airport, London's Gatwick Airport, USA's California San Jose Airport, and Germany's Dusseldorf Airport. Refer to Figures 27 to 31. Glare to pilots is of concern when landing or taking off, however the reflection from solar panels is not deemed to be detrimental to warrant the avoidance of co-locating this infrastructure close or within airport operational space.

To assist Council's assessment of this site, a glare assessment was undertaken, which confirmed there was no glare to surrounding dwellings, motorists or railways line to the south of the subject site, and that night time glare does not have the potential to harm the wellbeing of humans and is insignificant to affect the overall rural amenity of the area at night. Refer to Appendix J and K.

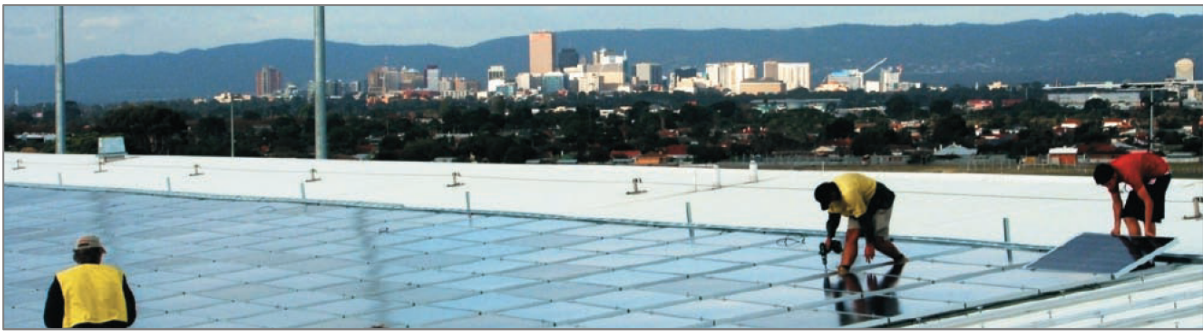


Figure 27 – Solar panels being laid on roof of Terminal 1, Adelaide Airport, 2008
Source: Solar Choice, www.solarchoice.net.au/blog/solar-panels-near-airports-glare-issue, 2013



Figure 28 – Solar panels on roof of Changi Airport Budget Terminal, Singapore, 2010
Source: Solar Choice, www.solarchoice.net.au/blog/solar-panels-near-airports-glare-issue, 2013



Figure 29 – Solar panels 150m from one of Europe's most frequently used landing strip, Gatwick Airport
Source: Solar Choice, www.solarchoice.net.au/blog/solar-panels-near-airports-glare-issue, 2013



Figure 30 – Solar panels on roof of Rental Car Center, San Jose International Airport, 2010
Source: Solar Choice, www.solarchoice.net.au/blog/solar-panels-near-airports-glare-issue, 2013



Figure 31 – 8,400 solar panel array on roof of Dusseldorf International Airport, 2011
Source: Solar Choice, www.solarchoice.net.au/blog/solar-panels-near-airports-glare-issue, 2013

4.1.11 Landscaping / Amenity Provisions

An assessment of the development proposal and the potential impacts on soil quality has been completed by specialist consultant, Land Resource Assessment and Management and is provided in Appendix A. This report makes specific recommendations in relation to the proposed buffer and pasture species to be implemented as well as a simple weed, pest, soil erosion and pasture management plan. These recommendations have been accepted as reflected in the attached landscape plans. Refer to Appendix A.

Appropriate landscaping is an integral aspect of this development with its main aim to provide visual screening of the solar panel arrays from public view points, typically being the commonly used road reserves. To that end

landscaping will align the full perimeter of Stage 1, and Stages 2 to 4 as illustrated in Appendix A. It should be noted that landscaping along Murlaggen Road will not be provided in Stage 1 if this stage is completed in conjunction with one or more of the other stages. Given that Murlaggen Road is a rural access road used infrequently the need to provide visual screening along this road reserve is considered unnecessary. Rather vegetation screening is concentrated along the peripheries of the solar farm to maximum screening to the greatest number of community members that may have a vantage point.

The proposed landscaping is to comprise of native shrubs and grasses as illustrated in Appendix A, and as identified by an agricultural scientist (Refer to appendix L). These mostly have a mature height between 6 and 25m, to be coppiced to be between 5 and 10m, which is sufficient to adequately screen the solar panel arrays from general public viewpoints given that the mounted solar panels are a maximum of 3.3 metres in height. This means that the solar farm will be shielded from view by people driving along Yarranlea Road, and Saint Helens Road which are the main thoroughfares in this area. Furthermore, dwellings within distance of the solar farm are not significantly impacted with use of landscaping measures. This is verified by a visual assessment report which identifies that the proposed landscaping provisions are suffice to avoid any significant impact to the overall visual amenity as seen from public viewpoints, and nearby residential dwellings. Refer to Appendix J.

Wire fencing will be used that is outside the landscape buffer areas. However, it can be clearly seen by the photomontages in the Visual Assessment Report (Appendix J) that the proposed wire fencing is indiscernible from the landscaping proposed. Whilst under construction and before vegetation is mature, additional screening is proposed around the fence line in the form of a mesh banner. This is typically used during the construction phase, and in this case we propose a green coloured banner that wraps around the fence line to screen the solar farm until such time that the vegetation is of a similar height. The banner material is typically bio-degradable and lasts 2 to 3 years, which will be suffice for this purpose.

In addition to the planting above, a mix of pasture grass species is proposed in line with advice from an agricultural scientist to cover the understorey of the solar panel arrays, and any other surfaces not gravel coated or sealed (Refer to Appendix A and L). This planting is possible due to the rotation of the solar panels which allows sunlight and water to penetrate the ground underneath. Grasses will be maintained through periodic slashing and potential grazing opportunities.

Implementation and maintenance of landscaping proposed is as detailed in the attached landscape plan. Refer to Appendix A. Of note is that the trees are to be coppiced to allow for spreading ('bushing') of the upper layers, and that weeds are treated using a slashing, chemicals similar to those used in adjoining land, and maintained with chemicals, slashing and manual methods depending on the weed and season. Spraying of weeds is not to occur via broad hectare wide boom or aerial spraying. Refer to landscape plans for further details. Refer to Appendix A.

With regards to the visual assessment undertaken in Appendix J, we note that the worst case scenarios where reviewed, which included taking the highest level for the solar panels (3.3m), assuming there is no vegetation, and taking photomontages from positions where residents are most likely to be affected. The results were that only half of the 14 rural dwellings that surround the site were capable of viewing the solar farm.

Of those, the dwelling at OP03 (Desmond Lane) which is approximately 700m from the solar farm and will be able to see part of the solar farm without landscaping, although this is likely to be obscured by construction green mesh on the fenceline. Upon establishment of mature landscaping, their view of the solar panels will be obscured, with a chance that the upgraded powerline and roofline of the battery storage shed may still be visible. The overall visual impact is considered minor given the solar panels are not visible and the other elements which may be visible are consistent with the existing features of the surrounding rural environment ie. Ergon substation, rural sheds.

The dwelling at OP08 (715 Yarranlea Road) is 1km from the solar farm and may have views of the project during construction. Initially mesh screening will be utilised to block the view of the solar farm, which will be overtaken

by the proposed landscaping in due course. Thus, the view of the solar farm from this location is screened from view. The proposed rural shed may be visible but is consistent with the existing features of the surrounding rural environment. This is further borne out by the photomontage of VP01, which is also located on Yarranlea Road, and is closer than OP08 to the solar farm making it very similar to, if not more affected than VP08. This photomontage illustrates that the overall impact to this dwelling will be minor.

The dwelling at OP05 (Roche Road) is in an elevated position and 1km from the solar farm, which therefore gives it the greatest potential to be affected compared to all other existing dwellings. As can be seen in the photomontage of VP12 that the solar farm does not change the nature of the view having a moderate visual impact, which will be lowered by the provision of a landscaping buffer.

The dwelling at OP10 (East of Roche Road) is in an elevated position and approximately 1.8km from the solar farm, which at this distance the change is noticeable, but not significant in that the nature of the overall rural vista, and will be further lowered by the provision of a landscaping buffer.

Viewpoints OP11, OP12 and OP13 (Wallingford Road) are more than 1.5km from the solar farm which at this distance the change is noticeable, but not significant in that the nature of the overall rural vista which can be clearly seen in photomontage VP09 and the viewpoint photos shown in Appendix of the B Visual Impact Assessment Report.

Given the visual assessment by Environmental Ethos we can conclude that the visual impact from this project is not significant to change the overall visual amenity, with appropriate screening measure, such as landscaping and mesh banners, which can be appropriately conditioned by Council.

4.1.12 Vegetation Clearing

Vegetation identified as significant in Figures 20 and 21 is referred to as the regulated remnant vegetation stand within Lot 2 RP7475. An application to the Department of Natural Resources and Mines has resulted in a PMAV granted over this lot on the 15th June 2016, which allows for the clearing of this vegetation. Refer to Appendix I. As a result, this vegetation stand will be removed as part of this development during Stage 1.

We note that during an ecological assessment of the site it was found that within the vegetation stand there exists '*Belsons Panic*'; a grass species which is of state and federal significance. No further assessment under SPA2009 is required for this development in relation to the clearing of this vegetation, however, it should be noted that approval was granted by the federal government to clear this vegetation. Refer to Appendix I.

4.1.13 Ecological Considerations

The ecological report, completed by an expert in that field, has found that reptile species frequented the land via ground methods, with koalas very unlikely to have ever crossed the subject land given land constraints and the provision of more suitable habitat along road reserves. Refer to Appendix H, P and Q. Thus the lower sections of the wire fence has been lifted to provide a 20cm gap with a vertical electricity shock line. This is suffice to allow reptiles to enter and leave the site without impediment as verified by an qualified ecologist. Refer to Appendix Q.

In accordance with the ecologist's original report, response to submitters, and response to Council's further RFI, there was no significant flora or fauna on this highly disturbed site that warrants the provision of a Flora and Fauna Management Plan.

4.1.14 Utility Connections

Connection to the electricity and telecommunication mains located on Yarranlea Road is required for the operation of this development. It is proposed to install up to two (2) 110KV cables within the Yarranlea Road reserve from the Ergon substation to the southwest corner of the subject land. Refer to Appendix A. This work will likely to be undertaken by Ergon Energy given their probable long-term ownership of this infrastructure. A permit to occupy is also being currently sought from State Government (DEHP) which is separate to this application.

Up to four (4) 33KV cables are proposed to cross over Yarranlea Murlaggan Road from Stage 1 to Lot 2 A34925 in order to facilitate creation of Stages 2 to 4. This crossing will likely require a further Permit to Occupy from the State Government (DEHP), which has being sought separately to this application.

Neither of the above infrastructure extensions are issues that would potentially halt the proposed development.

Telecommunication connection is required from the existing main in Yarranlea Road to service the Control Room within the internal substation area.

Water for drinking purposes will be bought into the site via trucks and stored onsite. Due to the small number of people operating the solar farm this arrangement provides adequate service.

Sewerage disposal is onsite in the form of an on-site treatment and disposal system.

4.1.15 Waste

Waste from this development is generated from the office operations. Office waste will be general rubbish including putrescible waste, and recyclable material which are to be placed into two (2) wheelie bins and collected every week for disposal.

4.1.16 Stormwater

The majority of the site covered by the solar panel arrays will have a negligible impact on stormwater as the land will remained grassed with rotating panels allowing for continued infiltration of stormwater flows into the ground below. Existing surface flows exit the site into the waterway located over part of Lot 2 A34925 and no further changes to the arrangement is proposed as any residual pollutants from existing agricultural activities will be mitigated by the grassed buffering proposed.

To be clear, it was found through further stormwater assessment, that the surface below and between the panels will be vegetated such that runoff from panels will return to sheet flow once it reaches the surface and existing soil conservation bunds to be shaped to ensure no soil erosion and gulying. This flood assessment also showed that velocities are less than 1m/s within the site with the exception of the outlets into the channel.

In order to cater for runoff passing through the proposed fence line, a 200mm gap will be left at the base of the fence and chain flood gates will be used at the end of the bunds. The exception is the security fence which will remain closed at the bottom, which is acceptable given that there is no significant overland stormwater flows in this area.

It was also found that the existing surface of the PV Array will be vegetated and soil conservation bunds will be repaired to ensure no scouring, erosion and gulying. It was found that the best long term scour protection is likely to be the establishment of good vegetative cover. Where scouring does occur, the scour is to be filled and surface rehabilitated via seeding and erosion control blanket or hydromulch depend in scour size and surface

gradient. Maintenance staff for the solar farm facility will ensure that the vegetation and drainage will be maintained, which can be conditioned as part of any approval granted.

Refer Appendix F for further details.

Impervious surfaces are created by the proposed internal substation features and these have been mitigated by the proposed bio-retention basin located to the northeast portion of the internal substation area. Refer to Appendix A.

Flooding occurs in Yarranlea, to the north of the subject site. The site is impacted by stormwater flows, and it has been demonstrated via 2D modelling that the existing agricultural drainage lines are suffice to handle these flows.

For further details refer to the Stormwater Management Report in Appendix F.

4.1.17 Lighting

All lighting proposed will be in accordance with Table 2.1 and 2.2 of Australian Standard AS4282-1997 using a control level of 1. [A lighting report is provided for the proposed development in Appendix T.](#)

Permanent motion sensitive, directional security lights will also to be installed to provide adequate illumination around the substation area and points of ingress/egress. All lighting will be directed downward to minimise the potential for glare or spill-over onto adjacent properties. Lighting is proposed to be used from dusk to dawn once the facility is operational.

4.1.18 Security

A 2.4 metre high chain wire security fence will surround the proposed access tracks for each solar farm section for security purposes. The internal substation and ancillary buildings requiring controlled access will be appropriately restricted to private access during construction and throughout ongoing operational use.

4.1.19 Dust

Generation of dust from vehicle movements has been mitigated by the provision of hardstand area in the frequently used areas (ie. carpark) and compacted gravel in irregularly used areas (ie. internal substation and perimeter tracks). Refer to plans in Appendix A.

[Construction of this facility requires limited earthworks and appropriate dust suppression measures are to be adopted and will form part of the conditional approval. A key factor in the development of this facility will be the progressive and early establishment of the proposed pasture grasses to limit the potential for dust, and more importantly to provide a stable surface, protected from wind and water erosion in the long term.](#)

Reduction of dust is essential to the long-term optimal performance of the solar panels and thus there is sufficient impetus to ensure this issue is managed appropriately.

4.1.20 Noise

[The operational plant will not generate noise above allowable background levels for sensitive receptors as outlined in the Environmental Protection Act.](#)

During construction, care will be taken to undertake activities during normal daylight working hours. Construction plant will be the primary source of noise and is considered to be similar to the large diesel powered equipment used currently as part of normal farming activities and can be appropriately conditioned in terms of timing and audibility above existing background levels.

4.1.21 Environmentally Relevant Activities

None of the activities from the solar farm trigger the requirement for an ERA.

4.1.22 Traffic Generation

A Traffic Impact Assessment (TIA) was carried out for the proposed development, and found that the low levels of traffic generated by the number of employees during the operation of this use was negligible, and would not trigger a requirement to upgrade the existing road network. Refer to Appendix E for TIA details.

During the construction phase traffic volumes are increased and there is the potential for impacts on the external road network which have been carefully considered and are addressed in the Traffic Impact Assessment submitted. Unlike the uncontrolled and significant heavy vehicle movements that exist in this area during harvest periods, project construction traffic has the ability to be implemented with significant control. Key feature of the traffic aspect of the Construction Management Plan will include;

- Pre and post construction dilapidation surveys on key transport routes
- Implement controls and signage plans
- Implement a School Bus Management Plan

It is anticipated that these requirements will be included in councils' conditional approval of the project and should the dilapidation surveys indicate any damage to the road network attributed to the project, then remedial works would be undertaken by the proponent.

4.1.23 Advertising

An advertising sign will be placed at the front of the main entrance from Yarranlea Road. This signage will be in accordance with Council's current policies at the time of placement.

4.1.24 Earthworks

The solar farm has been designed in such a manner as to minimise the extent of civil works required to occur on the site, by the following;

- All existing overland drainage flow paths are intended to be maintained so as to minimise the impact on the surrounding land uses
- No formalised internal roads are envisaged to be provided between panels and the level of sealing in the carparking area has been kept to a minimum.
- Maintenance of the existing soil conservation contour banks to restore their shape and ensure that they are mowable once pasture grass understory has been established
- Limited cut and fill at the location of the internal substation and ancillary building location which includes a small detention basin
- Limited cut and fill at the location of the new farm shed location
- Creation of the access driveway
- Creation of the perimeter access track

No further work is required on the existing drainage channel which will be located outside the solar farm fenced areas. No retaining walls are required or proposed.

Geotechnical investigation of the ground conditions at this location (Refer to Appendix N) have been completed, and will be used to determine the depth at which supporting poles will need to be driven into the ground to maintain stability. There are no geotechnical impediments to implementing an appropriate engineering solution for the physical structures associated with this project.

4.1.25 Lease Arrangement

It is proposed to subdivide the land into six (6) leases covering the extent of the solar farm use as illustrated in Appendix A. Timeframes for the leases is 31 years with an option to extend for a further 30 years. The lease arrangement allows for the applicant to progressively occupy and utilise the land as a solar farm under the proposed staging and commercial agreement in place.

The leases are of a sufficient size to facilitate the completion of the solar farm, and on decommission of the solar farm these leases will then expire. Thus, the proposed leases do not have a detrimental effect to the long-term viability of the land which can be reverted to agricultural activities in the future.

4.1.26 Community Consultation

Community consultation was carried out in accordance with SPA2009 in a manner that was above the minimum requirements – refer to Appendix M. In addition, community members were sought for comment with mixed results, which is also above SPA2009 requirements.

4.1.27 Electromagnetic Radiation (EMR)

An Electromagnetic Radiation Assessment report by Zenviron was undertaken which verified that EMR emissions from this solar farm are compliant with EMR exposure guidelines, in that the “The cumulative effects of the proposed PV Solar farm will not exceed safe limits for Human Exposure” (Appendix O).

Thus this issue, whilst relevant, is not of concern to the health and safety of humans.

4.1.28 Radiation / Heat

Solar panels are generally dark in colour to maximise the absorption of light, which in and of itself, creates heat on the surface of the panels. However the surface temperatures are not significant, given that they do not affect the mechanics of solar operations, nor the health of immediate vegetation and dual agricultural uses as demonstrated by the existence of solar farms which have both of these.

Thus, the issue of heat from the proposed solar farm is not significant.

4.1.29 Toxicity from damaged panels

As of June 2016 rooftop PV installations in Australia exceed 5.4GW, many of which are in rural areas where the supporting roofs also form part of the potable water supply. There is no evidence to indicate that the minor concentrations of heavy metals can be mobilised during normal operating conditions or in the case where a panel may be cracked. What is important to note is that the modules are connected electrically, in series and therefore if a panel does become cracked or damaged, the entire string in that array will not produce electricity. The completed installation at this site will be subject to frequent UAV survey using thermal imaging cameras to

identify damaged or defective modules, which would immediately be removed and replaced. This is to ensure power production at optimum availability and as consequence eliminates any concerns regarding damaged panels.

4.2 Approvals Required

This application seeks the following approval/s:

- Development Permit Material Change of Use to a Renewable Energy Facility
- Development Permit Reconfigure a Lot to Subdivide Land by Leases greater than 10 years

4.3 Level of Assessment

The proposed development is Impact Assessable in accordance with the Toowoomba Regional Planning Scheme v10 (20May2016). As the proposed development is subject to Impact Assessable, public notification of the development has been carried out in accordance with Section 297 of the *Sustainable Planning Act 2009*. [Refer to Appendix M for details.](#)

4.4 Referral Agencies

As per Section 5.3 of this report, the proposed development does not trigger referral to DILGP.

5. Statutory Provisions and Compliance

5.1 Regional Plans

The subject land is located within the Darling Downs Regional Plan (October 2013), whose regional outcomes are wholly captured by the Toowoomba Regional Planning Scheme v6 (3 Nov 2014).

Of note is the reference to Regional Outcome for Protecting Priority Agricultural, which requires “Agriculture and resources industries within the Darling Downs region continue to grow with certainty and investor confidence”, and has two regional policies being “Protect Priority Agricultural Land Uses within Priority Agricultural Areas” and “Maximise opportunities for co-existence of resource and agricultural land uses within Priority Agricultural Areas”.

Given the above policies, it is argued that the proposed solar farm provides a renewable energy resource which is sought after in this region, and that with the provision of landscaping and minimal disturbance of the land on installation and decommissioning, it achieves the aim of protecting the agricultural ability of the land for the future.

Thus, the solar farm is compliant with the policies and regional outcomes that are applicable from the Darling Downs Regional Plan.

5.2 State Planning Policies

As per s324(3) of SPA 2009, assessment against the SPP is required to assist Council in making a decision about the proposed development application.

Furthermore, in accordance with Queensland Government’s *State Planning Policy (SPP) April 2016*, any Local Government Planning Scheme which does not adequately reflect the state interests listed within this policy requires development applications to be assessed against Part E—Interim development assessment requirements.

Since the Minister is the only authority that can confirm if Toowoomba Regional Planning Scheme v6 (3 Nov 2014) adequately reflected the (SPP) April 2016, and no official record of this approval can be found online, assessment of the application against the Part E—Interim development assessment requirements is undertaken as a precaution to demonstrate compliance;

LIVEABLE COMMUNITIES

The application of the requirement is **NOT APPLICABLE** for this development proposal.

MINING AND EXTRACTIVE RESOURCES

Given that the material change of use proposed is not for extractive resources this state interest is **NOT APPLICABLE**.

BIODIVERSITY

Given that the subject site, on which the material change of use is proposed, has an identified state environmental significance grass being Belson’s Panic, this state interest is applicable. It is proposed to provide an offset or translocate this grass species for future preservation. This action will occur under separate application under the Nature Conservation Act 1992 (Qld) and Environment Protection and Biodiversity Conservation Act (Commonwealth) which govern this matter. No further assessment under SPA2009 is required and thus the development **COMPLIES**

COSTAL ENVIRONMENT

Given that the subject site, on which the material change of use is proposed, is not located within the coastal management district, this state interest is **NOT APPLICABLE**.

WATER QUALITY

Given that the subject site, on which the material change of use is proposed, has a site area greater than 2500 square metres, the state interest for *receiving waters* is applicable. Avoidance of adverse effects from stormwater flows to receiving waters has been achieved as described in the Stormwater Management Report in Appendix F. **COMPLIES**

Given that the subject site, on which the material change of use is proposed, is not located in a *water supply catchment in South East Queensland* this state interest is **NOT APPLICABLE**.

It is contended that the subject site is not within an acid sulfate soils affected area, as the topography of the land does not induce this issue. Thus, the state interest for *acid sulfate soils* is **NOT APPLICABLE**.

EMISSIONS AND HAZARDOUS ACTIVITIES

Given that the subject site, on which the material change of use is proposed, is not located wholly or partly within a management area, this state interest is **NOT APPLICABLE**.

NATURAL HAZARDS, RISK AND RESILIENCE

Based on Council's Overlay Mapping, the subject site, on which the material change of use is proposed, is not located within a flood hazard area, a bushfire hazard area, a landslide hazard area. There is no coastal hazard, given that no coastal waters touches land within Council's jurisdiction. Thus, these state interests are **NOT APPLICABLE**.

STATE TRANSPORT INFRASTRUCTURE

Given that the subject site, on which the material change of use is proposed, is not located within 400 metres of a public passenger transport facility or a future public passenger transport facility, this state interest is **NOT APPLICABLE**.

STRATEGIC AIRPORTS AND AVIATION FACILITIES

The subject site, on which the material change of use is proposed, does not lie or encroach in the operational or safety areas of an airport. This state interest is **NOT APPLICABLE**.

In conclusion, given above assessment it can be concluded that overall the proposed development **COMPLIES** with the assessment provisions Queensland Government's *State Planning Policy (SPP) April 2016*.

5.3 State Development Assessment Provisions (SDAP)

The SDAP (version 1.6) is prescribed in the *Sustainable Planning Regulation 2009*, and contains the matters that either Council or a Referral Authority may have regard to, when assessing a development application.

With regards to Council's assessment, we found that none of the matters listed in Table B.2, column 3, triggered further assessment against the SDAP modules for this development application.

With regards to any Referral Authorities assessment, we found that none of the matters listed in Table B.3, column 3 triggered further assessment against the SDAP modules for this development application. It should be

noted that Sch 7, Table 3, Item 10 of SPA 2009, is not triggered regardless of the clearing proposed due to the presence of a PMAV in place which allows such action to occur. Refer to Appendix H and I for further details and section 4.1.11 of this report.

Given above material it can be concluded that the proposed development **COMPLIES** with the assessment provisions of SDAP (version 1.6).

5.4 Local Government Strategic Framework Assessment

The proposal is for a Renewable Energy Facility (100MW) and is consistent with the strategic frameworks of the Toowoomba Regional Planning Scheme v10 (20May2016).

Settlement Pattern	
Strategic Outcomes	Proposed Development Assessment
(1) Open space, both natural and managed, is an intrinsic feature of the whole Region. From becalmed suburban tree-lined boulevards to the majestic Toowoomba escarpment and the numerous and extensive State Forests and National Parks, the Toowoomba Regional Council area is infused with a broad spectrum of parks, gardens, reserves and bushland that underlines its Toowoomba Garden City status.	(1) The proposed development does not propose not reduce the capacity of any designated open space within the Toowoomba Regional Council area.
(2) Settlement opportunities range from a multitude of diverse vibrant rural towns to the highly urbanised forms within Toowoomba City and its suburbs and interspaced with the significant rural townships of Clifton, Crows Nest, Highfields, Millmerran, Oakey and Pittsworth. These settlements are interspaced by extensive areas of natural bushland and rural production, providing a strong sense of identity through their individual local character and built form responses. It is the intent of this plan that these towns remain viable places in perpetuity.	(2) The proposed solar farm will does not dilute the identity of the nearest township being Pittsworth, given its location in Yarranlea.
(3) Toowoomba Regional Council area has a network of strong and dynamic towns. These towns support and service the needs and aspirations of the local communities and provide central place functions for their adjacent agricultural, manufacturing, Defence and extractive and mining industries. Population growth is directed towards the existing network of urban areas and towns rather than dispersed population growth throughout the rural area.	(3) The proposed development, once operational does not draw population growth outside of the township areas.
(4) There are seven major urban areas and towns throughout the Toowoomba Regional Council	(4) (a) N/A Site is not located within Toowoomba City

Settlement Pattern

area. These are:

- (a) Toowoomba City
 - (i) Toowoomba City is the principal centre in the Toowoomba Regional Council area and Southern Queensland, as well as northern inland New South Wales, for employment, retail and commerce, government, community services, medical services, education, cultural and recreational activities. Located on the eastern edge of the Great Dividing Range escarpment, Toowoomba City is Australia's largest inland non-capital city.
 - (ii) Known as the 'Garden City', Toowoomba City hosts the Carnival of Flowers - the longest running floral event of its kind in Australia - each September and annual Easterfest music festival over the Easter weekend. There are more than 150 public parks and gardens in Toowoomba, including state heritage listed Queens [park](#) and Picnic Point.
 - (iii) Toowoomba has an extensive heritage building portfolio including residential, commercial, industrial and community buildings. In addition, its network of mature tree-lined boulevards (dominated by camphor laurels) is a signature icon that one has entered the 'Garden City'.
 - (iv) As principal regional centre for the Darling Downs, Toowoomba provides the higher order retail, commercial, health, education, legal and government facilities for Southern Queensland.
 - (v) The future economic growth of the Toowoomba centre is maintained:
 - (A) through its principal regional centre function to the whole of the Toowoomba Regional Council area and Southern Queensland;
 - (B) the significant development

Settlement Pattern

- potential associated with the emerging energy resources from the Surat Basin;
- (C) the continued growth in development and employment associated with value-adding in food processing.
- (vi) Toowoomba City has thriving and diverse neighbourhoods that have a strong sense of community and local identity. Toowoomba City and the surrounding urban areas continue to experience sustained growth in residential, retail/commercial and industrial land uses. In response to these pressures, local planning will be undertaken to address issues such as growth management, infrastructure management, urban design and local character, and the transitioning of non-urban (predominately rural residential and rural) to urban areas and enterprise areas.
- (vii) The Toowoomba CBD is the civic, retail and commerce 'heart' of the Region. The Toowoomba City Centre Master Plan (TCCMP) outcomes are facilitated through the planning scheme by reinforcing the primacy of the City and providing the land use development framework for the centre over the next 20 years, which builds on the strengths of the City's natural and built assets such as parks, heritage buildings and streetscapes and laneways that sustain the CBD as a liveable centre.
- (viii) Residential growth will be accommodated through new urban areas in Glenvale and Darling Heights, and urban infill at increased residential densities throughout the existing urban area particularly around the major

Settlement Pattern

centres of Kearneys Spring, Wilsonton and Clifford Gardens. Future urban areas outside the existing urban footprint are not released prior to 2031 and are protected from development which would compromise long-term growth options beyond 2031. (b) Clifton (i) Clifton is located approximately 40 kilometres south of Toowoomba and approximately 8.5km west of the New England Highway, which provides a high level of accessibility to Toowoomba City and Warwick. (A) Clifton is a self-contained community that provides a range of services to its residents and performs a major centre role in the Region to service the surrounding rural hinterland and communities. Retail, commercial and community uses and services are focused within the town centre along the main street (King Street). The main industrial area is in the area southwest of the town, comprising a variety of lot sizes with strong links to the local road network and surrounding areas. Major community facilities include a secondary school and an area integrated sports and showground complex in the northeast of the town. (B) The historic buildings and streetscapes of Clifton, which have been used in a number of Australian movies, are important elements that contribute to the local identity. The distinguished boulevard of boab trees that were planted to honour the men of WWI is an important cultural heritage feature in the main	(4) (b) N/A Site is not located within Clifton
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Settlement Pattern

street. The cultural and tourism attractions also include the Clifton and District Historical Museum located in the former Butter Factor in Clifton and are enhanced by the Sister Kenny memorial and Rudd's Pub in the nearby township of Nobby. (c) Crows Nest (i) Crows Nest is situated on the western slopes of the Great Dividing range, approximately 45 kilometres northeast of Toowoomba City on the New England Highway. The town is surrounded by state forests and national parks including nearby Crows Nest Falls, Ravensbourne and Geeham National Parks. Part of the Bicentennial National Trail runs through the town. Lakes Perseverance and Cressbrook dams, which provide the major water supply for Toowoomba, are located approximately 6km east of the town and are major water recreational facilities in the Region. (ii) The town originated as a stopping place for timber haulers and is named after Jimmy Crow, a local aboriginal man who lived in a hollow tree and gave directions to early European settlers who passed with the bullock teams. (iii) The town centre is focussed on the 'Village Green', a central park adjacent to the New England Highway with wide streets abutting the park. The park, which contains a statue of Jimmy Crow, is the centre for celebrations and events/festivals within the town. The central focus of the Village Green as an important community place is consolidated by the recreation reserve opposite (western alignment of the New England Highway) which includes the Crows Nest Regional Art	(4) (c) N/A Site is not located within Crows Nest
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Settlement Pattern

Gallery in the former shire hall, swimming pool, bowls club and adjacent hospital. (iv) The commercial centre is of a main street style with buildings aligned to the street front and continuous awnings over the footpaths that overlook the Village Green. Conservation of the town's historic buildings, character and unique town setting will be balanced with localised growth and significant increases in destination and passing tourist traffic. The existing retail, commercial and community functions will be preserved and opportunities to attract and diversify the centre's functions will be investigated through local planning. (v) Crows Nest offers an attractive small town lifestyle that capitalises on 'tree change' lifestyle opportunities and provides a range of community facilities and services including primary and secondary schools, hospital/nursing home, sporting/recreational and cultural uses. With improved road access and public transport services, Crows Nest is within daily commuting distance to Toowoomba City. The New England Highway between Toowoomba and Crows Nest has become a minor tourist route with galleries, specialist nurseries, antique stores, art galleries and museums exploiting traffic passing to the nearby national parks and lakes and Bunya Mountains to the north. (d) Highfields (i) Highfields is located 12 kilometres north of Toowoomba on the New England Highway. The area originally attracted timber-getters and workers associated with the expansion of the railway line from	(4) (d) N/A Site is not located within Highfields
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Settlement Pattern

- Toowoomba to Ipswich through Highfields and Murphy's Creek. Dairying occupied the cleared hills.
- (ii) Highfields has evolved to function as a significant satellite town, offering an attractive suburban and rural residential lifestyle with the convenience of proximity to Toowoomba City, as well as easy accessibility to the Defence force bases at Cabarlah and Oakey. Notwithstanding the close settlement relationship with Toowoomba City, Highfields will continue to grow as a self-contained community with a range of employment, retail/commercial, community and cultural facilities.
 - (iii) The original Highfields centre and the Cabarlah township in the north of the district straddle the New England Highway. Traffic volumes and speeds of the highway restrict pedestrian and east-west vehicle traffic movements. Future development is located on the western side of the New England Highway to avoid fragmentation of development, to capitalise on urban infrastructure and to maintain efficiency of highway functions. Land to the east of the highway is constrained by the escarpment. The New England Highway continues to provide a tourism focus, attracting day trippers from Toowoomba as well as long distance travellers.
 - (iv) Highfields has a distinct local suburban residential character with a more urbanised and dense town centre. An inter-urban break reinforces the character of a physically discrete settlement from Toowoomba City.
 - (v) Highfields Village (Highfields and O'Brien Roads) is the town centre and is the major activity centre for the district and northern catchment of the regional council area.

Settlement Pattern

Development consolidates the Highfields town centre and incorporates a mix of uses and increased residential population. The centre has a 'main street' style, with a Town Square that provides a community and civic focal point. A range of higher order retail (including bulky-goods) and commercial, community, entertainment and cultural facilities is accommodated in the centre. (vi) Residential growth will be accommodated through expansion of new urban areas to the northwest of the town centre and increased residential density in and around the town centre. (e) Oakey (i) Oakey is located 29 kilometres west of Toowoomba City. It has a diversified economy with well established links to surrounding agricultural (including broadacre cropping and grazing), Defence and expanding mining sectors and performs a major centre role to surrounding rural hinterland and communities in the west/northwest. (ii) The town is located on the Warrego Highway, part of the national highway system, and offers a direct, quick link to Toowoomba City. The town is also located on the main rail link connecting southwest Queensland with Brisbane (via Toowoomba) which provides freight transport. (iii) The town is named after the river oaks that dominate the creek which bisects the town. The creek system is retained and enhanced and provides a link to a number of major open space areas within the town. (iv) The town centre established in the northern section of Campbell Street near the railway line. The 'main street' style of the town	(4) (e) N/A Site is not located within Oakey
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Settlement Pattern

centre has the character of a traditional Queensland country town with a long, wide main street (central parking) and continuous built form fronting the street. This character and heritage buildings are retained and enhanced as the focal point for commerce, retail and community activities within the town. The town centre was redeveloped in 2005 with significant landscaping and street tree planting and larger shops (supermarket) were sleeved behind buildings fronting and integrating with the main street. (v) The Oakey Civic Precinct, to the south of the town centre, is located on the main street adjoining Bicentennial park which includes a statue of famous local Australian racehorse Bernborough. The precinct includes the cultural/conference centre, library and aquatic centre. Other major community facilities include primary and secondary schools, hospital, RSL club and sporting grounds. (vi) Major employment generators in the town include the abattoir and Army Aviation Centre. The Oaky Army Aviation Centre, which was established on the outskirts of the town during World War II, is also home to the Museum of Australian Army Flying. The University of Queensland has a campus for Equine Studies in the town. (vii) Residential growth is accommodated within the existing town area and new urban area in the southeast of the town. Industrial development will continue to locate in the northwest of the town, however, major industrial activity will locate in the nearby Charlton Wellcamp Enterprise Area. (f) Pittsworth	(4) (f) N/A Site is not located within Pittsworth
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Settlement Pattern

- (i) Pittsworth is a large rural town located approximately 40 kilometres southwest of Toowoomba. It is situated on the basalt upland, overlooking the alluvium floodplains of the Condamine River. This floodplain has some of the best quality soils in Australia with mixed farming - predominantly grains and cotton - grown in the area. Established around a pastoral station and later [hotel](#) (Beauaraba), the town was named after the 'Pitt' family who had large landholdings in the district.
- (ii) Pittsworth is a self-contained community that provides a range of services to its residents and surrounding agricultural areas. It has a small manufacturing base. The annual Pittsworth Sprints consists of two days of car sprints against the clock on a set course around the Pittsworth Industrial Estate.
- (iii) Yandilla Street is the town centre and performs a major activity centre role by providing a range of retail, commerce, community and entertainment services. Opportunities exist to conserve these existing functions and diversity the centre's functions while maintaining the character of the town centre.
- (iv) The town centre has a main street style with small scale buildings that front the street. It contains a number of important heritage buildings including the former shire hall and council chambers and ANZ bank. It is planted with Silky Oaks and Jacarandas that enhance the amenity of the centre.
- (v) Localised growth associated with surrounding agriculture and mining is anticipated. However, the location of Pittsworth on highly productive agricultural land constrains urban expansion.

Settlement Pattern		
	Future expansion of the urban area will be underpinned by community need and enhancement of services/facilities and will be managed through local planning.	
(g)	Millmerran (i) Millmerran is a rural town located on the Gore Highway approximately 75 kilometres southwest of Toowoomba. It is located near a lookout commonly used by the local aboriginal population prior to European settlement from which the town derives its name. European settlement is linked with the pastoral industry and began with the establishment of a number of pastoral stations including 'Yandilla'. (ii) Millmerran performs a major service centre role to surrounding agricultural enterprises and has a small manufacturing base. A coal-fired power station is located to the south of the town. (iii) Millmerran is a self contained community that has a range of services including a hospital, primary and secondary (P-10) schools and good sporting facilities, including the Millmerran Indoor Sports Complex, a multi-purpose sports complex that is the largest single building in Millmerran. (iv) Millmerran is home to a series of larger-than-life murals placed throughout the town to depict specific rural industries as well as, stages of the town's and district's history. The town character is dominated by grain silos. (v) The commerce area of Millmerran is located in the main street (Campbell Street) which runs north from the Gore Highway. The street is characterised by centre median street tree planting and comprises a mix of building styles,	(4) (g) N/A Site is not located within Millmerran

Settlement Pattern	
including some heritage buildings. The centre continues to be the focus for retail, commerce and community functions. (vi) New urban development occurs within the existing town and provides a variety of lifestyle choices, including larger rural residential development in the southwest of the town. Two industrial estates have been developed, including an area to the northeast that accommodates heavy industry activities. (vii) The Australian Camp Oven Festival, held in Millmerran, is a biennial event that occurs in even-numbered years.	
(5) Growth that aligns with the existing and planned community and network infrastructure, occurs in integrated and compact form to promote and create accessible and walkable communities. Opportunities for broadening the housing mix provide a variety of opportunities for all members of the community, irrespective of age, lifestyle, economic status and physical ability, providing the opportunity for the Region's residents to age in place. Such needs consist of providing a diversity of housing forms supported and reinforced by robust and appropriate economic and community based activities including education, health, employment, services and recreational facilities, that are dispersed throughout the Toowoomba Regional Council area not concentrated into an ever decreasing number of larger centres at the expense of smaller or more disparate centres. Diverse rural towns and townships retain their attractive and vibrant character which underpins the uniqueness of the Toowoomba Region area. (6) Built forms are responsive to the climatic conditions, local topographic constraints and the variability in climate that is projected to be caused through climate change. Through reinforcement of a compact urban form, lands within urban areas that have high biophysical status and scenic value are conserved. Further, Indigenous and European historic and cultural past is respected, while promoting modern architectural forms and styles. Places	(5) The proposed development provides a long-term economic benefit to the region and contributed indirectly the vibrancy and attractiveness of the western rural townships in Toowoomba. The construction phase will provide employment for up to 120 persons (peak) for a period of approximately 1½ to 2 years. Steady fulltime employment for three (3) people and drought proof income for the lessor during the operational phase of the project. Other renewable energy projects indicate that between 10 to 20% of the project will be recycled into the local community. (6) The subject site is not known to have any cultural significance for conservation

Settlement Pattern	
of natural and spiritual significance are respected and conserved. (7) Rural residential development is limited to the opportunities within existing rural residential areas. (8) Regionally significant and logistic industries will establish within the Charlton Wellcamp Enterprise Area provided that their impacts are contained within the estate borders. Other industries will be accommodated within existing industrial areas throughout the Region, both on existing vacant land and on sites that become available as existing industry relocates into the Charlton Wellcamp Enterprise Area. (9) Retail and business services will be accommodated within the network of activity centres with the Toowoomba City Centre continuing to provide the greatest amount and broadest range of activity and services to the Region. The major activity centres of Highfields, Kearneys Spring, Wilsonton, Clifford Gardens and the town centres of Oakey, Pittsworth, Crows Nest, Millmerran and Clifton will provide substantial retail, office and community functions. Other centres at the district and local levels throughout the Region will provide facilities and services at a more local scale. (10) Provision has been made for the following transport links between Toowoomba and South-East Queensland: (a) the Commonwealth Government's Inland Rail Alignment Study; (b) the Gowrie-Grandchester rail project; and (c) the Toowoomba by-pass.	(7) N/A No rural residential use is proposed (8) N/A The proposed development is not an industrial use. (9) N/A The proposed development is not a retail or business services use. (10) The proposed development does not interfere with these transportation links. Refer to Appendix E for traffic assessment.

Natural Environment	
Strategic Outcomes	Proposed Development Assessment
(1) The Toowoomba Regional Council area possesses a rich and diverse natural environment with values for air quality, water resources and land based features interconnecting as viable and sustainable ecosystems. These functions are valued for their ability to provide ecosystem services of clean air, clean water, habitat and food and fibre production for the Region, Queensland and internationally. (2) The condition, extent, diversity and connectivity of the Region's natural assets are respected,	(1) The proposed development aims to retain the natural features and geological material of the land with minimal earthworks proposed and minimal changes to the existing stormwater drainage onsite (refer to Appendices S and F). Clearing of vegetation is required to a small section of the land, but this will further improve the agricultural ability of the land once the proposed use is decommissioned. This vegetative stand has received approval from the State and Federal Government, given that it is non-significant. Refer

Natural Environment

protected, managed and enhanced. The ecological integrity and processes necessary for biodiversity to be resilient to climate change and other threats is maintained. (3) Ecosystem function and resulting ecosystem services are maintained and valued. (4) The relationship between ecosystem health and human individual and community health and well-being and the continuity of our society is recognised and respected. (5) Although the Region has been extensively cleared for agriculture, it still contains significant areas of remnant native vegetation, including: (a) 21 regional ecosystems considered to be of high endangerment; (b) 40 regional ecosystems considered to be of medium endangerment; and (c) 66 regional ecosystems considered to be of low endangerment. These areas provide habitat to a variety of endangered, vulnerable and rare flora and fauna and are conserved. Where appropriate environmental corridors are provided to enable biophysical connectivity for flora and fauna (refer to Strategic Framework Map SF2 – Natural Environment). (6) The regional landscape comprises significant elements which contribute to the character and sense of place of the Region, including: (a) the Great Dividing Range, especially the Toowoomba escarpment; (b) major tributaries of the Murray Darling Basin, including the Condamine River; and (c) significant urban water storages.	to Appendix I. (2) As stated in response to (1) the development is respectful of the natural environment. This is further evident by the practices used to install and remove infrastructure as per Appendix S ** and section *** of this report. It is noted that this criteria also refers to assisting biodiversity in achieving resilient against climate change. In a non-direct way, the solar farm will assist biodiversity, through removing CO2 otherwise pushed into the atmosphere which warms our plant and affects the biospheres ability to function. (3) The existing stormwater drainage over the land is maintained by the proposed development as described in section 4.1.14. (4) Provision of grassed landscaping over the entire site will reduce the number of pollutants exiting the site from the previous agricultural activities that have taken place. (5) The remanent vegetation identified onsite has been re-classified by DNRM as being suitable for clearing – Refer to Appendix I – which will occur. (6) The proposed development does not interfere with the natural features listed, as stated in previous responses above, and it is not on or seen from any significant ridgeline.
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Community identity and diversity

Strategic Outcomes	Proposed Development Assessment
(1) Toowoomba is a growing regional city with an increasingly cosmopolitan heart that has retained the 'country town feel' that is greatly valued by residents and visitors. (2) The self-reliant and self-contained qualities of rural towns that are an intrinsic part of the Region's	(1) The proposed development does not interfere with the 'country town feel' given its out-of-the-way location and provision of adequate screening. (2) The proposed development will provide sufficient energy to enable rural townships to

Community identity and diversity

character and identity are retained and enhanced. (3) Community facilities and housing options respond to and provide for the diversity of our communities. (4) All members of the community, irrespective of age, lifestyle, economic status and physical ability, are provided with the opportunity to make the choice to age in place. This is achieved by providing a diversity of housing forms supported and reinforced by robust and appropriate economic and community based activities including education, health, employment, services and recreational facilities. These services and facilities are dispersed throughout the Region, not concentrated into an ever decreasing number of larger centres at the expense of smaller or more disparate centres. (5) Toowoomba Region's proud sporting tradition is an important component of the communities' identity and heritage. Continuation of this tradition important and is achieved through the provision of a hierarchy of sporting parks, facilities and community support networks. (6) Residents enjoy a range of community services and facilities appropriate to their needs and feel a strong sense of community identity, safety and security in the Toowoomba Regional Council area as a whole and the specific neighbourhood in which they reside. (7) The supply and construction of private schools in the Toowoomba Region reflects the socioeconomic profile of the population, its religious and ethnic mix, access to existing private schools within the Region and patterns of preference among families. (8) A community that is planned, designed and managed so that it is sustainable, safe and able to respond to the changing environment and community landscape. (9) A continuous supply and cater for a balanced range of community facilities, including cultural and physical activity opportunities, natural environments and attractive landscapes, to meet community needs is ensured through: (a) parks and facilities - a wide range and equitable distribution of high quality, usable parks and recreation facilities; (b) recreation diversity - parks and recreation facilities of different types and scales, containing different landforms, fauna communities, vegetation types and features, and maximising opportunities to protect cultural, recreational, ecological and aesthetic values; and (c) facilities and infrastructure - high quality physical activity facilities that are appropriate for potential users.	retain their self-contained and self-reliant qualities. (3) N/A No community facilities or housing options are proposed (4) Indirectly the provision of electricity to the nearby locality will act to retain the vibrancy of these areas and enable other 'aging in place' activities to occur. (5) N/A No sporting facility is proposed (6) The proposed development does not cause any safety or security issues (7) N/A No educational facility is proposed (8) The proposed solar farm is enhancing the sustainability and continued supply of electricity to service the communities needs (9) N/A No community facility is proposed.
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Natural resources and landscape	
Strategic Outcomes	Proposed Development Assessment
(1) Scenic landscapes are valued and protected and natural resources are well managed. (2) The protection and conservation of water resources is critical to the sustainability of all activities in the Region. (3) Diversified rural production is: (a) sustainably managed; (b) adaptive to changing markets and the highest and best use of land; and (c) efficient and adaptive to changing climatic conditions. (4) The economic benefits of extracting non-renewable resources are balanced against: (a) socio-economic and environmental impacts; and (b) the long term sustainable use of the land for non-extractive renewable activities. (5) Land and energy resources are sustainably managed to allow communities to meet present and future needs while not compromising the ability of future generations to meet their needs. (6) Development in and adjacent to natural resource areas is managed to prevent and otherwise minimise impacts on the continued and future use of the resource. (7) Use of the land and its natural resources is undertaken in a way that does not cause an adverse impact on the environment. (8) Natural ecosystems and water resources are critical to the sustainability of all activities in the Region and are to be protected and conserved.	(1) Positioning solar panels so that they follow the natural contours of the land reduced the disturbance to the land via earthworks. In addition, landscaping around the perimeter of the solar farm is proposed as a screening measure to residents and drivers along Yarranlea Road. Pasture grass is proposed underneath the solar panels. This is further justified by a visual assessment (Refer to Appendix J, which confirms that the overall significance of the project is low when considering the broader viewscape in which the use is located. Thus, the scenic landscape of the rural land is protected. (2) As mentioned in the above table stormwater resources are protected by the proposed development. Refer to Appendix F. (3) Rural production of the balance portion of the subject site will adhere to the diversification of rural production, most likely in conjunction with nearby agricultural lands. It is notable that this use is in direct response to changing climatic conditions which has a global impact on the ability of rural production. In that regard it is the best use of the land, being able to have a wider range of impact to benefit the long-term viability of rural production, which is more the loss of production from non-utilising the site for insensitive agricultural production for the next 30 years. (4) The proposed development is renewable, and it is noted that this is the preferred development type in this criterion, being a long-term sustainable use of the land that is non-extractive and renewable. (5) The agricultural use of the land can, and will, be renewed upon decommissioning of the solar farm. Refer to Appendix S and landscaping plans in Appendix A. The proposed development enables the community to meet their energy needs with minimal impact, and without compromising the future ability of the land to revert back to cropping production in long-term. (6) The natural resource of the land being water and soil is not impacted by this development as shown in Appendix F, A and S. (7) The solar farm caused less impact on the

Natural resources and landscape

	environment than traditional forms of harnessing energy (coal fired power plants), and as described in our report will have a low impact on the environment throughout construction and operation as described in Appendix F, A and S. (8) As described in the above tables the natural waterways as present on the land are preserved by this development. Refer to Appendix F.
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Access and mobility

Strategic Outcomes	Proposed Development Assessment
(1) Toowoomba Region is serviced by a road, rail and air network that provides practical transportation options which ensures the continuity and establishment of robust and complete communities by providing connection and mobility for all. (2) A sustainable integrated transport system provides effective rural and urban road and rail as well as air connections for the safe and efficient movement of people, the provision of services and distribution of freight, within and beyond the Region, without significantly diminishing the amenity of the communities that transport networks transect. (3) The Region's road network comprises: (a) quality rural and urban roads that support the needs of the community and the functions of freight, passenger transport and active transport; (b) higher order arterial roads that support significant inter-regional and intra-regional vehicle movements; (c) connected highways that support intra-regional vehicle movements and freight movements; (d) local roads dedicated to local people, which enhances the level of amenity experienced within neighbourhoods; and (e) roads which retain character elements identified within the Region through comprehensive landscaping and inclusion of pedestrian and where appropriate separate cycle networks. (4) The Region offers sustainable travel choices and significant investment in viable alternatives to individual car-based travel, through well established public, passenger and active transport infrastructure and services including car share, bus services, cycle and pedestrian networks. (5) Investment in the transport system is based on minimising the impacts of transport on the health of the	(1) The solar farm does not interfere with any of the transportation modes listed (2) The proposed development does not interfere with the urban road or rail movements of the region as demonstrated in Appendix E. (3) The proposed development does not interfere with the urban road movements of the region as demonstrated in Appendix E. (4) The proposed development does not interfere with travel choices. (5) No requirement to upgrade the existing network was found. Refer to Appendix E.

Access and mobility

community and the environment, while addressing the accessibility needs of all community members. These opportunities are maximised by promoting compact walkable mixed-use communities that are highly self contained, maximising short trips and minimising long trips for social, commercial, entertainment and recreation activities and especially the daily commute. (6) Pedestrian and cycle networks are designed to provide safe, efficient and legible connections between residences, centres and other logical destinations. Integrating the Region's natural environment with the pedestrian and cycle network is a key feature in providing an enjoyable and safe facility. (7) Car parking is designed to meet the logical needs of uses and patrons; it should not dominate or detract from the amenity of use or destination or deter the use of active and transport passenger modes. (8) Investment in our future transport system is supported through the protection and preservation of transport infrastructure corridors from encroachment by incompatible uses. Protection of future transport corridors will assist in provision of the Toowoomba Bypass, Gowrie-Grandchester rail project, Commonwealth Government's Inland Rail Alignment Study and greater capacity within the Toowoomba Airport. (9) Options to enable larger aircraft to land within the Region will be explored with the Army Aviation Airfield at Oakey to be considered as one option. (10) Safe, integrated, accessible and well connected local communities, both physically and through community participation and ownership, including provision of active transport infrastructure for connectivity, mobility and accessibility for residents and encouragement of physical activity through more walking and cycling trips whether for recreation or to and from nearby destinations. <i>Transport Planning and Coordination Act 1994</i> (TPCA) defines active transport infrastructure as – Infrastructure for use in connection with active transport, including the following: (a) a path or walkway for use by pedestrians; (b) a path, lane or other infrastructure for use by cyclists; (c) a device or facility designed and constructed for parking bicycles; and (d) an end-of-trip facility.	(6) No requirement for pedestrian or cycle networks was found. Refer to Appendix E. (7) Carparking proposed is adequate to meet the needs of the number of employees onsite at any one time, being 3, and being small does not dominate the amenity of the area. (8) No known transportation infrastructure corridors are encroached upon by this development. (9) The proposed development is not a hindrance to flights given the examples provided in section 4.1.9 of the report. (10) N/A This facility is not able to provide such measures given the type of activity proposed.
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Infrastructure and services

Strategic Outcomes	Proposed Development Assessment
(1) Infrastructure and services:	(1) The proposed solar is strategically located

Infrastructure and services	
(a) are planned, delivered and managed in an integrated manner to promote efficient development; (b) support the desired quality of life for current and future generations whilst protecting the surrounding environment; (c) are delivered to ensure the timely provision of infrastructure, guides and services growth within the Region; and (d) are prioritised to best utilise public resources and to ensure the community's needs are met. (2) The Region's water is managed in a holistic total water cycle basis to secure a sustainable supply to our water-wise community. (3) Council is committed to securing our community's water needs in the long term by ensuring: (a) the principal water source of Cooby Dam is preserved and enhanced to ensure that water supply is not compromised; (b) alternative water supply methods, including bores, are maintained to ensure that the demands for water resources are met; and (c) further implementation of water efficient technologies are highly supported within the Region to ensure the efficient use of this resource. (4) Public and environmental health is protected through effective wastewater and stormwater management. (5) Environmental impacts due to the generation of waste are minimised through improved consumption behaviour, effective recycling infrastructure and practices and the reduction of emissions from landfills. (6) Up-to-date information and communications technology is accessible to all sectors of the community. (7) Energy infrastructure has sufficient capacity and is located in areas able to support the needs of the Region and considers low emission energy generation.	near an existing substation in a planned move to ensure efficient transfer of electricity into the National Electricity Market (NEM) for distribution. The proposal supports the current and future generations by provided renewable energy that has a known reduced impact on the environment. Delivery of this infrastructure will assist in driving the economy of this region No public resources are required (2) Water that falls on the site will support the grasslands underneath the solar panels. (3) No change to the proposed water resources will occur as a result of this development (4) Existing agricultural pollutants on the land will be retained by the proposed pasture grasses over the site, which will improve the quality of stormwater running off the site. Effluent is to be treatment and disposed of onsite. (5) As discussed in (4) (6) N/A (7) Refer to response to (1). The existing substation has capacity for additional electricity to be supplied to the benefit of the wider community needs, via this solar farm. If there was no need in the region for this electricity supply, then this application would not be submitted.

Economic development	
Strategic Outcomes	Proposed Development Assessment
(1) The Toowoomba Region has a strong, prosperous and progressive economy that contributes to the health and wellbeing of both rural and urban communities and contributes to the character and liveability of the Region. (2) The Region promotes a diverse range of business,	(1) The proposed development ensuring that the economy of Toowoomba is strengthened by the provisions of renewable electricity to service the region and beyond. (2) The solar farm is an innovative and

Economic development

industry and tourism activity that is innovative, environmentally sustainable and generates a diverse range of employment opportunities. (3) Toowoomba City is the principal activity centre for the Region and provides a mix of businesses, industries and services which are readily accessible to our local and regional communities. (4) Our rural communities have strong and viable economies which support and are underpinned by a sustainable rural production sector. Readily accessible activity centres are located across the Toowoomba Regional Council area. (5) The Toowoomba Region supports two prime sectors of regional growth: (a) energy, through the Surat Energy province includes coal, coal seam gas, coal seam gas water, ethanol and power station development has the potential to more than triple the Gross Regional Product and create more than 16,000 new jobs in the Region over the next 22 years; (b) food processing, centred on value adding to agricultural production from the Darling Downs; and (c) in addition the Region has also fostered and expanded upon its expertise in offering administrative (Federal, State and Local Government), quality health and education services (both public and private); local tourism, fibre composite advanced manufacturing, agribusiness and aviation/Defence. (6) Energy and allied industries provide a significant opportunity to maximise economic outcomes for the Region. The on-going development of the Region's energy resources will provide significant flow-on effects to supply chain businesses from mining services and other sectors including construction, infrastructure, transportation and accommodation. (7) The Commonwealth Government's Inland Rail Alignment Study, completed in 2010, established that the North-South Rail Corridor connecting Melbourne and Brisbane along the Western Corridor will meet future freight demand nationally and internationally between 2030 and 2035 or earlier if the total tonnage of 25-26 million tonnes per annum is reached. The current interstate tonnage is approximately 5.2 million tonnes per annum. It is anticipated that this corridor will alleviate freight demands on the Melbourne-Sydney and Sydney-Brisbane coastal routes. It will also bring a national freight focus to the Toowoomba Regional Council area, enhancing market access and facilitating development, particularly the Charlton	environmentally sustainable use that generates further employment opportunities both directly and indirectly. (3) N/A The development is not located within Toowoomba City (4) The proposed solar farm creates a strong economy of support to the local rural area of Yarranlea and beyond. (5) The development will add to the energy sector which is one of Toowoomba's regional growth strategies (a). (6) As stated above, the solar farm will add to the energy sector which is part of Toowoomba's regional growth strategy. The additional electricity supply will be to the benefit of the community who are afforded more options to expand different business enterprises which in turn generates employment. (7) The proposed development does not interfere with the proposed inland railway line.
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Economic development	
Wellcamp Enterprise Area. (8) The Charlton Wellcamp Enterprise Area, located 13km west of Toowoomba at the junction of the Warrego, New England and Gore highways, provides much needed industrial land for the Region. The Toowoomba Regional Council sees the area as having potential to be a key catalyst for business growth, leading to a more self-sustained economy. (9) Economic development in the Region is supported by an efficient, sustainable and responsive freight system that meets the needs of the community and industry in the Region.	(8) N/A The development is not located in the Charlton Wellcamp Enterprise Area (9) N/A The development does not interfere with the regional freight system.

Given the above material it can be concluded that the proposed development **COMPLIES** with the Strategic Outcomes of Toowoomba Regional Planning Scheme v10 (20May2016).

5.5 Local Government Code Assessment

The proposal is for a Renewable Energy Facility (100MW) and is consistent with the definition of a Rural Use within Toowoomba Regional Council. The proposal has been designed to comply with the applicable Toowoomba Regional Planning Scheme v10 (20May2016), being;

- Rural Zone Code
- Rural Uses Code
- Environmental Standards Code
- Integrated Water Cycle Management Code
- Landscaping Code
- Transport, Access and Parking Code
- Works and Services Code
- Environmental Significance Overlay
- Agricultural Land Overlay Code
- Water Resource Catchment Overlay Code
- Reconfiguring a Lot Code

Statements of the proposal's compliance with the Acceptable Solutions and Performance Criteria of the relevant Codes are provided in Appendix B of this report.

It is noted that Toowoomba Regional Planning Scheme v10 (20May2016) also requires that the proposed development be assessed against 'State Planning Policy 4/10 Healthy Waters — Appendix 1 Development Assessment Code'. However, this SPP has been repealed on 2 December 2013, and its relevant provisions rolled into State Planning Policy (SPP) July 2014, for which the proposed development has been assessed against as detailed in section 5.2 of this report.

Given above material it can be concluded that the proposed development **COMPLIES** with the Code Assessable material in the Toowoomba Regional Planning Scheme v10 (20May2016).



6. Conclusion

This planning report addresses an application for a Development Permit for a Material Change of Use - Renewable Energy Facility (100MW) and Reconfigure a Lot – Six (6) Leases over 10 years, for Yarranlea Solar Pty Ltd over land within the Toowoomba Regional Council.

As demonstrated in this report, the proposed use complies with the assessment criteria of the Local and State Government planning instruments which are applicable to such a development.

Furthermore the proposed development contributes to one of two prime growth sectors of region of Toowoomba, being Energy. By enabling this innovative and environmentally sustainable use to proceed, the economic opportunities and diversity of growth within the region will be enhanced.

We therefore submit that the proposed Renewable Energy Facility and Lease areas be **APPROVED**.



Appendix A – Development Plans

Drawings prepared by i³ Consulting Pty Ltd

Document No:	Document Description
A01 Rev E	PROJECT OVERVIEW STAGING PLAN
A02 Rev E	STAGE 1 GA PLAN
A03 Rev D	STAGE 2, 3 AND 4 GA PLANS
A04 Rev C	SUBSTATION PLAN
A05 Rev C	INVERTER, SOLAR PANEL AND FENCE DETAILS
A06 Rev A	BATTERY STORE AND CONTROL ROOM FLOOR PLAN
A07 Rev C	BATTERY STORE AND CONTROL ROOM ELEVATIONS
A08 Rev C	LEASE PLAN
A09 Rev A	OVERALL PLAN
A10 Rev A	EXISTING ERGON TRANSMISSION LINES
A11 Rev A	PERMIT TO OCCUPY LAYOUT
A12 Rev A	NEW FARM SHED FLOOR PLAN
A13 Rev A	NEW FARM SHED ELEVATIONS
L01 Rev B	TYPICAL LANDSCAPING PLAN
C01 Rev A	STORMWATER MANAGEMENT PLAN
C02 Rev A	STORMWATER DETAILS PLAN



Appendix B – Planning Scheme Codes



Appendix C – Pre-lodgment Meeting Minutes

Meeting Minutes Reference No:	Relevant Authority
PREL/2016/104	TOOWOOMBA REGIONAL COUNCIL
SPL-0116-027196	DEPARTMENT OF STATE DEVELOPMENT, INFRASTRUCTURE AND PLANNING



Appendix D – Traffic Impact Report



Appendix F – Stormwater Report



Appendix G – Community Consultation



Appendix H – Ecological Assessment



Appendix I – Clearing Permits



Appendix J – Visual Amenity Assessment



Appendix K – Glare Assessment



Appendix L – Agricultural Scientist



Appendix M – Public Notification Documentation



Appendix N – Geotechnical Report



Appendix O – EMR Report



Appendix P – Ecological response to public submissions



Appendix Q – Ecological response to Council RFI



Appendix R – Solar Panel Safety Sheet



Appendix S – Decommissioning Report



Appendix T – Lighting Assessment



Appendix U – Property Valuation



Appendix V – EMP
